SAFETY DATA SHEET

Date of issue 18-12-2024 **Canada/English**

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Product identifier

Product Name Rechargeable Li-ion Battery Pack BCR-61P-4000MS

Other means of identification

Recommended use of the chemical and restrictions on use

Recommended Use LITHIUM ION BATTERIES

Uses advised against No information available

Details of the supplier of the safety data sheet

Initial supplier identifier De.power Technology Limited

Address No.1333, Jinjiao Road, Lanjiang Street, Lanxi County, Jinhua City, Zhejiang Province, P.R. China.

Telephone 0755-29516888
E-mail xiangjing@sunwoda.com

Emergency telephone number

Company Emergency Phone Number 0755-29516888

2. HAZARDS IDENTIFICATION

Classification

This is a battery. In case of rupture:

Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 2A
Carcinogenicity	Category 2
Specific target organ toxicity (repeated exposure)	Category 1

GHS Label elements, including precautionary statements

Danger

Hazard statements
This is a battery. In case of rupture:.

Causes skin irritation
Causes serious eye irritation
Suspected of causing cancer

Causes damage to organs through prolonged or repeated exposure



Precautionary Statements - Prevention
Obtain special instructions before use
Do not handle until all safety precautions have been read and understood Wear protective gloves/protective clothing/eye protection/face protection Wash face, hands and any exposed skin thoroughly after handling
Do not breathe dust/fume/gas/mist/vapors/spray Do not eat, drink or smoke when using this product

Precautionary Statements - Response
IF exposed or concerned: Get medical advice/attention
Specific treatment (see supplemental first aid instructions on this label)

Eyes
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing If eye irritat persists: Get medical advice/attention

Skin
IF ON SKIN: Wash with plenty of water and soap
If skin irritation occurs: Get medical advice/attention Take off contaminated clothing and wash it before reuse

Precautionary Statements - Storage
Store locked up

Precautionary Statements - Disposal
Dispose of contents/container to an approved waste disposal plant

Other information
Very toxic to aquatic life with long lasting effects

Unknown acute toxicity 30.9 % of the mixture consists of ingredient(s) of unknown toxicity
30.9 % of the mixture consists of ingredient(s) of unknown acute oral toxicity
30.9 % of the mixture consists of ingredient(s) of unknown acute dermal toxicity
30.9 % of the mixture consists of ingredient(s) of unknown acute inhalation toxicity (gas)
30.9 % of the mixture consists of ingredient(s) of unknown acute inhalation toxicity (vapor)
30.9 % of the mixture consists of ingredient(s) of unknown acute inhalation toxicity (dust/mist)

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance Not applicable.

Mixture

Chemical name	CAS-No	Percent(%) Max	Hazardous Material Information Review Act registry number (HMIRA registry #)	Date HMIRA filed and date exemption granted (if applicable)
Aluminum	7429-90-5	9%		
Cobalt lithium manganese nickel oxide	182442-95-1	47%		
1,1-Difluoroethylene polymer	24937-79-9	4%		
Copper	7440-50-8	9%		
Graphite	7782-42-5	28%		
Cellulose, carboxymethyl ether	9000-11-7	1.5%		
Styrene-Butadiene polymer	9003-55-8	1.5%		

4. FIRST AID MEASURES

First aid measures

General advice First aid is upon rupture of sealed battery. IF exposed or concerned: Get medical advice/attention. Show this safety data sheet to the doctor in attendance.

Inhalation Remove to fresh air. Get medical attention immediately if symptoms occur.

Eye contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Keep eye wide open while rinsing. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists. Do not rub affected area.

Skin contact Wash off immediately with soap and plenty of water for at least 15 minutes. Get medical attention if irritation develops and persists.

Ingestion Clean mouth with water and drink afterwards plenty of water. Never give anything by mouth to an unconscious person. Do NOT induce vomiting. Call a physician.

Self-protection of the first aider Avoid contact with skin, eyes or clothing. Wear personal protective clothing (see section 8).

Most important symptoms and effects, both acute and delayed

Symptoms Burning sensation.

Indication of any immediate medical attention and special treatment needed

Note to physicians Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media CAUTION: Use of water spray when fighting fire may be inefficient.

Specific hazards arising from the chemical . No information available

Hazardous Combustion Products Carbon oxides.

Explosion Data

Sensitivity to Mechanical Impact None.

Sensitivity to Static Discharge None.

Special protective equipment for	Firefighters should wear self-contained breathing apparatus and full firefighting turnout

fire-fighters	gear. Use personal protection equipment

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal precautions	Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Use personal protective equipment as required. Evacuate personnel to safe areas.
Other Information	Refer to protective measures listed in Sections 7 and8.
Environmental precautions	Prevent further leakage or spillage if safe to doso.

Methods and material for containment and cleaning up

Methods for containment	Prevent further leakage or spillage if safe to doso.
Methods for cleaning up	Pick up and transfer to properly labeledcontainers.
Prevention of secondary hazards	Clean contaminated objects and areas thoroughly observing environmental regulations.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling	In case of rupture: Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Do not eat, drink or smoke when using this product. Take off contaminated clothing and wash before reuse.

Conditions for safe storage, including any incompatibilities

Storage Conditions	Keep containers tightly closed in a dry, cool and well-ventilated place. Protect from moisture. Store locked up. Keep out of the reach of children. Store away from other materials.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Limits	The following ingredients are the only ingredients of the product above the cut-off level(or level that contributes to the hazard classification of the mixture) which have an exposure limit applicable in the region for which this safety data sheet is intended or other recommended limit. At this time, the other relevant constituents have no known exposure limits from the sources listed here.

Chemical name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Copper 7440-50-8	TWA: 0.2 mg/m3 fume	TWA: 0.1 mg/m3 fume TWA: 1 mg/m3 dust and mist (vacated) TWA: 0.1 mg/m3 Cu dust, fume, mist	IDLH: 100 mg/m3 dust, fume and mist TWA: 1 mg/m3 dust and mist TWA: 0.1 mg/m3 fume
Aluminum 7429-90-5	TWA: 1 mg/m3 respirable particulate matter	TWA: 15 mg/m3 total dust TWA: 5 mg/m3 respirable fraction (vacated) TWA: 15 mg/m3 total dust(vacated) TWA: 5 mg/m3 respirable fraction	TWA: 10 mg/m3 total dust TWA: 5 mg/m3 respirable dust

Chemical name	Alberta	British Columbia	Ontario TWAEV	Quebec
Copper 7440-50-8	TWA: 0.2 mg/m3 TWA: 1 mg/m3	TWA: 1 mg/m3 TWA: 0.2 mg/m3	TWA: 0.2 mg/m3 TWA: 1 mg/m3	TWA: 0.2 mg/m3 TWA: 1 mg/m3
Aluminum 7429-90-5	TWA: 10 mg/m3	TWA: 1.0 mg/m3	TWA: 1 mg/m3	TWA: 10 mg/m3

Other Exposure Guidelines	Vacated limits revoked by the Court of Appeals decision in AFL-CIO v. OSHA, 965 F.2d 962 (11th Cir., 1992).

Appropriate engineering controls

Engineering controls	Showers Eyewash stations Ventilation systems.

Individual protection measures, such as personal protective equipment

Eye/face protection	If splashes are likely to occur, wear safety glasses with side-shields.
Hand protection	Wear suitable gloves. Impervious gloves.
Skin and body protection	Wear suitable protective clothing. Long sleevedclothing.
Respiratory protection	No protective equipment is needed under normal use conditions. If exposure limits are exceeded or irritation is experienced, ventilation and evacuation may be required.
General hygiene considerations	Handle in accordance with good industrial hygiene and safety practice. Do not eat, drink or smoke when using this product. Wash hands before breaks and immediately after handling the product. Wear suitable gloves and eye/face protection. Avoid contact with skin, eyes or clothing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical and Chemical Properties

Physical state	Solid
Appearance	Black
Odor	Odorless
Color	No information available
Odor Threshold	Not applicable

Property	**Values**	**Remarks Method**
pH	No data available	None known
Melting / freezing point	No data available	None known
Boiling point / boiling range	No data available	None known
Flash Point	No data available	None known

Evaporation Rate	No data available	None known
Flammability (solid, gas)	No data available	None known
Flammability Limit in Air		None known
Upper flammability limit	No data available	
Lower flammability limit	No data available	
Vapor pressure	No data available	None known
Vapor density	No data available	None known
Relative density	No data available	None known
Water Solubility	Insoluble in water	
Solubility(ies)	No data available	None known
Partition coefficient: n-octanol/water	1	
Autoignition temperature	No data available	None known
Decomposition temperature	No data available	
Kinematic viscosity	No data available	
Dynamic viscosity		

Other Information

Explosive properties	No information available.
Oxidizing properties	No information available.
Softening Point	No information available
Molecular Weight	No information available
VOC Content (%)	No information available
Liquid Density	No information available
Bulk Density	No information available
Particle Size	No information available
Particle Size Distribution	No information available

10. STABILITY AND REACTIVITY

Reactivity No information available.

Chemical stability Stable under normal conditions.

Possibility of Hazardous Reactions None under normal processing.

Hazardous Polymerization Hazardous polymerization does not occur.

Conditions to avoid None known based on information supplied.

Incompatible materials Strong acids. Strong bases. Strong oxidizing agents.

Hazardous Decomposition Products Carbonoxides.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information Product does not present an acute toxicity hazard based on known or supplied information In case of rupture:

Inhalation Specific test data for the substance or mixture is not available. May cause irritation of respiratory tract.

Eye contact Specific test data for the substance or mixture is not available. Causes serious eye irritation. (based on components). Irritating to eyes.

Skin contact Specific test data for the substance or mixture is not available. Causes skin irritation. (based on components).

Ingestion Specific test data for the substance or mixture is not available. Ingestion may cause

gastrointestinal irritation, nausea, vomiting and diarrhea.

Information on toxicological effects

Symptoms Redness. Burning. May cause blindness. Coughing and/ or wheezing

Numerical measures of toxicity

Acute Toxicity

The following values are calculated based on chapter 3.1 of the GHS document .

ATEmix (oral) 12,452.00 mg/kg
ATEmix (dermal) 9,132.00 mg/kg

Unknown acute toxicity 30.9 % of the mixture consists of ingredient(s) of unknown toxicity
30.9 % of the mixture consists of ingredient(s) of unknown acute oral toxicity
30.9 % of the mixture consists of ingredient(s) of unknown acute dermal toxicity
30.9 % of the mixture consists of ingredient(s) of unknown acute inhalation toxicity (gas)
30.9 % of the mixture consists of ingredient(s) of unknown acute inhalation toxicity (vapor)
30.9 % of the mixture consists of ingredient(s) of unknown acute inhalation toxicity (dust/mist)

Component Information

Chemical name	Oral LD50	Dermal LD50	Inhalation LC50
Lithium Cobalt Oxide	> 5000 mg/kg (Rat)	> 2000 mg/kg (Rat)	> 5.05 mg/L (Rat) 4 h
Copper	-	-	> 5.11 mg/L (Rat) 4 h
Aluminum	-	-	> 0.888 mg/L (Rat) 4 h

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Skin corrosion/irritation Classification based on data available for ingredients. Irritating to skin.

