Material Safety Data Sheet (MSDS)

For

Shenzhen Hugnen Technology (HGT) Co., Ltd.

No.2, Yinhu, Baolihua Village, Guangming, Shenzhen City, GuangDong Province, China.

and for their product

Polymer Li-ion Battery

Model/type reference	752439-650mAh, 401225-80mAh, 401722-100mAh, 531728-175mAh, 701953-700mAh, 511643-300mAh, 611343-300mAh, 502530-300mAh, 423040-450mAh, 602248-560mAh, 702050-670mAh, 411740-240mAh, 511740-900mAh, 903242-1000mAh, 105085-5200mAh, 821960-1000mAh, 852439-750mAh, 703062-1400mAh, 952439-850mAh, 102053-1000mAh, 362843-350mAh.
Trademark	N/A
Nominal Voltage.....	3.7V
Typical Capacity.....	650mAh, 2.405Wh
Weight.....	13.2g
Shape and Physical Dimension (mm).....	L: 37.1mm W: 23.6mm T: 7.5mm
Version number.....	V1.0
Preparation Date.....	Jan,11,2018
Revision date.....	N/A.

Laboratory	**Shenzhen SEM.Test Technology Co., Ltd.**
Address	1/F, Building A, Hongwei Industrial Park, Liuxian 2nd Road, Bao'an District, Shenzhen, P.R.C. (518101)

Compiled by (name+ signature) ..:	Sean Zeng	Sean Zeng
Approved by (name+ signature) ..:	Ailis Ma	Ailis Ma

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

Product Identifier

Product name: Polymer Li-ion Battery

Model: 752439-650mAh, 401225-80mAh, 401722-100mAh, 531728-175mAh, 701953-700mAh, 511643-300mAh, 611343-300mAh, 502530-300mAh, 423040-450mAh, 602248-560mAh, 702050-670mAh, 411740-240mAh, 511740-900mAh, 903242-1000mAh, 105085-5200mAh, 821960-1000mAh, 852439-750mAh, 703062-1400mAh, 952439-850mAh, 102053-1000mAh, 362843-350mAh

Other means of identification

Synonyms:none

Recommended use of the chemical and restrictions on use

Recommended Use:Used in portabl electronic equipments;

Uses advidsed against:

a) Do not dismantle, open or shred secondary cells or batteries.

b) Do not expose cells or batteries to heat or fire. Avoid storage in direct sunlight.

c) Do not short-circuit a cell or a battery. Do not store cells or batteries haphazardly in a box or drawer where they may short-circuit each other or be short-circuited by other metal objects.

d) Do not remove a cell or battery from its original packaging until required for use.

e) Do not subject cells or batteries to mechanical shock.

f) In the event of a cell leaking, do not allow the liquid to come in contact with the skin or eyes. If contact has been made, wash the affected area with copious amounts of water and seek medical advice.

g) Do not use any charger other than that specifically provided for use with the equipment.

h) Observe the plus (+) and minus (–) marks on the cell, battery and equipment and ensure correct use.

i) Do not use any cell or battery which is not designed for use with the equipment.

j) Do not mix cells of different manufacture, capacity, size or type within a device.

k) Battery usage by children should be supervised.

l) Seek medical advice immediately if a cell or a battery has been swallowed.

m) Always purchase the battery recommended by the device manufacturer for the equipment.

n) Keep cells and batteries clean and dry.

o) Wipe the cell or battery terminals with a clean dry cloth if they become dirty.

p) Secondary cells and batteries need to be charged before use. Always use the correct charger and refer to the manufacturer's instructions or equipment manual for proper charging instructions.

q) Do not leave a battery on prolonged charge when not in use.

r) After extended periods of storage, it may be necessary to charge and discharge the cells or batteries several times to obtain maximum performance.

s) Retain the original product literature for future reference.

t) Use only the cell or battery in the application for which it was intended.

u) When possible, remove the battery from the equipment when not in use.

v) Dispose of properly.

Details of the supplier of the safety data sheet:

Supplier Name: Shenzhen Hugnen Technology (HGT) Co., Ltd.

Address: No.2, Yinhu, Baolihua Village, Guangming, Shenzhen City, GuangDong Province, China.
Telephone number of the supplier: 0086-0755-23420683
Emergency Telephone No.(24h): 0086-0755-23420683
Fax: 0086-0755-23420683
Postcode:518000
E-mail address: sun@Hugnen.com

Emergency telephone number

Company Emergency Phone Number: 0086-0755-23420683

2. HAZARDS IDENTIFICATION

Classification

No harm at the normal use. If contact the Electrolyte liquid in the Lithium ion battery, reference as follows:

Classification of the substance or mixture

Classification according to GHS
Acute Toxicity, Oral(Hazard category 4)
Acute Toxicity, Dermal(Hazard category 3)
Skin, irritate(Cagegory 1B)
Eye Irritate (Hazard category 1)

GHS Label elements, including precautionary statements:


GHS02


GHS05


GHS06

Signal word: Warning

Hazard statement(s):

H242: Heating may cause a fire;
H311: Toxic in contact with skin;
H314: Causes severe skin burns and eye damage;
H302: Harmful if swallowed;

precautionary statements:

Prevention:

P264 Wash thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P280 Wear protective gloves/protective clothing/eye protection/face protection.

Response:

P312:Call a Poison center or doctor/physician if you feel unwell.
P302+P350-IF ON SKIN: Gently wash with plenty of soap and water
P301+P330+P331-IF SWALLOWED: rise mouth. Do NOT induce vomiting
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Storage:

None

Disposal

P501: Dispose of contents/container in accordance with local/national regulations

Hazards not otherwise classified (HNOC)

Not Applicable

Other information

No information available.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical characterixation: Mixtures

Description:

Product: Consisting of the following components.

