



材料安全数据表
Material Safety Data Sheet

报告编号: 20211215002
MSDS NO.: 20211215002

Section 1 - Chemical and company identification 第一部分 化学品和公司标识				
产品名 Product Name	可充电聚合物锂离子电池组 Rechargeable Li-ion Polymer Battery			
样品型号 Type/Mode	AEC652035	3.7 V	400 mAh	1.48 Wh
能量值 Energy Value	1.48 Wh/pcs			
最大锂含量 Equivalent Max Lithium Content	0.12 g/pcs			
制造商 Manufacturer	广东国光电子有限公司 Apower Electronics Co.,Ltd.			
地址 Address	中国广东省广州市花都区新雅街镜湖大道8号 No.8, Jinghu Road of Xinya Street, Huadu District, Guangzhou City, Guangdong Province, P.R.China			
邮政编码 Postal Code	510800			
联系电话 Telephone No.	86-20-28609370			
紧急情况请联系 In case of emergency contact	13825751749			
鉴定依据 Inspection according to	依据GB/T 16483-2008&ISO11014:2009编制 According to GB/T 16483-2008&ISO11014:2009			
电子邮箱 E-mail	testing@aecbattery.com			
签发日期 Issue Date	2021/12/9			
有效日期 validity date	2022/1/1	—	2022/12/31	

Section 2 - Hazards identification 第二部分 危害识别	
<p>危害识别： 完好的电池在正常使用下不存在危险性。 锂离子电池组的构成物质：铝，镍，铜，石墨，电解液，六氟磷酸锂，镍钴锰酸锂和溶剂，以上物质不在SVHC219种高关注物质清单内，所以无危险性。</p>	
<p>Hazard identification: A good battery poses no danger in normal use. Lithium ion battery pack components: aluminum, nickel, copper, graphite, electrolyte, lithium hexafluorophosphate, lithium nickel cobalt manganese acid and solvent, the above substances are not in the SVHC219 list of high concern substances, so there is no danger.</p>	

Section 3 - Composition/Information on Ingredients 第三部分 成分/组成信息				
Ingredient Name 主要部件		Composition Material 组成材料	CAS No.	Concentration 含量
Positive 正极	Tab 极耳	Aluminum(Al) 铝	7429-90-5	0.11%
		Polypropylene 聚丙烯	9003-07-0	0.03%
	Slurry 浆料	Li(NiCoMn)O2镍钴锰酸锂	182442-95-1	40.52%
		NMP 烷铜	872-50-4	0.00%
			Aluminum(Al) 铝	7429-90-5
Negative 负极	Tab 极耳	Nickel(Ni) 镍	7440-02-0	0.35%
		Polypropylene 聚丙烯	9003-07-0	0.03%
	Slurry 浆料	Graphite 石墨	7782-42-5	22.11%
		Carbon black 导电碳	1333-86-4	1.34%
			Cu 铜	7440-50-8
Septum隔膜 (PP/PE)		PP	9003-07-0	0.00%
		PE	9002-88-4	3.93%
Al lamination film 铝塑膜		Aluminum(Al) 铝	7429-90-5	1.51%
		Polypropylene 聚丙烯	9003-07-0	0.57%
		O-Ny 尼龙	24937-16-4	0.94%
Electrolyte 电解液		lithium Salt 锂盐	21324-40-3	2.04%
		Solvent 溶剂	confidential	13.43%
Adhesive Tape 胶带		Polyimide PI膜	62929-02-6	0.05%
		Silicone 硅油	63148-58-3	0.00%
Inert components 惰性成分			...	balance

- trade secret claims.
- 商业保密声明

Because chemical composition involving company technology , the component ratio listed is an approximation, and for some trace amounts of harmful components not listed.