Serious eye damage/eye irritation Classification based on data available for ingredients. Irritating to eyes.

Respiratory or skin sensitization No information available.

Germ cell mutagenicity No information available.

Carcinogenicity Classification based on data available for ingredients. Contains a known or suspected carcinogen.

Legend
ACGIH (American Conference of Governmental Industrial Hygienists)
A3 - Animal Carcinogen
IARC (International Agency for Research on Cancer)
Group 2B - Possibly Carcinogenic to Humans
NTP (National Toxicology Program)
Reasonably Anticipated - Reasonably Anticipated to be a Human Carcinogen
OSHA (Occupational Safety and Health Administration of the US Department of Labor)
X - Present

Reproductive toxicity No information available.

STOT - single exposure No information available.

STOT - repeated exposure Causes damage to organs through prolonged or repeated exposure.

Aspiration hazard No information available.

12. ECOLOGICAL INFORMATION

Ecotoxicity Very toxic to aquatic life with long lastingeffects.

Chemical name	Algae/aquatic plants	Toxicity to Fish	Toxicity to Microorganism	Crustacea
Copper foil	96h EC50: 0.031 - 0.054 mg/L(Pseudokirchneriella subcapitata) 72h EC50: 0.0426 - 0.0535 mg/L (Pseudokirchneriella subcapitata)	96h LC50: 0.0068 - 0.0156 mg/L (Pimephales promelas) 96h LC50: < 0.3 mg/L(Pimephales promelas)	No data available	48h EC50: = 0.03 mg/L (Daphnia magna)

Persistence and Degradability No information available.

Bioaccumulation No information available.

Mobility No information available.

Other adverse effects No information available.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Waste from residues/unused products	Dispose of in accordance with local regulations. Dispose of waste in accordance with environmental legislation.
Contaminated packaging	Do not reuse emptycontainers.

14. TRANSPORT INFORMATION

Note: The transportation of primary lithium cells and batteries is regulated by the International Civil Aviation Organization, International Air Transport Association, International Maritime Dangerous Goods Code and the US Department of Transportation. The batteries must meet the following criteria for shipment: 1. Air shipments must meet the requirements listed in Special Provision A45 of the International Air Transport Association Dangerous Goods Regulations. 2. Meet the requirements for the US Department of Transportation listed in 49 CFR 173.185. 3. The transport of primary lithium batteries is prohibited aboard passenger aircraft. Refer to the Federal Register December 15, 2004 (Hazardous Materials; Prohibited on the Transportation of Primary Lithium Batteries and Cells Aboard Passenger Aircraft; Final Rule)
Lithium batteries shipped as "Lithium batteries", "Lithium batteries packed with equipment", or "Lithium batteries contained in equipment" may not be classified as "Dangerous Goods" when shipped in accordance with "special provision A45 of IATA-DGR" or "special provision 188 of IMO-IMDG Code"

TDG	Not regulated
DOT	NOT REGULATED
Proper Shipping Name	NON-REGULATED
Hazard Class	N/A
Emergency Response Guide Number	147
MEX	Not regulated
ICAO	Not regulated
IATA	
UN-No.	UN3480
Proper Shipping Name	LITHIUM ION BATTERIES
Hazard Class	9
ERG Code	12FZ
Description	Lithium Battery Mark, Class 9 lithium battery hazard label, Cargo Aircraft Only Label.
IMDG/IMO	Not regulated
Hazard Class	N/A
EmS-No.	F-A, S-I
RID	Not regulated
ADR	Not regulated
ADN	Not regulated

15. REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture

International Regulations

Ozone-depleting substances (ODS) Not applicable

Persistent Organic Pollutants Not applicable

Export Notification requirements Not applicable

International Inventories

TSCA	Contact supplier for inventory compliance status.
DSL/NDSL	Contact supplier for inventory compliance status.
EINECS/ELINCS	Contact supplier for inventory compliance status.
ENCS	Contact supplier for inventory compliance status.
KECL	Contact supplier for inventory compliance status.
PICCS	Contact supplier for inventory compliance status.
AICS	Contact supplier for inventory compliance status.

Legend

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances
ENCS - Japan Existing and New Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances
PICCS - Philippines Inventory of Chemicals and Chemical Substances
AICS - Australian Inventory of Chemical Substances

16. OTHER INFORMATION, INCLUDING DATE OF PREPARATION OF THE LAST REVISION

NFPA	**Health hazards** 1	**Flammability** 0	**Instability** 0	**Physical and Chemical Properties** -
HMIS	**Health hazards** 0	**Flammability** 0	**Physical hazards** 0	**Personal Protection** X

Prepared By Shenzhen Precise Testing Technology Co., Ltd.

Issuing Date 18-12-2024

Revision Note No information available

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

End of Safety Data Sheet

Inhalation Statement	dust
Not Hazardous	This is a battery. In case of rupture:
Hazard statements	Causes damage to organs through prolonged or repeated exposure
Signal word	Danger
Precautionary Statements	P302 + P352 - IF ON SKIN: Wash with plenty of water and soap P321 - Specific treatment (see supplemental first aid instructions on this label) P332 + P313 - If skin irritation occurs: Get medical advice/attention P362 + P364 - Take off contaminated clothing and wash it before reuse P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing P337 + P313 - If eye irritation persists: Get medical advice/attention P201 - Obtain special instructions before use P202 - Do not handle until all safety precautions have been read and understood P280 - Wear protective gloves/protective clothing/eye protection/face protection P308 + P313 - IF exposed or concerned: Get medical advice/attention P405 - Store locked up P260 - Do not breathe dust/fume/gas/mist/vapors/spray P264 - Wash face, hands and any exposed skin thoroughly after handling P270 - Do not eat, drink or smoke when using this product P314 - Get medical advice/attention if you feel unwell P501 - Dispose of contents/ container to an approved waste disposal plant
Signal word	Danger
Skin corrosion/irritation	Category 2

Hazard statements	Causes skin irritation
Signal word	Warning
Serious eye damage/eye irritation	Category 2A
Hazard statements	Causes serious eye irritation
Signal word	Warning
Carcinogenicity	Category 2
Hazard statements	Suspected of causing cancer
Signal word	Warning
Specific target organ toxicity (repeated exposure)	Category 1
Skin corrosion/irritation	- (H315)
Serious eye damage/eye irritation	- (H319)
Carcinogenicity	- (H351)
STOT - repeated exposure	- (H372)
STOT - repeated exposure	
Graphic	
Graphic	
Graphic	
Hazard statements	Causes skin irritation Causes serious eye irritation Suspected of causing cancer Causes damage to organs through prolonged or repeated exposure
Hazard statements	H315 - Causes skin irritation H319 - Causes serious eye irritation H351 - Suspected of causing cancer H351 - Suspected of causing cancer H372 - Causes damage to organs through prolonged or repeated exposure H372 - Causes damage to organs through prolonged or repeated exposure
Precautionary Statements - EU (§28, 1272/2008)	P103 - Read label before use P280 - Wear face protection P370 + P378 - In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish P234 - Keep only in original container P303 - IF ON SKIN (or hair):
Precautionary Statements	IF ON SKIN: Wash with plenty of water and soap IF ON SKIN: Wash with plenty of water and soap If skin irritation occurs: Get medical advice/attention If skin irritation occurs: Get medical advice/attention Take off contaminated clothing And wash it before reuse Take off contaminated clothing and wash it before reuse Take off contaminated clothing And wash it before reuse Take off contaminated clothing and wash it before reuse IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing If eye irritation persists: Get medical advice/attention If eye irritation persists: Get medical advice/attention Obtain special instructions before use Obtain special instructions before use Do not handle until all safety precautions have been read and understood Do not handle until all safety precautions have been read and understood Wear protective gloves Wear protective gloves IF exposed or concerned: Get medical advice/attention IF exposed or concerned: Get medical advice/attention Store locked up Do not breathe dust/fume/gas/mist/vapors/spray Do not breathe dust/fume/gas/mist/vapors/spray Do not breathe dust/fume/gas/mist/vapors/spray Do not eat, drink or smoke when using this product Do not eat, drink or smoke when using this product Get medical advice/attention if you feel unwell Get medical advice/attention if you feelunwell
Skin	IF ON SKIN: Wash with plenty of water and soap If skin irritation occurs: Get medical advice/attention Take off contaminated clothing and wash it before reuse

Precautionary Statements	P302 + P352 - IF ON SKIN: Wash with plenty of water and soap P321 - Specific treatment (see supplemental first aid instructions on this label) P332 + P313 - If skin irritation occurs: Get medical advice/attention P362 + P364 - Take off contaminated clothing and wash it before reuse P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing P337 + P313 - If eye irritation persists: Get medical advice/attention P201 - Obtain special instructions before use P202 - Do not handle until all safety precautions have been read and understood P280 - Wear protective gloves/protective clothing/eye protection/face protection P308 + P313 - IF exposed or concerned: Get medical advice/attention P405 - Store locked up P260 - Do not breathe dust/fume/gas/mist/vapors/spray P264 - Wash face, hands and any exposed skin thoroughly after handling P270 - Do not eat, drink or smoke when using this product P314 - Get medical advice/attention if you feel unwell P501 - Dispose of contents/ container to an approved waste disposal plant
Precautionary Statements - Prevention	Obtain special instructions before use Do not handle until all safety precautions have been read and understood Wear protective gloves/protective clothing/eye protection/face protection Wash face, hands and any exposed skin thoroughly after handling Do not breathe dust/fume/gas/mist/vapors/spray Do not eat, drink or smoke when using this product
Precautionary Statements - Response	IF exposed or concerned: Get medical advice/attention Specific treatment (see supplemental first aid instructions on this label)
Eyes	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing If eye irritation persists: Get medical advice/attention
Skin	IF ON SKIN: Wash with plenty of water and soap If skin irritation occurs: Get medical advice/attention Take off contaminated clothing and wash it before reuse
Precautionary Statements - Storage	Store locked up
Precautionary Statements - Disposal	Dispose of contents/container to an approved waste disposal plant
The following values are calculated based on chapter 3.1 of the GHS document	
ATEmix (oral)	12,452.00
Units	mg/kg
ATEmix (dermal)	9,132.00
Units	mg/kg
Contains Carbon black, Phosphate(1-), hexafluoro-, lithium	
Unknown acute toxicity	90.77 % of the mixture consists of component(s) of unknown hazards to the aquatic environment
Unknown Acute Aquatic Toxicity	90.77
Unknown Chronic Aquatic Toxicity	90.77
Product ATE Oral Status	1
Product ATE Dermal Status	1
Product ATE Inhalation - Gas Status	1
Product ATE Inhalation - Vapor Status	1
Product ATE Inhalation - Dust/Mist Status	1
Product Skin Corrosion Status	1
Product Eye Damage Status	1
Product Respiratory Sens. Status	1
Product Skin Sensitization Status	1
Product Mutagenic Status	1
Product Carcinogenic Status	1
Product Reproductive Toxicity Status	1
Product STOT Single Status	1
Product STOT Repeated Status	1
Product Aquatic Toxicity Status	1
Product Aspiration Toxicity Status	1
Product Ozone Status	1
Product and Component Overall Classification Status	1
STOT - repeated exposure	- (H372)
Unknown acute toxicity	30.9 % of the mixture consists of ingredient(s) of unknown toxicity

