



Safety Data Sheet

LITHIUM-ION BOOSTER

According to Regulation (EC) No 1272/2008

According to Regulation (EU) No 2020/878

Version :

5

Issue date

:

14/01/2026

1.PRODUCT AND COMPANY IDENTIFICATION COMPANY IDENTIFICATION

Product identifier:

Product Form: Article
Product name: LITHIUM-ION BOOSTER
Product code: PB-02 / PB-02AIR / PB-02MAX
UFI code: N/A

Relevant identified uses of the substance and uses advised against:

Identified uses: Multi-function Jump Starter (<100Wh)

Uses advised against: Not available.

Details of the supplier of the safety data sheet:

Supplier: **COFINAS SAS**
Address: 30 Rue Pasteur
92150
Suresnes
France
Telephone: (France) +33 1 83 62 45 55

Emergency telephone Number:

CHEMTREC (US, Canada & Mexico) 0086-1-800-424-9300

CHEMTREC (International) 0086-1-703-527-3887

Available outside office hours? YES

☐

NO

☒

2.HAZARDS IDENTIFICATION

2.1 Classification of the substance/mixture:

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Not classified

2.2 Label elements:

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

No labelling applicable



2.3 Other hazards :

Other hazards which do not result in classification

This product meets the definition of an “article” as defined in Regulation (EC) No. 1907/2006 (REACH), and is therefore out of scope of CLP

This article does not meet the PBT criteria of REACH regulation, annex XIII

This article does not meet the vPvB criteria of REACH regulation, annex XIII

Contains no endocrine disruptor and PBT/vPvB substances $\geq 0.1\%$ assessed in accordance with REACH Annex XIII.

3.COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Substances :

Not applicable

3.2 Mixtures :

IMPORTANT NOTE: The battery cell should not be opened or exposed to heat because exposure to the following ingredients contained within could be harmful under some circumstances.

Component	CAS No.	Weight
Lithium Cobalt Oxide	12190-79-3	30-35%
Lithium Hexafluorophosphate	21324-40-3	15-20%
Aluminum (Al)	7429-90-5	8-10%
Graphite	7782-42-5	12-15%
Copper (Cu)	7440-50-8	8-10%
Polyvinylidene Fluoride (PVDF)	24937-79-9	1-2%
Styrene-Butadiene Rubber (SBR)	61789-96-6	0-1%
Carboxymethylcellulose	9000-11-7	0-1%
Nickel (Ni)	7440-02-0	1-2%
Polyethylene	9002-88-4	3-4%
Nylon	24937-16-4	0-1%
Polypropylene	9003-07-0	2-3%

Weight % listed is based on approximate percent of the average weight of the battery.

4. FIRST-AID MEASURES

Spilled internal cell materials

After inhalation:

Make the victim blow his/her nose, gargle. Seek medical attention if necessary.

After skin contact:

Remove contaminated clothes and shoes immediately. Wash extraneous matter or contact region with soap and plenty of water immediately.



After eye contact:

Do not rub one's eyes. Immediately flush eyes with water continuously for at least 15 minutes.
Seek medical attention immediately.

After swallowing:

Make the victim vomit. When it is impossible or the feeling is not well after vomiting, seek medical attention.

5. FIRE-FIGHTING MEASURE

Suitable extinguishing media: Plenty of water, carbon dioxide gas, nitrogen gas, chemical powder fire extinguishing medium and fire foam

Specific hazards: Corrosive gas may be emitted during fire.

Specific methods of firefighting: When the battery burns with other combustibles simultaneously, take fire extinguishing method which correspond to the combustibles. Extinguish a fire from the windward as much as possible.

Special protective equipment for firefighters:

Respiratory protection: Respiratory equipment of a gas cylinder style or protection-against-dust mask.

Hand protection: Protective gloves

Eye protection: Goggle or protective glasses designed to protect against liquid splashes

Skin and body protection: Protective cloth

6. ACCIDENTAL RELEASE MEASURES

Spilled internal cell materials, such as electrolyte leaked from a battery cell, are carefully dealt with according to the followings.

Precautions for human body:

Remove spilled materials with protective equipment (protective glasses and protective gloves). Do not inhale the gas as much as possible. Moreover, avoid touching as much as possible.

Environmental precautions: Do not throw out into the environment.

Method of cleaning up:

The spilled solids are put into a container. The leaked place is wiped off with dry cloth.

