

Safety Data Sheet

Date of Issue: December 8, 2025

File No.: DS2FB301WEM01

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

1.1 Product Identifier

Name of Product: Rechargeable Lithium-ion Polymer Battery

1.2 Other means of identification

Product Models: MC-1668047A-B

Nominal Voltage: 3.87V

Nominal capacity: 1686mAh

Nominal Power: 6.53Wh

Weight: 23.56 g

1.3 Recommended use of the chemical and restriction on use

Recommended Use: Rechargeable Lithium-ion Polymer Battery

Restriction on Use: No information available

1.4 Information Of Supplier:

Company Name: Huizhou Desay Battery Co.,LTD

Address: No.15 Zone, Zhong Kai Hi_Tech Development Zone, Huizhou, Guangdong, China

Zip code: 516006

Contact person: Guocheng Wei

Tel: 86-752-2629634

E-mail: desay_certification@desay.com

1.5 Emergency Telephone

86-0752-2629750

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 WordDanger

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 breathe 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

39% 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

Use of alcoholic beverages may enhance toxic effect.

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3. Composition/ Information on Ingredients

Chemical Name	CAS No.	Weigh%
Cobalt lithium dioxide	12190-79-3	19
Ethyl propionate	105-37-3	17
Copper foil	7440-50-8	13
Aluminum foil	7429-90-5	12
Graphite	7782-42-5	14
Ethylene Carbonate	96-49-1	8
Propylene Carbonate	108-32-7	7
Lithium Hexafluorophosphate(1-)	21324-40-3	7
1,3-propanesultone	1120-71-4	1
Separator	9002-88-4	2

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 section8).

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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

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.

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6.4 Methods for cleaning up

Pick up and transfer to properly labeled containers.

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
Graphite 7782-42-5	TWA:2mg/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
Lithium Cobalt Oxide 12190-79-3	TWA:0.02mg/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

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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 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: Black

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: No data available

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

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Kinematic viscosity: No data available

Dynamic viscosity: No data available

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 (based on components). Inhalation of corrosion fumes/gases may cause coughing, choking, headache, dizziness and weakness for several hours. 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:

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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 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
Graphite 7782-42-5	> 10000mg/kg (Rat)	-	-

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
Lithium Cobalt Oxide12190-79-3	A3	Group 2B	-	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

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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.

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): 6513 mg/kg

ATE mix (dermal): 5141 mg/kg (ATE)

12. Ecological Information

Ecotoxicity:

Chemical name	Toxicity to Aqlae	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
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Lithium Cobalt Oxide 12190-79-3	Toxic
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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 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

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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 values(%)
Lithium Cobalt Oxide	12190-79-3	15-40	0.1

15.3SARA 311/312Hazard Categories

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

15.4CWA (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)

15.5CERCLA

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
-	Carcinogen

U.S State Right-to-Know Regulations

Chemical Name	NewJersey	Massachusetts	Pennsylvania	Rhodelsland	Illinois
Graphite 7782-42-5	x	x	x		
Lithium Cobalt Oxide 12190-79-3	x	x	x	x	x

15.7 International Regulations

Mexico

National occupational exposure limits

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

Canada

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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, 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: December 8, 2025

Revision Date: December 8, 2025

--- End of SDS ---



PRODUCT SPECIFICATION

DOC NO.: PS-FRLWPA2-01
REV. : A
Page: 1 of 21
ECN NO. : _____

Battery Specification Confirmation Sheet

Of

Dongguan NVT Technology Co.,Ltd (“NVT”)

NVT 电池产品规格书

NVT Product Part Number/NVT产品料号: 31920PA20009

Model / 型号: MC-1444851A-B3

Pack Configuration/电池结构: 1Series 1 Parallel (1S1P)

Prepared by TPM	Approved by TPM	Approved by CPD	Approved by QA

Customer Confirmation	Authorized Signatory		Date
	Signature	Print Name	
	Company Name Of Customer: META		
	Company Stamp Of Customer:		

Confidential : () Level 3 Private confidential () Level 2 High confidential (V) Level 1 Low confidential

AMENDMENT RECORDS/变更记录

Revision/版本	Description/描述	Originator/制作者	Date/日期
A	New Release	Sunny Liang	2025/08/11

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1 Scope/适用范围:

The purpose of this Document ("Document") is to specify the specifications of the Lithium-ion Polymer ("LIP") rechargeable battery with NVTPart Number 31920PA20009 ("Product" or "Pack") to be supplied by NVT to Customer under Customer's purchase order and NVT's confirmation relevant to the Product. For the avoidance of doubt, the specifications specified herein do not apply to any Host Device, apparatus, instrument, equipment or hardware device containing Product or Cell ("Host Device").

本产品规格书描述了 NVT 依据客户采购订单生产的可充电聚合物锂离子("LIP")电池的产品性能指标, NVT 产品代码号 31920PA20009("产品" 或 "电池")。为避免疑问, 本产品规格书不适用于任何包含该产品或电芯的主机设备、仪器、仪表、器件、硬件设备等 ("主机")。

2 Model Name/型号: MC-1444851A-B3

2.1 NVT Model Name: MC-1444851A-B3

2.2 META Model Name: MC-1444851A-B3

3 Standard Environmental Test Conditions/标准环境测试条件:

3.1 Unless otherwise specified, all tests stated in this Product Specification are conducted at below conditions:

除非特别指定, 本产品规格书所有的测试遵循如下条件:

Temperature/温度: $25 \pm 3^{\circ}\text{C}$ ("Temperature Condition" /温度条件)

Humidity/湿度: $65 \pm 20\%$ RH ("Humidity Condition" /湿度条件)

3.2 Throughout this Document, numeric criteria annotated by "*" means such criteria are only applicable to fresh unused Product within 30 days from manufacture by NVT. Products either have been used or stored for a period longer than 30 days by Customer and/or its customer may exhibit an inferior numeric parameter than such criteria. Customer agrees that such occurrence does not constitute nonconformance of specification.

本产品规格书中, 所有标有"*"的项目是指仅适用于 "未使用的且从NVT制造日起30天内的产品"。如果产品已被客户使用或存储时间超过30天, 可能表现出低于标准规格, 客户同意并接受产品不构成不符合规格。

4 Detailed Specifications/详细规格:

The specifications listed in this Section 4 shall be the detailed specifications for the Product ("Detailed Specifications"). 列在第 4 部分的规格作为产品的详细规格。

No.	Items/项目	Specifications/规格	Remark/备注
4.1	*Minimum Capacity (C_{min}) / Rated Capacity 额定容量	54mAh/0.211 Wh	Standard capacity measure method: 1.5Cmin to 4.25 V, CV to 0.7Cmin, 0.7Cmin to 4.48V, then CV to 0.05Cmin, then with 0.2Cmin discharge to 3.0V cut-off 标准容量测试方法: 先用 1.5Cmin 恒流充电至 4.25V, CV 到 0.7Cmin, 0.7Cmin 恒流充电至 4.48V, 再恒压充电直至充电电流 0.05Cmin, 然后用 0.2Cmin 放电至 3.0V
4.2	Nominal Capacity/ 典型容量	55mAh/0.214 Wh	
4.3	* Nominal Voltage/ 标称电压	3.89V	
4.4	Limited Charging Voltage/ 充电限制电压	4.48V	
4.5	End of Discharge Voltage/放电终止电压	3.0V	

4.6	Charge/Discharge 充电/放电	Cell Surface Temperature 电芯表面温度	Charge Current and Voltage 充电电流和电压
	Charge/充电	0°C~10°C	0.5Cmin to 4.25V, 0.2Cmin Max to 4.48V ,then CV to 0.05Cmin / 0.5Cmin 充电到4.25V, 0.2Cmin 充电到4.48V, 然后CV到0.05Cmin
		10°C~20°C	1.0Cmin to 4.25V, 0.5Cmin to 4.48V ,then CV to 0.05Cmin / 1.0Cmin 充电到4.25V, 0.5Cmin 充电到4.48V, 然后CV到0.05Cmin
		20°C ~45°C	1.5Cmin to 4.25V, 0.7Cmin to 4.48V ,then CV to 0.05Cmin / 1.5Cmin 充电到4.25V, 0.7Cmin 充电到4.48V, 然后CV到0.05Cmin
		45°C ~60°C	0.5Cmin to 4.2V, then CV to 0.05Cmin/ 0.5Cmin 充电到4.2V, 然后CV到0.05Cmin
	Discharge/放电	-20°C ~0°C	0.5Cmin Max to Vmin Discharge current sustained for time ≥ 10 seconds 0.5Cmin Max 放电到Vmin 放电电流持续时间 ≥ 10 秒
		0°C ~60°C	2.0Cmin Max to Vmin Discharge current sustained for time ≥ 10 seconds 2.0 Cmin Max 放电到Vmin 放电电流持续时间 ≥ 10 秒
4.7	Storage Condition/ 存贮条件	Temperature/温度: within 3 months/3个月内 -20°C ~ + 45°C; over three months/超过3个月 25 $\pm$ 3 °C ; Humidity/湿度: $\leq 75\%$ RH	The battery voltage should be kept in the range of 3.6V to 3.95V by charging batteries if batteries are stored more than 3 months/ 电池存储超过 3 个月需要给电池充电维持电压在 3.6V to 3.95V
4.8	*Initial resistance 初始内阻	850m Ω Max	Internal resistance measured at AC 1KHz after charge to shipment voltage. 充电到出货电压后, 测量其 AC 1KHz 下的交流阻抗
4.9	*Pack Voltage(as of shipment) 电池电压 (出货状态)	3.88~4.00V	Non air transport/非空运
		3.70~3.80V	Air transport (IATA require shipping SOC $\leq 30\%$)/空运 (IATA 要求出货 SOC $\leq 30\%$)

4.10	* Cycle life/循环寿命	Charge: 1.5Cmin to 4.25 V, CV to 0.7Cmin, 0.7Cmin to Vmax, CV to 0.05Cmin Discharge: 0.5Cmin to Vmin Repeat to 500 cycles, record remained capacity of 500th cycle. Test temperature: 25°C±2°C . 充电: 1.5Cmin Max 充电到 4.25V, CV 到 0.7Cmin, 0.7Cmin Max 充 电到 Vmax, 然后 CV 到 0.05Cmin 放电: 0.5Cmin 放电至 Vmin, 重复 500 次循环, 记录剩余容量 温度: 25°C±2°C	≥80Cinitial, ≤10%swelling
		Charge: 1.5Cmin to 4.25 V ,CV to 0.7Cmin, 0.7Cmin to Vmax, CV to 0.05Cmin Discharge: 0.5Cmin to Vmin Repeat to 400 cycles, record remained capacity of 400th cycle. Test temperature: 45°C±2°C . 充电: 1.5Cmin Max 充电到 4.25V, CV 到 0.7Cmin, 0.7Cmin Max 充 电到 Vmax, 然后 CV 到 0.05Cmin 放电: 0.5Cmin 放电至 Vmin, 重复 400 次循环, 记录剩余容量 温度: 45°C±2°C	≥80Cinitial, ≤10%swelling
		Charge: 1.0Cmin to 4.25 V ,CV to 0.5Cmin, 0.5Cmin to Vmax, CV to 0.05Cmin Discharge: 0.5Cmin to Vmin Repeat to 200 cycles, record remained capacity of 200th cycle. Test temperature: 10°C±2°C . 充电: 1.0Cmin Max 充电到 4.25V, CV 到 0.5Cmin, 0.5Cmin Max 充 电到 Vmax, 然后 CV 到 0.05Cmin 放电: 0.5Cmin 放电至 Vmin, 重复 200 次循环, 记录剩余容量 温度: 10°C±2°C	≥80Cinitial, ≤10%swelling



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		Charge: 0.5Cmin to 4.25 V ,CV to 0.2Cmin, 0.2Cmin to Vmax, CV to 0.05Cmin Discharge: 0.5Cmin to Vmin Repeat to 200 cycles, record remained capacity of 200th cycle. Test temperature: 0°C±2°C . 充电: 0.5Cmin Max 充电到 4.25V, CV 到 0.2Cmin, 0.2Cmin Max 充 电到 Vmax, 然后 CV 到 0.05Cmin 放电: 0.5Cmin 放电至 Vmin, 重复 200 次循环, 记录剩余容量 温度: 0°C±2°C	≥80Cinitial, ≤10%swelling
		Charge: 0.5Cmin to 4.2V ,CV at Vmax to 0.05Cmin Discharge: 0.5Cmin to Vmin Repeat to 200 cycles, record remained capacity of 200th cycle. Test temperature: 0°C±2°C . 充电: 0.5Cmin Max 充电到 4.2V, CV 充电到 0.05Cmin 放电: 0.5Cmin 放电至 Vmin, 重复 200 次循环, 记录剩余容量 温度: 60°C±2°C	
4.11	Pack Weight/电池重量	About 1.78g	

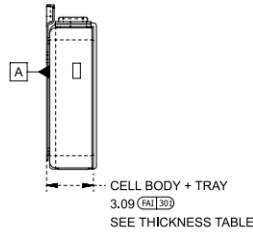
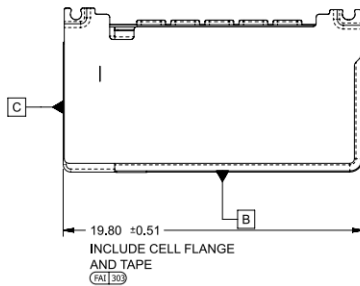
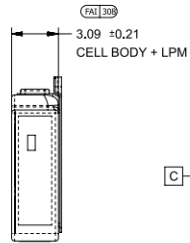
5 Warranty period/保质期:

The warranty period of Battery is 12Monthsafterthe manufacture date.