30.9 % of the mixture consists of ingredient(s) of unknown acute oral toxicity

30.9 % of the mixture consists of ingredient(s) of unknown acute dermal toxicity

30.9 % of the mixture consists of ingredient(s) of unknown acute inhalation toxicity (gas)

30.9 % of the mixture consists of ingredient(s) of unknown acute inhalation toxicity (vapor)

30.9 % of the mixture consists of ingredient(s) of unknown acute inhalation toxicity (dust/mist)

Symbols/Pictograms

Symbols/Pictograms

Other hazards	Very toxic to aquatic life with long lasting effects
Health hazards	Skull and Crossbones
Health hazards	Exclamation mark
Inhalation Statement	dust
Health hazards	1

BCR-61P-4000MF 电池规格书
BCR-61P-4000MF
Battery Specification

产品类型 Product Type:	Rechargeable Li-ion Battery Pack
产品型号 Product a2ŘŜt:	BCR-61P-4000MF
产品料号 Product No:	RH5G06010254

编制 :_____ 日期:_____
Created Date

标准化 :_____ 日期:_____
Standardized Date

审核 :_____ 日期:_____
Checked Date

项目经理 :_____ 日期:_____
Project manager Date

批准 :_____ 日期:_____
Approved Date

客户 Customer	确认 Confirm	批准 Approved

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修改历史 Revision History

版本 Version	日期 Date	描述 Description	修订者 Reviser
2024.08.29	V1.0	First edition 初版	许玉华，翁成，黄敏伟

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1. 概述 Overview

BCR-61P-4000MF 电池是由 6 颗（6S1P）冠宇 CA884669 锂离子电芯、充放电控制和管理等模块组成。通过阅读本规格书可了解产品的基本特性、功能、测试指标和使用注意事项等。

The BCR-61P-4000MF battery consists of 6pcs (6S1P) COSMX CA884669 cells, charge-discharge control & management module and others. This specification helps users understand the basic features, functionalities, testing standards and precautions of the battery.

2. 电池包基础信息 Battery Pack Basic Information

2.1 电芯性能信息 Cell Performance Information

项目 Item	描述 Description	备注 Notes
电芯厂家 Supplier	冠宇	/
电芯型号 Cell Model	CA884669	/
标称容量 Nominal Capacity	4060mAh	Charge:0.8A, 4.20V, CCCV 200mA cut-off Discharge :0.8A,2.50V DC cut-off
最小容量 Minimum Capacity	4000mAh	
电芯重量 Cell Weight	62.0g Max 最大 62.0g	/
电芯尺寸 Cell Dimensions	Height: 69.5mm Max 高度：69.5mm最大值 Width：47mm Max 宽度：47mm最大值 Thickness: 8.95mm Max 厚度：8.95mm 最大值	/
标称电压 Nominal Voltage	3.6V	/
充电限制电压 Charge limiting voltage	4.2V	/
放电截止电压 Discharge cut-off voltage	2.5V	/
标准充电	CCCV, 0.8A, 4.2V, 200mA cut-off	/

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Standard Charge	0.8A 恒流充电至 4.2V，恒压充电截止电流 200mA	
标准放电 Standard Discharge	DC, 0.8A, 2.50V cut-off 0.8A 恒流放电至 2.5V 截止	/
快速充电 Rapid Charge	0.5Cmin Max to 4.2V, then CV to 0.05Cmin/0.5Cmin 最大电流充电至 4.2V,0.05Cmin 截止	Temperature/温度: 0℃ ~ 15℃
	1.0Cmin Max to 4.2V, then CV to 0.05Cmin/1.0Cmin 最大电流充电至 4.2V,0.05Cmin 截止	Temperature/温度: 15℃ ~ 45℃
	0.5Cmin Max to 4.2V, then CV to 0.05Cmin/0.5Cmin 最大电流充电至 4.2V,0.05Cmin 截止	Temperature/温度: 45℃ ~ 60℃
最大持续放电 Max. Continuous Discharge	24A Max to 2.5V/24A 最大电流放电至 2.5V	Temperature/温度: -20℃ ~ 75℃
工作温度和湿度范围 Operating Temperature and Humidity Range	Charge/充电: 0~60℃	/
	Humidity/湿度: Less than/小于 85%RH	/
	Discharge/放电: -20~75℃ (cut off 75℃) Humidity/湿度: Less than/小于 85%RH	/
存储温度 （出货态 SOC) Storage Temperature (At Shipping SOC)	1 year 1 年	-20~30°C
	3 months 3 个月	-20~45°C
	1 month 1 个月	-20~60°C

2.2 电池包性能信息 Battery pack Performance Information

项目 Item	描述 Description	备注 Notes
标称电压/标称容量 Nominal Voltage/ Nominal Capacity	21.6V/3.7Ah	

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最小容量 wl·ûŜŘ Capacity	3.7Ah/79.92Wh	Charge :1A, 25.05V, 200mA cut-off @23±3℃ Discharge :0.8A, 16.38V cut-off @23±3℃
初始交流内阻 Initial AC Impedance	20~80mΩ	AC 1KHz
充电限制电压 Limited Charge Voltage	25.05V	/
放电终止电压 End of Discharging Voltage	17.4V	/
放电截止电压 Discharge cut-off voltage	16.2V	/
充电器电压 Charger voltage	25.75V	/
标准充电电流 Standard Charge Current	1A	/
标准放电电流 Standard Discharge Current	0.8A	/
输出电压范围 Output Voltage Range	16.38V~25.2V	/
最大持续输出电流 Max. Continuous Discharge Current	17A	/
最大持续充电电流 Max. Continuous Charge Current	1.3A	/
出厂电压范围 Shipment Voltage	23V≤Voltage≤24V	60%≤SOC≤80%
SOC 精度 SOC accuracy	≤5%	/
通讯方式 Communication Mode	UART	通信速率 Communication rate： 115200bps
工作功耗 Operating Current Consumption	＜8mA	/
关机功耗 Shipping Current Consumption	＜30μA	/
显示	/	/

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Display		
软件版本信息 Software version information	V101	/
校验码 Check code	0xf62f744b	/

2.3 认证和工作环境 Certification and Operation Environment

项目 Item	描述 Description	备注 Notes
安规&认证要求 Safety Regulations & Certification Requirements	CQC	SJ/T11778-2021
	CE-EMC	EN 61000-6-3:2007+A1:2011 ENIEC 61000-6-1:2019
	电池指令	Directive 2006/66/EC&2013/56/EU
	KC	KC62133-2
	PSE	JIs C62133-2:2020
	通用 CB	IEC 62133-2:2017/AMD1:2021
	UN38.3	ST/SG/AC.10/11/Rev.7
	Gost-R	ГОСТ 12.2.007.12-88, ГОСТ РМЭК 62133-2-2019, ГОСТ РМЭК 61960-3-2019
	EAC EMC	TPTC020/2011 TPTC004/2011
	EAC & Gost R 授权	/
	BSMI	CNS15364（102 年版）
	BSMI 授权	/
	FCC	FCC47CFRPart15SubpartB ANSIC63.4-2014
	RCM	IEC/EN62133-2:2017/AMD 1 :2021
	MSDS	/
		/

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环保要求 Environmental Requirement	ROHS2.0、REACH		/
静电防护等级 ESD Level	接触(Contact)：±8kV 空气(Air)：±15kV		/
工作温度环境范围 Operating Temperature (Ambient Temperature)	充电温度范围 Charging Temperature	2～+45℃	/
	放电温度范围 Discharging Temperature	-5~+60℃	/
电芯工作表面温度 Cell working surface temperature	充电温度范围 Charging Temperature: (recommended recharge release <45°C)	2 ~58°C	/
	放电温度范围 Discharging Temperature(recommended re-discharge release <60°C)	-10~ 72°C	/
存储环境 Storage Environment	-20～+60℃	1 month	长时间储存前要保证电量超过 30%，且系统处于关机等低功耗状态 Make sure that the SOC exceeds 30% before long storage, and the system is in a low power state such as shutdown.
	-20~ +45℃	3months	
	-20～+30℃	12 months	
存储相对湿度 Storage Relative Humidity	0%- 65% RH		/
废弃方式 Abandonment mode	当电池需要废弃时，应该按照当地有关废旧电子产品处理的相关规定进行处理。不能当做普通城市垃圾处理。 If batteries need to be discarded, dispose of them according to local regulations on the disposal of waste electronic products. It cannot be treated as ordinary		

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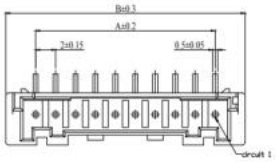
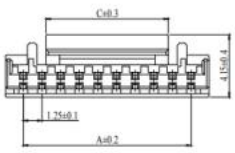
	municipal garbage.
推荐的充电说明 Recommended charging instructions	在 23±3℃下，以 25.75V/1A 充电，充电截止电流 200mA. Charging at 25.75V/1A at 23 ± 3 ℃, charging cutoff current 200mA.

