

Safety Data Sheet

Date of Issue: March 18, 2022.

File No.: DGGF20220318MSDS01

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product Identifier

Name of Product: Rechargeable Lithium-ion Battery

1.2 Other means of identification

Product Models: B0616B

Nominal Voltage: 10.8V

Nominal capacity: 6300mAh

Nominal Power: 68.04Wh

Weight: 306.2g

1.3 Recommended use of the chemical and restriction on use

Recommended Use: Rechargeable Li-ion Battery

Restriction on Use: No information available

1.4 Information Of Supplier:

Company Name: DONGGUAN GANFENG ELECTRONICS CO., LTD.

Address: 1A、2A、1B,NO.1,Pushi 1st Road ,Qiaotou Town,Dongguan City, Guangdong Province

Contact person: Maozhen Liu

Tel: +86-769-81037198

E-mail: std-qa@ganfengdz.com

1.5 Emergency Telephone

+86-769-81037198

2. Hazard(s) Identification

2.1 Classification

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200).

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

2.2 Label elements

2.2.1 Signal Word **Danger**

2.2.2 Hazard Statements

Causes skin irritation

Causes serious eye damage

Suspected of causing cancer

Causes damage to organs through prolonged or repeated exposure

2.2.3 Symbol



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This product is an article which contains a chemical substance. Safety information is given for exposure to the article as solid. Intended use of the product should not result in exposure to the chemical substance, This is a battery. In case of rupture: the above hazards exist.

2.3 Precautionary Statements

2.3.1 Precautionary Statements – Prevention

Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Use personal protective equipment as required.
Wash face, hands and any exposed skin thoroughly after handling.
Contaminated work clothing should not be allowed out of the workplace.
Keep away from flames and hot surface –no smoking.
Do not breath dust/fume/gas/mist/vapors/spray.
Do not eat, drink or smoke when using this product.

2.3.2 Precautionary Statements – Response

If exposed or connected: Get medical advice/attention.
Specific treatment(see supplemental first aid/instruction on this label).

Skin

If ON SKIN: wash with plenty of soap and water.
Take off contaminated clothing and water before reuse.
If skin irritation or rash occurs: get medical advice/attention if feel unwell.

Eye

If IN EYES: Rinse cautiously with water for several minutes, remove contact lenses, if present and easy to do, Continue rinsing. Call a POISON CENTER or doctor/physician.

Inhalation

If inhalation: if breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. If experiencing respiratory symptoms: Call a poison center or doctor/physician.

Ingestion

If swallowed: rinse mouth, do not induce vomiting ,Call a poison center or doctor/physician if feel unwell.

2.3.3 Precautionary Statements – Storage

Store locked up

2.3.4 Precautionary Statements – Disposal

Dispose of contents/container to an approved waste disposal plant.

2.4 Hazards not otherwise classified (HNOc)

Not applicable

2.5 Unknown Toxicity

40% of the mixture consists of ingredient(s) of unknown toxicity.

2.6 Other information

Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

2.7 Interactions with other chemicals

No information available.

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3. Composition/ Information on Ingredients

Chemical Name	CAS No.	Weigh%
Aluminum Foil	7429-90-5	0.97
Copper Foil	7440-50-8	10.62
Lithium nickel cobalt manganate	182442-95-1	41.62
styrene-butadiene copolymer (SBR)	9003-55-8	0.79
N-methyl-pyrrolidone(NMP)	872-50-4	5.15
Sodium Carboxymethyl Cellulose(CMC)	9004-32-4	1.33
Polyvinylidene Fluoride (PVDF)	24937-79-9	1.39
Carbon (Proprietary)	7782-42-5	24.0
Electrolyte (proprietary)	616-38-6	14.13

4. First Aid Measures

4.1 General Advice

First aid is upon rupture of sealed battery.

4.1.1 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. Do not rub affected area. Seek immediate medical attention/advice.

4.1.2 Skin Contact

Wash off immediately with plenty of water and soap for at least 15 minutes. Remove and isolate contaminated clothing and shoes. Get medical attention if irritation develops and persists.

4.1.3 Inhalation of Vented Gas

Remove to fresh air. Get medical attention immediately if symptoms occur. If not breathing, give artificial respiration. If breathing is difficult, (trained personnel should) give oxygen.

4.1.4 Ingestion

Do NOT induce vomiting. Rinse mouth immediately and drink plenty of water. Never give anything by mouth to an unconscious person. Call a physician or poison control center immediately.

4.1.5 Self-protection of the first aider

Ensure that medical personnel are aware of the material(s) involved. Take precaution to protect themselves and prevent spread of contamination. Avoid contact with skin, eyes or clothing. Avoid direct contact with skin. Use barrier to give mouth-to-mouth resuscitation. Use personnel protective equipment as required. Wear personnel protective clothing (see section 8).

4.2 Most important symptoms and effects, both acute and delayed

Burning sensation, Itching. Rashes. Hives, Coughing.

4.3 Indication of any immediate medical attention and special treatment needed

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Notes to physician

Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated. Do not give chemical antidotes. Asphyxia from glottal edema may occur. Marked decrease in blood pressure may occur with moist rales, frothy sputum, and high pulse pressure. May cause sensitization of susceptible persons. Treat symptomatically.

5. Fire –Fighting Measures

5.1 Suitable Extinguishing Media

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Dry chemical, CO₂, water spray or regular foam. Move containers from fire area if you can do it without risk.

5.2 Unsuitable Extinguishing Media

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

5.3 Specific Hazards Arising from the chemical

Thermal decomposition can lead to release of irritating gases and vapors. In the event of fire and/or explosion do not breathe fumes. May cause sensitization by inhalation and skin contact. Product is or contains a sensitizer.

Hazardous Combustion products

Carbon oxides

5.4 Explosion Data

Sensitivity to Mechanical Impact :None.

Sensitivity to Static Discharge: None.

5.5 Protective equipment and precautions for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/IOSH (approved or equivalent) and full protective gear. Move containers from fire area if you can do it without risk.

6. Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Use personal protective equipment as required. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak.

6.2 Environmental Precautions

Refer to protective measures listed in Sections 7 and 8. Prevent further leakage or spillage if safe to do so. Should not be released into the environment. Do not allow to enter into soil/subsoil. Prevent product from entering drains.

6.3 Methods for containment

Prevent further leakage or spillage if safe to do so. Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal.

6.4 Methods for cleaning up

Pick up and transfer to properly labeled containers.

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7. Handling and Storage

7.1 Precaution for safe handling

In case of rupture, use personal protection equipment. Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Do not breathe dust/fume/gas/mist/vapors/spray.

7.2 Conditions for safe storage, including any incompatibilities

Storage

Keep containers tightly closed in a dry, cool and well-ventilated place. Store locked up. Keep out of the reach of children.

Incompatible products

Strong acids. Strong oxidizing agent. Strong bases.

8. Exposure Controls/Personal Protection

8.1 Exposure Guidelines

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Lithium nickel cobalt manganite 182442-95-1	TWA: 2 mg/m ³ respirable particulate matter all forms except graphite fibers	TWA: 15 mg/m ³ total dust synthetic TWA: 5 mg/m ³ respirable fraction synthetic (vacated) TWA: 2.5 mg/m ³ respirable dust natural (vacated) TWA: 10 mg/m ³ total dust synthetic (vacated) TWA: 5 mg/m ³ respirable fraction synthetic TWA: 15 mppcf natural	IDLH: 1250 mg/m ³ TWA: 2.5 mg/m ³ respirable dust
Copper Foil 7440-50-8	TWA: 2.5 mg/m ³ F	TWA: 2.5 mg/m ³ F TWA: 2.5 mg/m ³ dust (vacated) TWA: 2.5 mg/m ³	-

ACGIH TLV: American Conference of Governmental Industrial Hygienists-Threshold Limit Value
OSHA PEL : Occupational Safety and Health Administration-Permissible Exposure Limits
NIOSH IDLH Immediately Dangerous to Life or Health.

Other Exposure Guidelines:

Vacated limits revoked by the court of Appeals decision in AFL-CLO v. OSHA, 965F, 2d 962(11th Cir., 1992) See section 15 for national exposure control parameters.

8.2 Appropriate engineering controls

Engineering Measures:

Showers, Eyewash stations, Ventilation systems

8.3 Individual protection measures, such as personal protective equipment

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

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required.

Eye /face protection: if splashes are likely to occur: Wear safety glasses with side shields(or goggles). None required for consumer use.

Skin protection: Wear protective gloves and protective clothing. Long sleeved clothing. Imperious gloves.

Hygiene Measure: Handle in accordance with good industrial hygiene and safety practice. Do not eat, drink or smoke when using this product. Take off contaminated clothing and wash before reuse. Avoid contact with skin, eyes or clothing. Wear suitable gloves and eye/face protection. Wash hands before breaks and immediately after handling the product. For environmental protection, remove and wash all contaminated protective equipment before re-use. No information available.

9. Physical and Chemical Properties

Physical State: Solid

Color: Silver

Odor: Odorless

Odor Threshold: No information available

pH: No data available

Melting/freezing point: No data available

Boiling point/boiling range: No data available

Flash Point: No data available

Evaporation Rate: No data available

Flammability (Solid, gas): No data available

Flammability Limit in Air:

Upper flammability limit: No data available

Lower flammability limit: No data available

Vapor pressure: No data available

Vapor density: No data available

Specific Gravity: No data available

Solubility: Insoluble in water

Partition coefficient:n-octanol/water: No data available

Autoignition temperature: No data available

Decomposition temperature: No data available

Kinematic viscosity: No data available

Dynamic viscosity: No data available

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10. Stability and Reactivity

Reactivity:

No data available

Chemical stability:

Stable under recommended storage conditions.

Possibility of Hazardous Reactions:

None under normal processing.

Hazardous Polymerization:

Hazardous polymerization does not occur.

Conditions to avoid:

Do not subject battery to mechanical shock. Keep away from open flames, high temperature.

Incompatible materials:

Strong acids, Strong oxidizing agents. Strong bases.

Hazardous decomposition products:

Carbon oxides

11. Toxicological Information

11.1 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. Corrosive by inhalation (base on components). Inhalation of corrosion fumes/gases may cause coughing, choking, headache, dizziness and weakness for several hour. Pulmonary edema may occur with tightness in the chest, shortness of breath, bluish skin, decreased blood pressure and increased heart rate. Inhaled corrosion substances can lead to a toxic edema of the lungs. Pulmonary edema can be fatal. May cause irritation of respiratory tract.

Eye Contact:

Specific test data for the substance or mixture is not available. Cause burns. (based on components). Corrosion to the eyes and may cause severe damage including blindness. Cause serious eye damage. May cause irreversible damage to eyes.

Skin Contact:

Specific test data for the substance or mixture is not available. Corrosion (based on components). Cause burns. Toxic in contact with skin. May be absorbed through the skin in harmful amounts.

Ingestion:

Specific test data for the substance or mixture is not available. Cause burns. (based on components). Ingestion cause burns of the upper digestive and respiratory tracts. May cause severe burning pain in the mouth and stomach with vomiting and diarrhea of dark blood. Blood pressure may decrease. Brownish or yellowish stains may be seen around the mouth. Swelling of the throat may cause shortness of breath and choking. May cause lung damage if

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swallowed. May be fatal if swallowed and enters airways. Ingestion may cause irritation to mucous membranes. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea. May be harmful if swallowed.

Component Information

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
-	-	-	-

11.2 Information on toxicological effects

Symptoms:

Erythema (skin redness). May cause redness and tearing of eyes. Itching. Rashes. Hives. Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, lightheadedness, chest pain, muscle pain, or flushing. Coughing and/or wheezing.