Common Chemical Name	Concentration (%)	CAS Number	EC No.
Lithium Cobalt Oxide (LiCoO2)	30-40	12190-79-3	235-362-0
Aluminum Foil (Al)	1-5	7429-90-5	231-072-3
Graphite (C)	5-10	7782-42-5	231-955-3
Copper Foil (Cu)	5-15	7440-50-8	231-159-6
Artficial Graphite	5-10	7440-44-0	231-153-3
Organic electrolyte	15-20	N/A	----
Other	2-3	N/A	----
Iron	15-25	7439-89-6	231-096-4

Note: CAS number is Chemical Abstract Service Registry Number.
N/A=Not apply.

4. FIRST-AID MEASURES

First aid measures

Eye Contact Rinse thoroughly with plenty of water, also under the eyelids. If symptoms persist, call a physician.

Skin Contact Remove contaminated clothing and shoes. Wash skin with soap and water. In the case of skin irritation or allergic reactions see a physician.

Inhalation Move to fresh air. If symptoms persist, call a physician.

Ingestion Do NOT induce vomiting. Drink plenty of water. If symptoms persist, call a physician.

Most important symptoms and effects, both acute and delayed

Swallowing Do not induce vomiting. Get medical attention.

Most Important Symptoms/Effects No information available.

Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media

CO2, dry chemical powder, water spray.

Unsuitable Extinguishing Media:No information available.

Specific Hazards Arising from the Chemical

Formation of toxic gases is possible during heating or in case of fire.

In case of fire, the following can be released:

Carbon monoxide(CO)

Carbon dioxide

Other irritating and toxic gases.

Hazardous Combustion Products

Carbon oxides.

Explosion Data

Sensitivity to Mechanical Impact No

Sensitivity to Static Discharge No

Protective Equipment and Precautions for Firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. For example: Wear self-contained respiratory protective device. Wear suitable protective clothing and eye/face protection.

Special hazards arising from the substance or mixture:

Battery may burst and release hazardus decomposition products when exposed to a fire situation. Lithium ion batteries contain flammable electrolyte that may vent, ignite and produce sparks when subjected to high temperature(>150℃), When damaged or abused(e.g. mechanical damage or electrical overcharging); may burn rapidly with flare-burning effect; may ignite other batteries in clothes proximity.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions Avoid contact with eyes.

Refer to section 8 for personal protective equipment. Ensure adequate ventilation. Remove all sources of ignition.

Evacuate personnel to safe areas.

Environmental precautions

Environmental Precautions Refer to protective measures listed in Sections 7 and 8.

Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).

Dispose contaminated material as waste according to item 13.

Methods and material for containment and cleaning up

Methods for Containment Prevent further leakage or spillage if safe to do so.

Methods for Cleaning up Use personal protective equipment. Dam up. Cover liquid spill with sand, earth or other Non combustible absorbent material. Pick up and transfer to properly labeled containers. Clean contaminated surface thoroughly.

7. HANDLING AND STORAGE

Precautions for safe handling

Handling Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes and clothing. Wear personal protective equipment.
Wash thoroughly after handling. Use this material with adequate ventilation.
The product is not explosive.

Conditions for safe storage, including any incompatibilities

If the Polymer Li-ion Battery is subject to storage for such a long term as more than 3 months, it is recommended to recharge the Lithium-ion Polymer Battery periodically.
3 months: -10℃~+40℃, 45 to 85%RH
And recommended at 0℃~+35℃ for long period storage.
The capacity recovery rate in the delivery state (50% capacity of fully charged) after storage is assumed to be 80% or more.
The voltage for a long time storage shall be 3.7V~4.2V range.
Do not storage Lithium-ion Battery haphazardly in a box or drawer where they may short-circuit each other or be short-circuited by other metal objects.
Keep out of reach of children.
Do not expose Lithium-ion Polymer Battery to heat or fire. Avoid storage in direct sunlight.
Do not store together with oxidizing and acidic materials.
Keep ignition sources away- Do not smoke.
Store in cool, dry and well-ventilated place.

Incompatible Products None known.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Control parameters

Ingredients with limit values that require monitoring at the workplace:	
12190-79-3 Lithium Cobalt Oxide	
TLV (USA)	0.02mg/m^3
MAK (Germany)	0.1mg/m^3

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

Appropriate engineering controls

Engineering Measures Showers
Eyewash stations
Ventilation systems

Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits. Ensure adequate ventilation.

Individual protection measures, such as personal protective equipment

Eye/Face Protection:

Tightly sealed goggles

Body protection:

Protective work clothing.

Skin protection:

Protective gloves

Material of gloves:

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

Penetration time of glove material:

The exact break trough time has to be found out by the manufacturer of the protective gloves and has to be observed.

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.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Form: prismatic	
	Color: Silver-white	
	Odour: Odourless	
	Odor Threshold: No information available	
Change in condition:		
pH, with indication of the concentration		Not determined.
Melting point/freezing point		Not determined.
Initial boiling point and Boiling range:		Not determined.
Flash Point		Not determined.
Evaporation rate		Not determined.
Flammability (solid, gas)		Not determined.
Upper/lower flammability or explosive limits		Not determined.
Vapor Pressure:		Not determined.
Vapor Density:		Not determined.

relative density:	Not determined.
Solubility in Water:	Not determined.
Solubility in other solvents	Not determined.
n-octanol/water partition coefficient	Not determined.
Auto-ignition temperature	Product is not self-igniting.
Decomposition temperature	Not determined.
Odout threshold	Not determined.
Evaporation rate	Not determined.
Viscosity	Not determined.
Other Information	No further relevant information available.

10. STABILITY AND REACTIVITY

Reactivity: Stable under recommended storage and handling conditions (see section 7, Handling and storage).

Chemical stability: Stable under normal conditions of use, storage and transport.

Thermal decomposition/conditions to be avoided: No decomposition if used according to specifications.

Possibility of Hazardous Reactions: None under normal processing.