Prevention of secondary hazards:

Avoid re-scattering. Do not bring the collected materials close to fire.

7. HANDLING AND STORAGE

Handling technical measures =

Prevention of user exposure: Not necessary under normal use.

Prevention of fire and explosion: Not necessary under normal use.

Precaution for safe handling: Do not damage or remove the external tube.

Specific safe handling advice:

Never throw out cells in a fire or expose to high temperatures. Do not soak cells in water or seawater. Do not expose to strong oxidizers. Do not give a strong mechanical shock or fling. Never disassemble, modify or deform. Do not connect the positive terminal to the negative terminal with electrically conductive material. In the case of charging, use only dedicated charger or charge according to the conditions specified by BS BATTERY.

Storage technical measures =

Storage conditions (suitable, to be avoid): Avoid direct sunlight, high temperature, high humidity. Store in cool place (temperature: -20 ~ 35 degree C, humidity: 45 ~ 85%).



Incompatible products: Conductive materials, water, seawater, strong oxidizers and strong acids
Packing material (recommended, not suitable): Insulative and tearproof materials are recommended.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters:

Not established

Appropriate engineering controls:

Under normal conditions (during discharge) release of ingredients does not occur. ACGIH: American Conference of Governmental Industrial Hygienists, Inc.

TLV-TWA: Threshold Limit Value-Time Weighted Average concentration BEI:

Biological Exposure Indices

Personal protective equipment:

Respiratory protection: Respirator with air cylinder, dust mask

Hand protection: Protective gloves

Eye protection: Goggle or protective glasses designed to protect against liquid splashes

Skin and body protection: Working clothes with long sleeve and long trousers

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties:

Physical state:	Solid
Colour:	Not available
Odour:	Not available
Odour threshold:	Not available
pH:	Not available
Melting point/range (°C):	Not available
Boiling point/range (°C):	Not available
Flash point (°C):	Not available
Evaporation rate:	Not available
Flammability limit - lower (%):	Not available
Flammability (solid, gas):	Non-Flammable
Ignition temperature (°C):	Not available
Upper/lower flammability:	Not available
Explosive limits:	Not available
Vapour pressure (20°C):	10 mm Hg
Vapour density at (20°C):	1
Relative Density:	Not available
Bulk density (kg/m³):	Not available
Water solubility :	Soluble in water
Water (log Po/w):	Not available
Auto-ignition temperature:	Not available
Decomposition temperature:	Not available



Viscosity, dynamic (mPa.s):	Not available
Explosive properties:	Not available
Oxidising properties:	Not available
Molecular Formula:	Not applicable
Molecular Weight:	Not applicable

9.2 Other information:

No other additional information available

10. STABILITY AND REACTIVITY

Stability: Stable under normal use

Hazardous reactions occurring under specific conditions

Conditions to avoid: Heat above 70° or incinerate. Deform, mutilate, crush, disassemble, overcharge, short circuit, expose over a long period to humid conditions. Do not put it under sunlight and high humidity directly.

Materials to avoid: Conductive materials, water, seawater, strong oxidizers and strong acids.

Hazardous decomposition products: Acrid or harmful gas is emitted during fire.

11. TOXICOLOGICAL INFORMATION

11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008:

There is no available data on the product itself. The information of the internal cell materials is as follows.

Irritation: Risk of irritation occurs only if the cell is mechanically thermally or electrically abused to the point of compromising the enclosure. If this occurs, irritation to the skin, eyes and respiratory tract may occur.

Sensitization: Not available

Neurological effects: Not available

Teratogenicity: Not available

Reproduce toxicity: Not available

Mutagenicity: Not available

Toxicology Synergistic: Not available

11.2 Information on other hazards

Endocrine disrupting properties
Other information

The mixture does not contain endocrine disruptor.
Not applicable

12. ECOLOGICAL INFORMATION

12.1 Toxicity: Not available

12.2 Persistence and degradability: Not available.



- 12.3 Bioaccumulative potential:** Not available.
- 12.4 Mobility in soil:** Persistent.
- 12.5 Results of PBT & vPvB assessment:** The PBT and vPvB criteria of Annex XIII to the Regulation does not apply to inorganic substances
- 12.6 Endocrine disrupting properties** The mixture does not contain endocrine disruptor

13. DISPOSAL CONSIDERATIONS

Recommended methods for safe and environmentally preferred disposal:

Product (waste from residues)