电池保质期为从生产日期算起12个月。

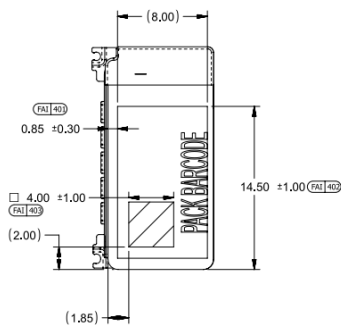
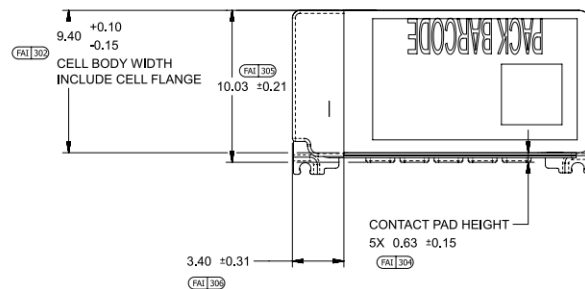
6 Assembly Drawing (all unit is mm, not in scale) / 电池图纸 (单位: mm)

6.1 Battery Drawing/电池图纸

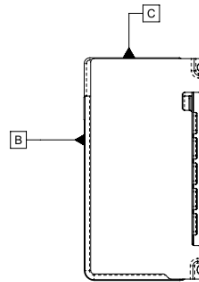


FAI 301 THICKNESS TABLE

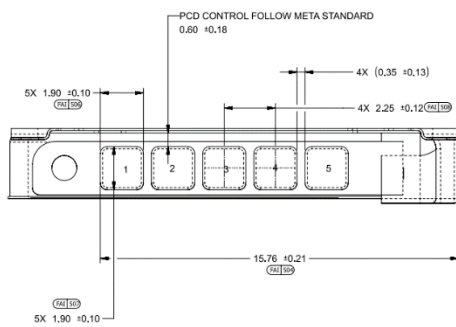
	THICKNESS	NOTE
OQC	3.09±0.1	SHIPPING STATE
CYCLE 0	3.23 MAX	100% SOC
EOL	3.53 MAX	100% SOC. SEE CELL ERS FOR CYCLE REQUIREMENT.



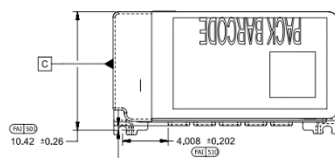
LASER ETCH ON LID SIDE



PINOUTS:



SIGNAL	PIN NUMBER
GND	1
SDA	2
SCL	3
ALRT	4
PACKP	5

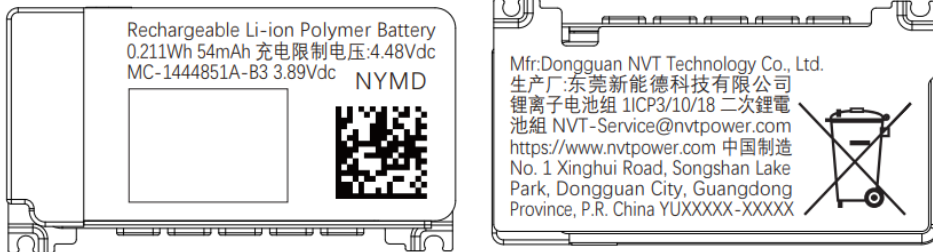


SIDE B DOC MC

APPROVED MEASUREMENT METHODS

DM ID	NPI INSPECTION FREQUENCY	INSPECTION METHOD
FAI 301	32 PCS/BUILD	OMM
FAI 302	32 PCS/BUILD	OMM
FAI 303	32 PCS/BUILD	OMM
FAI 304	32 PCS/BUILD	OMM
FAI 305	32 PCS/BUILD	OMM
FAI 306	32 PCS/BUILD	OMM
FAI 307	32 PCS/BUILD	OMM
FAI 401	32 PCS/BUILD	OMM
FAI 402	32 PCS/BUILD	OMM
FAI 403	32 PCS/BUILD	OMM
FAI 404	32 PCS/BUILD	OMM
FAI 405	32 PCS/BUILD	OMM
FAI 501	32 PCS/BUILD	OMM
FAI 503	32 PCS/BUILD	OMM
FAI 504	32 PCS/BUILD	OMM
FAI 505	32 PCS/BUILD	OMM
FAI 506	32 PCS/BUILD	OMM
FAI 507	32 PCS/BUILD	OMM
FAI 508	32 PCS/BUILD	OMM
FAI 509	32 PCS/BUILD	OMM
FAI 510	32 PCS/BUILD	OMM

6.2 Battery Barcode Drawing/电池喷码图纸



Two-dimension code definition

二维码大小: L4.0±1.0*W4.0±1.0mm;类型: Data Matrix

Barcode dimension size: L4.0±1.0*W4.0±1.0mm ; Barcode type:Data Matrix.



Barcode content: AABBBCCCYMDEEEEE 条码内容共14位

AA=43 (Project code reference battery pack ERS,Fixed /项目代码参考PACK ERS,2位固定值)

BB=8G (Vendor code Meta assigned, Fixed/供应商代码,2位具体咨询PM)

CCC=DA2 (Part and Configuration,reference battery pack ERS and Build Matrix ,

Variable value confirm with PM/组件方案, 参考Pack ERS和 Build Matrix,具体需咨询PM,3位变量)

Y=Year/年(Details ref as below/具体规则参考如下, 1位变量)

M=Month /月(Details ref as below/具体规则参考如下, 1位变量)

D=Day/日(Details ref as below/具体规则参考如下, 1位变量)

EEEE= Unique Identifier (Base-31 value 0001 to ZZZZ with the exception of alpha characters A, E, I, O and U used for unique identifier allows up to 923520 unique serial numbers within a single day of production/allocation /流水码, 31进制从0001到ZZZZ字母A E I O U 除外, 单日生产或分配最大值为923520)

NYMD

电池明码, 共4位:

1位: N, 代表生产厂, N代表东莞新能德科技有限公司;

2位: Y, 生产年份, 与暗码规则一致, 具体规则参考图表;

3位: M, 生产月份, 与暗码规则一致, 具体规则参考图表;

4位: D, 生产日期, 与暗码规则一致, 具体规则参考图表;

Battery code, a total of 4 digits:

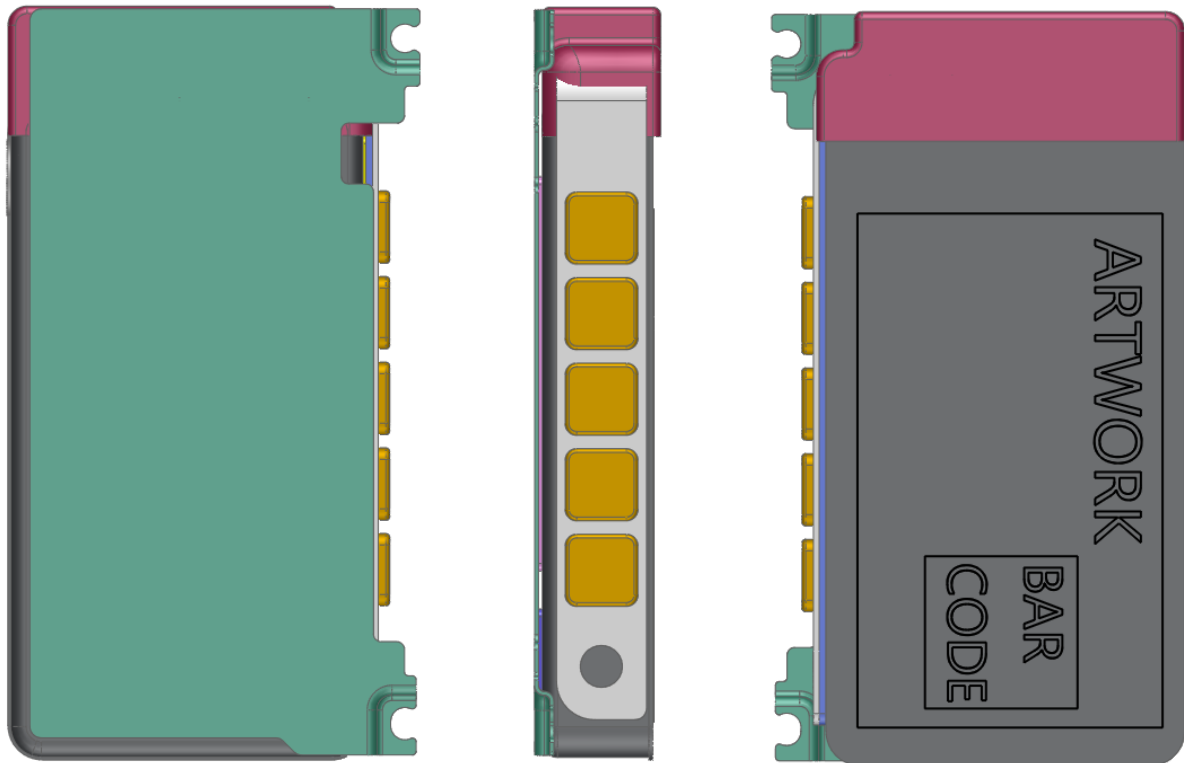
1 digits: N, represents the manufacturer, N represents Dongguan Xinnengde Technology Co., LTD.

2 digits: Y, production year, Consistent with barcode rules Details ref as table;

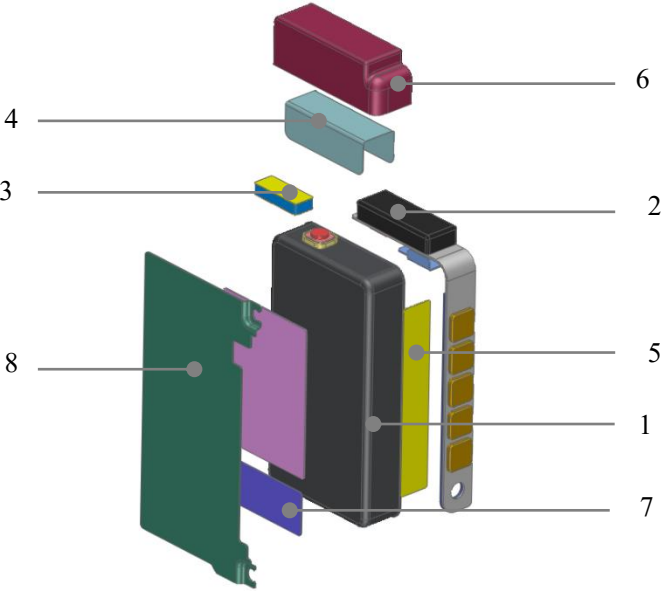
3 digits: M, Production months, Consistent with barcode rules Details ref as table;

4 digits: D, Production date, Consistent with barcode rules Details ref as table;

6.3 Battery Photos/电池图片

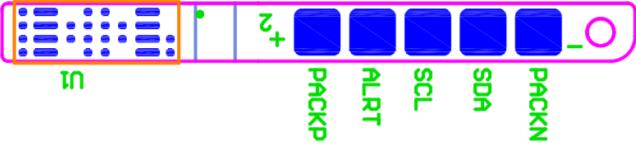


6.4 Disassembly Drawing for Pack/电池拆分图



Item/项目	Specification/规格	Qty/数量	Remark/备注
Cell	TL GC-NSC-301018-100H 54mAh 3.89V	1pcs	1
PCM	FPC+SIP	1pcs	2
Foam	T=0.8mm	1pcs	3
Tape	T=0.05mm	1pcs	4
PSA	T=0.08mm	1pcs	5
LPM	Black	1pcs	6
PSA	T=0.1mm	1pcs	7
Plate	SUS T=0.1mm	1pcs	8