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

Sensitization: May cause sensitization of susceptible person, May cause sensitization by skin contact. May cause sensitization by inhalation.

Mutagenic Effects: No information available.

Carcinogenicity: the table below whether each agency has listed any ingredient as a carcinogen.

Chemical Name	ACGIH	IARC	NTP	OSHA
-	-	-	X	X

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 Carcinogenic.

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: Cause damage to organs through prolonged or repeated exposure. Based on classification criteria from the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200), this product has been determined to cause systemic target organ toxicity from chronic or repeated exposure. (STOT RE)

Chronic Toxicity: Prolonged exposure may cause chronic effects. Repeated contact may cause allergic reactions in very susceptible persons. Contain a known or suspected carcinogen. Avoid repeated exposure. May cause adverse effects on the bone marrow and blood-forming system. May cause adverse liver effects.

Target Organ Effects: Respiratory system. Eyes. Skin. Gastrointestinal tract(GI). Blood. Central Nervous System(CNS). Kidney. Liver. Lungs. Nasal cavities.

Aspiration Hazard: No information available.

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11.4 Numerical measures of toxicity product information

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

ATE mix(oral): 5400 mg/kg

12. Ecological Information

Ecotoxicity :

Chemical name	Toxicity to Aglae	Toxicity to Fish	Toxicity to Microorganisms	Daphnia Magna (Water Flea)
-	-	-	-	-

Persistence and Degradability: No information available

Bioaccumulation: No information available

Other adverse effects: No information available

13. Disposal Considerations

13.1 Waste treatment methods

Disposal methods:

This material, as supplied, is not a hazardous waste according to Federal regulations (40 CFR 261). This material could become a hazardous waste if it is mixed with or otherwise comes in contact with a hazardous waste, if chemical additions are made to this material, or if the material is processed or otherwise altered. Consult 40 CFR 261 to determine whether the altered material is a hazardous waste. Consult the appropriate state, regional, or local regulations for additional requirements. Should not be released into the environment.

Contaminated Packaging:

Dispose of in accordance with federal, state and local regulations.

California Hazardous Waste Codes 141

This product contains one or more substances that are listed with the State of California as a hazardous waste.

Chemical Name	California Hazardous Waste
-	-

14. Transportation Information

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

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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 "PI965-967 section II of IATA-DGR" or "special provision 188 of IMO-IMDG Code"

DOT: NOT REGULATED

Proper Shipping Name: NON REGULATED

Emergency Response Guide Number: 147

Hazard Class: N/A

TDG: Not regulated

MEX: Not regulated

ICAO: Not regulated

IATA: Not regulated

Proper Shipping Name: Not regulated

Hazard Class: Not regulated

IMDG/IMO: Not regulated

Proper Shipping Name: NON REGULATED

Hazard Class: N/A

Ems No.: F-A, S-1

RID: Not regulated

ADR: Not regulated

AND: Not regulated

15. Regulatory information

15.1 International Inventories

TSCA Complies

DSL All components are listed either on the DSL or NDSL.

TSCA – United State Toxic Substance Control Act Section 8(b) Inventory

DSL/NDSL – Canadian Domestic Substance List/Non-Domestic Substance List

15.2 US Federal Regulations

SARA 313: Section 313 of Title III of the superfund Amendments and Reauthorization Act of 1986(SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

Chemical Name	CAS No.	Weight (%)	SARA313-Threshold
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			values(%)
-	-	-	-

15.3 SARA 311/312 Hazard Categories

Acute Health Hazard	No
Chronic Health Hazard	No
Fire Hazard	No
Sudden release of pressure hazard	No
Reactive Hazard	No

15.4 CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

15.5 CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355).

There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material

15.6 US State Regulations

California Proposition 65

This product contains the following Proposition 65 chemicals.

Chemical Name	California Proposition 65
Nickel 7440-02-0	Carcinogen

U.S State Right-to-Know Regulations

Chemical Name	New Jersey	Massachusetts	Pennsylvania	Rhode Island	Illinois
Copper Foil 7440-50-8	×		×	×	×
Lithium nickel cobalt manganite 182442-95-1	×				

15.7 International Regulations

Mexico

National occupational exposure limits

Chemical Name	Carcinogen Status	Exposure Limits
-	-	Mexico: TWA= 2 mg/m ³

Canada

WHMIS Hazard Class

Non-controlled

16. Other Information

Disclaimer:

The information provided in this Safety Data Sheet is correct to the best of our knowledge,

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information and belief at the date of its publication. The information given is designed only as 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 material used in combination with any other materials or in any process, unless specified in the test.

Prepared By: Guangzhou MCM Certification and Testing Co., Ltd.

Issuing Date: Mar. 18, 2022

Revision Date: Mar. 18, 2022

--- End of SDS ---

Specification Approval Sheet

产品规格书

Customer Name 客户名称:

极米

Customer Model 客户型号:

B0614B

Customer P/N 客户料号:

400EC

Product Model 产品型号:

B0614B

Gan Feng P/N 物料编码:

DGB. S32. 18650-0900

Prepared by	Checked by	Approved By	Checked By	Approved by
RD	RD	PRJ	QA	RD
制作	审核	项目部审核	品质部审核	批准
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Customer Approved	Test by 测试	Checked by 审核	Approved by 批准
客户承认			
(Stamp)			
(盖章)			

DongGuan GanFeng Electronics Co.ltd

东莞赣锋电子有限公司

修改记录

版本	描述	日期	备注
A0	The new release 新版发行	2021.05.04	

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1. Scope 概述

This specification is applicable to the rechargeable lithium ion battery manufactured by ganfeng electronics.

此产品规格书适用于赣锋电子制造的可充式锂离子电池.