2.4 结构性能信息 Mechanical Performance Information

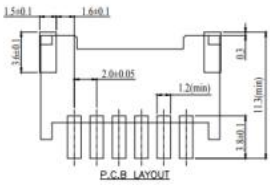
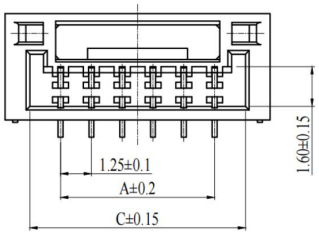
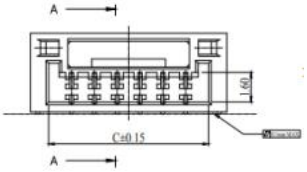
项目 Item	描述 Description	备注 Notes
电芯组合方式 Cell Configuration	6S1P	/
尺寸 Dimensions	95.82*78.15*64.79mm	详见附件 Refer to the appendix
重量 Weight	4MM⌀pg	仅供参考 For reference only
充放电接口 Charge-Discharge Port	充放电异口 Separate Ports	P+,C+,P-/C-
其他接口 Other Port	信号口 Signal port	SW,TX,RX,F+,F-
防水等级 Waterproof Level	/	/

3. 结构性能参数 Mechanical Performance Parameters

3.1 连接器型号 Connector Model

序号 No.	品牌 Brand	连接器型号 Connector Model	图示 Figure
1	津达	PA-LT-8A	
2	津达	1.25T-7-LT-3A	

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3	津达	PHS-WT-2A-B	
4	津达	1.25T-7-LT-5A	
5	津达	1.25T-7-WT-5A	

3.2 连接器 PIN 定义 Connector PIN Definition

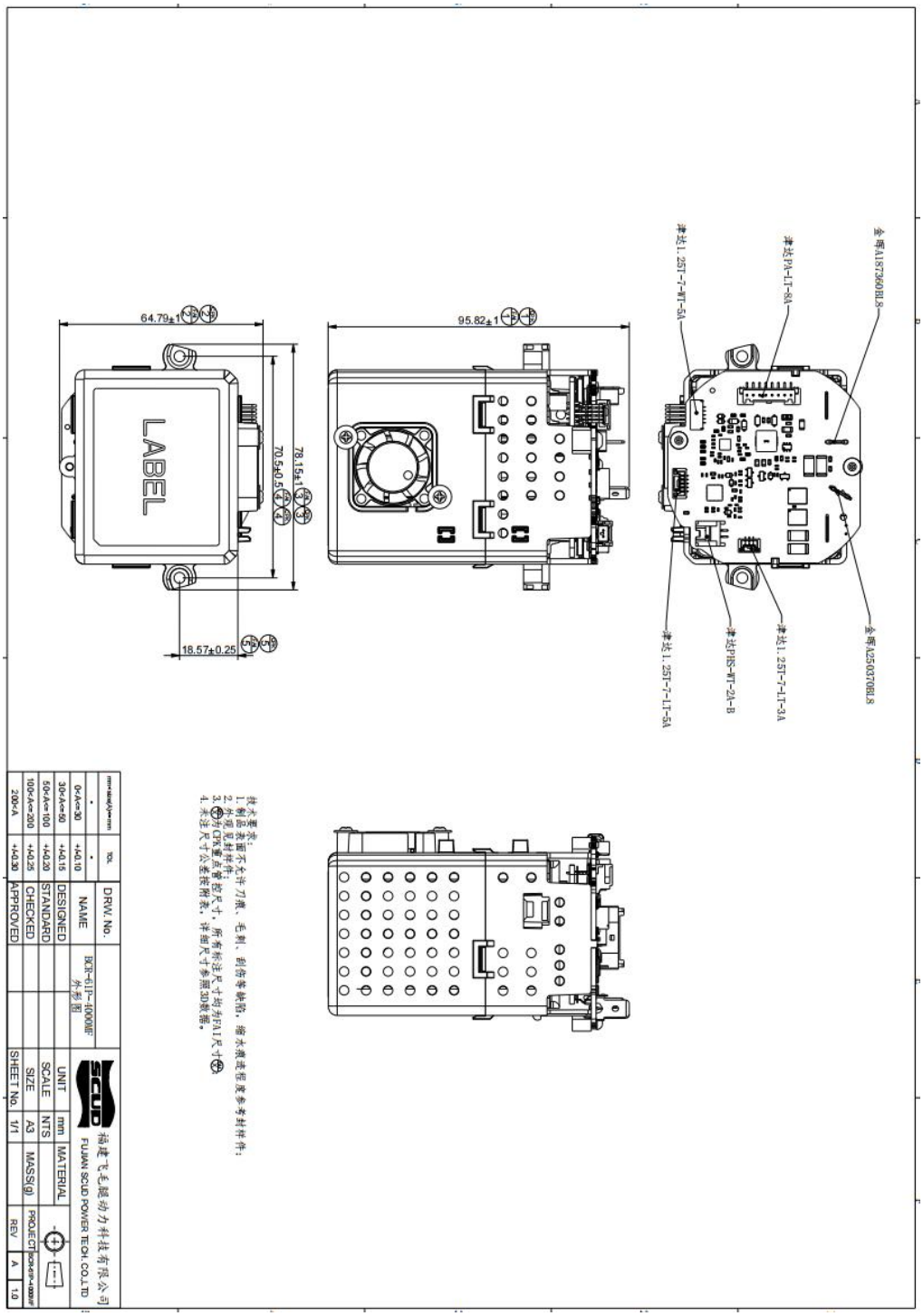
PA-LT-8A			
PIN	引脚定义 Pin Definition	IO 类型 IO Type	功能定义 Function Definition
1	P+	P	放电正极 Discharge Positive
2			
3	C+	P	充电正极 Charge Positive
4	SW	I	按键激活开关，通过按键短接到 P+ Key Activates the switch and is connected to P+ through the key
5	TX	O	整机通讯 IO System communication IO
6	RX	I	整机通讯 IO System communication IO
7	P-/C-	P	放电负极/充电负极 Discharge Negative/ Charge Negative
8			

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3.3 外形尺寸图 Mechanical Outline

请参阅附页。

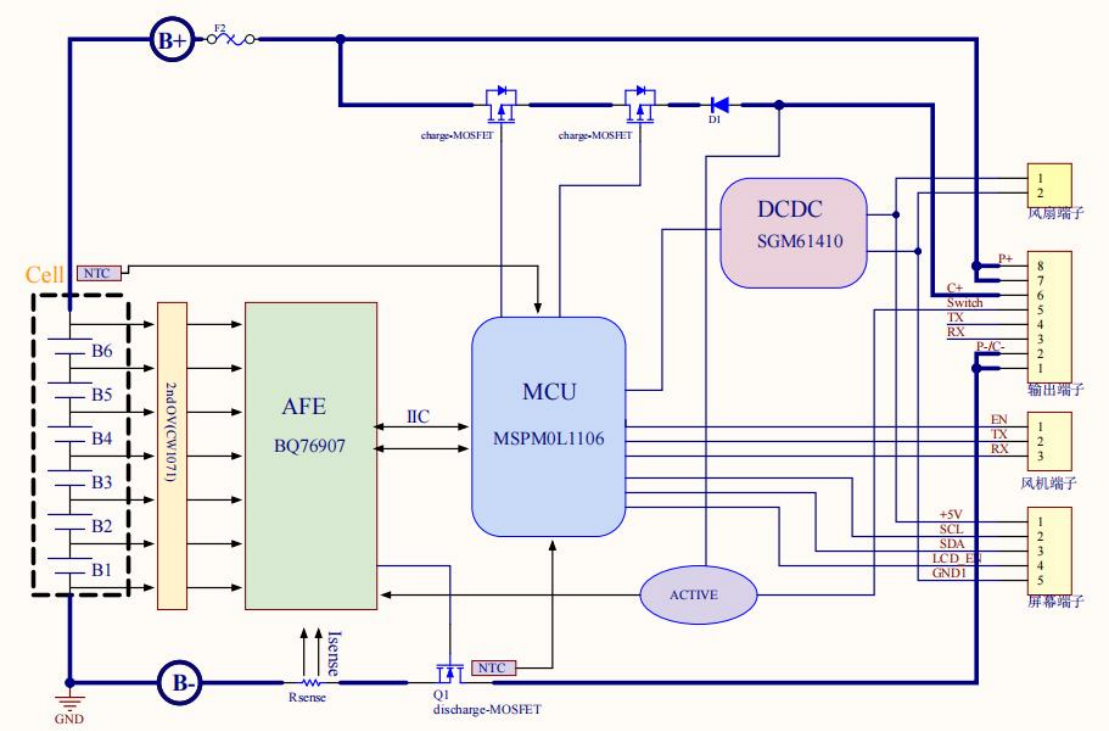
Please refer to the appendix.



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4. 电气性能参数 Electrical Performance Parameters

4.1 电路框图 Circuit Block Diagram



4.2 框图功能说明 Function Description of Block Diagram

本方案是 6S 正异口负同口 BMS 方案，本方案包含三个模拟采集部分：电压采集部分、电流采集部分、温度采集部分；三个执行部分：CMOS、DMOS、FUSE；四个控制部分：BQ76907、CW1071BLAM、MSPM0L1106、SGM61410。控制芯片会根据采集到的电压信号、电流信号和温度信号对电芯进行保护。包括如下保护：充电过压保护、充电过流保护、充电过温/低温保护、放电欠压保护、放电过流保护、放电过温/低温保护。

This scheme is a 6S positive different mouth negative same mouth BMS scheme, which consists of three analog acquisition parts: voltage acquisition part, current acquisition part, temperature acquisition part, and three executive parts: CMOS, DMOS, FUSE ; Four control parts: BQ76907, CW1071BLAM, MSPM0L1106, SGM61410.The control chip protects the battery according to the collected voltage signal, current signal and temperature signal.It includes the following protection: charge over voltage protection, charge over current protection, charge over

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temperature/low temperature protection, discharge under voltage protection, discharge over current protection, discharge over temperature/low temperature protection.

4.3 功能逻辑描述(软件逻辑)Function Logic Description(Software Logic)

PCBA 功能逻辑表 PCBA Function Logic Table

事件 Event	状态 State	动作 Action
充电器接入并工作 Charger connected and operation	充电器检测 Charger Detection	检测到充电器电压>15V，开启充电 MOSFET,切换为充电器在位 Detect the charger voltage >15V,turn on the charging MOSFET. switch the state to charger in position.
	电池包正常充电 Normal Charging	充电 MOSFET 应该正常打开，放电 MOSFET 应该正常关闭 Charging MOSFET should be turn on normally，Discharging MOSFET should be turn off normally
	电池包充电过流 Pack charging over current	BMS 应切断充电 MOSFET，并保持过流状态，充电器移除后才可恢复。 Charging MOSFET should be cut off until the charger be recovered after removed
	电芯过压 Cell over voltage	BMS 应切断充电 MOSFET，电芯电压回落到恢复电压后才允许重新开启充电 MOSFET。 Charging MOSFET should be cut off until the voltage below the released threshold
	充电电芯过温 Charger Cell over temperature	BMS 应切断充电 MOSFET，温度回落到恢复温度后才允许重新开启充电 MOSFET。 Charging MOSFET should be cut off until the temperature below the released threshold
	充电电芯低温 Charger Cell under temperature	BMS 应切断充电 MOSFET，温度恢复到恢复温度后才允许重新开启充