Hazardous Polymerization: Hazardous polymerization does not occur.

Conditions to avoid: Strong heating, fire, Incompatible materials.

Incompatible materials: Strong oxidizing agents. Strong acids.Base metals.

Hazardous Decomposition Products: Carbon oxides, Other irritating and toxic gases.

11. TOXICOLOGICAL INFORMATION

Acute toxiciy: No data available.

LD/LC50 values relevant for classification:
Not available.

Skin corrosion/irritation: No irritant effect.

Serious eye damage/irritation: Cause serious eye irritation.

Respiratory or skin sensitization: No sensitizing effects known.

Specific target organ system toxicity: No information available.

CMR effects(carcinogenity, mutagenicity and toxicity for reproduction): No information available.

12. Ecological Information

Toxicity:

Acquatic toxicity:
No further relevant information available.

Persistence and degradability: No further relevant information available.

Bioaccumulative potential: No further relevant information available.

Mobility in soil: No further relevant information available.

Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

Other adverse effects: No information available.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Recommendation: Must not be disposed together with household garbage.

Do not allow product to reach sewage system

Uncleaned packaging:

Recommendation: Disposal must be made according to official regulations.

14. TRANSPORT INFORMATION

The Polymer Li-ion Battery had been tested according to the requirements of the UN manual of tests and Criteria, Part III, subsection 38.3;

The Polymer Li-ion Battery with a Watt-hour rating not exceeding 100Wh or the cell with a Watt-hour rating in not exceeding of 20Wh, The lithium ion batteries according to Section II/Section IB of PACKING INSTRUCTION 965, or Section II of PACKING INSTRUCTION 966～967 of the Dangerous Goods regulations 58th Edition may be transported.

The packaging shall be adequate to avoid mechanical damage during transport, handling and stacking. The materials and pack design shall be chosen so as to prevent the development of unintentional electrical conduction, corrosion of the terminals and ingress of moisture.

According to the Packing Instruction of IATA DGR 58th Edition for transportation.

Meets requirements of International Maritime Dangerous Goods(IMDG)-2014 Special Provision 188 to be transported as non-dangerous goods;

Meets the requirements of 49CFR173.185 to be transported as non-dangerous goods for road, rail, air, and vessel.

Meets the requirements of TDG special provision 34 to be transported as non-dangerous goods.

The package must be handled with care and that a flammability hazard exists if the package is damaged;

UN number of lithium battery: UN3480 or UN3481;

UN Proper shipping name/Description (technical name): Lithium ion batteries or Lithium ion batteries contained in equipment or Lithium ion batteries packed with equipment;

UN Classification (Transport hazard class): Non dangerous;

15. REGULATORY INFORMATION

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

EU Regulation:

Authorisations: No information available.

Restrictions on use: No information available.

Regulatory information

CAS No.	EU (EINECS)	**US (TSCA)**	**Japan (ENCS)**	**Canada (DSL/ NDSL)**	**Austrlia (AICS)**	**Korea (ECL)**	**China (IECSC)**
12190-79-3	Listed	Not listed	Not listed	NDSL	Not listed	Not listed	Not listed
7429-90-5	Listed	Listed	Listed	DSL	Listed	Listed	Listed
7782-42-5	Listed	Listed	Listed	DSL	Listed	Listed	Listed
7440-50-8	Not listed	Listed	Not listed	DSL	Listed	Listed	Listed
7440-44-0	Not listed	Listed	Not listed	DSL	Listed	Listed	Listed
7439-89-6	Listed	Listed	Not listed	NDSL	Not listed	Not listed	Not listed

Chemical safety assessment A Chemical Safety Assessment has not been carried out.

16. OTHER INFORMATION

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

Relevant phrases:

R20/22: Harmful by inhalation and if swallowed.

R36: Irritating to eyes.

H302: Harmful if swallowed.

H332: Harmful if inhaled.

**********End of MSDS**********

UN38.3 检 测 报 告
UN38.3 Test Report

申 请 商 名 称: 深圳市言杰电子科技有限公司

Applicant's name: YJ POWER GROUP LIMITED

产品名称 Product Name:	锂离子聚合物电池 Li-ion Polymer Battery
商标名称 Brand Name:	YJ
型号 Model Name:	YJ102050T
报告编号 Report No :	STS1903152B01
测试标准 Test Standard:	ST/SG/AC.10/11/Rev.6/Amend.1/Section 38.3

Shenzhen STS Test Services Co., Ltd.
1/F., Building B, Zhuoke Science Park, No.190, Chongqing Road,
Fuyong Street, Bao'an District, Shenzhen, Guangdong, China
TEL: +86-755 3688 6288 FAX: +86-755 3688 6277 E-mail:sts@stsapp.com

TEST REPORT
UN38.3, Sixth Edition Amend.1
Recommendations on transport of dangerous goods, manual of test and criteria, Section 38.3 – Lithium metal and Li-ion polymer batteries

Report Number. .....:	STS1903152B01
Tested by (+ signature) .....:	黎旭
Reviewed by (+ signature)	易正元
Approved by (+ signature) .....:	杨超
Date of issue.....:	16 Mar.2019
Total number of pages	15 Pages
Testing laboratory .....:	Shenzhen STS Test Services Co., Ltd.
Address .....:	1/F., Building B, Zhuoke Science Park, No.190, Chongqing Road, Fuyong Street, Bao'an District, Shenzhen, Guangdong, China
Applicant's name.....:	YJ POWER GROUP LIMITED
Address .....:	2nd Floor,B6 Building,,Tianrui Industrial park,Fuyuanyi Road,FuYong,Bao'an,ShenZhen
Test specification:	
Standard .....:	ST/SG/AC.10/11/Rev.6/Amend.1/Section 38.3
Test procedure .....:	Test report
Non-standard test method.....:	N/A
Test item description ..... :	Li-ion Polymer Battery
Trade Mark .....:	YJ
Manufacturer .....:	YJ POWER GROUP LIMITED
Address .....:	2nd Floor,B6 Building,,Tianrui Industrial park,Fuyuanyi Road,FuYong,Bao'an,ShenZhen
Model/Type reference .....:	YJ102050T
Ratings .....:	Rated Voltage: 3.8Vd.c. Rated Capacity :1200mAh, 4.56Wh