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

Contaminated packaging

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

14. TRANSPORT INFORMATION

SHIPPING BY AIR

- 14.1 UN Number :** 3481
- 14.2 UN Proper shipping name :** LITHIUM ION BATTERIES
- 14.3 Transport Hazard class :** 9
- 14.4 Packing group :** II
- 14.5 Environmental hazards :** No
- 14.6 IATA Transport :** PI 967-Section IB ($\leq 100\text{Wh}$)

SHIPPING BY SEA or ROAD

- 14.1 UN Number :** UN3481
- 14.2 UN Proper shipping name :** LITHIUM ION BATTERIES
- 14.3 Transport Hazard class :** 9
- 14.4 Packing group :** II
- 14.5 Environmental hazards :** No
- 14.6 IMDG Transport :** SP188 ($\leq 100\text{Wh}$)
- 14.7 Maritime transport in bulk according to IMO instruments:** Not regulated

15. REGULATORY INFORMATION

《Classification, Labeling and Packaging Regulation》
《REACH (EC)1907/2006》
《Dangerous Goods Regulation》
《Recommendations on Transport of Dangerous Goods Model Regulations》
《International Maritime Dangerous Goods》
《Technical Instructions for the Safe Transport of Dangerous Goods》

《Classification and code of dangerous goods》
《Occupational Safety and Health Act》 (OSHA)
《Toxic Substances Control Act》 (TSCA)
《Consumer Product Safety Act》 (CPSA)
《Federal Environmental Pollution Control Act》 (FEPCA)

《The Oil Pollution Act》 (OPA)
《Resource Conservation and Recovery Act》 (RCRA)
《Safety Drinking Water Act》 (CWA)
《Code of Federal Regulations》 (CFR)

In accordance with all Federal, State and local laws

16. OTHER INFORMATION

The information contained in this Safety data sheet is based on the present state of knowledge and current legislation.

This safety data sheet provides guidance on health, safety and environmental aspects of the product and should not be construed as any guarantee of technical performance or suitability for applications.

Reference

ECHA Registered substances data

Chemical substances information: Japan Advanced Information center of Safety and Health

International Chemical Safety Cards (ICSCs):

International Occupational Safety and Health Information Centre (CIS)

2002 TLVs and BEIs: American Conference of Governmental Industrial Hygienists (ACGIH) New Dangerous Goods Best Practice 008--in the 51st Edition IATA DGR (2010)(with effect from 01 January 2010)

GB/T 16483-2008 Safety data sheet for chemical products Content and order of sections ISO 11014:2009(E)

Safety data sheet for chemical products –Content and order of sections IMDGCode – 2008

Edition: International Maritime Organization (IMO)

RTECS(CD-ROM)

MSDS of raw materials prepared by the manufactures First

Edition: Feb. 05 2016

Latest Edition: 03/05/2023

Prepared and approved by BS BATTERY S.a.s



中国认可
国际互认
检测
TESTING
CNAS L16465

Lithium Battery UN38.3 Test Report

锂电池UN38.3 测试报告

Sample name : Car Jump Starter

物品名称 : 汽车应急启动电源

Model name : POWER BOX AIR PB-02

型号 :

Applicant : COFINAS Sas

申请商 :

**深圳市卓越检测技术有限公司
Shenzhen ECT Testing Technology Co.,Ltd**

**UN38.3 Test Report**
UN38.3测试报告

Tested by (+ signature) 测试(签名)	Hanink.Tian/Testing Engineer 田世豪/测试工程师	<i>Hanink.Tian</i>
Checked by (+ signature) 审核(签名)	Eddie.Shi/Project Manager 施磊/项目经理	<i>Eddie.Shi</i>
Approved by (+ signature) 批准(签名)	Eric.Ren/Technical Manager 任博/技术总监	<i>Eric.Ren</i>
Total number of pages..... 页数.....	21 pages	
Date of issue 签发日期.....	2025.11.24	
Testing Laboratory Name 测试实验室.....	Shenzhen ECT Testing Technology Co.,Ltd 深圳市卓越检测技术有限公司	
Address 地址.....	B121,B202,B206-1, Block A.B, 107 Chuangzhi Park, Huiju Xinqiao, No.18, Shangnan Shangliao Industrial Road, Shangliao Community, Xinqiao Subdistrict, Bao'an District, Shenzhen, Guangdong, China 广东省深圳市宝安区新桥街道上寮社区上南上寮工业路18号汇聚新桥107创智园A.B座B121,B202,B206-1	
Applicant's Name 申请商.....	COFINAS Sas	
Address 地址.....	30 rue Pasteur, 92150 Suresnes - France	
Manufacturer Name..... 制造商.....	BS Power Technology Co.,Ltd 毕尔思电源科技(秦皇岛)有限公司	
Address 地址.....	No.1302,No.283,Xigang Road,Haigang District,Qinhuangdao City,Hebei Province-China 河北省秦皇岛市海港区西港路283号1302号	
Manufacturer Telephone Number..... 制造商联系电话.....	0335-8082625	
Manufacturer Email address..... 制造商邮件地址.....	Sunny@bs-battery.com	
Manufacturer Website..... 制造商网址.....	/	
Factory Name..... 工厂.....	BS Power Technology Co.,Ltd 毕尔思电源科技(秦皇岛)有限公司	
Address 地址.....	No.1302,No.283,Xigang Road,Haigang District,Qinhuangdao City,Hebei Province-China 河北省秦皇岛市海港区西港路283号1302号	