Reference standard 参考标准:

GB 31241-2014

IEC62133

UL1642

2. Product basic information 产品基本信息

No.	Items 项目	Parameter 参数
1	Cell model 电芯型号	INR18650M29/2750mAh/3.67V
2	Protection & Gauge IC 保护和电量计IC	BQ4050RSMR+ (QN3103M3N/AM7338N) *4
3	Array mode 组合方式	3S2P
4	Nominal voltage 标称电压	11.01V
5	Shipment voltage 出货电压	≥11.4V
6	Minimum capacity 最小容量	5400mAh(59.454Wh) (0.2Cmin discharge)
7	Typical capacity 典型容量	5700mAh(62.757Wh) (0.2Cmin discharge) (仅供参考)
8	Charging voltage 充电电压	12.6V
9	Standard charge current 标准充电电流	2750mA at: 0℃~45℃
10	Maximum charge current 最大充电电流	3000mA at: 15℃~45℃
11	Standard discharge current 标准放电电流	1100mA at: -20℃~60℃
12	Maximum discharge current 最大放电电流	7000mA at: 15℃~60℃
13	Discharging cut-off voltage 放电截止电压	8.55V
14	Battery initial impedance 电池初始内阻	≤160mΩ
15	Battery pack weight 电池重量	290±10g
16	Initial Gas gauge FCC range 初始电量计FCC范围	5225~6050mAh

Note:

1. Typical capacity 典型容量

The capacity means the average discharge capacity of the battery, which is measured with discharge current of 0.2C with discharging cut-off voltage after the standard charge at 23±5℃ environment temperature.

典型容量指 23±5℃温度下，电池以 0.2C 电流放电至放电截止电压时所放出容量对应的容量分布中心值。

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Form No.: QF-T-PS-02A

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<div>3. Electrical Characteristics 电气特性</div>					
<div>N</div>	<div>Items 项目</div>	<div>Test Method 测试方法</div>	<div>Criteria 标</div>		
<div>1</div>	<div>Standard Charge 标准充电</div>	<div>Charging the battery initially with Standard charge current and then with constant voltage at Charging Voltage (ref: 2.8) till charge current declines to 100mA. 先以标准充电电流充电，当电池电压达到充电电压（参考 2.8 项）后，改为恒压充电直到充电电流小于或等于 100mA。</div>	<div>N. A</div>		
<div>2</div>	<div>Standard Discharge 标准放电</div>	<div>After standard charged, discharging the battery with constant current at 1100mA till the voltage drops to discharge cut-off voltage (ref: 2.13). 标准充电后，将电池以 1100mA 恒流放电至放电截止电压（参考 2.13 项）。</div>	<div>N. A</div>		
<div>3</div>	<div>Initial impedance 初始内阻</div>	<div>At 25 ± 2 °C condition, the battery after standard charged, use AC impedance tester (1KHz) measuring the initial impedance. 在 25±2℃环境条件下，经过标准充电的电池，使用交流抗测试仪（KHz）测量初始内阻。</div>	<div>≤160m Ω</div>		
<div>4</div>	<div>Initial capacity 初始容量</div>	<div>The capacity means the discharge capacity of the cell, which is measured with discharge current of 1100mA with Discharging cut-off voltage (ref: 2.13) after the standard charge. 电芯满充电后，以 1100mA 电连续放电至电截止电压（参考 2.13 项）所放出的容量。</div>	<div>≥5400mAh</div>		
<div>5</div>	<div>Charge/Discharge Cycle 充放电循环</div>	<div>The capacity on 0.2C discharge shall be measured after 500 cycles Of 0.2C charge and discharge at 23±2℃. 23±2℃条件下 0.2C 充放电循环 500 次。</div>	<div>Capacity≥70% 容量≥70%</div>		
<div>6</div>	<div>Storage Capability 储存能力</div>	<div>Battery should be charged and discharge one time at 0.5C one time after stored 3 months. 电池存放 3 个月后需用 0.5C 做一次充放电。</div>	<div>/</div>		
<div>7</div>	<div>ESD Requirement ESD 要求</div>	<div>Contact discharge ±8KV, Air discharge ±15KV 接触放电±8KV，隔空放电±15KV</div>	<div>No damage or loss of function 无损坏或性能不良</div>		

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4. Battery safety performance 电池安全性能					
1	Overcharge protection 过充保护	After the battery is discharged according to standard, it is charged at a constant current of 3 times the maximum current. When the charging current gradually decreases, the charging state and constant voltage are 4.2v. The charge lasts for 7 hours 电池按标准放电后，再以最大电流 3 倍的恒流充电。当充电电流逐渐减小时，充电状态和恒定电压为 4.2V。充电持续 7 小时			No explode, No fire. 无爆炸、无起火、
2	Over discharge protection 过放保护	After the battery is fully charged, discharge at 25±3℃ conditions with 0.2C until the battery voltage drops to the over discharge voltage, then discharge with a 30 Ω resistor for 24 hours. 电池满充电后，在 25±3℃条件下，以 0.2C 过放保护电压后，外接 30 Ω 负载放电 24h.			No explode, No fire. 无爆炸、无起火、
3	Short Circuit Protection 短路保护	Fully charging the battery, discharge through a 0.1 Ω resistor for 8h. Then charge at 1C for 5s, observe the battery' s appearance. 电池按规定充电结束后，将正负极用0.1 Ω 电阻短路1h 后，目测电池外观。将正负极连接电阻断开，电池以1C 恒流瞬时充电 5S 后用电 表测量电池开路电压。			No explode, No fire. 无爆炸、无起火、
4	Drop Test 跌落测试	Drop the battery pack free to the oak plate from a height of 1 meter. Each battery pack will fall 1 time, 6 times in the positive and negative direction of the three vertical axes. 将电池组从1米的高度自由跌落到橡木板上，每个电池组将沿着三个互相垂直轴的正负方向跌落1次，总共跌6次；			No explode, No fire. 无爆炸、无起火、
5	Vibration Test 振动测试	After charging according to standard, the battery pack vibrates for 90 minutes for each of the three mutually perpendicular shafts (x, y, z), with a total stroke of 0.8mm, frequency of 10hz-55hz and frequency of 1Hz per minute. 电池组按标准充电后，每三个相互垂直的轴(x, y, z)每轴振动 90分钟，总行程0.8mm，频率10Hz - 55Hz，扫频1Hz每分钟。			No explosion, no fire, no leak 不爆炸，不起火，不漏液