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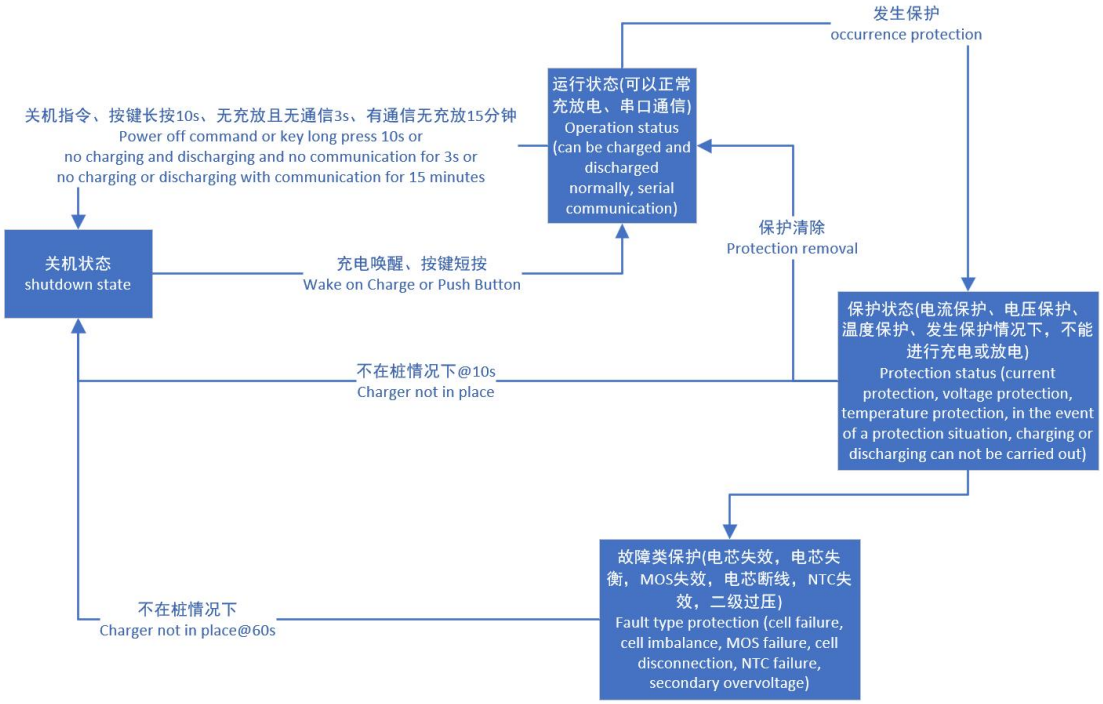
		电 MOSFET。 Charging MOSFET should be cut off until the temperature below the released threshold
	电芯充满 The cell is fully charged	BMS 应切断充电 MOSFET，电芯电压回落到恢复充电后才允许设备充电 Charging MOSFET should be cut off until the cell voltage below the released threshold
	电芯失衡故障 Cells imbalance fault	电芯之间最大压差大于 600mv，且电芯单节电压最高节大于 3.8v，且电流值小于 120mA 时，触发电芯 PF 保护 When the maximum voltage difference between cells is greater than 600mv, the maximum voltage of a single cell is greater than 3.8v, and the current value is less than 120mA, the PF protection of the cell is triggered.
	外设异常 Peripheral exception	检测出外设异常，设备掉电 Peripheral abnormality detected, equipment power failure
负载接入并工作 Loader access and operation	欠压保护 Under voltage	关闭放电 MOSFET，达到欠压恢复点后允许恢复输出 Turn off the discharge MOSFET to allow the output Discharging to resume after the under voltage recovery point is reached
	电压过低 Voltage is too low	单节最低电压小于 2.0v，触发电芯 PF 保护 The lowest voltage of a single section is less than 2.0v, triggering the PF protection of the battery.
	正常放电 Normal discharge	放电 MOSFET 应打开 Discharging MOSFET should be turn on normally
	放电电芯过温 Discharge Cell over temperature	应切断放电 MOSFET，温度回落到恢复温度后才允许重新开启放电

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		MOSFET。 Discharging MOSFET should be cut off until the temperature below the released threshold
	放电电芯低温 Discharge Cell under temperature	应切断放电 MOSFET，温度回升到恢复温度后才允许重新开启放电 MOSFET。 Discharging MOSFET should be cut off until the temperature below the released threshold
	放电 mos 高温 Discharge mos over temperature	应切断放电 MOSFET，温度回升到恢复温度后才允许重新开启放电 MOSFET。 Discharging MOSFET should be cut off until the temperature below the released threshold
	过流保护 Over current	关闭放电 MOSFET 直到达到恢复条件。Discharging MOSFET should be cut off until reaching released conditions
	短路保护 short circuit	BMS 应切断充电 MOSFET 放电 MOSFET，并保持短路状态，充电器移除后才可恢复。 Charging MOSFET and Discharging MOSFET should be cut off until the device be power off
	按键功能 Button function	按下按键，可以开启放电 MOSFET Press the button to turn Discharging MOSFET on

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4.4 状态机 State Machine



4.5BMS 主要功能参数 Main BMS Parameters

BMS 参数表 BMS Parameters Table

No.	Item	Unit	Min.	Typ.	Max.	Remark
Voltage protection						
1	电芯一级过压保护电压 Cell 1st overcharge protection voltage	V	4.15	4.175	4.2	/
2	电芯一级过压保护延时 Cell 1st overcharge protection delay time	s	0.1	1.00	2	/
3	电芯一级过压保护解除电压 Cell 1st overcharge protection release voltage	V	4.03	4.06	4.09	/

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4	电芯二级过压保护电压 Cell 2nd overcharge protection voltage	V	4.25	4.275	4.3	/
5	电芯二级过压保护延时 Cell 2nd overcharge protection delay time	s	0.1	1	2	/
6	电芯一级欠压保护电压 Cell 1st under voltage protection voltage	V	2.67	2.70	2.73	/
7	电芯一级欠压保护延时 Cell 1st under voltage protection delay time	s	2	3	4	/
8	电芯一级欠压保护解除电压 Cell 1st under voltage protection release voltage	V	2.97	3.00	3.03	/
9	电芯二级欠压保护电压 Cell 2nd under voltage protection voltage	V	2.47	2.5	2.53	/
10	电芯二级欠压保护延时 Cell 2nd under voltage protection delay time	s	0.5	1.00	2	/
11	电芯三级欠压保护电压 Cell 3rd under voltage protection voltage	V	1.9	2	2.1	永久失效 Permanent failure
12	电芯三级欠压保护延时 Cell 3rd under voltage protection delay time	s	8	10	12	/
13	电芯失衡故障 Cells imbalance fault （Vmax.＞3.8V，Current＜120mA ）	mV	△550	△600	△650	永久失效 Permanent failure
14	电芯压差失衡故障延时 Cells imbalance fault delay time	s	8	10	12	/
Current protection						
15	一级充电过流保护电流 Charge 1st over current protection	A	1.5	2	2.5	正常充电模式 Normal charge and Dumb charge mode

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16	一级充电过流保护延时 Charge 1st over current protection delay time	s	1	2	3	/
17	二级充电过流保护电流 Charge 2nd over current protection	A	2.5	3	3.5	/
18	二级充电过流保护延时 Charge 2nd over current protection delay time	s	/	1	1.5	/
19	充电过流保护解除条件 Charge over current protection release condition	/	掉电后重新激活解除保护 The protection is removed when the device is reactivated after power failure			
20	一级放电过流保护电流 Discharge 1st over current protection	A	18	20	22	/
21	一级放电过流保护延时 Discharge 1st over current protection delay time	s	1.0	2.0	3.0	/
22	二级放电过流保护电流 Discharge 2nd over current protection	A	26	30	34	/
23	二级放电过流保护延时 Discharge 2nd over current protection delay time	s	/	1	1.5	/
24	放电过流保护解除条件 Discharge over current protection release condition	/	掉电后重新激活解除保护 The protection is removed when the device is reactivated after power failure			
25	短路保护电流 Short-circuit protection current	A	35	40	45	外部短路 External short circuit
26	短路保护延时 Short-circuit protection delay time	us	100	250	500	/
27	短路保护解除条件 Short-circuit protection release condition	/	参考放电过流保护解除条件 Refer to Discharge over current protection release condition			
28	熔断器额定电流 Rated current of FUSE	A	/	30	/	/

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Temperature protection						
29	电芯充电高温保护温度 Charge High temperature protection	℃	52	55	58	/
30	电芯充电高温保护延时 Charge High temperature protection delay time	s	1	2	3	/
31	电芯充电高温保护解除温度 Charge High temperature protection release	℃	47	50	53	/
32	电芯充电高温保护解除延时 Charge High temperature protection release delay time	s	1	2	3	/
33	电芯充电低温保护温度 Charge Low temperature protection	℃	0	2	4	/
34	电芯充电低温保护温度延时 Charge Low temperature protection delay time	s	1	2	3	/
35	电芯充电低温保护解除温度 Charge Low temperature protection release	℃	3	5	7	/
36	电芯充电低温保护解除延时 Charge Low temperature protection release delay time	s	1	2	3	/
37	电芯放电高温保护温度 Discharge High temperature protection	℃	69	72	75	/
38	电芯放电高温保护延时 Discharge High temperature protection delay time	s	1	2	3	/
39	电芯放电高温保护解除温度 Discharge High temperature protection release	℃	59	62	65	/
40	电芯放电高温保护解除延时 Discharge High temperature protection release delay time	s	1	2	3	/

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41	电芯放电低温保护温度 Discharge Low temperature protection	℃	-13	-10	-7	/
42	电芯放电低温保护延时 Discharge Low temperature protection delay time	s	1	2	3	/
43	电芯放电低温保护解除温度 Discharge Low temperature protection release	℃	2	5	8	/
44	电芯放电低温保护解除延时 Discharge Low temperature protection release delay time	s	1	2	3	/
45	充放电 MOSFET 高温保护温度 Charge & Discharge MOSFET High Temperature Protection	℃	85	90	95	/
46	充放电 MOSFET 高温保护延时 Charge & Discharge MOSFET High Temperature Protection Delay Time	s	9	10	11	/
Other protection						
47	均衡开启条件 Balance start-up Condition-(Charging)	在适配器在位时，所有电芯电压≥3.5V，最大与最小电芯压差≥50mV 时，均衡功能打开。 When the adapter is in place, the voltage of all cells is ≥3.5V, and the pressure difference between the maximum and minimum cells is ≥50mV, the equalization function is turned on.				
48	均衡电流 Balance Current	mA	5	10	15	/
49	均衡结束条件 Close balance function condition	适配器不在位，或者电芯压差≥0.6V（MCU 判决满足后停止充电），或者电芯压差≤30mV 时，均衡功能关闭。 Adapter absent, or cell pressure difference ≥0.6V (MCU decision to stop charging), or cell pressure difference ≤30mV, the equalization function is turned off.				

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4.6 标准充放电 Standard Charge and Discharge

标准充电：在标准环境温度下，用 25.75V / 1A(CC-CV 模式)对电池进行充电，当充电电流小于充电结束电流(200mA)时，停止充电。

Standard charge: In standard environment, using 25.75V / 1A(CC-CV mode) to charge battery, stop charging when the charge current is less than the charge termination current(200mA).

标准放电：在标准环境温度下，用 0.8A(CC 模式)对电池进行放电，当电压达到放电截止电压时，停止放电。

Standard discharge: In standard environment, using 0.8A(CC mode) to discharge battery, stop discharging when the voltage achieves the discharge termination voltage.