Summary of testing:

Tests performed (name of test and test clause):

Test items	Sample Number
T.1: Altitude simulation / 高度模拟	B1# - B10 #
T.2: Thermal test / 温度测试	
T.3: Vibration / 振动	
T.4 Shock / 冲击	
T.5 External short circuit / 外接短路	
T.6 Crush / 挤压 or Impact/撞击	C11# - C20#
T.7 Overcharge / 过充电	B21# - B28#
T.8 Forced discharge / 强制放电	C29#- C48#

The sample's status is good.
样品状况良好。

The conditions of the batteries of samples No. B1# to B5# are at first cycle, in fully charged states.
样品编号 B1# - B5#为第一次循环充放电周期完全充电状态的电池。

The conditions of the batteries of samples No. B6# to B10# are after twenty five cycles, in fully charged states.
样品编号 B6# - B10#为第二十五次循环充放电周期完全充电状态的电池。

The conditions of the cells of samples No. C11# to C15# are at first cycle at 50% of the design rated capacity.
样品编号 C11# - C15#为第一次循环充放电周期充电至标称容量的 50%状态的电芯。

The conditions of the cells of samples No. C16# to C20# are after twenty five cycles at 50% of the design rated capacity.
样品编号 C16# - C20#为第二十五次循环充放电周期充电至标称容量的 50%状态的电芯。

The conditions of the batteries of samples No. B21# - B24# are at first cycle, in fully charged states.
样品编号 B21# - B24#为第一次循环充放电周期后完全充电状态的电池。

The conditions of the batteries of samples No. B25# - B28# are after twenty five cycles ending in fully charged states.
样品编号 B25# - B28#为二十五次循环充放电周期后完全充电状态的电池。

The conditions of the cells of samples No. C24# to C33# are at first cycle, in fully discharged states.
样品编号 C29# - C38#为第一次循环充放电周期完全放电状态的电芯。

The conditions of the cells of samples No. C34# to C43# are after twenty five cycles ending in fully discharged states.
样品编号 C39# to C48#为二十五次循环充放电周期后完全放电状态的电芯。

The Li-ion polymer Battery submitted by manufacturer are single cell batteries. According to the standard, a single cell Battery is considered a "cell" and shall be tested according to the testing requirements for "cell".

制造商提供的锂离子聚合物电池为单电芯电池，根据标准规定，单电芯电池要作为电芯来评估，按照电芯的测试要求进行测试。

Test Procedure:

1.Each battery type is subjected to tests T.1 to T.8. Tests T.1 to T.5 are conducted in sequence on the same battery. Tests 6 and 8 are conducted using not otherwise tested batteries. Test T.7 may be conducted using undamaged batteries previously used in Tests T.1 to T.5 for purposes of testing on cycled batteries.

每一种类型的电池均应进行 T.1 至 T.8 项试验。电池必须按顺序在相同的一组电池上进行试验 T.1 至 T.5。试验 T.6 和 T.8 应使用未另外试验过的电池。试验 T.7 可以使用先前在试验 T.1 至 T.5 中使用过的未损坏电池进行，以便测 试进行在循环过的电池上。

2.In order to quantify the mass loss, the following procedure is provided:

Mass loss(%)=(M1-M2)/M1×100

为了量化质量损失，可用以下公式计算：质量损失(%)=(M1-M2)/M1×100

Where M1 is the mass before the test and M2 is the mass after the test. When mass loss does not exceed the values in Table below, it is considered as "no mass loss".

式中：M1 是试验前的质量，M2 是试验后的质量。如果质量损失不超过下表所列的数值，应视为"无质量损失"。

Mass M of cell or battery 电芯或电池的质量	Mass loss limit 质量损失限值
M＜1g	0.5%
1g≤M≤75g	0.2%
M＞75g	0.1%

3. In test T.1 to T.4, batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test battery after testing is not less than 90% of its voltage immediately prior to this procedure.

在测试 T.1 至 T.4 中，电池须满足无渗漏、无泄气、无解体、无破裂和无起火，并且每个试验电池在试验后的开路电压不小于其在进行这一试验前电压的 90%。

Comment:

This report also includes:
- Photo documentation: 1 pages

Possible test case verdicts:	
- test case does not apply to the test object	N (not applicable)
判定不适用于测试对象:	
- test object does meet the requirement	P (Pass)
测试符合规定:	
-test object does not meet the requirement ..... :	F (Fail)
测试不符合规定:	
Testing .....:	
Date of receipt of test item .....:	19 Feb. 2019
Date(s) of performance of tests .....:	19 Feb. 2019 ~ 16 Mar. 2019

General remarks:

The test results presented in this report relate only to the object tested.
本报告的测试结果仅对送检样品负责。
This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory. 本报告未经本实验室书面批准不得全部复制。
"(See Enclosure #)" refers to additional information appended to the report.
"(See appended table)" refers to a table appended to the report.
Throughout this report a point is used as the decimal separator.

General product information:

The batteries, model no. YJ102050T, are Li-ion Polymer Battery and used in port-able applications, consist of single Li-ion Polymer cell, model no. YJ102050T
Additionally, details information of the cell and battery, as following:

Product name/产品名称	Li-ion Polymer Cell	Li-ion Polymer Battery
Type/model/型号	YJ102050T	YJ102050T
Nominal voltage/标称电压	3.8V	3.8V
Rated capacity/额定容量	1200mAh	1200mAh
Recommended charging Voltage/推荐充电电压	4.35V	4.35V
Maximum charging Current/最大充电电流	1200mA	1200mA
Maximum discharging Current/最大放电电流	1200mA	1200mA
Discharge cut-off voltage/放电截止电压	3.0V	3.0V
Dimensions/尺寸	TxWxL: 10.2mm*20.5mm*50.5mm	TxWxL: 10.2mm*20.5mm*50.5mm
Weight/重量	Approx.18.6g	Approx. 18.7g

The final evaluation of the battery must be conducted in the end product for which the battery will be used.