5. Condition adapting characteristics 环境适应性

No.	Items 项目	Test Method 测试方法	Criteria 标准
1	Heating Test 加热测试	The battery is charged according to standard, and the rate of heating in the circulating oven is 5 deg C - 130 deg C per minute. At 130 PCT, the oven is kept for 10 minutes before stopping the test 电池按标准充电，循环烘箱内加热的速度每分钟 5°C - 130°C。在 130°C，烤箱是保持 10 分钟停止测试之前	No explode, No fire. 无爆炸、无起火、

6. Others 其他事项

Any matters that this specification doesn't cover should be conferred between the customer and Ganfeng
任何本规格书中未提及的事项，需要经双方协商确定。

7. Agency approvals 承认机构

Ganfeng battery safety performance is designed according to UL1642 and IEC62133 requirement, the product's safety performance is conforming to UL1642 and IEC62133 requirement.
赣锋电子的安全性能是根据 UL1642、IEC62133 要求制定. 产品的安全特性与 UL1642、IEC62133 要求是一致的。

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8. Testing requirements 测试要求

8.1 Battery test environment 电池试验环境

Temperature 温度: 20±5℃

Relative humidity 相对湿度: 40~80% RH

Atmospheric pressure 大气压力: 86~106 KPa

8.2 Measuring instrumentation requirements 测量仪表要求

Dimension instrumentation requirements: Measuring the dimension meter accuracy no less than 0.01mm scale

尺寸仪表要求: 测量尺寸的仪表的精确度在 0.01mm 内

Voltage instrumentation requirements: Measuring the voltage meter accuracy class no less than class 0.5

电压仪表要求: 测量电压的仪表的精确度不低于 0.5 级

Current instrumentation requirements: Measuring the current meter accuracy class no less than class 0.5

电流仪表要求: 测量电流的仪表精确度不低于 0.5 级

Time instrumentation requirements: Measuring the time meter accuracy no less than 0.1%

时间仪表要求: 测量时间的仪表精确度不低于 0.1%

Temperature instrumentation requirements: Measuring the temperature meter accuracy no less than 0.5 °C

温度仪表要求: 测量温度的仪表准确度不低于 0.5℃

Impedance instrumentation requirements: Measuring impedance should by sinusoidal alternating (1 KHZ) test

内阻仪表要求: 测量内阻应由正弦交变(1KHZ)进行测试

9. Operation temperature and humidity range 运行温湿度范围

9.1 Charging temperature 充电环境温度:

0℃ ~ +50℃, Maximum relative humidity: 85%

0℃ ~ +50℃, 最大相对湿度: 85%

9.2 Discharge temperature 放电环境温度:

-20℃ ~ +60℃, Maximum relative humidity: 85%

-20℃ ~ +60℃, 最大相对湿度: 85%

10. Storage temperature and humidity range 存储温湿度范围

10.1 0 ne month 一个月内:

-20℃~+60℃, humidity 40 to 80%

-20℃~+60℃, 湿度 40 ~ 80%

10.2 Three months 三个月内:

-20℃~+45℃, humidity 40 to 80%

-20℃~+45℃, 湿度 40 ~ 80%

10.3 Six months 六个月内:

23℃±2℃, humidity 40 to 80%

23℃±2℃, 湿度 40 ~ 80%


10.4 Long-term storage 长期存储:

23℃±2℃, humidity 60 to 70%

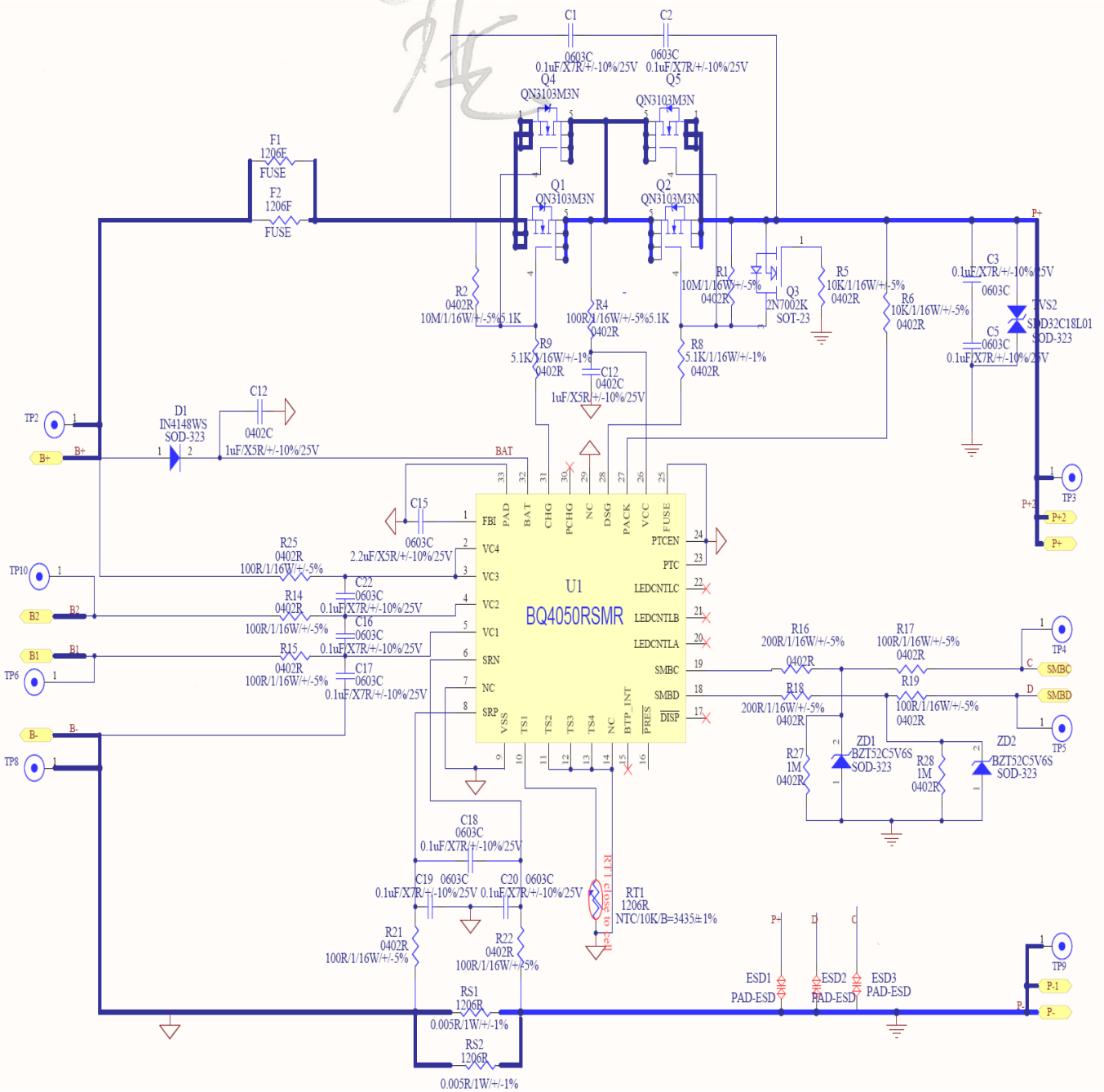
23℃±2℃, 湿度 60 ~ 70%

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11. PCM protection characteristics 电路保护特性				
No.	Items 项目	Parameter 参数	Unit 单位	Action 保护动作
1	1st Overcharge protection detection voltage 一级过充保护检测电压	4.25±0.025	V	Chg FET cut off
2	1st Overcharge protection delay time 一级过充保护延时	3±1	S	
3	Overcharge protection release 过充保护恢复电压	4.1±0.025	V	Chg FET turn on
4	Over discharge protection detection voltage 过放保护检测电压	2.85±0.025	V	Dsg FET cut off
5	Over discharge protection delay time 过放保护延时	3±1	S	
6	Over discharge protection release 过放保护恢复电压	3.0±0.025	V	Dsg FET turn on
7	1st Over current discharge protection current 一级放电过流保护电流	8.5±0.25	A	Dsg FET cut off
8	1st Over current discharge protection delay time 一级放电过流保护延时	3±1	S	
9	1st Over current discharge protection release 一级放电过流保护解除	≥15	S	Dsg FET turn on
10	1st Over current charge protection current 一级充电过流保护电流	3.5±0.25	A	Chg FET cut off
11	1st Over current charge protection delay time 一级充电过流保护延时	3±1	S	
12	1st Over current charge protection release 一级充电过流保护解除	放电恢复 (>500mA)	/	Chg FET turn on
13	Short current protection Current 短路保护电流	31.00±3	A	Chg & Dsg FET cut off
14	Short current protection delay time 短路保护延时	610±122	us	
15	Short current protection release 短路保护解除	≥10	S	Chg & Dsg FET turn on
16	1st Charge over temperature protection 一级充电过温保护	46±2	℃	Chg FET cut off
17	1st Charge over temperature protection delay time 一级充电过温保护延时	6±1	S	
18	1st Charge over temperature protection release 一级充电过温保护解除	42±2	℃	Chg FET turn on
19	1st Discharge over temperature protection 一级放电过温保护	65±3	℃	Dsg FET cut off
20	1st Discharge over temperature protection delay time 一级放电过温延时	6±1	S	
21	1st Discharge over temperature protection release 一级放电过温保护解除	55±3	℃	Dsg FET turn on

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No.	Items 项目	Parameter 参数	Unit 单位	Action 保护动作	
22	Charging low temperature protection 充电低温保护	-1	℃	Dsg FET cut off	
23	Protect the delay 保护延时	2±1	S		
24	Low temperature protection of charging is lifted 充电低温保护解除	4±1	℃	Dsg FET turn on	
25	Low temperature discharge protection 放电低温保护	-20±3	℃	Dsg FET cut off	
26	Protect the delay 保护延时	2±1	S		
27	Discharge low temperature protection removed 放电低温保护解除	-10±3	℃	Dsg FET turn on	
28	MOSFET over temperature protection MOSFET 过温保护	100±3	℃	Chg & Dsg FET cut off	
29	MOSFET over temperature protection delay time MOSFET 过温保护延时	6±1	S		
30	Power consumption of PCM PCM自耗电	Sleep Mode 休眠模式	≤200	uA	
		Operation Mode 工作模式	≤600	uA	

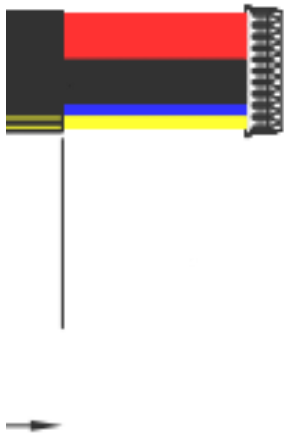
12. Schematic circuit diagram 电路原理图



13. Key components 主要元件

项次	零件品名	规格型号	用量	备注	环保要求
1	IC	BQ4050RSMR S-PVQFN-N32 SMT	1	TI	RoHS
2	MOSFET	QN3103M3N/AM7338N DFN3*3 SMT	4	UBIQ/ AP	RoHS
3	FUSE	S1206-S-7A, 1206, 7A/32V SMT	2	萨特	RoHS
4					