标准环境 Standard environment:

环境温度 Ambient temperature：23±3℃；

湿度 Relative humidity：25%~65%；

大气压力 Atmospheric pressure：86kPa~106kPa。

4.7 容量需求 Capacity Requirements

容量指标表Capacity indicators table

序号 No.	项目 Item	条件 Conditions	性能 Performances
1	标准放电容量 Standard Discharge Capacity	按标准充电，并搁置 30min 后，再按标准放电计算电池实际放电容量。 After 30min standard charge, Measure the capacity according to standard discharge.	新生产电池放电容量：≥3.7Ah。 New production battery discharge capacity:≥3.7Ah
2	低温容量 Low Temperature Capacity	电池按标准充电后，将其置于低温环境中搁置 8 小时，再在低温环境中以 0.2C 电流放电至规定终止电压或电池保护，计算电池实际容量。 The battery is placed in environment of low temperatures for 8hrs after standard charge,and discharged with 0.2C in the low-temperature environment until it reaches the cut-off voltage or the protection	0℃下放电容量满足：≥80%可用容量，其中 25℃10A 放电容量为 100%；0℃容量仅作参考，温度设定误差不应超过±3℃。 The discharge capacity at 0℃ is ≥ 80% of available capacity, and the discharge capacity at 25℃10A is

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		activates. Calculate the actual capacity of the battery.	100%.The 0℃ capacity is for reference only, and the temperature setting error should not exceed ±3℃.
3	高温容量 High Temperature Capacity	电池按标准充电后，将其置于高温环境中搁置 8 小时，再在高温环境中以 0.2C 电流放电至规定终止电压或电池保护，计算电池实际容量。 The battery is placed in different environment of high temperatures for 8hrs after standard charge, and discharged with 0.2C in the high-temperature environment until it reaches the cut-off voltage or the protection activates. Calculate the actual capacity of the battery.	60℃下放电容量满足：≥90％可用容量，其中 25℃ 10A 放电容量为 100%；60℃容量仅作参考，温度设定误差不应超过±3℃。 The discharge capacity at 60℃ is ≥ 90% of available capacity, and the discharge capacity at 25℃10A is 100%.The 60℃ capacity is for reference only, and the temperature setting error should not exceed ±3℃.
4	倍率放电容量 Rate discharge capacity	按标准充电，并搁置 30min 后，再按 2C 或 3C 放电计算电池实际放电容量。 After 30min standard charge, Measure the capacity according to 2C or 3C discharge.	2C 或 3C 放电容量满足：≥90％标准放电容量 @25℃； 2C or 3C discharge capacity meets:≥ 90% standard discharge capacity @25℃;
5	荷电保持能力 Capacity Retention and Capacity Recovery	电池按标准充电，并开路搁置 60 天后，将其以 0.2C 电流放电至规定终止电压或电池保护，计算放电容量。 The battery is charged according to the standard, and after 30 days on the open circuit, it is discharged at 0.2C current to the specified termination voltage or battery Protection, calculate discharge capacity.	保持容量 Retention capacity≥90%; 恢复容量 Capacity recovery≥95% 其中 25℃10A 放电容量为 100% The discharge capacity at 25℃10A is 100%.
6	循环寿命 Cycle Life	在 23±3℃下，电池按标准充电后，以 2C 电流放电，直至达到截止电压或保护动作。在标准环境下重复此循环，充放电间隔 30 分钟。循环 500 次后，按标准充放电进行一次循环，记录放电容量。 After standard charging, discharge with 2C current until reaching the cut-off voltage or	500 次循环后，容量≥初始容量 80%。 After 500 cycles, capacity ≥ 80% of the initial capacity.

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		protection action.Repeat this cycle in a standard environment with 30 minutes between charges and discharges.After 500 cycles, a cycle is performed according to the standard charge and discharge, and the discharge capacity is recorded.	

5. 可靠性 Reliability

依据飞毛腿《智能家庭类测试清单》。

Refer to the reliability standard of SCUD "Smart Home Test List".

6. 铭牌、包装和运输 The label, Package and Shipment

6.1 铭牌和条形码 Label and Bar Code

请参阅附件。

Please refer to the appendix.

6.2 包装 Package

请参阅附件。

Please refer to the appendix.

6.3 运输 Shipment

产品运输中应防雨淋、水浸，不应有剧烈震动

Product should prevent from rain, immersion, severe vibration during transportation

7. 其它 Others

7.1 环境保护 Protection for Environment

封装电池组所用材料须全部符合环境保护标准 RoHs 2.0、Reach

All the materials of pack should meet the environmental protection standards RoHs 2.0, REACH.

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7.2 Manufacturer and Factory/制造商和生产厂

Manufacturer： Fujian SCUD Power Technology Co., Ltd.

/制造商：福建飞毛腿动力科技有限公司

Address： 6/F, No.98, Jiangbin East Avenue, Mawei District, Fuzhou, Fujian, China (inside Pliot Free Trade Zone)

/制造商地址：福州市马尾区江滨东大道 98 号 6 层（自贸试验区内）

Factory： Fujian SCUD Power Technology Co., Ltd.

/生产厂：福建飞毛腿动力科技有限公司

Address： No. 135, East of Rujiang Road, Mawei District, Fuzhou, Fujian

/生产厂地址：福建省福州市马尾区儒江东路 135 号

8. 警告、注意及提醒 Warnings, Notice and Caution



1.请勿将电池组放入火中或加热电池组。

Do not put the battery into a fire, or heat the battery.

2.请勿将电池组储存在高温环境中。

Do not store the battery in high temperature environment.

3.请勿将电池组反接在充电器或设备的正极(+)和负极(-)上。

Do not connect the battery reversed in positive (+) and negative (-) terminals in the charger or equipment.

4.不要让电池组(+和-)端子与随身携带或储存在一起的电线或任何金属(如金属项链或发夹)接触，可能导致短路。

Do not let the battery terminals (+ and -) contact a wire or any metal (like a metal necklace or a hairpin) with which it carried or stored together, may cause short-circuit.

5.禁止钉、锤、戳电池组，禁止用任何方式敲击电池组。

Do not drive a nail in, hit with a hammer, or stamp on the battery, do not strike the battery in any ways.

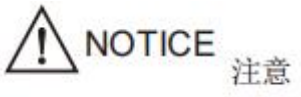
6.禁止拆卸或改变电池组的外部结构。

Do not disassemble or alter the batteries' outside structure.

7.请勿将电池组浸入水中，储存电池组时请勿弄湿电池组。

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Do not submerge the battery in water, do not wet the battery when store the battery.



1.电池组应按照正确的操作内容，使用合适的充电器进行充放电。

Battery should be charged and discharged with proper charger, in compliance with correct operation Contents.

2.请勿与其他厂商的电池、干电池、镍氢电池、镍镉电池、新旧锂电池等不同型号和类型的电池或电池组混用。

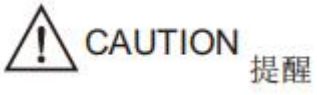
Do not use the battery with other maker's batteries, different types and /or models of batteries such as dry batteries, nickel-metal hydride batteries, or nickel-cadmium batteries, or new and old lithium batteries together.

3.如果电池组产生老化和/或发热、变色和/或形状改变、电解液泄漏或导致其他任何异常，请不要将电池组留在充电器或设备中。

Do not leave the battery in a charger or equipment if it generates an older and/or heat, changes color and/or shape, leaks electrolyte, or cause any other abnormality.

4.电池组未充电时，请勿连续放电。

Do not discharge the battery continuously when it is not charged.



1.使用电池组前，请仔细阅读和遵守电池组组规格书，以及电池组组表面的信息。

Before using the battery, carefully read and follow battery specification and the information on the surface of the batteries.

2.避免儿童玩弄电池组。

Children should not be allowed to play with them

3.本电池组只能使用配套充电器充电。

The batteries should only be charged with a matching charger.

4.注意事项-在设备中使用的电池组如果使用不当，可能存在着火或化学灼伤的风险。请不要拆卸、加热超过规格书定义的最高温度限制，或焚烧。只使用(电 池组制造商名称或最终产品制造商名称和零件号)替换电池组。使用其他电池组可能会有起火或爆炸的危险。

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Caution – The battery used in this device may present a risk of fire or chemical burn if mistreated. Do no disassemble, heat above (manufacturer's maximum temperature limit), or incinerate. Replace battery with (battery manufacturer's name or end product manufacturer's name and part number) only. Use of another battery may present a risk of fire or explosion.

5.长期不用时，请将电池组储存完好，电池组应每隔 3 个月补电一次，让电池组处于半荷电状态。请用不导电材料包裹电池组， 以避免金属直接接触电池组造成电池组损坏。将电池组保存于阴凉干燥处。

When the batteries are not be used for a long time, please store them safely. The batteries shall be charged every three months so that they will stay in a half-charged state. Please wrap the batteries with non-conductive materials in order that metallic materials will not contact the batteries directly, which may result in damage to the batteries. Keep the batteries in a cool and dry place.

6、当电池需要废弃时，应该按照当地有关废旧电子产品处理的相关规定进行处理。不能当做普通城市垃圾处理。

If batteries need to be discarded, dispose of them according to local regulations on the disposal of waste electronic products. It cannot be treated as ordinary municipal garbage.

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9. 附件 Appendix

关键器件清单

No.	Object/ part no.	Manufacturer/ Trademark	Type/Model	Technical Data	Standard	Mark(s) of Conformity
1	PCB	GLOBAL SUCCESS CIRCUITS CO LTD	T-1	130℃,V-0	/	E324220
1-1	PCB (Alternative)	HX Circuit Technology Co Ltd	HX-1	130℃,V-0	/	E500302
2	MCU (U3)	Texas Instruments Incorporated	MSPM0L1106TRHBR	Frequency:32MHz TFUNC: -40℃ to 105℃	/	/
3	AFE(U1)	Texas Instruments Incorporated	BQ76907	Battery monitoring capability for 2-series to 7- series cells TFUNC: -40℃ to 110℃	/	/
4	IC(U2)	CellWise Microelectronics Co., Ltd	CW1071BLAM	Over -charge Threshold Voltage: 4.250V to 4.3V, TFUNC: -40℃ to 85℃	/	/
5	IC(U4)	SG Micro Corp	SGM61410	Wide 5V to 42V Operating Input Voltage Range 0.8V to 24V Adjustable Output Voltage TFUNC: -40℃ to 125℃	/	/
6	NTC (RT1)	Guangzhou Newlife New Material CO., LTD	NL103F3435	R25=10KΩ, Tmax:150℃	/	E505719
6-1	NTC	SHENZHENSHI	MF5210K	R25=10KΩ,	/	E356449