Clause	Requirement + Test	Result - Remark	Verdict
38.3.4.1	**Test T.1: Altitude simulation/高度模拟**		P
	Test cells and batteries shall be stored at a pressure of 11.6 kPa or less for at least six hours at ambient temperature(20±5℃) /温度为 20±5℃、大气压力不大于 11.6 kPa 的环境中贮存不少于 6 个小时。		
	Cells and batteries meet this requirement if there is no mass loss, no leakage, no venting no disassembly , no rupture and no fire and if the open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure .the requirement relating to voltage is not applicable to test cells and batteries at fully discharged states./电芯和电池符合要求：无质量损失、无漏液、无冒烟、无分解、无破裂以及无着火现象： 电芯或电池测试后的开路电压不低于测试前开路电压的 90%。此项关于电压方面的要求不适用于完全放电后的电芯和电池	No leakage, no venting, no disassemby, no rupture and no fire./无漏液、无冒烟、无分解、无破裂以及无着火现象。 The data see table 1./测试数据见表 1。	P
38.3.4.2	**Test .2： thermal test/温度测试**		P
	Test cells and batteries are to be stored for at least six hours at a test temperature equal to 72±2℃, followerd by storage for at least six hours at a test temperature equal to -40±2℃. The maximum time interval between test temperature extremes is 30 minutes. This procedure is to be repeated 10 times, after which all test cells and batteries are to be stored for 24 hours at ambient temperature(20±5℃). /首先将样品放在 72 ±2℃的环境中放置至少 6 个小时，然后放在-40±2℃的环境中放置至少 6 个小时，温度暂缓的最大间隔时间为 30 分钟。如此循环 10 次，最后将样品放在 20±5℃的环境中静置 24 小时。		P
	For large cells and batteries the duration of exposure to the test temperature extremes should be at leastr 12 hours./对于大电芯，在高温和低温中放置的时间最少为 12 小时。		N
	Cells and batteries meet this requirement if there is no mass loss no leakage, no venting, disassembly, no rupture and no fire and if the open circuit voltage of each cell or battery after testing is not less than 60% of its voltage immediately prior to this procedure. The requirement I relating to voltage is not applicable to test cells and batteries st fully discharged states./电芯和电池符合要求： 无质量损失、无漏液、无冒烟、无分解、无破裂以及无着火现象：电芯和电池测试后的开路电压不低于测试前开路电压的 90%。此项关于电压方面的要求不适用于完全放电后的电芯和电池 。	No leakage, no venting, no disassemby, no rupture and no fire./无漏液、无冒烟、无分解、无破裂以及无着火现象。 The data see table 1./测试数据见表 1。	P
38.3.4.3	**Test t.3: Vibration/振动**		P

Clause	Requirement + Test	Result - Remark	Verdict
	Cells and batteries are firmly secured the platform of the vibration machine without distorting the cells in such a manner as a faithfully transmit the vibration. The vibration shall be a sinusoidal waveform with a logarithmic sweep between 7 Hz and 200Hz and back to 7 Hz traversed in 15 minutes. This cycle shall be repeated 12 times for a total of hours for each of there mutually perpendicular mounting positions of the cell. One of the terminal face./样品必须牢固的安装在振动台面上。振动以正弦波形式，以 7Hz 增加至 200Hz，然后减少回到 7Hz 为一个循环，一个循环持续 15 分钟。对样品从三个互相垂直的方向上循环 12 次，共 3 个小时，其中一个振动方向必须是垂直样品的极性平面 。		P
	The logarithmic frequency sweep shall differfor cells and batteries with a gross mass of not more than 12 kg(cells and small batteries),and for batteries witn a gross mass of more than 12 kg(large batteries)./对于质量不大于 12kg 的样品（电芯和电池）和质量超过 12kg 的电池（大电池），对数扫频不同。		P
	For cells and small batteries: from 7 Hz a peak acceleration of 1 gn is maintained until 18 Hz is reached. The amplitude is then maintained at 0.8 mm (1.6 mm total excursion) and the frequency increased until a peak acceleration of 8 gn occurs (approximately 50 Hz). A peak acceleration of 8 gn is then maintained until the frequency is increased to200 Hz. /对于电芯和小电池，对数扫频为：从7Hz开始保持1gn的最大加速度直到频率为18Hz，然后将振幅保持在0.8mm (总偏移1.6mm) 并增加频率直到最大加速度达到8gn (频率约为50Hz)，将最大加速度保持在8gn直到频率增加到200Hz。		P
	For large batteries: from 7 Hz to a peak acceleration of 1 gn is maintained until 18 Hz is reached. The amplitude is then maintained at 0.8 mm (1.6 mm total excursion) and the frequency increased until a peak acceleration of 2 gn occurs (approximately 25 Hz). A peak acceleration of 2 gn is then maintained until the frequency is increased to 200 Hz. /对于大电池，对数扫频为：从 7Hz 开始保持 1gn 的最大加速度直到频率为 18Hz，然后将振幅保持在 0.8mm (总偏移 1.6mm) 并增加频率直到最大加速度达到 2gn (频率约为 25Hz)，将最大加速度保持在 2gn 直到频率增加到 200Hz。		N