7 Terminal Specification/引脚定义

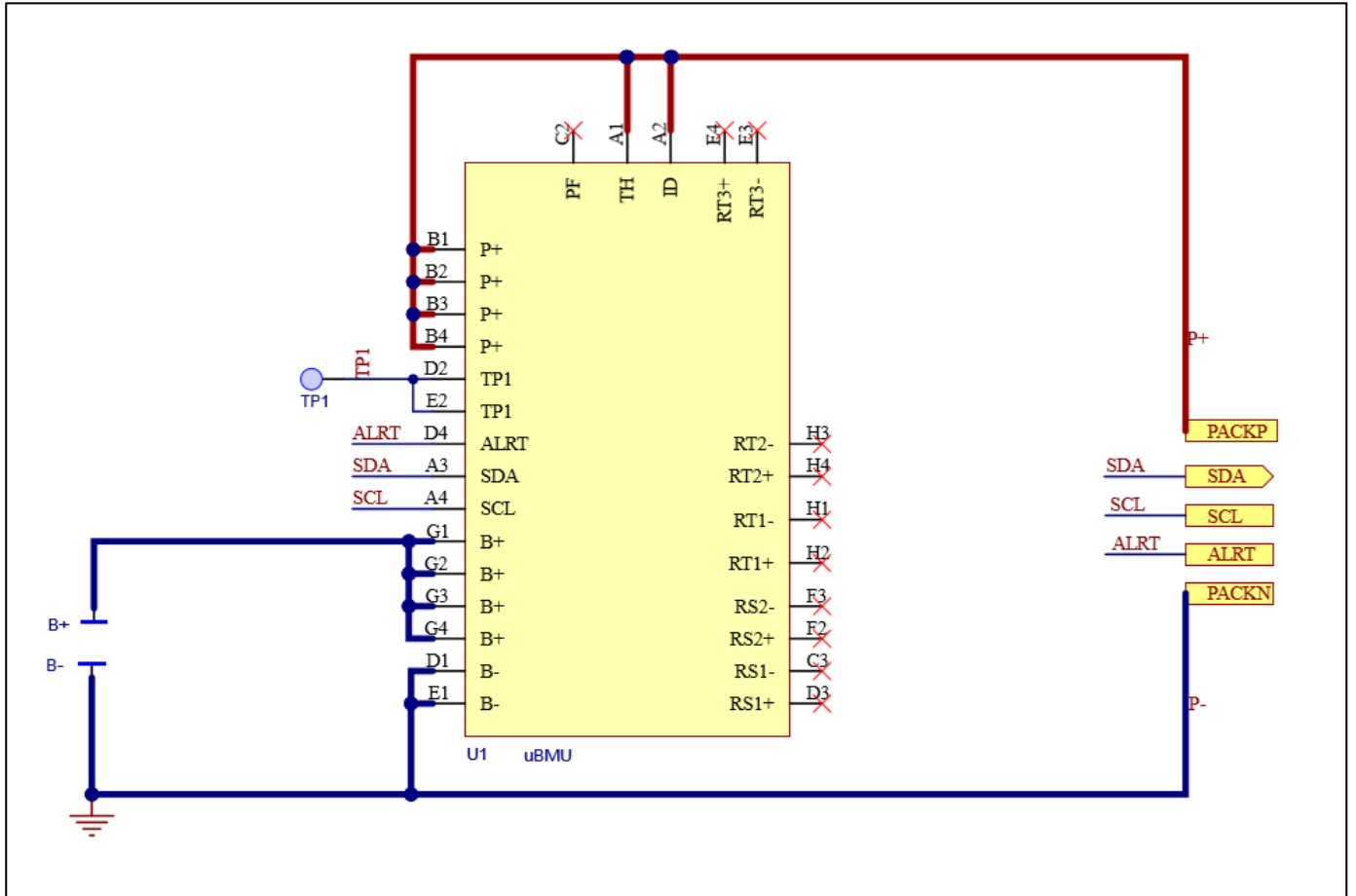


Pin Number	Signal
1	PACKN
2	SDA
3	SCL
4	ALRT
5	PACKP

Name/名称	Pin No./引脚编号	Function/功能	Remark/备注
PACKN	PIN 1	Battery negative terminal for charge & discharge/电池负端用于充电和放电	-
SDA	PIN 2	Serial Data Input/Output for I2C Communication Modes /I2C通信模式数据输入/输出	-
SCL	PIN 3	Serial Clock Input for I2C Communication/I2C通信模式时钟输入	-
ALRT	PIN 4	Alert Output /报警输出	-
PACKP	PIN 5	Battery positive terminal for charge & discharge/电池正端用于充电和放电	-

8 PCM Specifications/保护板规格

8.1 Circuit diagram/电路图



8.2 PCM and FPC Layout/保护板和FPC布局

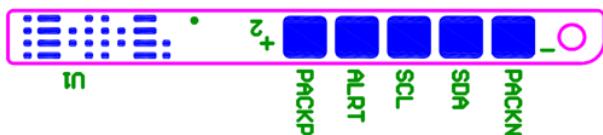
Top overlay



Top layer



Bottom overlay (已上下镜像)



Bottom layer (已上下镜像)



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8.3 PCM Part list/保护板清单

SIP module code C:

SN.	Discription	Specification	Number	Unit	Symbol	Vendor	Remark
1	SIP module	BUB010101-1CC ; 1GC ; MAX17335X22+,S-PI14BBG-H8T2S7	1	PCS	U1		
2	Nickel	B+ Nickel ,L-shape ,H=0.1mm	1	PCS	B+		
3	Nickel	B- Nickel ,L-shape ,H=0.1mm	1	PCS	B-		
4	FPC	25.76x2.35x0.15mm ,ENIG ,Block solder mask ,HF	1	PCS			
5	Glue	UV glue	0.02	g	TP1 test point		
6	GOLD BRICK	金砖;NI;L1.9×W1.9×T0.3mm;Gold plating;RoHS+REACH	5	PCS			

SIP module code B:

SN.	Discription	Specification	Number	Unit	Symbol	Vendor	Remark
1	SIP module	BUB010101-1CB ;1GB ; 1NB ; MAX17335X22+,R5449Z606NE-E2-T	1	PCS	U1		
2	Nickel	B+ Nickel ,L-shape ,H=0.1mm	1	PCS	B+		
3	Nickel	B- Nickel ,L-shape ,H=0.1mm	1	PCS	B-		
4	FPC	25.76x2.35x0.15mm ,ENIG ,Block solder mask ,HF	1	PCS			
5	Glue	UV glue	0.02	g	TP1 test point		
6	GOLD BRICK	金砖;NI;L1.9×W1.9×T0.3mm;Gold plating;RoHS+REACH	5	PCS			

8.4 PCM Parameter/保护板参数

PCM Primary Protector Thresholds(-20℃~60℃)/PCM主保护参数(-20℃~60℃)

No.	Item/项目	Unit/单位	Min./最小值	Typ./典型值	Max./最大值
1	Over charge protection voltage 过充保护电压	V	4.520	4.530	4.540
2	Delay time for over charge protection 过充保护延迟时间	S	0.7	1.0	1.75
3	Over discharge protection voltage 过放保护电压	V	2.48	2.50	2.52
4	Delay time for over discharge protection 过放保护延迟时间	mS	175	525	1579
5	Discharge over current protection(Fast) 放电过流保护(快)	mA	345.0	387.5	430.0
6	Delay time for over current protection(Fast) 过流保护延迟时间(快)	mS	7	7.89	9
7	Discharge over current protection(slow) 放电过流保护(慢)	A	0.245	0.255	0.265
8	Delay time for over current protection(slow)	mS	175	525	1579



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	过流保护延迟时间(慢)				
9	Charge over Current Protection Current(slow)/ 充电过流保护电流(慢)	mA	104	108	112
10	Charge Over Current Protection Delay Time(slow)/ 充电过流保护延迟时间(慢)	mS	175	525	1579
11	Short circuit protection/ 短路保护	A	1.085	1.178	1.324
12	Delay time for short circuit protection/ 短路保护延迟时间	uS	240	253	260
13	Over Temperature Protection 过温保护	°C	65	70	75
14	0V Charging 0V 充电	Enabled			

PCM Secondary Protector Thresholds (-20°C~60°C)/ PCM次保护参数(-20°C~60°C)

No.	Item/项目	Unit/单位	Min./最小值	Typ./典型值	Max./最大值
1	Over charge protection voltage 过充保护电压	V	4.534	4.550	4.562
2	Delay time for over charge protection 过充保护延迟时间	S	0.788	1.024	1.292
3	Over discharge protection voltage 过放保护电压	V	2.361	2.400	2.440
4	Delay time for over discharge protection 过放保护延迟时间	mS	95.2	128	163.3
5	Discharge over current protection 放电过流保护	A	0.492	0.750	1.003
6	Delay time for over current protection 过流保护延迟时间	mS	166.4	256	409.6
7	Charge over Current Protection Current/ 充电过流保护电流	A	0.418	0.6	0.752
8	Charge Over Current Protection Delay Time/ 充电过流保护延迟时间	mS	5.2	8	12.8
9	Short circuit protection/ 短路保护	A	1.229	2.0	2.759
10	Delay time for short circuit protection/ 短路保护延迟时间	uS	154	280	476
11	Over Temperature Protection 过温保护	°C	72	75	78
12	0V Charging 0V 充电	Disabled			

PCM Current / Impedance/PCM 电流和内阻

No.	Item/项目	Condition/条件	Unit/单位	Min./最小值	Typ./典型值	Max./最大值
1	PCM CurrentConsumption	Normal Mode VBAT > 3.0V	uA	-	39	60



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	PCM 消耗电流	Ship Mode VBAT > 3.0V	uA	-	15	30
		DeepShip 1 Mode VBAT > 3.0V	uA	-	4.5	10
		Shutdown Mode VBAT < 2.4V	nA	-	-	50
2	PCM Impedance PCM 内阻	Cell+ -> PACKP to PACKN- -> Cell-	mΩ	-	-	155

10 Appendix Handling Precautions and Guidelines for LIP Rechargeable Batteries:**附录聚合物锂离子充电电池操作指示及注意事项****Foreword/前言**

These *Handling Precautions and Guidelines for LIP Rechargeable Batteries* shall apply to the Product.

本文件《聚合物锂离子充电电池操作指示及注意事项》仅适用于新能源科技有限公司生产的电池。

Statement (1):

Customer is requested to contact NVT in advance, if and when the customer needs other applications or operating conditions than those described in this document. Additional experimentation may be required to verify performance and safety under such conditions.

声明 (1): 客户若需要将电池用于超出文件规定以外的设备, 或在文件规定以外的使用条件下使用电池应事先联系 NVT, 因为需要进行特定的实验测试以核实电芯在该使用条件下的性能及安全性。

Statement (2):

NVT will take no responsibility for any accident when the Product is used under other conditions than those described in this Document.

声明 (2): 对于在超出文件规定以外的条件下使用电池而造成的任何意外事故, NVT 概不负责。

Statement (3):

Customer shall implement the requirements of this Document by setting up corresponding control measures and protection devices on charger, terminal Charger IC, etc. NVT will take no responsibility for any consequences arising from Customer's failure to implement the requirements of this Document.

声明 (3): 客户应当在充电器、终端 Charger IC 等方面落实执行本产品规格书的要求, 设置相应的控制措施和保护装置。对于客户未落实执行本产品规格书要求而产生的任何后果, NVT 将不承担任何责任。

- Use specified charge/discharge conditions/使用指定的充放电条件。
- Specified product use only/仅用于指定产品。
- Do not immerse in water pour/禁止投入水中。
- Do not heat or throw in fire/禁止加热或投入火中。
- Do not attempt to crush or drop/禁止尝试挤压或跌落。
- Do not attempt to modify/禁止任何修改。
- Leave in cool places/存放在阴凉处。
- Do not put it in microwave oven, oven or pressure container/禁止放在微波炉, 炉子或压力容器里。
- Do not use battery if not recover during conditions above/假如在上述条件下电池不能恢复请不要继续使用。
- During assembly, charging, normal use and storage of battery pack, such as change of color, mechanical are detected do not use/在组装, 充电, 正常使用和存储中, 如有变色或机械损伤, 请不要继续使用。
- In case of leakage or smells remove from thermal conditions, Also wash off with clean water/万一有漏液或气味, 要从热源移除, 并且用清水清洗干净。
- Do not place or leave the battery and equipment in the reach of infants so that they are not able to swallow or mistreat the battery by mistake. In case of ingestion, consult with a doctor immediately/请将电池放在幼儿不宜触碰的地方, 以免吞食和误处理。万一发生请立即就医。
- Do not let leaked electrolyte come into contact with eyes or skin. In such a case, immediately wash the area of contact with clean water and seek help from a doctor. If not treated soon, prolonged contact may cause serious injury/漏出的电解液远离眼睛和皮肤, 万一发生立即清洗干净或就医, 假如不能立即处理, 可能引起严重伤害。
- Do not put the battery into a fire. Do not use it or leave it in a place near fire, heaters, or high temperature sources. In such a case, the insulator in the battery may be melted, the safety vent and structure may be damaged, or the electrolyte may catch fire, all of which may cause heat generation, explosion, or fire/不要将电池丢入火中。不要在离火源, 热源或高温源近的地方使用或放置。在这种情况下, 电池中的绝缘保护可能融化, 安全阀等结构可