因化学组分涉及公司技术，故所列组分比例均为近似值，且对一些极微量的不对人体有害的组分未有列出。

Section 4 - First-Aid Measures 第四部分 急救措施
<p>吸入：使受害者呼吸畅通，必要时寻找医药救助。</p> <ul style="list-style-type: none"> • Inhalation: Make the victim blow his/her nose, gargle. Seek medical attention if necessary
<p>皮肤接触：立即脱去受污染的衣服和鞋子。立即用肥皂和大量的水清洗外部受污皮肤。</p> <ul style="list-style-type: none"> • Skin contact: Remove contaminated clothes and shoes immediately. Immediately wash extraneous matter or contact region with soap and plenty of water.
<p>眼睛接触：不要揉眼睛。立刻用水不断的冲洗眼部至少15分钟。寻找医药救助。</p> <ul style="list-style-type: none"> • Eye contact: Do not rub eyes. Immediately flush eyes with water continuously for at least 15 minutes. Seek
<p>摄入：使食入者立即呕吐。并立即寻找医药救助。</p> <ul style="list-style-type: none"> • Ingestion: Make the victim vomit. Immediately seek medical attention.

Section 5 - Fire-Fighting Measures 第五部分 消防措施
<p>危险特性：如果电池已经破解，电池内的电解质溶液将是易燃的。电池在过热时可能会破解，这可能导致易燃或腐蚀性材料的释放。</p> <p>Hazardous Properties: If the battery has been cracked, the electrolyte solution in the battery will be flammable. Batteries can crack when overheated, which can lead to the release of flammable or corrosive materials.</p>
<p>有害危险产物：一氧化碳，二氧化碳，锂氧化物浓烟。</p> <p>Hazardous combustion products: CO, CO₂, Lithium oxide flue gas.</p>
<p>灭火措施：</p> <ul style="list-style-type: none"> • 特殊的灭火方法：当电池与其他易燃物同时燃烧时，应采取与该易燃物相应的灭火措施，尽可能的在顺风向灭火。 • 灭火时需要保护器材. 呼吸保护：供呼吸的气筒设备或防护面具。手部保护：护手套。眼部保护：护目镜。或者其他设计用来防止液体进入眼睛。皮肤及身体保护：防护装。 <p>Fire-Fighting Measure:</p> <ul style="list-style-type: none"> • Specific methods of fire-fighting: When the battery burns with other combustibles simultaneously, take fire extinguishing method which corresponds to the combustibles. Extinguish a fire from the windward as much as possible. • Special protective equipment for firefighters. Respiratory protection: Respiratory equipment of a gas cylinder style or protection-against-dust mask. Hand protection: Protective gloves. Eye protection: Goggle or protective glasses designed to protect against liquid splashes. Skin and body protection: Protective clothes.
<p>灭火介质：对锂电池，大量冷水是一个有效的灭火剂。不要使用温水或热水，不要使用哈龙类灭火材料。可使用干粉、沙、土。</p> <p>Extinguishing media: For lithium-ion batteries, plenty of cold water is an effective extinguishing agent. Do not use warm or hot water and do not use halon extinguishing materials. Can use dry powder, sand, soil.</p>

Section 6 - Accidental Release Measures 第六部分 意外泄露措施
<p>如果电池发生泄露，马上移去易燃物质，所有人员需要撤离泄露区域直到电池冷却和烟气消散。然后提供最大的通风以清除有害气体，避免皮肤和眼睛接触或吸入蒸汽。可以用砂，土，吸收剂或其他惰性物质除去溢出液体。</p> <p>If the battery leaks, remove the flammable material immediately and all personnel need to evacuate the leaking area until the battery cools and the fumes dissipate. Maximum ventilation is then provided to remove harmful gases and to avoid skin and eye contact or inhalation of vapors. Sand, soil, absorbent, or other inert material can be used to remove the spilled liquid.</p>
<p>废弃物处置方式：将电池扔进废气盒之前，先将其在电阻超过5欧姆的条件下放电至零压，将废弃电池放入有对应标识的废弃盒。</p> <p>Waste disposal method: before throwing the battery into the exhaust gas box, first lower the battery to zero voltage under the condition that the resistance exceeds 5 ohm, and then put the waste battery into the waste box with corresponding label.</p>

Section 7 - Handling and Storage

第七部分 处理和储存

处理: Handling:

- 1, 不要用金属制品处理电池
- 1, Do not treat batteries with metalwork
- 2, 不要将电池放入火中或置于高温中
- 2, Do not put the battery in a fire or high temperature
- 3, 不要打开、销毁或焚烧电池, 因为电池可能泄露破裂, 释放有害物质
- 3, Do not open, destroy, or burn batteries as they may leak and rupture, releasing harmful ingredients
- 4, 不要让电池收到过度物理冲击或震动
- 4, Do not allow the battery to receive excessive physical shock or vibration
- 5, 不要将电池浸入水中或弄湿
- 5, Do not immerse batteries in water or get them wet

储存: Storage:

- 1, 不要把电池和其他材料一起储存, 电池应存在不燃, 干燥, 通风良好的条件下。墙壁和电池堆之间应该有足够的间隙
- 1, Do not store the battery with other materials. The battery should be kept under non-flammable, dry and ventilated conditions. There should be enough space between the wall and the battery stack
- 2, 将电池储存在阴凉, 干燥, 通风良好的条件下 (温度-20~30℃, 湿度45~85℃)。不要长时间暴露在阳光直射下。远离火源和热源, 不要用氧化剂和酸保存样品。
- 2, Store the battery in a cool, dry, well-ventilated environment (temperature -20~30℃, humidity 45-85℃). Don't be exposed to direct sunlight for long periods of time. Keep away from fire and heat sources and do not store samples with oxidizing agents and acids.
- 3, 储存电池的地方应该配备足够数量的有效灭火介质的灭火器。储存地方还应配备适当的掩蔽材料, 以便意外泄露时处理。
- 3, The battery storage area should be equipped with a sufficient number of fire extinguishers with effective fire extinguishing media. The storage area should also be equipped with appropriate masking materials to handle accidental leaks.
- 4, 对于可充电电池, 即使长时间不适用电池, 也需要定期 (如每6个月) 将电池充电到制造商规定的电量
- 4, For rechargeable batteries, it is necessary to charge the battery to the amount specified by the manufacturer at regular intervals (e.g. every 6 months), even if the battery is not applicable for a long period of time

Section 8 - Exposure Controls/Personal Protection

第八部分 暴露控制/个人防护

工程控制 Engineering control

使用局部排气或其他工程控制来控制灰尘, 雾, 浓烟等。远离热源和明火。存储在阴凉干燥的地方。

Use local exhaust or other engineering controls to control dust, fog, smoke, etc. Keep away from heat and open flames. Store in a cool, dry place.

呼吸保护 Respiratory protection

正常使用条件下不需要。在紧急救援或疏散情况下, 需要佩戴呼吸器。

Not required under normal service conditions. In case of emergency rescue or evacuation, a respirator is required.

皮肤和身体保护 Skin and body protection

正常使用条件下不需要。如果在处理破裂或泄露电池时, 需要带上防护手套和防护服。

Not required under normal service conditions. Wear protective clothing if dealing with broken or leaked batteries

手部保护 Hands protection

正常使用条件下不需要。如果在处理破裂或泄露电池时, 请戴上耐磨耐化学腐蚀橡胶手套。

Not required under normal service conditions. Wear wear-resistant and chemical-resistant rubber gloves when handling cracked or leaked batteries.

<p>眼睛保护 Eyes protection 正常使用条件下不需要。如果在处理破裂或泄露电池时，请戴上护目镜。 Not required under normal service conditions.Wear goggles if you are handling cracked or leaked batteries.</p>
<p>卫生措施 Hygienic measure 不要在工作区域吃，喝，吸烟，保持良好工作环境。 Do not eat, drink or smoke in the working area. Keep a good working environment.</p>

Section 9 - Physical and Chemical Properties 第九部分 物理和化学性质	
外观 Appearance	金属色 Metallic color
形状 Form	几何固体 Geometric solid
物理状态 Physical state	固体 Solid
气味 Odor	无 No odor
溶解度 Solubility	不溶于水 Insoluble in water
闪点 Flash point	NA
密度 Density	NA
爆炸特性 Explosion properties	NA
酸碱度 PH	NA