Clause	Requirement + Test	Result - Remark	Verdict
	Cells and batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire during the test and after the test and if the open circuit voltage of each test cell or battery directly after testing in its third perpendicular mounting position is not less than 90% of its voltage immediately prior to this procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states./电芯和电池符合要求：无质量损失、无漏液、无冒烟、无分解、无破裂以及无着火现象；电芯或电池测试后的开路电压不低于测试前开路电压的 90%。此项关于电压方面的要求不适用于完全放电后的电芯和电池。	No leakage, no venting, no disassemby, no rupture and no fire./无漏液、无冒烟、无分解、无破裂以及无着火现象。 The data see table 1./测试数据见表 1	P
38.3.4.4	**Test T.4: Shock/冲击**		P
	Test cells and batteries shall be secured to the testing machine by means of a rigid mount which will support all mounting surfaces of each test battery. Each cell or battery shall be subjected to a half-sine shock of peak acceleration of 150 gn and pulse duration of 6 milliseconds. Each cell or battery shall be subjected to three shocks in the positive direction followed by three shocks in the negative direction of three mutually perpendicular mounting positions of the cell or battery for a total of 18 shocks. /以稳固的托架固定住每个样品。对每个样品以峰值为 150gn 的半正弦的加速度撞击，脉冲持续 6ms。每个样品必须在三个互相垂直的电池安装方位的正方向经受三次冲击，接着在反方向经受三次冲击，总共经受 18 次冲击。		P
	However, large cells and large batteries shall be subjected to a half-sine shock of peak acceleration of 50 gn and pulse duration of 11 milliseconds. Each cell or battery is subjected to three shocks in the positive direction followed by three shocks in the negative direction of each of three mutually perpendicular mounting positions of the cell for a total of 18 shocks. /大电芯和大电池须经受最大加速度50gn和脉冲持续时间11ms的半正弦波冲击。每个样品必须在三个互相垂直的电池安装方位的正方向经受三次冲击，接着在反方向经受三次冲击，总共经受18次冲击。		N

Clause	Requirement + Test	Result - Remark	Verdict
	Cells and batteries meet this requirement if there is no mass loss, no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states. / 电芯和电池符合要求：无质量损失、无漏液、无冒烟、无分解、无破裂以及无着火现象；电芯或电池测试后的开路电压不低于测试前开路电压的 90%。此项关于电压方面的要求不适用于完全放电后的电芯和电池。	No leakage, no venting, no disassemby, no rupture and no fire./无漏液、无冒烟、无分解、无破裂以及无着火现象。 The data see table 1./测试数据见表 1	P
38.3.4.5	**Test T.5: External short circuit/外部短路**		P
	The cell or battery to be tested shall be temperature stabilized so that its external case temperature reaches 57±4°C and then the cell or battery shall be subjected to a short circuit condition with a total external resistance of less than 0.1 ohm at 57±4°C. This short circuit condition is continued for at least one hour after the cell or battery external case temperature has returned to 57±4°C. /保持测试环境温度稳定在 57±4°C，以便样品外表温度达到 57±4°C，然后将样品正负极用小于 0.1 欧姆的总电阻回路进行短路，样品的外表温度恢复到 57±4°C 之后保持短路状态 1 小时以上。		P
	Cells and batteries meet this requirement if their external temperature does not exceed 170 °C and there is no disassembly, no rupture and no fire during the test and within six hours after the test./电芯和电池符合要求：在测试过程中以及之后 6 个小时内，外表温度不超过 170°C，并且无分解、无破裂和无着火现象发生。	No disassembly, no rupture and no fire during the test and within six hours after the test./ 在测试过程中以及之后6个小时内，外表温度不超过 170°C，并且无分解、无破裂和无着火现象发生。 The data see table 1. / 测试数据见表 1。	P
38.3.4.6	**Test T.6: Impact / Crush/撞击/挤压**		P
	Test procedure – Impact (applicable to cylindrical cells greater than or equal to 18 mm in diameter) / 撞击(适合于直径大于或等于18mm的圆柱形电芯)		N

Clause	Requirement + Test	Result - Remark	Verdict
	The sample cell or component cell is to be placed on a flat smooth surface. A 15.8 mm±0.1mm diameter, at least 6 cm long, or the longest dimension of the cell, whichever is greater, Type 316 stainless steel bar is to be placed across the center of the sample. A 9.1 kg±0.1 kg mass is to be dropped from a height of 61±2.5 cm at the intersection of the bar and sample in a controlled manner using a near frictionless, vertical sliding track or channel with minimal drag on the falling mass. The vertical track or channel used to guide the falling mass shall be oriented 90 degrees from the horizontal supporting surface. /将样品放在一个平坦的光滑平面上。将一直径为15.8 mm± 0.1mm，长度不小于6cm的316不锈钢棒横过样品中部放置后，将一质量为9.1 kg±0.1kg的重物从61±2.5 cm的高度落向样品。		N
	The test sample is to be impacted with its longitudinal axis parallel to the flat surface and perpendicular to the longitudinal axis of the 15.8 mm±0.1mm diameter curved surface lying across the center of the test sample. Each sample is to be subjected to only a single impact. /接受撞击的样品，纵轴应与平坦的表面平行并与横放在样品中心的直径15.8 mm±0.1mm弯曲表面的纵轴垂直。每一个样品只接受一次撞击。		N
	Test Procedure – Crush (applicable to prismatic, pouch, coin/button cells and cylindrical cells not more than 18 mm in diameter). /挤压 (适用于棱柱形、袋状、硬币/纽扣电芯和直径不超过18mm的圆柱形电芯)	Pouch cell/袋状电芯	P
	A cell or component cell is to be crushed between two flat surfaces. The crushing is to be gradual with a speed of approximately 1.5 cm/s at the first point of contact. The crushing is to be continued until the first of the three options below is reached. /将样品放在两个平面之间挤压，挤压力度逐渐加大，在第一个接触点上的速度大约为1.5cm/s。挤压持续进行，直到出现以下三种情况之一		P
	(a) The applied force reaches 13 kN±0.78 kN; /施 加力达到 13 kN±0.78 kN		P
	(b) The voltage of the cell drops by at least 100 mV;/样品的电压下降至少100mV		N
	(c) The cell is deformed by 50% or more of its original thickness. /电池变形达原始厚度的50%以上。		N