14. Pin definition 接口定义



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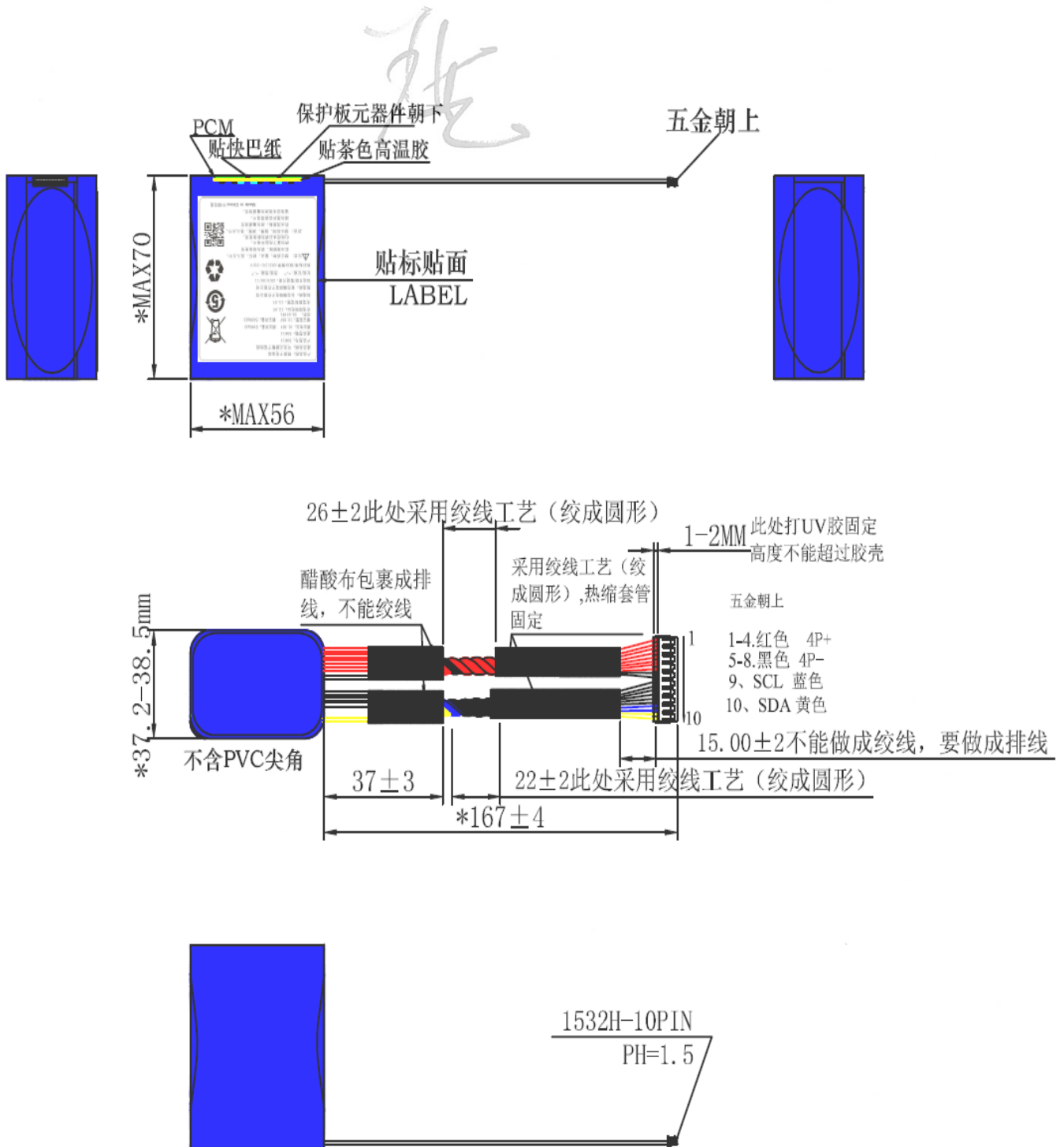
1-4. 红色 4P+

5-8. 黑色 4P-

9、 蓝色 SCL

10、 黄色 SDA

16. Battery pack outline drawing 电池外形尺寸示意（单位：mm）：



17. Battery pack label 电池标贴:



二维码内容:

0910K53400EC0001

0910固定不变

YMD代表生产年月日(各一码, 不包含字母I、O, 详见上表)