Section 10 - Stability and Reactivity 第十部分 稳定性和反应性	
<p>稳定性 Stability 常温常压下正常使用是稳定的 It is stable under normal use at room temperature and pressure.</p>	
<p>应避免的条件 Conditions to be avoided 当电池处于外部短路，压力，变形或超过100℃高温时将产生大量热和燃烧，避免阳光直照和高温。 When cell is exposed to an external short-circuit, crushes, deformation, high temperature above 100 degree C, it will cause heat generation and ignition. Avoid direct sunlight and high humidity.</p>	
<p>应避免的材料 Materials to avoid 可导电材料：水，海水，强氧化剂和酸 Conductive materials, water, seawater, strong oxidizers and strong acids.</p>	
<p>危险聚合 Hazardous polymerization 不会发生 Will not occur</p>	
<p>分解产物 Decomposition product 一氧化碳，二氧化碳，锂氧化物浓烟 CO, CO2, Lithium oxide flue gas.</p>	

Section 11 - Toxicological Information 第十一部分 毒理性信息
<p>刺激：当电池被机械，热或电滥用到内部物质暴露的情况下，蒸汽烟雾可能会对眼睛和皮肤有刺激性。如：吸入对肺有刺激性，皮肤接触对皮肤有刺激性，眼睛接触对眼睛有刺激性，食入会中毒。</p> <p>Irritation: Vapor fumes may irritate eyes and skin when the battery is mechanically, thermally or electrically abused to the extent that the interior material is exposed.Irritant to the lungs by inhalation, to the skin by skin contact, to the eyes by eye contact, and may be toxic if ingested.</p>
<p>急性毒性：没有可用信息</p> <p>Acute toxicity: No information available</p>
<p>亚急性和慢性毒性：没有可用信息</p> <p>Subacute and chronic toxicity: No information available</p>
<p>致敏作用：电池中的液体可能会对某些人有致敏作用，长期接触或反复接触也有可能会有敏化作用。</p> <p>Allergic effect: the liquid in the battery may sensitize some people, long-term contact or repeated contact may also have sensitization effect.</p>
<p>致突变性：没有可用信息</p> <p>Mutagenicity: No information available</p>
<p>致癌性：钴及其钴的化合物有致癌的风险</p> <p>Carcinogenicity: Cobalt and its compounds have the risk of causing cancer</p>
<p>下列情况下会危险人员身体健康：如果与电池内部材料直接接触，皮肤可能会出现干燥，灼烧等轻微或严重的刺激，并且损坏靶器官的神经，肝脏和肾脏。</p> <p>If the battery material comes into direct contact with the battery material, the skin may be dry, burning and other minor or severe irritation, and damage to the nerves, liver and kidneys of the target organs.</p>

Section 12 - Ecological Information 第十二部分 生态信息
<p>生物毒性：没有可用信息</p> <p>Biotoxicity: No information available</p>
<p>生物降解性：没有可用信息</p> <p>Biodegradability: No information is available</p>
<p>非生物降解性：没有可用信息</p> <p>Non-biodegradability: No information is available</p>
<p>土壤流动性：没有可用信息</p> <p>Soil mobility: no information available</p>
<p>生物积累：没有可用信息</p> <p>Bioaccumulation: No information available</p>
<p>其他有害影响：锂离子电池组的处置必须按照专业处理：企业按照政府以及当地政府要求，处理有害废弃物，对废弃物的运输。不允许个人进行焚烧电池或电池组，可能造成水或土壤污染。</p> <p>Other harmful effects: the disposal of lithium-ion battery packs must be handled professionally: the enterprise shall handle hazardous wastes and transport wastes in accordance with the requirements of the government and local government.Individuals are not allowed to burn batteries or battery packs, which may cause water or soil contamination.</p>