Standard	UN "Manual of Tests and Criteria" ST/SG/AC.10/11/Rev.8/Subsection 38.3
标准.....	联合国《试验和标准手册》（第8版）38.3节
Test item description	Car Jump Starter
测试项目描述.....	汽车应急启动电源
Trade Mark	BS BATTERY
商标.....	
Model/type reference	POWER BOX AIR PB-02
型号/引用型号.....	
Ratings.....	Battery: 14.8V, 2500mAh, 37Wh
额定值.....	Output: 5V
Classification.....	Li-ion Battery
类别.....	锂离子电池
Type of Sample.....	Approximate Red And White Cuboid
样品形状.....	红色和黑色近长方体

Details information of the battery and the cell built in the battery, as following:
电池和电芯的详细信息见下表:

Nominal Voltage 标称电压	14.8V	Rated Capacity 额定容量	2500mAh 37Wh	Charge Voltage 充电电压	5.25V
Nominal Charge Current 标称充电电流	5V/2A	Maximum Charge Current 最大充电电流	5V/2A	End of Charge Current 结束充电电流	50mA
Discharge Cut-off Voltage 放电截止电压	12V	Nominal Discharge Current 标称放电电流	5V/2.4A	Maximum Discharge Current 最大放电电流	5V/2.4A
Battery Model 电池型号	POWER BOX AIR PB-02	Size 尺寸 (L×W×T)	(184.0×117.0×4 7.8)mm	Cells Number 电芯数量	4PCS
Cell Model 电芯型号	606080	Cell Nominal Voltage 电芯标称电压	3.7V	Cell Rated Capacity 电芯额定容量	2500mAh



Possible test case verdicts:

报告中可能用到的结论标识:

Test case does not apply to the test object.....: 测试项目不适用于该产品.....:	N/A 不适用
Test item does meet the requirement 测试项目符合标准的要求.....:	P(ass) 合格
Test item does not meet the requirement: 测试项目不符合标准的要求.....:	F(ail) 不合格
Testing: 测试:	
Date of sample received.....: 样品接收日期.....:	2025.09.29
Date(s) of performance of test.....: 测试执行日期.....:	2025.09.29 ~ 2025.10.22
Test conclusion: 检验结论: Test result: Pass 检验结果: 通过	



I、CONCLUSION 结论

Item 项目	Sample Number 样品号	Conclusion 结论
Altitude simulation 高空模拟	B01-B08	PASS 合格
Thermal test 温度试验		PASS 合格
Vibration 振动		PASS 合格
Shock 冲击		PASS 合格
External short circuit 外部短路		PASS 合格
Crush/ Impact 挤压/撞击	C01-C10	PASS 合格
Overcharge 过充电	B09-B16	PASS 合格
Forced discharge 强制放电	C11-C30	PASS 合格
CXX is used as the sample number of cells 251013017CXX, "X" is 0~9. CXX 代表电芯样板编号251013017CXX, X=0~9。 BXX is used as the sample number of batteries 251013017BXX, "X" is 0~9. BXX 代表电池包样板编号251013017BXX, X=0~9。		

Notes备注:

The conditions of the battery of sample No. B01 to B04, B09-B12 are at first cycle, in fully charged state;

样品编号B01-B04, B09-B12的状态为第一个交替充电放电周期完全充电状态的电池;