能会被毁坏，这样可能会过热，爆炸或起火。

- Do not submerge the battery in water, or wet the battery. If the protecting device assembled in the battery is damaged, the battery may be charged with an abnormal current and voltage and may cause a chemical reaction within the battery, which may result in the cause of heat generation, explosion, or fire of the battery/禁止浸泡或弄湿电池，如果电池保护装置被损坏，电池可能会被异常电流和电压充电从而引起电池内化学变化，导致过热，爆炸或起火。
- Do not use any battery charger not specified. Incorrect charging method and charging equipment, the battery will be damaged, which may cause firing, or other problems/禁止使用非指定充电器，错误的充电方法和充电设备，可能损坏电池，导致起火或其它安全问题。
- Do not use, charge, or leave the battery near fire or in a car under the blazing sun. Such a high temperature may cause damage of the protecting device in the battery, which may result in an abnormal reaction, and then heat generation, explosion, or fire/禁止离火源很近的位置或烈日下的车中放置，使用或给电池充电，这种高温环境下可能毁坏电池中的保护机构，从而引起异常反应，发热，爆炸和起火。
- Do not connect the battery reversed in positive (+) and negative (-) terminals in the charger or equipment. In the case the battery is connected in reverse, it is charged reversibly and may cause heat generation, explosion, or fire due to an abnormal chemical reaction/禁止反接电池正负极，在这种情况下，电池被异常充电可能会导致过热，爆炸或起火。
- Do not short terminals. 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. In such a case, the battery is shorted and causes an excessive current, which may result in heat generation, explosion, or fire/禁止短接，禁止直接用导线或任何金属（比如金属项链或发卡）连接电池正负极。这种情况下，电池外短路引起过电流，有可能导致过热，爆炸或起火。
- Do not connect the battery directly to an electric outlet or cigarette heater socket in car. With a high voltage applied, the battery may overheat, explode, or cause fire/车上禁止直接连接到电源插座和点烟器上，因为高压下，电池可能会过热，爆炸，或起火。
- Do not throw or drop the battery. Strong impact may damage the protecting device, which may cause an abnormal chemical reaction during its charge and result in heat generation, explosion, or fire of the battery/禁止抛扔或跌落电池，强的重力冲击可能破坏保护机构，可能引起异常化学反应导致发热，爆炸或起火。
- Do not drive a nail in, hit with a hammer, or stamp on the battery. In such a case, the battery may be deformed and shorted, which may cause heat generation, explosion, or fire of the battery/禁止针刺，砸锤或邮戳电池，这种情况下，电池可能变形和短路，从而导致过热，爆炸，起火。
- Do not solder the battery directly. Heat applied during soldering may damage the insulator of the safety vent and mechanism, which may result in heat generation, explosion, or fire of the battery/禁止锡焊电池，可能破坏安全阀，以及机构的绝缘保护措施，导致过热，爆炸，起火。
- Do not disassemble or alter the battery. The battery employs a safety mechanism and a protecting device in order to avoid any danger. If these are damaged, heat, explosion or fire may be caused/禁止拆解或更换电池，电池安置了安全机构和保护机构避免安全隐患，假如损坏，可能导致过热，爆炸或起火。
- Do not put the battery in a microwave oven or a pressure cooker. Sudden heat may damage the seal of the battery and may cause heat generation, explosion, or fire of the battery/禁止将电池放在微波炉或压力锅内，极速的热可能导致过热，爆炸或起火。
- Do not leave the battery in a charger or equipment if it generates an odor and/or heat, changes color and / or shape, leaks electrolyte, or causes any other abnormality. In such a case, immediately take the battery out of the charge or equipment and keep it away from fire, otherwise, the battery might overheat, explode, or cause fire/如果电池已经发出气味或发热，颜色和/或外形有变化，电解液露出或任何不正常的现象，请不要再将电池放到充电器或设备里。这种情况下，应立刻将电池从充电器或设备中取出并远离火源，否则电池可能过热，爆炸或起火。
- Discontinue charging after specified charging time even if the charge is not complete, otherwise, the battery might cause heat generation, explosion, or fire/规定时间内不能完成充电不要继续充电，否则可能导致过热，爆炸或起火。

- Do not use the battery in the place where the static electricity (more than the limit of the manufacturer's guarantee) occurs. Otherwise, the protecting device in the battery might be damaged and cause heat generation, explosion, or fire/禁止将电池搁置在超出制造商定义的静电区, 否则保护机构可能损坏导致过热, 爆炸或起火。
- Do not use the battery in other than the conditions specified; otherwise, the battery might cause heat generation, damage, or deterioration of its performance/禁止在超出规定条件下使用电池, 否则可能导致过热, 损坏, 恶化电池电性能。
- Read the instructions of your equipment regarding the battery installation and removal from the equipment so as not to mishandle and waste the battery/阅读设备和电池关于安装和拆卸指导书, 避免误操作导致浪费。
- In case young children use the battery, instruct them on the contents of the instructions and ensure the battery is correctly used by them at all times/如果小孩使用电池, 务必指导他们正确操作, 确保电池正确使用。
- The battery was manufactured and inspected carefully before shipment to conform with the specification. However, in the case any abnormality of bad smell or heat, etc. arises after purchase, bring the battery back to the retail shop where you bought it/电池制造和出厂前检查是满足本规格的, 万一购买后发现像气味, 热等任何异常, 去购买处退回处理。
- The battery was charged a little before shipment for temporary use by an end user. In case your equipment does not operate with the battery or in the case of a long use, charge the battery with a specified charger once/出厂前电池充了一点电, 购买后使用不能工作或使用一段时间后, 需要规定的充电器充电。
- Do not charge the battery over the specified time described in the instructions, otherwise, the battery performance might deteriorate/禁止用超出规格书规定的充电时间, 否则可能恶化电池电性能。
- Turn off your equipment power switch after use, otherwise, the performance of the battery might deteriorate/设备使用后请关掉电源, 否则可能恶化电池电性能。
- The battery after long storage might not be sufficiently charged for use/电池长期存储不用可能导致电量不足。
- Prolonged standing or storage, PACK must be stored after removal from the host (disconnect the electrical properties of contacts); PACK need to conduct a test at least once in half of year. If necessary, the PACK needs to supplement electricity. PACK shall be kept for at least 40% capacity after a path to storage.
- 长时间搁置或储存, 电池必须从主机上拆卸下储存(断开电子器件的接触); 电池至少在半年需要进行测试一次, 如有必要, 电池需要补充电力, 保持至少 40%的容量。
- If the PACK cannot removed from the host , the PACK need to be set to the lowest power consumption mode before the storage, and arrangements the PACK supplementary charge regularly and performance testing according the Consumption rate (recommendation: supplementary charge to 60 - 70% every two months), adjustment depending on the system actual storage conditions and power consumption. With Smart-Gauge products, it is strongly recommended to set Shipping Mode of the PACK after storage.
- 如果电池无法从主机上拆卸, 电池需要被设置为最低功耗模式存储, 并安排定期充电和性能测试, 根据自耗电率(建议: 每 2 个月补充电至 60-70%), 根据系统的实际存储条件和耗电调整。带有智能电量计的产品, 强烈建议储存设置为电池出货模式。
- In the case the battery terminals are dirty, clean the terminals with a dry cloth before use, otherwise, the contact with equipment might cause insufficiency, and power failure or charge failure/万一电池金手指脏污, 请清理干净后使用, 否则连接设备后可能引起一些异常, 甚至可能导致电源或充电失效。
- Despite being rechargeable, the battery has a limited life span, Replace when usage time between charges becomes short/尽管可充电, 电池有极限使用寿命, 当满充后使用时间明显变短需要更换电池。
- Keep the handling instructions and your equipment instructions in a suitable place for future reference/确保操作指导书和设备指导书在合适的位置为进一步参考。

11. Disclaimer/免责声明

11.1 The Customer hereby agrees that it has carefully read and understand any and all terms and conditions, safety



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precautions and measures set forth in this Document, furthermore, the Customer agrees to bear full responsibilities of these risks and responsible for any accidents, injury to persons, or property damage that may occur, Customer further agrees to waive claiming any liability against NVT.

客户在此确认并同意，其已认真阅读并理解本产品规格书中所阐明的条款、所有安全规范及措施，并且将完全地对可能因此产生的任何意外事故、人身伤害及财产损失等风险承担责任而不会向 NVT 主张任何责任。

11.2 The Product is produced and supplied to Customer with B2B nature, and is not for direct consumer use. Customer should verify the fitness for a particular purpose of such Product described hereof under certain application. Except as provided in the Specifications, NVT makes no representation or warranty of any kind, whether express or implied, including with respect to any warranty as to merchantability, compatibility, fitness for use or for any particular purpose. The parameters provided in this Document may vary in different applications and performance may vary from time to time. All operating parameters, including typical parameters, must be validated for each customer application by the Customer's technical experts.

本产品是基于企业对企业(B2B)的交易模式所向客户制造及供应，非供终端消费者之直接使用。客户应当验证本规格书定义的产品在客户特定终端（或应用）满足特定用途的适用性。除规格书中有明确规定的情况外，NVT 不作任何明示或暗示的陈述或保证，包括关于适销性、兼容性、适用性或任何特定目的的任何保证。本产品规格书中提供的参数在不同的应用中可能会有所不同，并且性能可能随时间而变化。客户的技术专家必须就每次应用对所有操作参数（包括典型参数）进行验证。

11.3 The parties agree that NVT shall have no liability or obligation with respect to any infringement, claim or action which is based upon:

双方同意对于下列的侵权、索赔或诉讼，NVT 无须承担任何责任：

11.3.1 NVT's incorporation or use of materials, designs, technology or intellectual property designed, designated or instructed by Customer, its affiliates, contract manufacturers, customer, or end user into the products;

NVT 在其产品上结合或使用客户、客户之关联方、分包方、客户或终端用户的设计、指定或指示的材料、设计、技术或知识产权；

11.3.2 the combination, assembly, operation, or use of the products with materials, devices, parts, or software not supplied by NVT;

客户将 NVT 的产品与非 NVT 提供的材料、设备、组件或软件进行结合、组装使用/运行；

11.3.3 modifications, disassembly, repair, and rework to the products made by Customer or any third party without the prior written consent of NVT;

未经 NVT 授权(包括甲方或其他第三人)而对 NVT 的产品进行的修改、拆解、维修或重工；

11.3.4 NVT's modification of the products in compliance with the design, specification, requirements, or instructions of Customer;

NVT 依照客户的设计、规格、要求或指示而对其产品进行的修改；

11.3.5 the claim or action arising from non-compliance with the requirements for use, storage, delivery, assembly, and disposal of the products designated by NVT;

客户或任何第三方未依据 NVT 指定的产品使用方式对 NVT 的产品进行使用或未按照 NVT 指定的标准对产品进行安置、贮存、运输、组装或处理而导致的任何侵权或索赔事项；

11.3.6 use of the products outside the scope of intended use under this Document; or

客户或任何第三方未依据本产品规格书中约定的使用范围对 NVT 的产品进行使用；或

11.3.7 any defect that may exist before NVT's product enters the market or any defect that is unable to be detected by the existing technology at the time NVT's product enters market.

NVT 未投入流通的产品或 NVT 产品在投入流通时引起损害发生的缺陷尚不存在或投入流通时的技术水平尚不能发现缺陷的存在的。

11.4 NVT shall have no liability or obligation with respect to any Products which have been subjected to abuse, misuse, improper use, negligence, accident, alternation, repair or rework performed by any unauthorized persons or entities other

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than NVT.

对于任何未经授权的个人或非 NVT 实体滥用，滥用，不当使用，疏忽，意外，改动，修理或返工的产品，NVT 概不承担任何责任或义务。

11.5 Neither party shall be liable for any indirect, special, incidental, punitive or consequential damages of any kind (including lost profits), regardless of the form of action, whether in contract, tort (including negligence), strict liability or otherwise, even if informed of the possibility of such damages in advance.

即便对方已提前通知一方下述损失发生的可能性，双方同意并确认，任何一方均不对任何间接的、特别的、附带的、惩罚性的或结果性的损失（包括可得利益损失）承担赔偿责任，无论是基于任何诉讼方式、无论是基于合同或侵权之债（包含过失侵权行为）、无论是否基于严格责任。

11.6 The maximum overall liability of each party, alone or in the aggregate with respect to all claims of any kind, if any, whether in contract, tort (including negligence), strict or product liability, damages, reimburse, indemnification or otherwise, shall not exceed two times of the goods price allocable to the specific Product upon which the claim is directly based.

任一方所应承担的全部责任，无论是基于合同、侵权（包括过失）、严格责任或产品责任、损害、补偿、赔偿或其他任何原因，单次及累计金额应不超过引发该索赔的特定产品的货款的两倍。

12. Miscellaneous/其他

In the event of any conflict, ambiguity or discrepancy between the Chinese version and English version of this Document, both parties agree that the Chinese version of this Document shall prevail.