Clause	Requirement + Test	Result - Remark	Verdict
	A prismatic or pouch cell shall be crushed by applying the force to the widest side. A button/coin cell shall be crushed by applying the force on its flat surfaces. For cylindrical cells, the crush force shall be applied perpendicular to the longitudinal axis. /棱柱形或袋状电芯应从最宽的一面施压。纽扣/硬币形电芯应从其平坦表面施压。圆柱形应从与纵轴垂直的方向施压。		P
	Each test cell or component cell is to be subjected to one crush only. The test sample shall be observed for a further 6 h. The test shall be conducted using test cells or component cells that have not previously been subjected to other tests./每个样品都是全新样品，并且只经受一次施压。施压结束后样品应静置观察6小时。		P
	Cells and component cells meet this requirement if their external temperature does not exceed 170°C and there is no disassembly and no fire during the test and within six hours after this test. /电芯满足要求：在测试过程中以及之后6个小时内，外表温度不超过 170°C，并且无分解和无着火现象发生。	No disassembly and no fire. /无分解，无着火现象发生。 The data see table 2. / 测试数据见表 2。	P
38.3.4.7	**Test T.7: Overcharge/过充电**		P
	The charge current shall be twice the manufacturer's recommended maximum continuous charge current. Tests are to be conducted at ambient temperature. The duration of the test shall be 24 hours. The minimum voltage of the test shall be as follows: /在室温下，以2倍的制造商宣称的最大持续充电电流对样品充电，测试时间为24小时。测试的最小电压如下：		P
	(a) When the manufacturer's recommended charge voltage is not more than 18V, the minimum voltage of the test shall be the lesser of two times the maximum charge voltage of the battery or 22V. /如果制造商宣称的充电电压不超过18V，本测试的最小充电电压应是制造商宣称的最大充电电压的两倍或者是22V之中的较小者。	The voltage of the test is 8.7V,and the current is 2.4A. / 测试电压为 8.7V, 电流为 2.4A.	P
	(b) When the manufacturer's recommended charge voltage is more than 18V, the minimum voltage of the test shall be 1.2 times the maximum charge voltage. /如果制造商宣称的充电电压超过18V，本测试的最小充电电压应该是制造商宣称的最大充电电压的1.2倍。		N
	There is no disassembly and no fire during the test and within seven days after the test. /在测试中和测试完成后 7 天内，样品无分解和无着火现象。	No disassembly and no fire. /无分解，无着火现象发生。 The data see table 3. /测试数据见表 3。	P
38.3.4.8	**Test T.8: Forced discharge/强制放电**		P

Clause	Requirement + Test	Result - Remark	Verdict
	Each cell shall be forced discharged at ambient temperature by connecting it in series with a 12V D.C. power supply at an initial current equal to the maximum discharge current specified by the manufacturer. /在室温下，将单个电芯连接在12V的直流电源上进行强制放电，此直流电源供给每个电芯初始电流为制造商宣称的最大放电电流。 The specified discharge current is to be obtained by connecting a resistive load of the appropriate size and rating in series with the test cell. Each cell shall be forced discharged for a time interval (in hours) equal to its rated capacity divided by the initial test current (in ampere). /指定的放电电流通过串联在测试电芯上的合适大小和功率的负载来获得，每个电芯的强制放电时间(小时)为额定容量除以初始电流(安培)。		P
	There is no disassembly and no fire during the test and within seven days after the test./在测试中和测试完成后 7 天内，样品无分解和无着火现象发生	No disassembly and no fire. /无分解和无着火现象发生。 The data see table 4. / 测试数据见表 4	P

Table 1: T.1~T.5 / 表 1. 测试 T.1~测试 T.5

Sample No. 样品编号	Mass prior to Test (g)/试验前质量	OCV prior to test (V)/ 试验前电压	Test 1: Altitude Simulation/ 试验1：高度模拟		Test 2: Thermal test/ 试验 2：温度试验		Test 3: Vibration/ 试验 3：振动		Test 4 : Shock/ 试验 4：冲击		Test 5 :External Short Circuit/ 试验5：外部短路
			Mass loss(%) 质量损失(%)	Change ratio 电压比(%)	Mass loss(%) 质量损失(%)	Change ratio 电压比(%)	Mass loss(%) 质量损失(%)	Change ratio 电压比(%)	Mass loss(%) 质量损失(%)	Change ratio 电压比(%)	Temp.(°C)温度(°C)
B1#	18.668	4.312	0.016	99.258	0.021	99.930	0.016	99.930	0.032	99.906	57.7
B2#	18.625	4.305	0.016	99.884	0.016	99.884	0.038	99.953	0.021	99.930	56.2
B3#	18.577	4.302	0.011	99.954	0.032	99.907	0.016	99.907	0.032	99.953	57.4
B4#	18.599	4.319	0.016	99.560	0.022	99.884	0.022	99.907	0.027	99.930	56.5
B5#	18.650	4.308	0.011	99.536	0.021	99.930	0.021	99.883	0.016	99.930	56.8
B6#	18.642	4.303	0.011	99.698	0.005	99.930	0.021	99.883	0.032	99.930	56.5
B7#	18.598	4.310	0.016	99.652	0.016	99.930	0.011	99.907	0.011	99.907	57.2
B8#	18.624	4.303	0.011	99.582	0.016	99.930	0.038	99.953	0.016	99.930	56.8
B9#	18.620	4.310	0.011	99.443	0.032	99.953	0.016	99.907	0.038	99.907	58.0
B10#	18.588	4.300	0.016	99.767	0.016	99.953	0.016	99.907	0.027	99.907	57.4