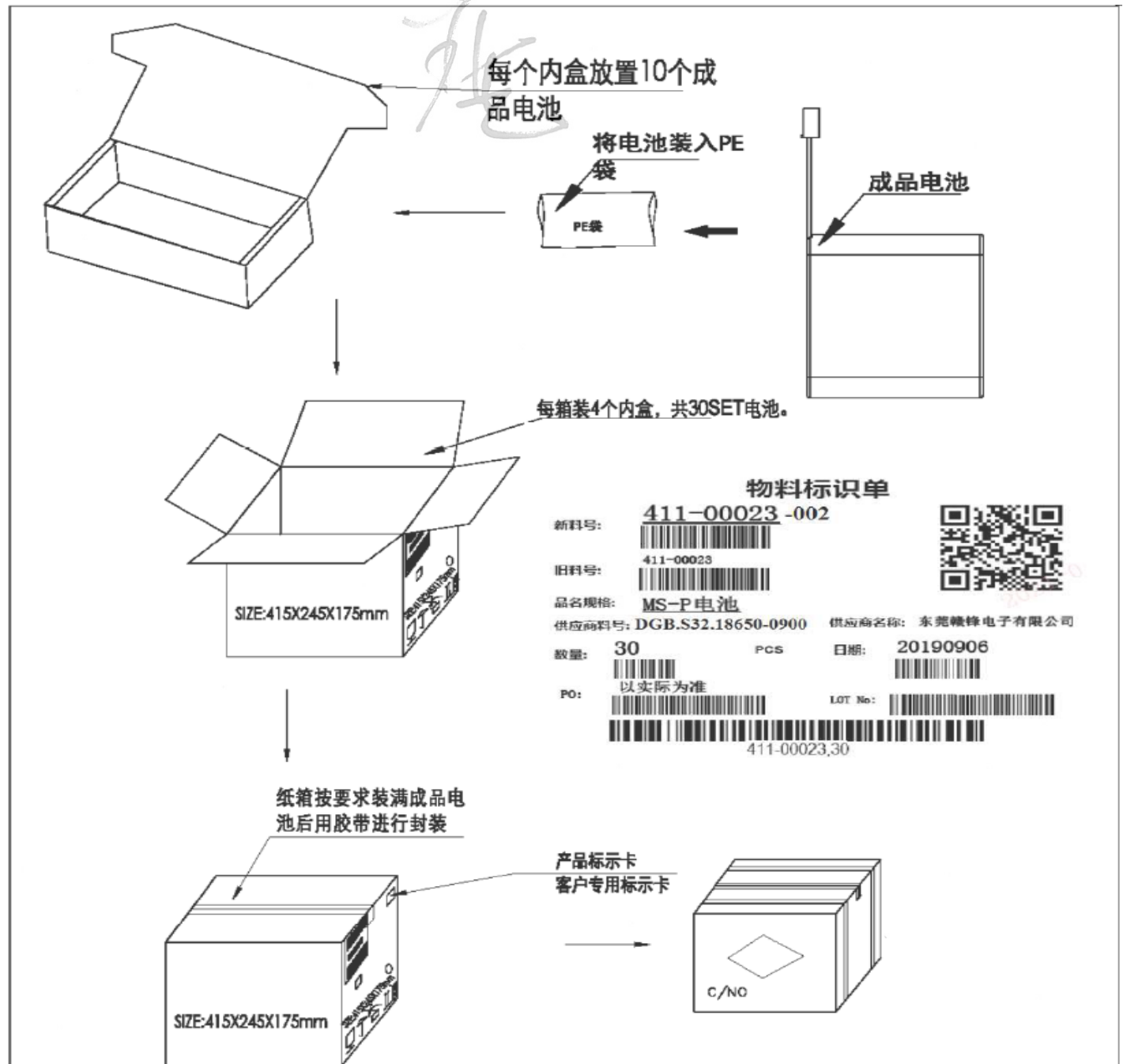
E code码(五位): 400EC(固定码)

0001代表4位流水号, 以4位16进制编写0-F,

每个生产周期重新从0000开始跳码;

日		月		年	
时间	对应代号	时间	对应代号	时间	对应代号
1	1	1	1	2001	1
2	2	2	2	2002	2
3	3	3	3	2003	3
4	4	4	4	2004	4
5	5	5	5	2005	5
6	6	6	6	2006	6
7	7	7	7	2007	7
8	8	8	8	2008	8
9	9	9	9	2009	9
10	A	10	A	2010	A
11	B	11	B	2011	B
12	C	12	C	2012	C
13	D			2013	D
14	E			2014	E
15	F			2015	F
16	G			2016	G
17	H			2017	H
18	J			2018	J
19	K			2019	K
20	L			2020	L
21	M			2021	M
22	N			2022	N
23	P			2023	P
24	Q			2024	Q
25	R			2025	R
26	S			2026	S
27	T			2027	T
28	U			2028	U
29	V			2029	V
30	W			2030	W
31	X			2031	X
				2032	Y
				2033	Z

18. Battery pack package show 电池包装示意



版本	描述	签名	日期
A	新发行		

GanfengLithium		赣锋锂电 东莞赣锋电子有限公司 Dongguan Ganfeng Electronics Co., Ltd	
产品型号 MODEL	MS-18650-3S2P	部件名称 PART NAME	MS-18650-0100 电池包装2D图
物料编码 STOCK NO.	DGB.S32.18650-0100		版次 REV. A
设计 DESIGN	黄志雄	日期 DATE 2019-05-13	审核 CHECKED WLY
材料 MATERIAL	表面处理 FINISH	单位 UNIT	图幅 SIZE A4

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19. Battery Precautions and Safety Instructions 电池组使用注意事项及安全说明

Please be sure to take to comply with the specifications and the following precautions to use with batteries, did not follow the specifications for the operation caused any accidents, gan feng electronic Co., Ltd. will not accept any responsibility.

请您务必遵守本规格书和以下使用注意事项使用电池，对于没有按照规格书进行操作所造成的任何意外事故，赣锋电子有限公司将不承担任何责任。

- Guarantee to keep the battery in good repair in 12 months from the shipment.
- 从出厂代码日起 12 个月内保修.
- Please use 0.5C current to charge up 60% capacity after the battery placed 3 months.
- 电池每放置三个月, 请预先以 0.5C 充电 1 次, 即让电池具备 60%以上的电量.
- Before Use the battery, carefully read the instruction manual and battery labels on the surface.
- 使用电池前, 请仔细阅读使用说明书和电池表面标识.
- Need to use the original battery charger, and should be placed in a dry ventilated place.
- 电池需使用原装充电器充电, 并应放置在干燥通风场所.
- Such as long-term when not in use, the battery charger to charge state half full, remove the battery from the device and separated, to avoid metal contact with the battery, causing short-circuit or damage to the phenomenon.
- 如长期不使用时, 请将电池充电至半满电荷状态, 把电池从设备中拆除并分开放置, 避免金属接触电池, 造成短路或损坏现象.
- In use or during storage, battery found there has been high fever, leakage, odor, distortion and other anomalies, please stop using it immediately and stay away from the battery.
- 在使用或储存期间, 如发现电池有出现高温发热、漏液、散发异味、变形及其它异常现象时, 请立即停止使用并远离电池.
- Do not short-circuit the battery positive and negative, and careful not to allow the battery to moisture, to avoid danger.
- 切勿将电池正负极短路, 并注意不可让电池受潮, 以免发生危险.
- Using, keep away from heat, High pressure place, and do not beat, hit the battery.
- 使用过程中, 应远离热源、高压场所, 并勿摔打、撞击电池.
- Battery end of life should be immediately removed from the equipment, Please properly handle security of spent batteries, do not put into fire or water.
- 电池寿命终止应立刻从设备中取出, 废弃电池请安全妥善处理, 切勿投入火中或水中.