本产品规格书之中文文本与英文文本如有任何矛盾，歧义或者不一致之处，双方同意应以中文文本优先适用。



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ECN NO. :

Battery Specification Confirmation Sheet

Of

Dongguan NVT Technology Co.,Ltd (“NVT”)

NVT 电池产品规格书

NVT Product Part Number/NVT产品料号: **31920PA30007**

Model/型号: **MC-1444206A-B3**

Pack Configuration/电池结构: 1Series 1 Parallel (1S1P)

Prepared by TPM	Approved by TPM	Approved by CPD	Approved by QA

Customer Confirmation	Authorized Signatory		Date
	Signature	Print Name	
	Company Name Of Customer: META		
	Company Stamp Of Customer:		

Confidential : () Level 3 Private confidential () Level 2 High confidential (V) Level 1 Low confidential

AMENDMENT RECORDS/变更记录

Revision/版本	Description/描述	Originator/制作者	Date/日期
A	New Release	Sunny Liang	2025/08/11

Content/目录

SECTION/部分 Page/页码

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1 Scope/适用范围:

The purpose of this Document (“Document”) is to specify the specifications of the Lithium-ion Polymer (“LIP”) rechargeable battery with NVT Part Number 31920PA30007 (“Product” or “Pack”) to be supplied by NVT to Customer under Customer’s purchase order and NVT’s confirmation relevant to the Product. For the avoidance of doubt, the specifications specified herein do not apply to any Host Device, apparatus, instrument, equipment or hardware device containing Product or Cell (“Host Device”).

本产品规格书描述了 NVT 依据客户采购订单生产的可充电聚合物锂离子(“LIP”)电池的产品性能指标, NVT 产品代码号 31920PA30007(“产品”或“电池”)。为避免疑问, 本产品规格书不适用于任何包含该产品或电芯的主机设备、仪器、仪表、器件、硬件设备等 (“主机”)。

2 Model Name/型号: MC-1444206A-B3

2.1 NVT Project Name: FRLWPA3

2.2 META Model Name: MC-1444206A-B3

3 Standard Environmental Test Conditions/标准环境测试条件:

3.1 Unless otherwise specified, all tests stated in this Product Specification are conducted at below conditions:

除非特别指定, 本产品规格书所有的测试遵循如下条件:

Temperature/温度: $25 \pm 3^{\circ}\text{C}$ (“Temperature Condition” /温度条件)

Humidity/湿度: $65 \pm 20\% \text{ RH}$ (“Humidity Condition” /湿度条件)

3.2 Throughout this Document, numeric criteria annotated by “*” means such criteria are only applicable to fresh unused Product within 30 days from manufacture by NVT. Products either have been used or stored for a period longer than 30 days by Customer and/or its customer may exhibit an inferior numeric parameter than such criteria. Customer agrees that such occurrence does not constitute nonconformance of specification.

本产品规格书中, 所有标有“*”的项目是指仅适用于 “未使用的且从NVT制造日起30天内的产品”。如果产品已被客户使用或存储时间超过30天, 可能表现出低于标准规格, 客户同意并接受产品不构成不符合规格。

4 Detailed Specifications/详细规格:

The specifications listed in this Section 4 shall be the detailed specifications for the Product (“Detailed Specifications”). 列在第 4 部分的规格作为产品的详细规格。

No.	Items/项目	Specifications/规格	Remark/备注
4.1	*Minimum Capacity ($C_{\min}$) / Rated Capacity 额定容量	162mAh / 0.631Wh	Standard capacity measure method: 1.5Cmin to 4.25 V, CV to 0.7Cmin, 0.7Cmin to 4.48V, then CV to 0.05 Cmin , then with 0.2Cmin discharge to 3.0V cut-off 标准容量测试方法: 先用 1.5Cmin 恒流充电至 4.25V, CV 到 0.7Cmin, 0.7Cmin 恒流充电至 4.48V, 再恒压充电直至充电电流 0.05Cmin, 然后用 0.2Cmin 放电至 3.0V
4.2	Nominal Capacity/ 典型容量	167mAh	
4.3	* Nominal Voltage/ 标称电压	3.89V	
4.4	Limited Charging Voltage/ 充电限制电压	4.48V	
4.5	End of Discharge Voltage/放电终止电压	3.0V	
4.6	Charge/Discharge 充电/放电	Cell Surface Temperature 电芯表面温度	Charge Current and Voltage 充电电流和电压

	Charge/充电	0°C~10°C	0.5Cmin to 4.25V, CV to 0.2Cmin; 0.2Cmin to 4.48V ,then CV to 0.05Cmin / 0.5Cmin充电到4.25V, CV到0.2Cmin, 0.2Cmin恒流充电至4.48V , 然后CV到0.05Cmin
		10°C~20°C	1.0Cmin to 4.25V, CV to 0.5Cmin; 0.5Cmin to 4.48V ,then CV to 0.05Cmin / 1.0Cmin 充电 到 4.25V, CV 到 0.5Cmin , 0.5Cmin恒流充电至4.48V , 然后CV到0.05Cmin
		20°C ~45°C	1.5Cmin to 4.25V, CV to 0.7Cmin; 0.7Cmin to 4.48V,then CV to 0.05Cmin / 1.5Cmin 充电到 4.25V, CV 到 0.7Cmin, 0.7Cmin 恒流充电至 4.48V 然后 CV 到 0.05Cmin
		45°C ~60°C	0.5Cmin to 4.2V, then CV to 0.05Cmin / 0.5Cmin充电到4.2V, 然后CV到0.05Cmin
	Discharge/放电	-20°C ~0°C	0.5Cmin to 3.0 V Discharge current sustained for time ≥ 10 seconds 0.5Cmin放电到3.0 V 放电电流持续时间 ≥ 10 秒
		0°C ~60°C	2.0Cmin to 3.0 V Discharge current sustained for time ≥ 10 seconds 2.0 Cmin放电到3.0 V 放电电流持续时间 ≥ 10 秒
4.7	Storage Condition/ 存贮条件	Temperature/温度: within 3 months/3个月内 -20°C ~ + 45°C; over three months/超过3个月 25 $\pm$ 3°C ; Humidity/湿度: $\leq 75\%$ RH	The battery voltage should be kept in the range of 3.6V to 3.95V by charging batteries if batteries are stored more than 3 months/电池存储超过 3 个月需要给电池充电维持电压在 3.6V to 3.95V
4.8	*Initial resistance 初始内阻	250m Ω Max	Internal resistance measured at AC 1KHz after charge to shipment voltage. 充电到出货电压后, 测量其 AC 1KHz 下的交流阻抗
4.9	*Pack Voltage(as of shipment) 电池电压 (出货状态)		
		3.70~3.80V	Air transport (IATA require shipping SOC $\leq 30\%$)/空运 (IATA 要求出货 SOC $\leq 30\%$)

4.10	* Cycle life/循环寿命	Charge: 1.5Cmin to 4.25 V, CV to 0.7Cmin; 0.7Cmin to Vmax, CV to 0.05Cmin Discharge: 0.5Cmin to Vmin Repeat to 500 cycles, record remained capacity of 500th cycle. Test temperature: 25°C±2°C . 充电: 1.5Cmin 充电到 4.25V, CV 到 0.7Cmin, 0.7Cmin 恒流充电至 Vmax, 然后 CV 到 0.05Cmin 放电: 0.5Cmin 放电至 Vmin, 重复 500 次循环, 记录剩余容量 温度: 25°C±2°C	≥80Cinitial, ≤10%swelling
		Charge: 1.5Cmin to 4.25 V, CV to 0.7Cmin; 0.7Cmin to Vmax, CV to 0.05Cmin Discharge: 0.5Cmin to Vmin Repeat to 400 cycles, record remained capacity of 400th cycle. Test temperature: 45°C±2°C . 充电: 1.5Cmin 充电到 4.25V, CV 到 0.7Cmin, 0.7Cmin 恒流充电至 Vmax, 然后 CV 到 0.05Cmin 放电: 0.5Cmin 放电至 Vmin, 重复 400 次循环, 记录剩余容量 温度: 45°C±2°C	≥80Cinitial, ≤10%swelling
		Charge: 1.0Cmin to 4.25 V, CV to 0.5Cmin; 0.5Cmin to Vmax, CV to 0.05Cmin Discharge: 0.5Cmin to Vmin Repeat to 200 cycles, record remained capacity of 200th cycle. Test temperature: 10°C±2°C . 充电: 1.0Cmin 充电到 4.25V, CV 到 0.5Cmin, 0.5Cmin 恒流充电至 Vmax, 然后 CV 到 0.05Cmin 放电: 0.5Cmin 放电至 Vmin, 重复 200 次循环, 记录剩余容量 温度: 10°C±2°C	≥80Cinitial, ≤10%swelling

		Charge: 0.5Cmin to 4.25 V, CV to 0.2Cmin; 0.2Cmin to Vmax, CV to 0.05Cmin Discharge: 0.5Cmin to Vmin Repeat to 200 cycles, record remained capacity of 200th cycle. Test temperature: 0°C±2°C . 充电: 0.5Cmin 充电到 4.25V, CV 到 0.2Cmin, 0.2Cmin 恒流 充电至 Vmax, 然后 CV 到 0.05Cmin 放电: 0.5Cmin 放电至 Vmin, 重复 200 次循环, 记录剩余容量 温度: 0°C±2°C	≥80Cinitial, ≤10%swelling
		Charge: 0.5Cmin to 4.2 V, CV to 0.05Cmin Discharge: 0.5Cmin to Vmin Repeat to 200 cycles, record remained capacity of 200th cycle. Test temperature: 60°C±2°C 充电: 0.5Cmin Max 充电到 4.2V, 然后 CV 到 0.05Cmin 放电: 0.5Cmin 放电至 Vmin, 重复 200 次循环, 记录剩余容量 温度: 60°C±2°C	≥80Cinitial, ≤10%swelling
4.11	Pack Weight/电池重量	4.13 ± 0.15g	

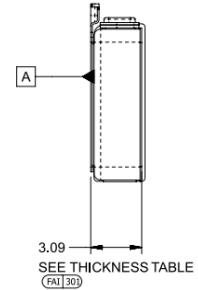
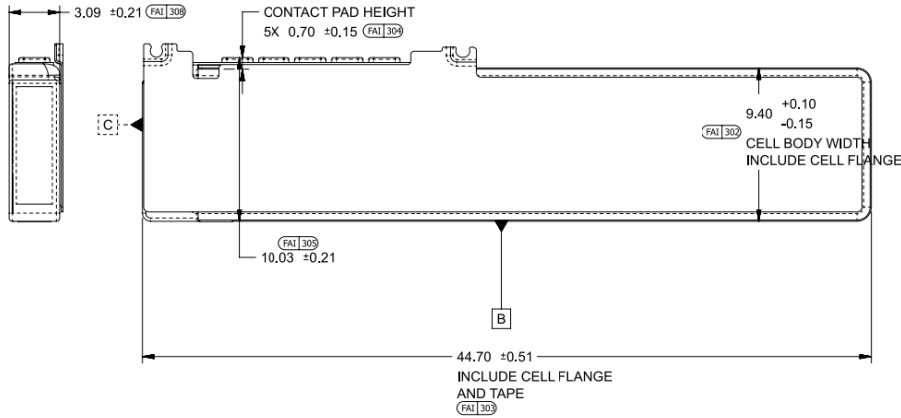
5 Warranty period/保质期:

The warranty period of Battery is 12Monthsafterthe manufacture date.

电池保质期为从生产日期算起12个月。

6 Assembly Drawing (all unit is mm, not in scale) / 电池图纸 (单位: mm)

6.1 Battery Drawing/电池图纸

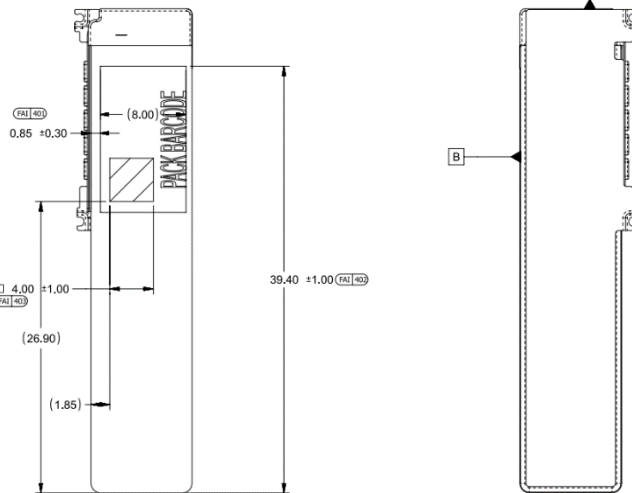


THICKNESS TABLE

QOC	THICKNESS	NOTE
CYCLE 0	3.09±0.1	SHIPPING STATE
EOL	3.23 MAX	100% SOC
	3.53 MAX	100% SOC: SEE CELLERS FOR CYCLE REQUIREMENT.

