MATERIAL SAFETY DATA SHEET（物质安全数据表）

1. Product and Company Identification（产品及公司识别）

A. Product Identification（产品识别）

Lithium ion Rechargeable Battery Pack （锂离子二次电池组）

B. Battery Product Matrix（电池产品矩阵）

Battery Name （电池名称）	Product P/N （产品料号）	Battery Rating （电池组规格）	Cell Applied （电芯规格）
VM13-147	DAKB014K0-T091J01LT	36V-14 Ah 504Wh	LGC-MJ1(3.5Ah,12.6Wh) 18650 CL cell

Notice 1: CL – Cylindrical type; PM – Prismatic type; PY – Polymer type

Notice 2:

Lithium ion cells and batteries may be offered for transport if they meet the following :

*** for cells, the Watt-hour rating is not more than 20 Wh;**

*** for batteries, Watt-hour rating must be marked on the outside of the battery case**

注记 1: CL – 圆筒型 Cylindrical type; PM – 角型 Prismatic type; PY – 锂聚合物 Polymer type

注记 2

锂离子电池芯和电池组运送，符合下列:

*电池芯，容量不大于 20 瓦特-小时;

*电池组，瓦特-小时 容量要标识在电池组外部

MANUFACTURER（制造商）

Headquarter （总部）

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2. Hazards Identification（危害辨识数据）

Hazard classification:

The product is not classified for GHS. The batteries are defined as "articles", they are exempt from the requirements of the Hazard Communication Standard.

Primary routes of entry: Skin contact. Skin absorption, eye contact, inhalation and ingestion: NO

Symptoms of exposure: Skin contact. No effect under routine handling and use.

Skin absorption: No effect under routine handling and use.

Eye contact: No effect under routine handling and use.

Inhalation: No effect under routine handling and use.

Reported as carcinogen: Not applicable

According to the OSHA Hazard Communication Standard (29 CFR 1910.1200) this product is not classified as hazardous.

主要进入途径: 皮肤接触，皮肤吸收，眼睛接触，吸入和食入- 无

暴露症状: 皮肤接触，在一般处置及使用下无影响

皮肤吸收: 在一般处置及使用下无影响

眼睛接触: 在一般处置及使用下无影响

吸入: 在一般处置及使用下无影响

致癌物质: 未被分类

3.Composition/information on ingredients（组成辨识数据）

Composition

CAS number（化学文摘社登记号码）: Not specified未被分类(A-1 and A-2):

A-1. Cases: Plastic or Metal Not dangerous （外壳: 塑料或金属，非危险物质）

A-2. Printed Circuit Board Assembly Not dangerous （印刷电路板组装，非危险物质）

A-3. Lithium Ion Cell（锂离子电池）:

Material Name	材料中文名称	Weight Percentage	CAS No.
Aluminum	铝	2% - 10%	7429-90-5
Metal Oxide (proprietary)	金属氧化物	20% - 50%	12190-79-3
Polyvinylidene fluoride (PVDF)	聚偏二氟乙烯	0% - 5%	24937-79-9
Copper	铜	2% - 10%	7440-50-8
Carbon (proprietary)	碳	10% - 30%	1333-86-4
Electrolyte (proprietary)	电解液	10% - 20%	96-49-1 623-53-0 108-32-7

4. First Aid Measures（紧急措施）

IF EXPOSURE TO INTERNAL MATERIALS WITHIN CELL DUE TO DAMAGED OUTER CASING , THE FOLLOWING ACTIONS ARE RECOMMENDED.

Inhalation: Leave area immediately and seek medical attention.

Eye contact: Rinse eyes with water for 15 minutes and seek medical attention.

Skin contact: Wash area thoroughly with soap and water and seek medical attention.

Ingestion: Drink milk/water and induce vomiting; seek medical attention

如果因为电池组外部毁损,而导致电池芯内部材料外露,建议采取以下措施

吸入: 立刻离开该区域并且就医治疗

眼睛接触: 持续用清水清洗眼睛 15 分钟并且就医治疗

皮肤接触: 用肥皂及清水彻底清洗皮肤并且就医治疗

食入: 饮用牛奶及开水及催吐，就医治疗

5. Fire Fighting Measures（消防措施）

Extinguishing Media: Use extinguishing media suitable (ex CO_2, Water) for the materials that are burning. Use metal fire extinction powder or dry sand if only few cells are involved.