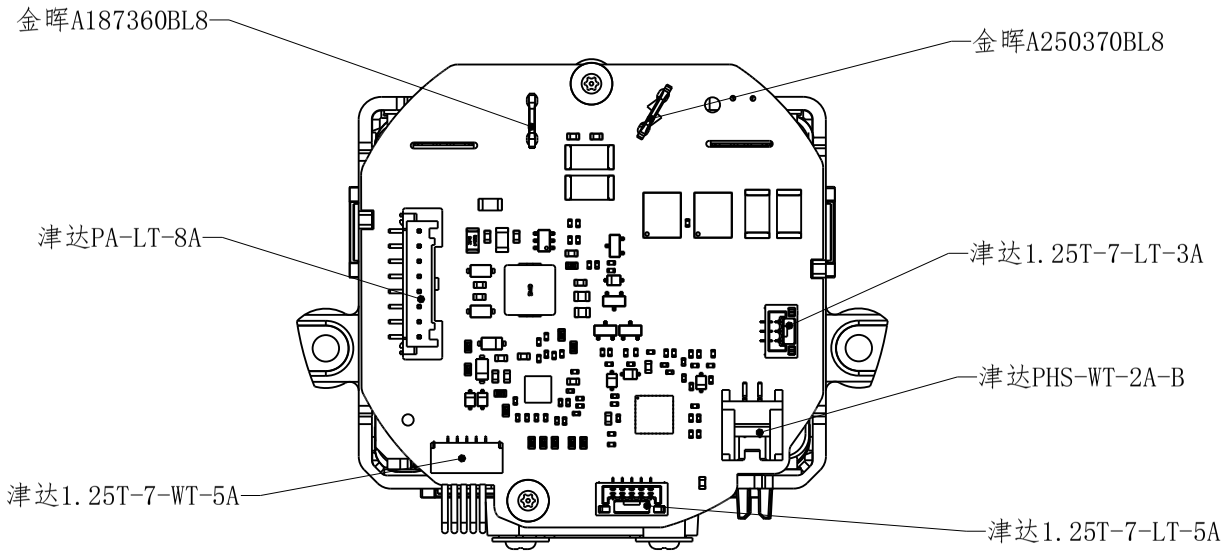
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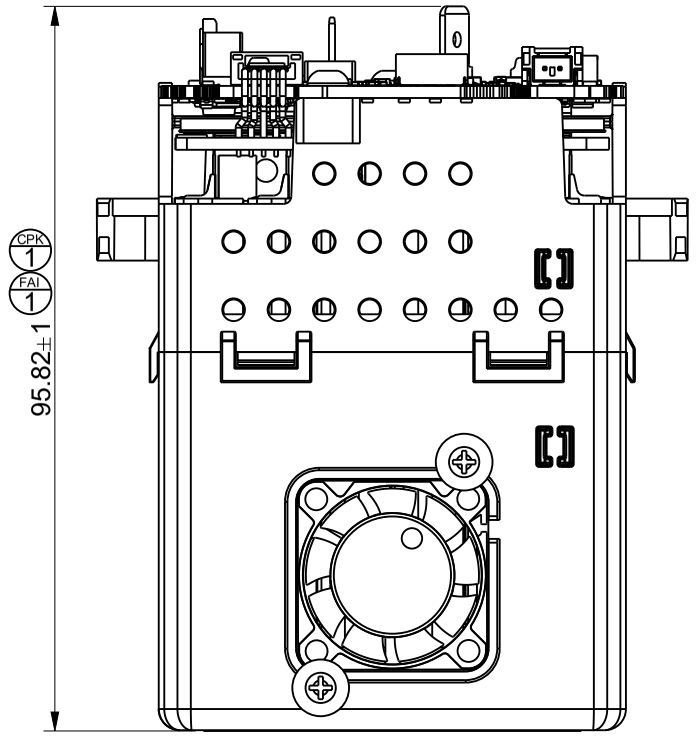
	(Alternative)	KEMIN SENSOR CO LTD		Tmax:125℃		
6-2	NTC (Alternative)	Guangdong Xinshiheng Technology Co. , Ltd.	MF52C103F3435	R25=10KΩ，Tmax:105℃	/	E526963
7	MOSFET (Q10,Q15)	China Resources Microelectronics Limited	CRTM030N04L	VDS=40V,ID=116A (TC=25℃), VGS: ±20V, TSTG: -55° C to 150 ° C	/	/
7-1	MOSFET (Alternative)	WUXI NCE POWER CO.,LTD.	NCEP40T11G	VDS=40V,ID=110A (TC=25℃), VGS: ±20V, TSTG: -55° C to 150 ° C	/	/
8	MOSFET (V1、V2)	China Resources Microelectronics Limited	CRTE210P04L2-G	VDS=-40V,ID=-8A (TC=25℃), VGS: ±18V, TSTG: -55° C to 150 ° C	/	/
8-1	MOSFET (Alternative)	Micro Commercial Components Corporation	MCQ12P04A	VDS=-40V,ID=-12A (TC=25℃), VGS: ±20V, TSTG: -55° C to 150 ° C	/	/
9	Fuse (F1)	Suzhou Walter Electronic Co.,Ltd.	1206HC 30A 48V	30A，48V	/	E56092
9-1	Fuse (Alternative)	ADVANCED SURGETECH MATERIALS	12 111.30	30A，36V	/	E355868
		KURARAY CO LTD	GN2330(#)	V-0,-25° C~ 85° C, 3A,250V	UL 94, UL 746	E90350
			GN2330(#)	V-0,-25° C~ 85° C, 1A,50V		
			GN2330(#)	V-0,-25° C~ 85° C, 1A,50V		
			GN2330(#)	V-0,-25° C~ 85° C,		

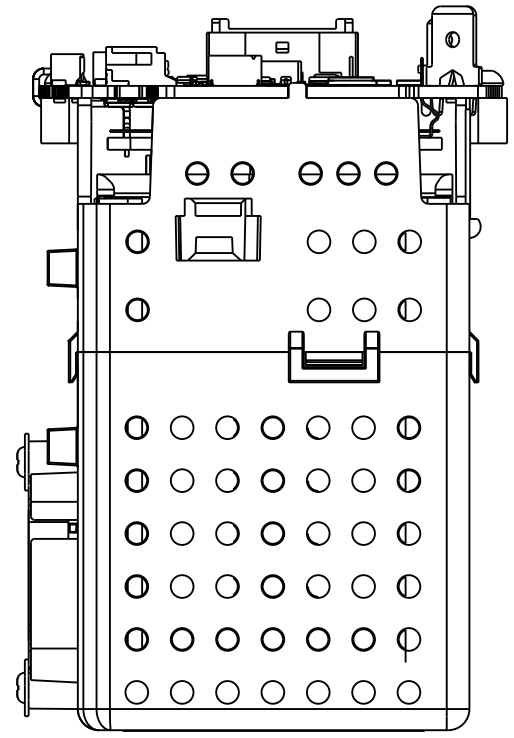
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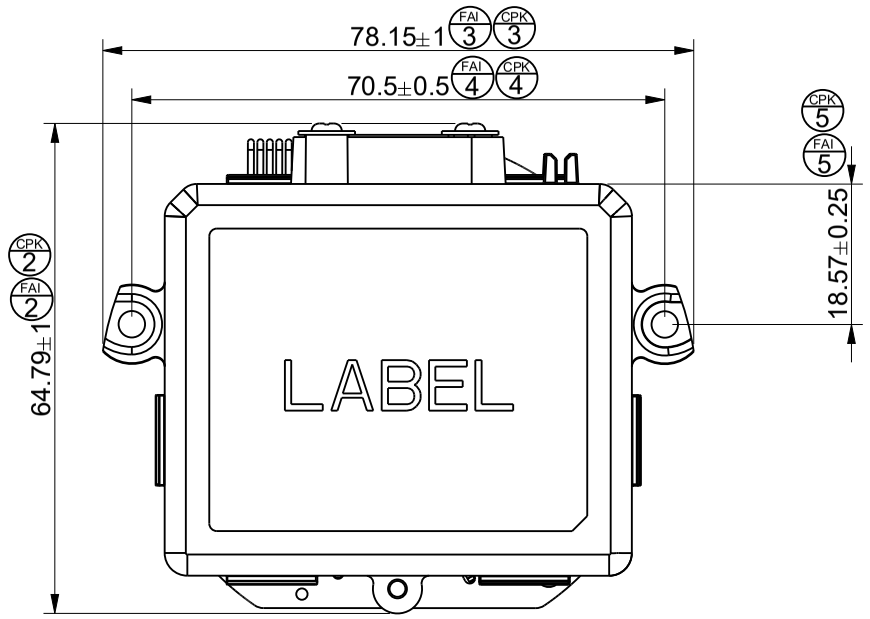
10	Connector			2A,125V		
			GN2330(#)	V-0,-25° C~ 85° C, 2A,125V		
		CHANG CHUN PLASTICS CO LTD	4815	V-0,-25° C~ 85° C, 1A,50V		E59481
11	Plastic Enclosure	Covestro Deutschland AG	FR3010	min 1.5mm， 85℃ V0	UL 94, UL 746	E41613
12	Wire	DONGGUAN ZHONGZHENG WIRE & CABLE TECH CO LTD	10368	AWG26, FT2, 300V,105°C	UL758	E336285
13	Electric Fans	SHENZHEN XIEHENGDA ELECTRONIC CO LTD	DFS250705H	V-0,-10° C~ 70° C, 5V/0.2A,	UL 507	E349048
14	FOAM	Yibao (Fujian) Polymer Material Stock Co Ltd	YB-2535A	V-0	UL 94	E520752

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技术要求：
1. 制品表面不允许刀痕、毛刺、刮伤等缺陷，缩水痕迹程度参考封样件；
2. 外观见封样件；
3. Ⓒ为CPK重点管控尺寸，所有标注尺寸均为FAI尺寸Ⓕ；
4. 未注尺寸公差按附表，详细尺寸参照3D数据。

mm<size(A)<=mm	TOL
-	-
0<A<=30	+/-0.10
30<A<=50	+/-0.15
50<A<=100	+/-0.20
100<A<=200	+/-0.25
200<A	+/-0.30

DRW. No.		福建飞毛腿动力科技有限公司 FUJIAN SCUD POWER TECH. CO.,LTD						
NAME	BCR-61P-4000MF 外形图							
DESIGNED			UNIT	mm	MATERIAL			
STANDARD			SCALE	NTS				
CHECKED			SIZE	A3	MASS(g)	PROJECT	BCR-61P-4000MF	
APPROVED			SHEET No.	1/1		REV	A	1.0

Safety Data Sheet (SDS) Report

SDS Number: SHJ160732505

Applicant: Beijing Roborock Technology Co.,Ltd.
Building 3, Yard 17, Anju Road,ChangPing District, Beijing, China

Issue Date: 2023-09-08

Sample Description:

The sample information was submitted and identified on client's behalf to be:

Product Name	:	Floor Cleaning Solution
Physical State	:	Liquid
Data Received	:	Sep 01, 2023
Data Reviewed	:	Sep 08, 2023

Service Requested:

Based on the information provided by the applicant, the Safety Data Sheet (SDS) was generated in accordance with the requirements of OSHA HazCom Standard (2012), for details please refer to attached pages.