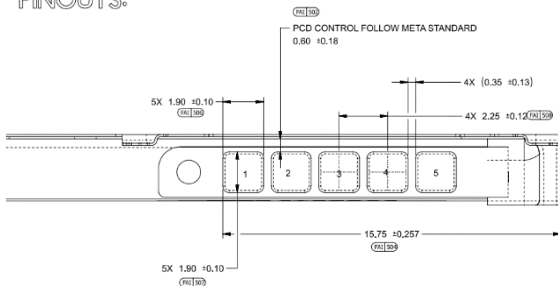
INSULATION TAPE
(CHECK DIMENSIONS ON BOTH SIDES)

ARTWORK

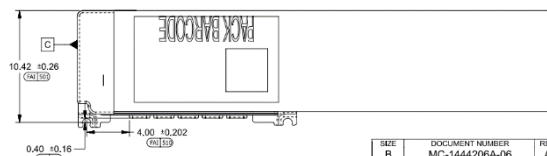


LASER ETCH ON LID SIDE

PINOUTS:



SIGNAL	PIN NUMBER
GND	1
SDA	2
SCL	3
ALRT	4
PACKP	5



REV	DOCUMENT NUMBER	REV
B	MC-1444206A-06	A

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DM ID	INSPECTION FREQUENCY	INSPECTION METHOD
FAI 301	32 PCS/BUILD	OMM
FAI 302	32 PCS/BUILD	OMM
FAI 303	32 PCS/BUILD	OMM
FAI 304	32 PCS/BUILD	OMM
FAI 305	32 PCS/BUILD	OMM
FAI 306	32 PCS/BUILD	OMM
FAI 307	32 PCS/BUILD	OMM
FAI 401	32 PCS/BUILD	OMM
FAI 402	32 PCS/BUILD	OMM
FAI 403	32 PCS/BUILD	OMM
FAI 404	32 PCS/BUILD	OMM
FAI 405	32 PCS/BUILD	OMM
FAI 501	32 PCS/BUILD	OMM
FAI 503	32 PCS/BUILD	OMM
FAI 504	32 PCS/BUILD	OMM
FAI 505	32 PCS/BUILD	OMM
FAI 506	32 PCS/BUILD	OMM
FAI 507	32 PCS/BUILD	OMM
FAI 508	32 PCS/BUILD	OMM
FAI 509	32 PCS/BUILD	OMM
FAI 510	32 PCS/BUILD	OMM

6.2 Battery Barcode Drawing/电池喷码图纸



Two-dimension code definition

二维码大小: L4.0±1.0*W4.0±1.0mm; 类型: Data Matrix

Barcode dimension size: L4.0±1.0*W4.0±1.0mm ; Barcode type: Data Matrix.



Barcode content: AABBBCCCYMDEEEE 条码内容共14位

AA=42 (Project code reference battery pack ERS, Fixed /项目代码参考PACK ERS, 2位固定值)

BB=8G (Vendor code Meta assigned, Fixed/供应商代码, 2位具体需咨询PM)

CCC=DA2 (Part and Configuration, reference battery pack ERS and Build Matrix ,

Variable value confirm with PM/组件方案, 参考Pack ERS和 Build Matrix, 具体需咨询PM, 3位变量)

Y=Year/年 (Details ref as below/具体规则参考如下, 1位变量)

M=Month /月 (Details ref as below/具体规则参考如下, 1位变量)

D=Day/日 (Details ref as below/具体规则参考如下, 1位变量)

EEEE= Unique Identifier (Base-31 value 0001 to ZZZZ with the exception of alpha characters A, E, I, O and U

used for unique identifier allows up to 923520 unique serial numbers within a single day of production/allocation
/流水码, 31进制从0001到ZZZZ字母A E I O U 除外, 单日生产或分配最大值为923520)

NYMD

电池明码, 共4位:

1位: N, 代表生产厂, N代表东莞新能德科技有限公司;

2位: Y, 生产年份, 与暗码规则一致, 具体规则参考图表;

3位: M, 生产月份, 与暗码规则一致, 具体规则参考图表;

4位: D, 生产日期, 与暗码规则一致, 具体规则参考图表;

Battery code, a total of 4 digits:

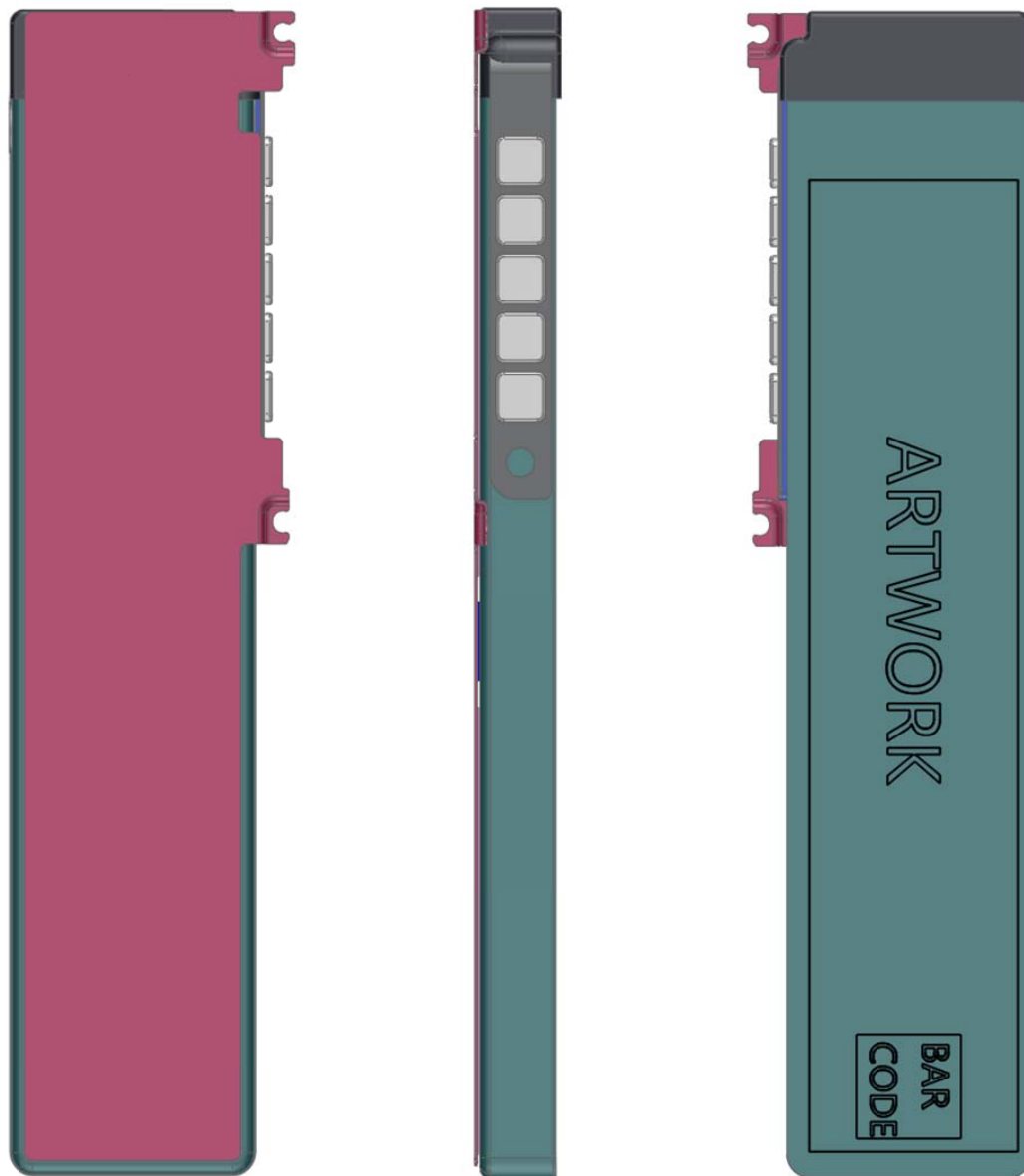
1 digits: N, represents the manufacturer, N represents Dongguan Xinnengde Technology Co., LTD.

2 digits: Y, production year, Consistent with barcode rules Details ref as table;

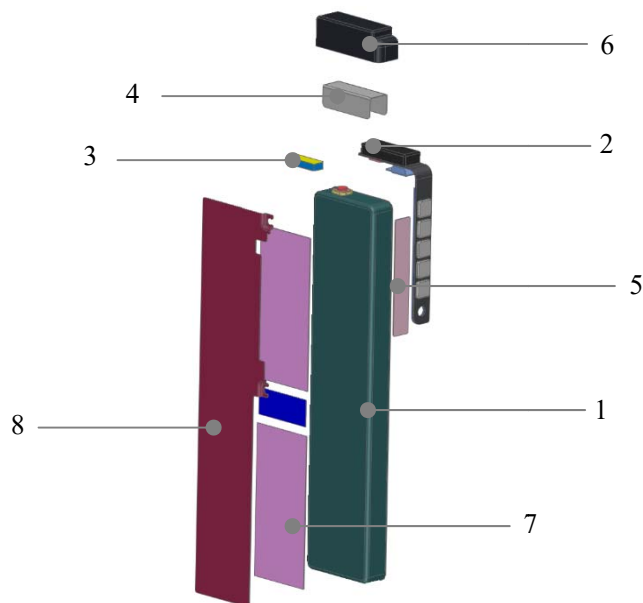
3 digits: M, Production months, Consistent with barcode rules Details ref as table;

4 digits: D, Production date, Consistent with barcode rules Details ref as table;

6.3 Battery Photos/电池图片

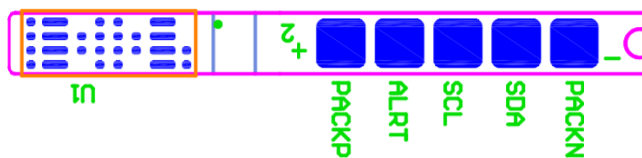


6.4 Disassembly Drawing for Pack/电池拆分图



Item/项目	Specification/规格	Qty/数量	Remark/备注
Cell	ATL-GC-NSC-301043-100H163mAh 3.89V	1pcs	1
PCM	FPC+SIP	1pcs	2
Foam	T=0.8mm	1pcs	3
Tape	T=0.05mm	1pcs	4
PSA	T=0.08mm	1pcs	5
LPM	Black	1pcs	6
PSA	T=0.1mm	1pcs	7
Plate	SUS T=0.1mm	1pcs	8

7 Terminal Specification/引脚定义

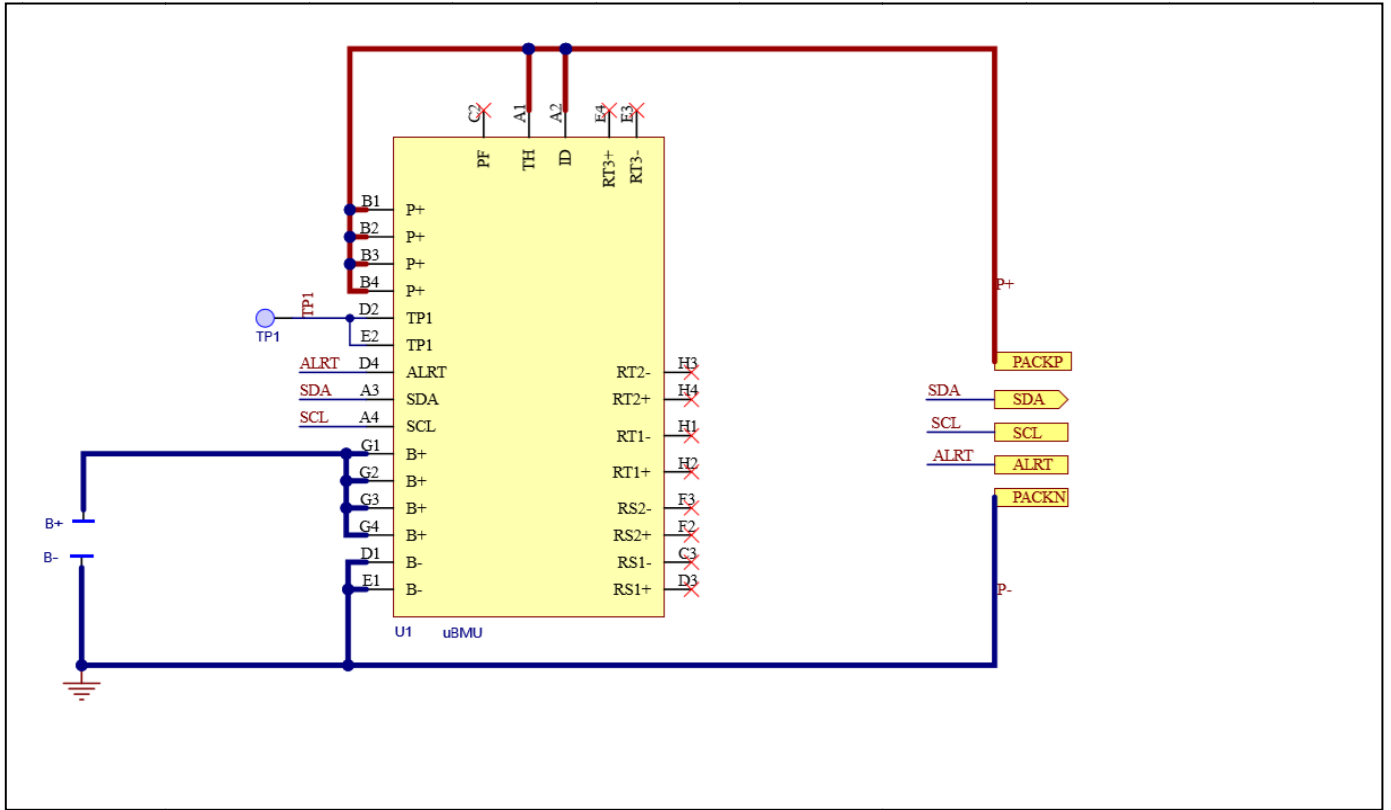


Pin Number	Signal
1	PACKN
2	SDA
3	SCL
4	ALRT
5	PACKP

Name/名称	Pin No./引脚编号	Function/功能	Remark/备注
PACKN	PIN 1	Battery negative terminal for charge & discharge/电池负端用于充电和放电	-
SDA	PIN 2	Serial Data Input/Output for I2C Communication Modes /I2C通信模式数据输入/输出	-
SCL	PIN 3	Serial Clock Input for I2C Communication/I2C通信模式时钟输入	-
ALRT	PIN 4	Alert Output /报警输出	-
PACKP	PIN 5	Battery positive terminal for charge & discharge/电池正端用于充电和放电	-