Section 13 - Disposal Considerations 第十三部分 废弃处置
<p>废弃处置方法：应遵循国家或地方法规进行处置或再利用</p> <p>Disposal method: national or local laws and regulations should be followed for disposal or reuse</p>
<p>废弃处置注意事项：废电池不能当做普通垃圾。为防止短路，处置前应将电池完全放电。不能扔进火中或置于高温下。不能解体，穿刺或类似的处理。电池含有可回收材料，建议回收利用。处理过程可参考MSDS中的第八部分 暴露控制和个人防护。</p> <p>Disposal precautions: waste batteries can not be treated as ordinary garbage.To prevent short circuit, the battery should be completely discharged before disposal.Do not throw it into fire or heat.Do not disintegrate, puncture or similar procedures.Batteries contain recyclable materials. Recycling is recommended.Refer to section 8 of the MSDS for treatment of exposure control and personal protection.</p>
<p>电池处理应由获得国家或地方法规的许可的具有危险废物处置和危险废物运输的专业处理公司进行</p> <p>Battery treatment should be carried out by a professional treatment company with hazardous waste disposal and transportation approved by national or local regulations</p>

Section 14 - Transport Information 第十四部分 运输信息		
<p>运输前，每一个电池设计均需要通过联合国试验和标准手册38.3节所载的测试。锂电池分为“锂电池”，“锂电池与设备打包”和“锂电池装在设备中”三种形式出货。</p> <p>Before shipping, each battery design is required to pass the tests contained in section 38.3 of the United Nations Manual of Tests and Standards.The lithium battery is divided into "lithium battery", "lithium battery and equipment packaging" and "lithium battery installed in the equipment" three forms of shipping.</p>		
<table border="0" style="width: 100%;"> <tr> <td style="width: 30%; text-align: center;">UN 编号 UN NO.</td> <td style="text-align: center;">UN3480 UN3481</td> </tr> </table>	UN 编号 UN NO.	UN3480 UN3481
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<table border="0" style="width: 100%;"> <tr> <td style="width: 30%; text-align: center;">运输标签 label of conveyance</td> <td style="text-align: center;">锂离子操作标签 Lithium Battery Label 第九类危险品标签 Class 9 Hazard Label 仅限货机标签 Cargo aircraft Only Label</td> </tr> </table>	运输标签 label of conveyance	锂离子操作标签 Lithium Battery Label 第九类危险品标签 Class 9 Hazard Label 仅限货机标签 Cargo aircraft Only Label
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<p>危险性分类： 该电池包应遵循IATA DGR 63版包装说明965/966/967的运输要求</p> <p>The battery pack shall comply with the shipping requirements of IATA DGR 63 Package Instructions 965/966/967</p> <p>该电池包应遵循IMDG（40-20）或“关于危险货物运输的规章范本”的特殊规定188</p> <p>The battery packs shall be in accordance with Special Rule 188 of IMDG (40-20) or 《Recommendations On The Transport of Dangerous Goods-Model Regulations》</p>		

Section 15 - Regulatory Information

第十五部分 法规信息

国际航空运输协会《危险品规则》（63版）
 IATA《Dangerous Goods Regulations》（63版）
 《对危险货物运输的有关规定的建议》
 《Recommendations On The Transport of Dangerous Goods-Model Regulations》
 《国际海运危险货物规则》（40-20版）
 《International Maritime Dangerous Goods Code》（IMDGCODE）（40-20版）
 《国际危险货物道路运输欧洲协定》（ADR）
 《European Agreement concerning the International Carriage of Dangerous Goods by Road》
 《国际危险货物铁路运输欧洲协定》（RID）
 《Regulations concerning the International Carriage of Dangerous Goods by Rail》
 《职业安全卫生法》
 《Occupational Safety and Health Act》
 《有毒物质控制法》
 《Toxic Substances Control Act》
 《美国联邦法规》
 《Code of Federal Regulations 》（CFR）
 符合所有联邦，州和地方法律
 Comply with all federal, state and local laws

Section 16 - Other Information

第十六部分 其他信息

此版的MSDS编写于	2021/12/9
This edition of MSDS was prepared at	2021/12/9

需要更多信息请联系: For more information please contact:

李奇军 Albert Li

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手机: 13825751749

Mob: 13825751749

官网: www.aecbattery.com

URL: www.aecbattery.com

邮箱: qc@aecbattery.com

E-mail: qc@aecbattery.com

备注: 电池组在运输中是安全的, 建议使用干粉灭火器以防爆炸或者燃烧的情况出现。

Remark: The batteries are safe for transportation, and it is advised to use dry power fire extinguisher in case of explosion or inflammation