Firefighting Equipment: Use NIOSH/MSHA approved full-face self-contained breathing apparatus (SCBA) with full protective gear.

灭火剂： 对于那些正在燃烧中的材料使用适当的灭火剂，例如二氧化碳、水

消防设备：使用 NIOSH/ MSHA 认可的全脸自给式呼吸器（SCBA）与全套防护装备

6. Accidental Release Measures（泄漏处理方法）

On Land: Place material into suitable containers and call local fire/police department.

In water: Keep material in water to cool it down and call local fire/police department

陆上：将材料放入适当的容器中，并通知当地消防/警察部门。

水中：保持在水中降温，并通知当地消防/警察部门。

7. Handling and Storage（处理和储存）

Handling:

Do not expose the battery to excessive physical shock or vibration. Short-circuiting should be avoided. Prolonged short circuits will cause the battery to rapidly lose energy, could generate enough heat to burn skin. Sources of short circuits include jumbled batteries in bulk containers, coins, metal jewelry, metal covered tables, or metal belts used for assembly of batteries in devices. To minimize risk of short-circuiting, the protective case supplied with the battery should be used to cover the terminals when transporting or storing the battery. Do not disassemble or deform the battery. If an individual cell of battery becomes ruptured, do not allow it contact with water.

Storage:

The lithium ion battery should be between 25% and 75% of full charge when stored for a long period of time. Store in a cool, dry, well ventilated area. And temperature above 100 degrees Celsius can result in loss of battery performance, leakage, or rust. Do not expose the battery to open flames.

处理:

1. 勿将电池暴露在过多的物理撞击或震动。
2. 应避免短路。长时间短路会导致电池迅速失去能量，可以产生足够的热量灼伤皮肤。
3. 短路来源包括在容器中凌散的电池，硬币，金属饰品，金属覆盖表，或是被用来在设备中组装电池的金属带。
4. 为了尽量减少短路的风险，在运输或存放电池时，电池所搭配的保护壳应该要能够来覆盖终端。
5. 电池不要拆卸或形变。如果电池组内中其中一颗电芯有破裂，不能与水有接触。

储存:

锂离子电池组要长时间贮存,需于完全充电电容量的 25%和 75%之间。存放在阴凉，干燥，通风良好的地方。而温度高于 100℃会导致电池性能失效，漏水或生锈损失。不要将电池暴露在火中。

8. Exposure Controls / Personal Protection（曝露控制/个人防护）

Engineering Controls : Keep away from heat and open flame. Store in a cool dry place.

Personal Protection :

Respirator: Not required during normal operations. SCBA required in the event of a fire.

Eye/Face Protection: Not required beyond safety practices of employer.

Gloves: Not required for handling of battery

Foot Protection: Steel toed shoes recommended for large container handling.

工程控制：远离热源和火。存放在阴凉干燥的地方。

个人防护：

呼吸防护：在正常操作不需要。需要在发生火灾时空气呼吸器。

眼部/脸部保护：不适用熟练安全单位以外的人员。

手套：不要求

脚的保护：建议对于处理大型集装箱装卸使用钢头鞋。

9. Physical and Chemical Properties（物理和化学性质）

Item(项目)	Condition(状态)
State（状态）	Solid（固态）
Odor（气味）	N/A
PH（酸碱值）	N/A
Vapor pressure（蒸气压）	N/A
Vapor density（蒸气密度）	N/A
Boiling point（沸点）	N/A
Solubility in water（溶解度）	Insoluble（不可溶）
Specific gravity（比重）	N/A
Density（密度）	N/A

10. Stability and Reactivity （稳定性和反应性）

Reactivity: None

Incompatibilities: None during normal operation. Avoid exposure to heat, open flame, and corrosives.

Conditions To Avoid: Avoid exposure to heat and open flame. Don not puncture, crush or incinerate.