Table 2: Crush or impact/ 表 2：挤压或撞击

Test 6: Crush or impact / 试验 6 挤压或撞击	Sample No. 样品编号	C11#	C12#	C13#	C14#	C15#	C16#	C17#	C18#	C19#	C20#
	OCV prior to test (V) 试验前电压	3.672	3.685	3.713	3.706	3.677	3.680	3.675	3.687	3.706	3.682
	Temp. (°C) 温度	85.6	89.3	86.3	88.2	87.8	86.2	87.5	90.2	88.3	87.8

Table 3：Overcharge / 表 3：过充电

Test 7: Overcharge/ 试验 7 过充电	Sample No. 样品编号	B21#	B22#	B23#	B24#	B25#	B26#	B27#	B28#
	OCV prior to test (V) 试验前电压	4.302	4.318	4.305	4.319	4.300	4.318	4.308	4.308

Table 4：Force discharge / 表 4：强制放电											
Test 8: Forced discharge/ 试验 8 强制放电	Sample No. 样品编号	C29#	C30#	C31#	C32#	C33#	C34#	C35#	C36#	C37#	C38#
	OCV prior to test (V) 试验前电压	3.125	3.137	3.120	3.155	3.122	3.106	3.112	3.131	3.123	3.125
	Sample No. 样品编号	C39#	C40#	C41#	C42#	C43#	C44#	C45#	C46#	C47#	C48#
	OCV prior to test (V) 试验前电压	3.115	3.121	3.136	3.130	3.128	3.127	3.135	3.120	3.113	3.128

Photos

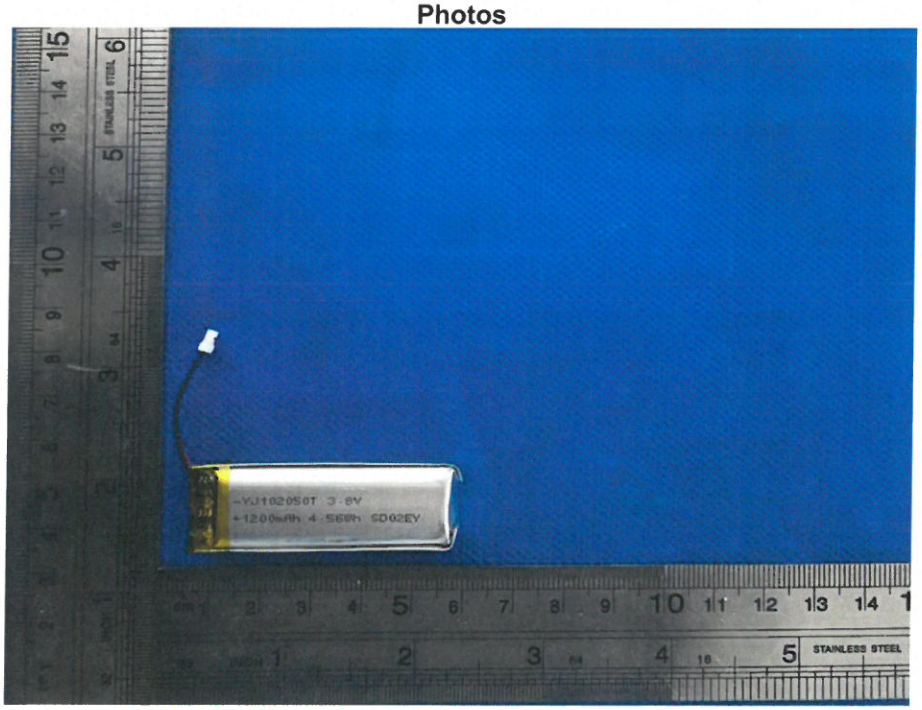

Fig.1 Front view of Battery

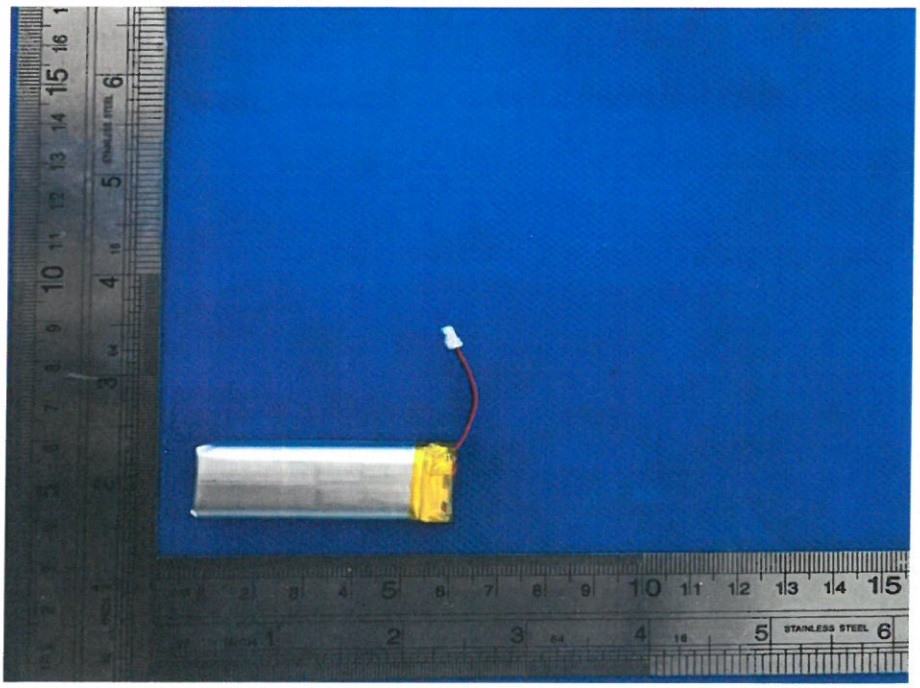

Fig. 2 Back view of Battery

===END OF TEST REPORT===