8 PCM Specifications/保护板规格

8.1 Circuit diagram/电路图



8.2 PCM and FPC Layout/保护板和FPC布局

Top overlay



Top layer



Bottom overlay (已上下镜像)



Bottom layer (已上下镜像)



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8.3 PCM Part list/保护板清单

SIP module code D:

SN.	Discription	Specification	Number	Unit	Symbol	Vendor	Remark
1	SIP module	BUB010101-1CD ; 1GD; 1ND MAX17335X22+,R5449Z606NE-E2-T	1	PCS	U1		
2	Nickel	B+ Nickel ,L-shape ,H=0.1mm	1	PCS	B+		
3	Nickel	B- Nickel ,L-shape ,H=0.1mm	1	PCS	B-		
4	FPC	25.76x2.35x0.15mm ,ENIG ,Block solder mask ,HF	1	PCS			
5	Glue	UV glue	0.02	g	TP1 test point		
6	GOLD BRICK	金砖;NI;L1.9×W1.9×T0.3mm;Gold plating;RoHS+REACH	5	PCS			

SIP module code 6:

SN.	Discription	Specification	Number	Unit	Symbol	Vendor	Remark
1	SIP module	BUB010101-1C6 ; 1G6 MAX17335X22+,S-PI14BBG-H8T2S7	1	PCS	U1		
2	Nickel	B+ Nickel ,L-shape ,H=0.1mm	1	PCS	B+		
3	Nickel	B- Nickel ,L-shape ,H=0.1mm	1	PCS	B-		
4	FPC	25.76x2.35x0.15mm ,ENIG ,Block solder mask ,HF	1	PCS			
5	Glue	UV glue	0.02	g	TP1 test point		
6	GOLD BRICK	金砖;NI;L1.9×W1.9×T0.3mm;Gold plating;RoHS+REACH	5	PCS			

8.4 PCM Parameter/保护板参数

PCM Primary Protector Thresholds(-20℃~60℃)/PCM主保护参数(-20℃~60℃)

No.	Item/项目	Unit/单位	Min./最小值	Typ./典型值	Max./最大值
1	Over charge protection voltage 过充保护电压	V	4.520	4.530	4.540
2	Delay time for over charge protection 过充保护延迟时间	S	0.7	1.0	1.75
3	Over discharge protection voltage 过放保护电压	V	2.480	2.500	2.520
4	Delay time for over discharge protection 过放保护延迟时间	mS	175	525	1579
5	Discharge over current protection(Fast) 放电过流保护(快)	A	1.77	1.94	2.11
6	Delay time for over current protection(Fast) 过流保护延迟时间(快)	mS	7	7.89	9
7	Discharge over current protection(slow) 放电过流保护(慢)	A	1.225	1.25	1.275
8	Delay time for over current protection(slow)	mS	175	525	1579



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	过流保护延迟时间(慢)				
9	Charge over Current Protection Current(slow)/ 充电过流保护电流(慢)	mA	290	300	310
10	Charge Over Current Protection Delay Time(slow)/ 充电过流保护延迟时间(慢)	mS	175	525	1579
11	Short circuit protection/ 短路保护	A	3.80	4.10	4.20
12	Delay time for short circuit protection/ 短路保护延迟时间	uS	240	253	260
13	Over Temperature Protection 过温保护	°C	65	70	75
14	0V Charging 0V 充电	Enabled			

PCM Secondary Protector Thresholds _CodeD and 6(-20°C~60°C)/PCM次保护参数 _CodeD and 6(-20°C~60°C)

No.	Item/项目	Unit/单位	Min./最小值	Typ./典型值	Max./最大值
1	Over charge protection voltage 过充保护电压	V	4.534	4.550	4.562
2	Delay time for over charge protection 过充保护延迟时间	S	0.788	1.024	1.292
3	Over discharge protection voltage 过放保护电压	V	2.361	2.400	2.440
4	Delay time for over discharge protection 过放保护延迟时间	mS	95.2	128	163.3
5	Discharge over current protection 放电过流保护	A	1.17	1.5	1.85
6	Delay time for over current protection 过流保护延迟时间	mS	197.9	256	324.9
7	Charge over Current Protection Current/ 充电过流保护电流	A	0.84	1.2	1.52
8	Charge Over Current Protection Delay Time/ 充电过流保护延迟时间	mS	6.1	8	10.4
9	Short circuit protection/ 短路保护	A	3.51	4.0	4.47
10	Delay time for short circuit protection/ 短路保护延迟时间	uS	205	280	374
11	Over Temperature Protection 过温保护	°C	72	75	78
12	0V Charging 0V 充电	Disabled			

PCM Current / Impedance/PCM 电流和内阻

No.	Item/项目	Condition/条件	Unit/单位	Min./最小值	Typ./典型值	Max./最大值
1	PCM CurrentConsumption	Normal Mode VBAT > 3.0V	uA	-	39	60



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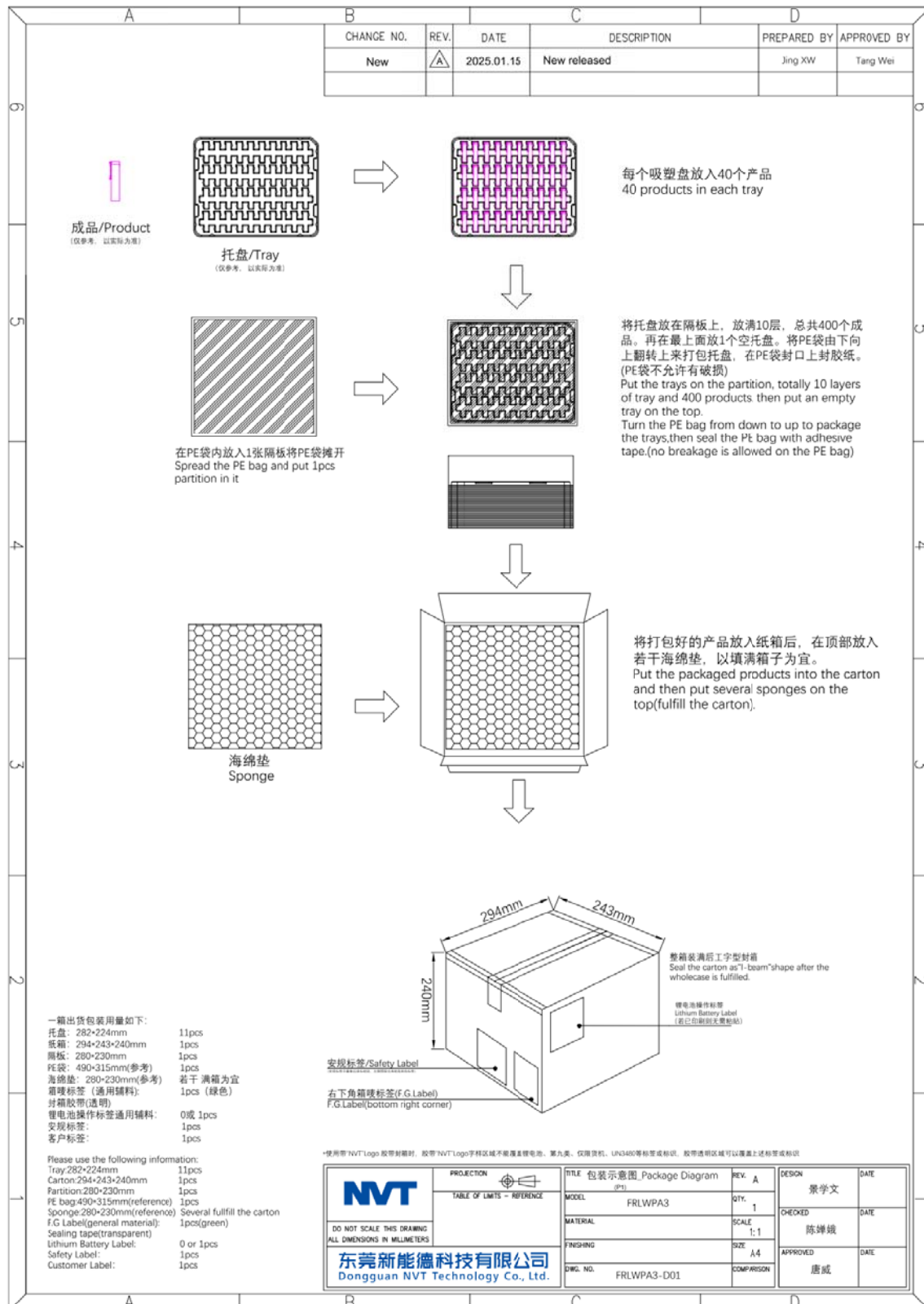
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	PCM 消耗电流	Ship Mode VBAT > 3.0V	uA	-	15	30
		DeepShip 1 Mode VBAT > 3.0V	uA	-	4.5	10
		Shutdown Mode VBAT < 2.4V	nA	-	-	50
2	PCM Impedance PCM 内阻	Cell+ -> PACKP to PACKN- -> Cell-	mΩ	-	-	65

9 Battery Packing requirement/电池包装要求:

9.1 Pack Packing method/电池包装方式

The battery are delivered in trays with 40 pcs in a tray, 400 pcs battery are packed in a bulk package then put into the carton box. Tray dimensions are 282mm (L) *224mm (W) , Carton box dimensions are 294mm(L)*243mm(W)*240mm(T)./ 每盘吸塑盒可装 40 pcs 电池, 每箱装 400 pcs 电池, 吸塑盒尺寸为 282mm(L)*224mm(W), 纸箱尺寸为 294mm(L)*243mm(W)*240mm(T), 一体化打包。



10 Appendix Handling Precautions and Guidelines for LIP Rechargeable Batteries:**附录聚合物锂离子充电电池操作指示及注意事项****Foreword/前言**

These *Handling Precautions and Guidelines for LIP Rechargeable Batteries* shall apply to the Product.

本文件《聚合物锂离子充电电池操作指示及注意事项》仅适用于新能源科技有限公司生产的电池。

Statement (1):

Customer is requested to contact NVT in advance, if and when the customer needs other applications or operating conditions than those described in this document. Additional experimentation may be required to verify performance and safety under such conditions.

声明 (1): 客户若需要将电池用于超出文件规定以外的设备,或在文件规定以外的使用条件下使用电池应事先联系 NVT, 因为需要进行特定的实验测试以核实电芯在该使用条件下的性能及安全性。

Statement (2):

NVT will take no responsibility for any accident when the Product is used under other conditions than those described in this Document.

声明 (2): 对于在超出文件规定以外的条件下使用电池而造成的任何意外事故, NVT 概不负责。

Statement (3):

Customer shall implement the requirements of this Document by setting up corresponding control measures and protection devices on charger, terminal Charger IC, etc. NVT will take no responsibility for any consequences arising from Customer's failure to implement the requirements of this Document.