反应：无

不兼容性：正常运行时，无。避免接触高温、火及腐蚀。

应避免的条件：避免接触热源和明火。勿穿刺，挤压或焚烧。

11. Toxicological Information （毒理学讯息）

This product does not elicit toxicological properties during routine handling and use.

在常规操作和使用本产品并不引起毒理学性质。

12. Ecological Information（生态学资料）

Lithium ion battery pack can be disposable in accordance with appropriate federal, state and local regulations.

锂离子电池组可以是一次性的遵循于适当的联邦，州和地方法规。

13. Disposal Considerations （处置注意事项）

Recommended methods for safe and environmentally preferred disposal:

Product (waste from residues)-

Do not throw out a used battery. Recycle it through the recycling company.

Contaminated packaging-

Neither a container nor packing is contaminated during normal use. When internal materials leaked from a battery contaminates, dispose as industrial wastes subject to special control.

安全和环保优先处置建议的方法：

产品（废弃残留物）- 不要扔掉用过的电池。通过回收公司回收。

受污染的包装 - 在正常使用中容器及包装皆不会被污染。只有当内部材料泄漏电池污染物时，需受特殊的控制，如处置工业废物

14. Transport Information（运输信息）

Lithium ion batteries containing greater than 1.5g/cell and 8g/battery pack and also power is greater than 20Wh/cell and 100Wh/battery pack of lithium must be treated as “Dangerous goods” under the United Nations Recommendations on the Transport of Dangerous Goods, Special Provision 188, provided that packaging is strong and prevent the products from short-circuit.

With regard to air transport, the following regulations are cited and considered:

依据美国危害商品运输特别法第188条款规定，当锂离子电池产品超过1.5g/cell and 8g/battery pack以及20Wh/cell and 100Wh/battery pack则适用“危害商品”的定义.

特别法第188条款主要是，该包装材提供足够强度及避免电池短路意外的发生.

如是空运运输，则引用以下相关法规 ：

- The International Civil Aviation Organization (ICAO) Technical Instructions (2017-2018 Edition)
- The International Air Transport Association (IATA) Dangerous Goods Regulations (59th Edition, 2018) Special Provisions A154, A164& package instruction Section II of 965, 966 and 967 for lithium ion batteries).
- The International Maritime Dangerous Goods (IMDG) Code (2016 Edition), Special Provision 188.
- The US Hazardous Materials Regulation (HMR) pursuant to a final rule issued by RSPA (Part 49 CFR Sections 100-185),
- The Office of Hazardous Materials Safety within the US Department of Transportation’s (DOT) Research and Special Programs Administration (RSPA), and
- The UN Recommendations on the Transport of Dangerous Goods Model Regulations and the Manual of Tests and Criteria.

Our products are properly classified, described, packaged, marked, and labeled, and are

in proper condition for transportation according to all the applicable international and national governmental regulations, not limited to the above mentioned. We further certify that the enclosed products have been tested and fulfilled the requirements and conditions in accordance with UN Recommendations 38.3 (T1-T8) on the Transport of Dangerous Goods Model Regulations and the Manual of Testes and Criteria
UN# for this shipment is 3480, Haz-Mat class is 9, Proper DOT shipping name is Lithium ion batteries. Packing group IA.
Lithium ion batteries only transport by air in accordance with PI965 at a state of charge (SOC) not to exceed 30 percent of rated design capacity.

15. Regulatory Information （管制相关信息）

OSHA Hazard communication standard (29 CFR 1910.1200)
Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria.

_____√_____ Hazardous _____Non-hazardous

16. Other Information – UN Test Result （UN 测试结果）

There is no hazards in accordance with the UN recommendations tests (Manual of Tests and Criteria , Part III , sub-section 38.3).
以下為依 UN 建议相关测试進行，結果不产生任何危害風險

No	ITEMS	RESULT	REMARKS
1	Altitude Simulation	Pass	
2	Thermal Test	Pass	
3	Vibration	Pass	
4	Shock	Pass	
5	External Short Circuit	Pass	
6	Impact	Pass	For cell only
7	Overcharge	Pass	
8	Forced discharge	Pass	