The conditions of the cells of sample No. C01 to C05 are at first cycle at 50% of the design rated capacity, in fully charged state;

样品编号C01-C05的状态为第一个交替充电放电周期完全充电状态电芯容量设计值的50%的电芯;

The conditions of the cells of sample No. C06 to C10 are after 25 cycles at 50% of the design rated capacity, in fully charged state;

样品编号C06-C10的状态为在二十五个交替充电放电周期完全充电状态电芯容量设计值的50%的电芯;

The conditions of the battery of sample No.B05 to B08, B13 to B16 are after 25 cycles, in fully charged state;

样品编号B05-B08, B13-B16的状态为在二十五个交替充电放电周期结束后完全充电状态的电池;

The conditions of the cells of sample No.C11 to C20 are at first cycle, in fully discharged state;

样品编号C11-C20的状态为第一个交替充电放电周期完全放电状态的电芯;

The conditions of the cells of sample No.C21 to C30 are after 25 cycles ending in fully discharged state.

样品编号C21-C30的状态为在二十五个交替充电放电周期结束后完全放电状态的电芯。



II、MAIN TEST EQUIPMENT 主要测试设备

No. 序号	Name 名称	Model 型号	Item 编号	Due. date 校准有效期至	The use 本次使用 (√)
1	High-performance battery detection system 高性能电池检测系统	CT-4008T-5V6A-S1	SZZY-YQ-109	2026-09-17	√
2	Charge and discharge tester 充放电测试仪	CE-7002-100V50A-R28	SZZY-YQ-118	2026-09-17	√
3	Charge and discharge tester 充放电测试仪	PBTS-24V10A-220W	SZZY-YQ-111	2026-09-17	--
4	Charge and discharge tester 充放电测试仪	CT-4008-20V20A-NA	SZZY-YQ-110	2026-09-17	√
5	Vibration test stand 震动试验台	JQA-062-230	SZZY-YQ-097	2026-10-29	√
6	High acceleration impact table 高加速冲击台	IS-25	SZZY-YQ-098	2026-10-29	√
7	Temperature controlled battery extrusion tester 温控型电池挤压试验机	GX-5067-HSM	SZZY-YQ-099	2026-04-13	√
8	Battery heavy impact testing machine 电池重物冲击试验机	ZZ-A11	SZZY-YQ-100	2026-09-17	--
9	Low pressure high altitude simulation test chamber 低压高空模拟试验箱	GX-3020-Z50H	SZZY-YQ-102	2026-09-17	√
10	Temperature controlled battery short circuit testing machine 温控型电池短路试验机	GX-6055-T5	SZZY-YQ-108	2026-04-13	√
11	Constant temperature and humidity test chamber 恒温恒湿试验箱	ZZ-K01B	SZZY-YQ-107	2026-09-17	√
12	Digital display hygograph 数显温湿度计	HTC-1	SZZY-YQ-120	2026-09-18	√
13	DC power supply 直流电源	ETM-6010	SZZY-YQ-006	2026-10-29	√
14	Digital multimeter 数字万用表	F15B+	SZZY-YQ-037	2026-02-06	√
15	Temperature measuring device 温度测试仪	GK-TCP	SZZY-YQ-027	2026-02-06	√
16	Electronic load 电子负载	TH8401	SZZY-YQ-009	2026-02-06	√
17	Electronic scale 电子秤	ACS	SZZY-YQ-072	2026-02-06	√



III. TEST METHOD AND DATA测试方法和数据

Tests T.1 to T.5 shall be conducted in sequence on the same cell or battery. Tests T.6 and T.8 shall be conducted using not otherwise tested cells or 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.

Cells and 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 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.

小型电池或电池组必须按顺序进行试验T1至T5。试验T6和T8应使用未试验过的电池或电池组。试验T7可以使用原先在试验T1至T5中使用过的未损坏的电池组进行，以便测试交替充电放电的电池组。

要求电池和电池组无渗漏、无漏气、无解体、无破裂和无起火并且每个电池或电池组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%。有关电压的要求不适用于完全放电状态的电池和电池组。

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

$$\text{mass loss} = (M_1 - M_2) / M_1 \times 100\%$$

Where M_1 is the mass before the test and M_2 is the mass after the test, when mass loss does not exceed the values in Table below, it shall be considered as “no mass loss”.