声明 (3): 客户应当在充电器、终端 Charger IC 等方面落实执行本产品规格书的要求, 设置相应的控制措施和保护装置。对于客户未落实执行本产品规格书要求而产生的任何后果, NVT 将不承担任何责任。

- Use specified charge/discharge conditions/使用指定的充放电条件。
- Specified product use only/仅用于指定产品。
- Do not immerse in water pour/禁止投入水中。
- Do not heat or throw in fire/禁止加热或投入火中。
- Do not attempt to crush or drop/禁止尝试挤压或跌落。
- Do not attempt to modify/禁止任何修改。
- Leave in cool places/存放在阴凉处。
- Do not put it in microwave oven, oven or pressure container/禁止放在微波炉, 炉子或压力容器里。
- Do not use battery if not recover during conditions above/假如在上述条件下电池不能恢复请不要继续使用。
- During assembly, charging, normal use and storage of battery pack, such as change of color, mechanical are detected do not use/在组装, 充电, 正常使用和存储中, 如有变色或机械损伤, 请不要继续使用。
- In case of leakage or smells remove from thermal conditions, Also wash off with clean water/万一有漏液或气味, 要从热源移除, 并且用清水清洗干净。
- Do not place or leave the battery and equipment in the reach of infants so that they are not able to swallow or mistreat the battery by mistake. In case of ingestion, consult with a doctor immediately/请将电池放在幼儿不宜触碰的地方, 以免吞食和误处理。万一发生请立即就医。
- Do not let leaked electrolyte come into contact with eyes or skin. In such a case, immediately wash the area of contact with clean water and seek help from a doctor. If not treated soon, prolonged contact may cause serious injury/漏出的电解液远离眼睛和皮肤, 万一发生立即清洗干净或就医, 假如不能立即处理, 可能引起严重伤害。
- Do not put the battery into a fire. Do not use it or leave it in a place near fire, heaters, or high temperature sources. In such a case, the insulator in the battery may be melted, the safety vent and structure may be damaged, or the electrolyte may catch fire, all of which may cause heat generation, explosion, or fire/不要将电池丢入火中。不要在离火源, 热源或高温源近的地方使用或放置。在这种情况下, 电池中的绝缘保护可能融化, 安全阀等结构可

能会被毁坏，这样可能会过热，爆炸或起火。

- Do not submerge the battery in water, or wet the battery. If the protecting device assembled in the battery is damaged, the battery may be charged with an abnormal current and voltage and may cause a chemical reaction within the battery, which may result in the cause of heat generation, explosion, or fire of the battery/禁止浸泡或弄湿电池，如果电池保护装置被损坏，电池可能会被异常电流和电压充电从而引起电池内化学变化，导致过热，爆炸或起火。
- Do not use any battery charger not specified. Incorrect charging method and charging equipment, the battery will be damaged, which may cause firing, or other problems/禁止使用非指定充电器，错误的充电方法和充电设备，可能损坏电池，导致起火或其它安全问题。
- Do not use, charge, or leave the battery near fire or in a car under the blazing sun. Such a high temperature may cause damage of the protecting device in the battery, which may result in an abnormal reaction, and then heat generation, explosion, or fire/禁止离火源很近的位置或烈日下的车中放置，使用或给电池充电，这种高温环境下可能毁坏电池中的保护机构，从而引起异常反应，发热，爆炸和起火。
- Do not connect the battery reversed in positive (+) and negative (-) terminals in the charger or equipment. In the case the battery is connected in reverse, it is charged reversibly and may cause heat generation, explosion, or fire due to an abnormal chemical reaction/禁止反接电池正负极，在这种情况下，电池被异常充电可能会导致过热，爆炸或起火。
- Do not short terminals. 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. In such a case, the battery is shorted and causes an excessive current, which may result in heat generation, explosion, or fire/禁止短接，禁止直接用导线或任何金属（比如金属项链或发卡）连接电池正负极。这种情况下，电池外短路引起过电流，有可能导致过热，爆炸或起火。
- Do not connect the battery directly to an electric outlet or cigarette heater socket in car. With a high voltage applied, the battery may overheat, explode, or cause fire/车上禁止直接连接到电源插座和点烟器上，因为高压下，电池可能会过热，爆炸，或起火。
- Do not throw or drop the battery. Strong impact may damage the protecting device, which may cause an abnormal chemical reaction during its charge and result in heat generation, explosion, or fire of the battery/禁止抛扔或跌落电池，强的重力冲击可能破坏保护机构，可能引起异常化学反应导致发热，爆炸或起火。
- Do not drive a nail in, hit with a hammer, or stamp on the battery. In such a case, the battery may be deformed and shorted, which may cause heat generation, explosion, or fire of the battery/禁止针刺，砸锤或邮戳电池，这种情况下，电池可能变形和短路，从而导致过热，爆炸，起火。
- Do not solder the battery directly. Heat applied during soldering may damage the insulator of the safety vent and mechanism, which may result in heat generation, explosion, or fire of the battery/禁止锡焊电池，可能破坏安全阀，以及机构的绝缘保护措施，导致过热，爆炸，起火。
- Do not disassemble or alter the battery. The battery employs a safety mechanism and a protecting device in order to avoid any danger. If these are damaged, heat, explosion or fire may be caused/禁止拆解或更换电池，电池安置了安全机构和保护机构避免安全隐患，假如损坏，可能导致过热，爆炸或起火。
- Do not put the battery in a microwave oven or a pressure cooker. Sudden heat may damage the seal of the battery and may cause heat generation, explosion, or fire of the battery/禁止将电池放在微波炉或压力锅内，极速的热可能导致过热，爆炸或起火。
- Do not leave the battery in a charger or equipment if it generates an odor and/or heat, changes color and / or shape, leaks electrolyte, or causes any other abnormality. In such a case, immediately take the battery out of the charge or equipment and keep it away from fire, otherwise, the battery might overheat, explode, or cause fire/如果电池已经发出气味或发热，颜色和/或外形有变化，电解液露出或任何不正常的现象，请不要再将电池放到充电器或设备里。这种情况下，应立即将电池从充电器或设备中取出并远离火源，否则电池可能过热，爆炸或起火。
- Discontinue charging after specified charging time even if the charge is not complete, otherwise, the battery might cause heat generation, explosion, or fire/规定时间内不能完成充电不要继续充电，否则可能导致过热，爆炸或起火。

- Do not use the battery in the place where the static electricity (more than the limit of the manufacturer's guarantee) occurs. Otherwise, the protecting device in the battery might be damaged and cause heat generation, explosion, or fire/禁止将电池搁置在超出制造商定义的静电区, 否则保护机构可能损坏导致过热, 爆炸或起火。
- Do not use the battery in other than the conditions specified; otherwise, the battery might cause heat generation, damage, or deterioration of its performance/禁止在超出规定条件下使用电池, 否则可能导致过热, 损坏, 恶化电池电性能。
- Read the instructions of your equipment regarding the battery installation and removal from the equipment so as not to mishandle and waste the battery/阅读设备和电池关于安装和拆卸指导书, 避免误操作导致浪费。
- In case young children use the battery, instruct them on the contents of the instructions and ensure the battery is correctly used by them at all times/如果小孩使用电池, 务必指导他们正确操作, 确保电池正确使用。
- The battery was manufactured and inspected carefully before shipment to conform with the specification. However, in the case any abnormality of bad smell or heat, etc. arises after purchase, bring the battery back to the retail shop where you bought it/电池制造和出厂前检查是满足本规格的, 万一购买后发现像气味, 热等任何异常, 去购买处退回处理。
- The battery was charged a little before shipment for temporary use by an end user. In case your equipment does not operate with the battery or in the case of a long use, charge the battery with a specified charger once/出厂前电池充了一点电, 购买后使用不能工作或使用一段时间后, 需要规定的充电器充电。
- Do not charge the battery over the specified time described in the instructions, otherwise, the battery performance might deteriorate/禁止用超出规格书规定的充电时间, 否则可能恶化电池电性能。
- Turn off your equipment power switch after use, otherwise, the performance of the battery might deteriorate/设备使用后请关掉电源, 否则可能恶化电池电性能。
- The battery after long storage might not be sufficiently charged for use/电池长期存储不用可能导致电量不足。
- Prolonged standing or storage, PACK must be stored after removal from the host (disconnect the electrical properties of contacts); PACK need to conduct a test at least once in half of year. If necessary, the PACK needs to supplement electricity. PACK shall be kept for at least 40% capacity after a path to storage.
- 长时间搁置或储存, 电池必须从主机上拆卸下储存 (断开电子器件的接触); 电池至少在半年需要进行测试一次, 如有必要, 电池需要补充电力, 保持至少 40%的容量。
- If the PACK cannot removed from the host , the PACK need to be set to the lowest power consumption mode before the storage, and arrangements the PACK supplementary charge regularly and performance testing according the Consumption rate (recommendation: supplementary charge to 60 - 70% every two months), adjustment depending on the system actual storage conditions and power consumption. With Smart-Gauge products, it is strongly recommended to set Shipping Mode of the PACK after storage.
- 如果电池无法从主机上拆卸, 电池需要被设置为最低功耗模式存储, 并安排定期充电和性能测试, 根据自耗电率 (建议: 每 2 个月补充电至 60-70%), 根据系统的实际存储条件和耗电调整。带有智能电量计的产品, 强烈建议储存设置为电池出货模式。
- In the case the battery terminals are dirty, clean the terminals with a dry cloth before use, otherwise, the contact with equipment might cause insufficiency, and power failure or charge failure/万一电池金手指脏污, 请清理干净后使用, 否则连接设备后可能引起一些异常, 甚至可能导致电源或充电失效。
- Despite being rechargeable, the battery has a limited life span, Replace when usage time between charges becomes short/尽管可充电, 电池有极限使用寿命, 当满充后使用时间明显变短需要更换电池。
- Keep the handling instructions and your equipment instructions in a suitable place for future reference/确保操作指导书和设备指导书在合适的位置为进一步参考。

11. Disclaimer/免责声明

11.1 The Customer hereby agrees that it has carefully read and understand any and all terms and conditions, safety



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precautions and measures set forth in this Document, furthermore, the Customer agrees to bear full responsibilities of these risks and responsible for any accidents, injury to persons, or property damage that may occur, Customer further agrees to waive claiming any liability against NVT.

客户在此确认并同意，其已认真阅读并理解本产品规格书中所阐明的条款、所有安全规范及措施，并且将完全地对可能因此产生的任何意外事故、人身伤害及财产损失等风险承担责任而不会向 NVT 主张任何责任。

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11.3.1 NVT's incorporation or use of materials, designs, technology or intellectual property designed, designated or instructed by Customer, its affiliates, contract manufacturers, customer, or end user into the products;

NVT 在其产品上结合或使用客户、客户之关联方、分包方、客户或终端用户的设计、指定或指示的材料、设计、技术或知识产权；

11.3.2 the combination, assembly, operation, or use of the products with materials, devices, parts, or software not supplied by NVT;

客户将 NVT 的产品与非 NVT 提供的材料、设备、组件或软件进行结合、组装使用/运行；

11.3.3 modifications, disassembly, repair, and rework to the products made by Customer or any third party without the prior written consent of NVT;

未经 NVT 授权(包括甲方或其他第三人)而对 NVT 的产品进行的修改、拆解、维修或重工；

11.3.4 NVT's modification of the products in compliance with the design, specification, requirements, or instructions of Customer;

NVT 依照客户的设计、规格、要求或指示而对其产品进行的修改；

11.3.5 the claim or action arising from non-compliance with the requirements for use, storage, delivery, assembly, and disposal of the products designated by NVT;

客户或任何第三方未依据 NVT 指定的产品使用方式对 NVT 的产品进行使用或未按照 NVT 指定的标准对产品进行安置、贮存、运输、组装或处理而导致的任何侵权或索赔事项；

11.3.6 use of the products outside the scope of intended use under this Document; or

客户或任何第三方未依据本产品规格书中约定的使用范围对 NVT 的产品进行使用；或

11.3.7 any defect that may exist before NVT's product enters the market or any defect that is unable to be detected by the existing technology at the time NVT's product enters market.

NVT 未投入流通的产品或 NVT 产品在投入流通时引起损害发生的缺陷尚不存在或投入流通时的技术水平尚不能发现缺陷的存在。

11.4 NVT shall have no liability or obligation with respect to any Products which have been subjected to abuse, misuse, improper use, negligence, accident, alternation, repair or rework performed by any unauthorized persons or entities other

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than NVT.

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11.5 Neither party shall be liable for any indirect, special, incidental, punitive or consequential damages of any kind (including lost profits), regardless of the form of action, whether in contract, tort (including negligence), strict liability or otherwise, even if informed of the possibility of such damages in advance.

即便对方已提前通知一方下述损失发生的可能性，双方同意并确认，任何一方均不对任何间接的、特别的、附带的、惩罚性的或结果性的损失（包括可得利益损失）承担赔偿责任，无论是基于任何诉讼方式、无论是基于合同或侵权之债（包含过失侵权行为）、无论是否基于严格责任。

11.6 The maximum overall liability of each party, alone or in the aggregate with respect to all claims of any kind, if any, whether in contract, tort (including negligence), strict or product liability, damages, reimburse, indemnification or otherwise, shall not exceed two times of the goods price allocable to the specific Product upon which the claim is directly based.

任一方所应承担的全部责任，无论是基于合同、侵权（包括过失）、严格责任或产品责任、损害、补偿、赔偿或其他任何原因，单次及累计金额应不超过引发该索赔的特定产品的货款的两倍。

12. Miscellaneous/其他

In the event of any conflict, ambiguity or discrepancy between the Chinese version and English version of this Document, both parties agree that the Chinese version of this Document shall prevail.

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