Authorized By:

On Behalf Of Regulatory Affairs in Intertek Testing Services Ltd., Shanghai

Anna Wang
Technical Manager

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Tel: +86 021 53397981
E-mail:hers@intertek.com

Floor Cleaning Solution

Safety Data Sheet

according to US HazCom 2012

Issue date: 9/8/2023 Revision date: 9/8/2023 Version: 1.0 SDS number: SHJ160732505

SECTION 1: Identification

1.1. Identification

Product form : Mixtures

Product name : Floor Cleaning Solution

1.2. Recommended use and restrictions on use

Amplifing the cleaning power of Roborock robot mops

1.3. Supplier

Supplier
Beijing RoborockTechnology Co.,Ltd.
Building 3, Yard 17, Anju Road,ChangPing District, Beijing, China
T +86-010-53241660
support@roborock-eu.com

Importer
RoborockTechnologyCo.(US)
OOM 1227,12TH FLOOR,1000 N.WEST STREET,WILMINGTON,DE 19801.(US)
T 1-855-960-4321(US)
support@roborock.com(US)

1.4. Emergency telephone number

1-855-960-4321 (24hrs)(US)

SECTION 2: Hazard(s) identification

2.1. Classification of the substance or mixture

GHS US classification

Serious eye damage/eye irritation Category 2 — Causes serious eye irritation

2.2. GHS Label elements, including precautionary statements

GHS US labeling

Hazard pictograms (GHS US) :



Signal word (GHS US) : Warning

Hazard statements (GHS US) : Causes serious eye irritation

Precautionary statements (GHS US) : If medical advice is needed, have product container or label at hand.
Keep out of reach of children.
Wash hands, forearms and face thoroughly after handling.
Wear protective gloves/protective clothing/eye protection/face protection.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If eye irritation persists: Get medical advice/attention.

2.3. Other hazards which do not result in classification

No additional information available

2.4. Unknown acute toxicity (GHS US)

No additional information available

SECTION 3: Composition/Information on ingredients

3.1. Substances

Not applicable

3.2. Mixtures

Name	Product identifier	%
Water	CAS-No.: 7732-18-5	96.2 – 97.4
D-Glucopyranose, oligomeric, decyl octyl glycosides	CAS-No.: 68515-73-1	2 – 2.5
Disodium EDTA	CAS-No.: 139-33-3	0.5 – <1
Oxirane, methyl-, polymer with oxirane	CAS-No.: 9003-11-6	0.1 – 0.2
Parfum	CAS-No.: /	0.03 – 0.06
1,2-Benzisothiazol-3(2H)-one	CAS-No.: 2634-33-5	0.003 – <0.005

SECTION 4: First-aid measures

4.1. Description of first aid measures

First-aid measures general : Get medical advice/attention if you feel unwell.
First-aid measures after inhalation : Remove person to fresh air and keep comfortable for breathing.
First-aid measures after skin contact : Wash skin with plenty of water.
First-aid measures after eye contact : Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.
First-aid measures after ingestion : Call a poison center or a doctor if you feel unwell.

4.2. Most important symptoms and effects (acute and delayed)

Symptoms/effects after eye contact : Eye irritation.

4.3. Immediate medical attention and special treatment, if necessary

Treat symptomatically.

SECTION 5: Fire-fighting measures

5.1. Suitable (and unsuitable) extinguishing media

Suitable extinguishing media : Water spray. Dry powder. Foam. Carbon dioxide.

5.2. Specific hazards arising from the chemical

Hazardous decomposition products in case of fire : Toxic fumes may be released.

5.3. Special protective equipment and precautions for fire-fighters

Protection during firefighting : Do not attempt to take action without suitable protective equipment. Self-contained breathing apparatus. Complete protective clothing.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Emergency procedures : Ventilate spillage area. Avoid contact with skin and eyes.

6.1.2. For emergency responders

Protective equipment : Do not attempt to take action without suitable protective equipment. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up : Take up liquid spill into absorbent material.

Other information : Dispose of materials or solid residues at an authorized site.

6.4. Reference to other sections

For further information refer to section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Ensure good ventilation of the work station. Avoid contact with skin and eyes. Wear personal protective equipment.

Hygiene measures : Do not eat, drink or smoke when using this product. Always wash hands after handling the product.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store in a well-ventilated place. Keep cool.

Packaging materials : Plastic,e.g. HDPE, PET, PP, or glass.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Floor Cleaning Solution

No additional information available

Water (7732-18-5)

No additional information available

D-Glucopyranose, oligomeric, decyl octyl glycosides (68515-73-1)

No additional information available

Disodium EDTA (139-33-3)

No additional information available

Oxirane, methyl-, polymer with oxirane (9003-11-6)

No additional information available

1,2-Benzisothiazol-3(2H)-one (2634-33-5)

No additional information available

8.2. Appropriate engineering controls

Appropriate engineering controls : Ensure good ventilation of the work station.
Environmental exposure controls : Avoid release to the environment.

8.3. Individual protection measures/Personal protective equipment

Hand protection:

Protective gloves

Eye protection:

Safety glasses

Skin and body protection:

Wear suitable protective clothing

Respiratory protection:

In case of insufficient ventilation, wear suitable respiratory equipment. (EN 136/140/145)

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	:	Liquid
Appearance	:	Transparent.
Color	:	Blue
Odor	:	Floral
Odor threshold	:	No data available
pH	:	6 – 8
Melting point	:	Not applicable
Freezing point	:	No data available
Boiling point	:	No data available
Flash point	:	No data available
Relative evaporation rate (butyl acetate=1)	:	No data available
Flammability (solid, gas)	:	Not applicable.
Vapor pressure	:	No data available
Relative vapor density at 20°C	:	No data available
Relative density	:	No data available
Solubility	:	No data available
Partition coefficient n-octanol/water (Log Pow)	:	No data available
Auto-ignition temperature	:	No data available
Decomposition temperature	:	No data available
Viscosity, kinematic	:	No data available
Viscosity, dynamic	:	No data available
Explosion limits	:	No data available
Explosive properties	:	No data available
Oxidizing properties	:	No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

The product is non-reactive under normal conditions of use, storage and transport.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

No dangerous reactions known under normal conditions of use.

10.4. Conditions to avoid

None under recommended storage and handling conditions (see section 7).

10.5. Incompatible materials

No additional information available

10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity (oral) : Not classified
Acute toxicity (dermal) : Not classified
Acute toxicity (inhalation) : Not classified

D-Glucopyranose, oligomeric, decyl octyl glycosides (68515-73-1)	
LD50 dermal rabbit	> 2000 mg/kg (Source: ECHA_API)

Disodium EDTA (139-33-3)	
LD50 oral rat	2800 mg/kg (Source: NLM_CIP)

Oxirane, methyl-, polymer with oxirane (9003-11-6)	
LD50 oral rat	16 g/kg (Source: NLM_CIP)

1,2-Benzisothiazol-3(2H)-one (2634-33-5)	
LD50 oral rat	1020 mg/kg (Source: NZ_CCID)
LD50 dermal rat	> 2000 mg/kg (Source: ECHA_API)
LC50 Inhalation - Rat (Dust/Mist)	100 mg/l

Skin corrosion/irritation : Not classified
Serious eye damage/irritation : Causes serious eye irritation.
Respiratory or skin sensitization : Not classified
Germ cell mutagenicity : Not classified
Carcinogenicity : Not classified
Reproductive toxicity : Not classified
STOT-single exposure : Not classified
STOT-repeated exposure : Not classified
Aspiration hazard : Not classified
Symptoms/effects after eye contact : Eye irritation.

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : The product is not considered harmful to aquatic organisms nor to cause long-term adverse effects in the environment.

Disodium EDTA (139-33-3)	
LC50 - Fish [1]	320 mg/l (Exposure time: 96 h - Species: Poecilia reticulata [semi-static] Source: IUCLID)
EC50 - Crustacea [1]	> 114 mg/l Test organisms (species): Daphnia magna
EC50 72h - Algae [1]	> 60 mg/l Test organisms (species): Pseudokirchneriella subcapitata (previous names: Raphidocelis subcapitata, Selenastrum capricornutum)
LOEC (chronic)	50 mg/l Test organisms (species): Daphnia magna Duration: '21 d'
NOEC (chronic)	25 mg/l Test organisms (species): Daphnia magna Duration: '21 d'
NOEC chronic fish	≥ 25.7 mg/l Test organisms (species): Duration: '35 d'

1,2-Benzisothiazol-3(2H)-one (2634-33-5)	
LC50 - Fish [1]	≈ 16.7 mg/l Test organisms (species): Cyprinodon variegatus
EC50 - Crustacea [1]	2.94 mg/l Test organisms (species): Daphnia magna
EC50 - Other aquatic organisms [1]	2.94 mg/l waterflea
LC50 - Fish [2]	2.15 mg/l Test organisms (species): Oncorhynchus mykiss (previous name: Salmo gairdneri)
EC50 - Crustacea [2]	2.9 mg/l Test organisms (species): Daphnia magna
EC50 - Other aquatic organisms [2]	0.11 mg/l

12.2. Persistence and degradability

No additional information available

12.3. Bioaccumulative potential

Disodium EDTA (139-33-3)	
Partition coefficient n-octanol/water (Log Pow)	-11.7

1,2-Benzisothiazol-3(2H)-one (2634-33-5)	
Partition coefficient n-octanol/water (Log Pow)	0.99 (at 20 °C (at pH 5)

12.4. Mobility in soil

No additional information available

12.5. Other adverse effects

No additional information available

SECTION 13: Disposal considerations

13.1. Disposal methods

Waste treatment methods : Dispose of contents/container in accordance with licensed collector's sorting instructions.

SECTION 14: Transport information

In accordance with DOT / TDG / IMDG / IATA

DOT	TDG	IMDG	IATA
14.1. UN number			
Not regulated for transport			
14.2. Proper Shipping Name			
Not regulated	Not regulated	Not regulated	Not regulated
14.3. Transport hazard class(es)			
Not regulated	Not regulated	Not regulated	Not regulated
14.4. Packing group			
Not regulated	Not regulated	Not regulated	Not regulated
14.5. Environmental hazards			
Not regulated	Not regulated	Not regulated	Not regulated
No supplementary information available			

14.6. Special precautions for user

DOT
Not regulated

TDG
Not regulated

IMDG
Not regulated

IATA
Not regulated

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable

SECTION 15: Regulatory information

15.1. US Federal regulations

All components of this product are present and listed as Active on the United States Environmental Protection Agency Toxic Substances Control Act (TSCA) inventory

This product or mixture is not known to contain a toxic chemical or chemicals in excess of the applicable de minimis concentration as specified in 40 CFR §372.38(a) subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

15.2. US State regulations

California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer, developmental and/or reproductive harm

SECTION 16: Other information

according to US HazCom 2012

Issue date : 9/8/2023

Safety Data Sheet (SDS), USA

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.