质量损失依照下式计算：

$$\text{质量损失} = (M_1 - M_2) / M_1 \times 100\%$$

式中 M_1 是试验前的质量， M_2 是试验后的质量。如质量损失不超过下表所列数值，即视为“无质量损失”。

Mass M of cell or battery 电池或电池组质量M	Mass lost limited 质量损失限值
$M < 1\text{g}$	0.5%
$1\text{g} \leq M \leq 75\text{g}$	0.2%
$M > 75\text{g}$	0.1%

**Test T1: Altitude simulation 高度模拟****Test procedure 试验程序:**

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 °C). 试验样品在压力不大于11.6kPa和温度 $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$ 的环境下存放至少6小时。

Requirement 要求:

Cells and 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 cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure.

要求样品无漏液、无漏气、无解体、无破裂以及无起火, 且样品试验后开路电压应不低于试验前开路电压的90%。

Data数据:

Ambient temperature 环境温度: 23.3°C 。

No. 编号	Pre-test测试前		After test测试后		Mass loss 质量损失 (%)	Voltage loss 电压损失 (%)	Verdict# (判定#)
	Mass(g) 质量(g)	Voltage(V) 电压(V)	Mass(g) 质量(g)	Voltage(V) 电压(V)			
B01	850.989	5.08	850.989	5.07	0.000	0.20	PASS/合格
B02	850.999	5.07	850.909	5.07	0.011	0.00	PASS/合格
B03	850.996	5.08	850.996	5.08	0.000	0.00	PASS/合格
B04	850.988	5.08	850.988	5.07	0.000	0.20	PASS/合格
B05	850.997	5.07	850.997	5.07	0.000	0.00	PASS/合格
B06	850.994	5.08	850.894	5.08	0.012	0.00	PASS/合格
B07	850.998	5.07	850.998	5.06	0.000	0.20	PASS/合格
B08	850.987	5.07	850.877	5.07	0.013	0.00	PASS/合格

#: No leakage, No venting, No disassembly No rupture and no fire

#: 无漏液、无漏气、无解体、无破裂以及无起火现象

**Test T.2: Thermal test 耐热测试****Test procedure 测试程序:**

Test cells and batteries are to be stored for at least six hours at a test temperature equal to $72 \pm 2^\circ\text{C}$, followed by storage for at least six hours at a test temperature equal to $-40 \pm 2^\circ\text{C}$. The maximum time interval between test temperature extremes is 30 minutes. This procedure is to be repeated until 10 total cycles are complete, after which all test cells and batteries are to be stored for 24 hours at ambient temperature ($20 \pm 5^\circ\text{C}$). For large cells and batteries the duration of exposure to the test temperature extremes should be at least 12 hours.

试验样品在试验温度等于 $72^\circ\text{C} \pm 2^\circ\text{C}$ 下存放至少6小时, 然后在试验温度等于 $-40^\circ\text{C} \pm 2^\circ\text{C}$ 下存放至少6小时。两个极端温度之间的最大时间间隔为30分钟。这一过程须重复10次, 接着将所有样品在环境温度 $20^\circ\text{C} \pm 5^\circ\text{C}$ 下存放24小时。对于大型电池和电池组, 暴露于极端试验温度的时间至少应为12小时。

Requirement 要求

Cells and 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 cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure.

要求样品无漏液、无漏气、无解体、无破裂以及无起火, 且样品试验后开路电压应不低于试验前开路电压的90%。

Data数据:

Ambient temperature 环境温度: 23.6°C .

No. 编号	Pre-test测试前		After test测试后		Mass loss 质量损失 (%)	Voltage loss 电压损失 (%)	Verdict# (判定#)
	Mass(g) 质量(g)	Voltage(V) 电压(V)	Mass(g) 质量(g)	Voltage(V) 电压(V)			
B01	850.989	5.07	850.759	5.05	0.027	0.39	PASS/合格
B02	850.909	5.07	850.699	5.04	0.025	0.59	PASS/合格
B03	850.996	5.08	850.716	5.06	0.033	0.39	PASS/合格
B04	850.988	5.07	850.788	5.05	0.024	0.39	PASS/合格
B05	850.997	5.07	850.757	5.05	0.028	0.39	PASS/合格
B06	850.894	5.08	850.624	5.06	0.032	0.39	PASS/合格
B07	850.998	5.06	850.748	5.04	0.029	0.40	PASS/合格
B08	850.877	5.07	850.697	5.04	0.021	0.59	PASS/合格

#: No leakage, No venting, No disassembly No rupture and no fire

#: 无漏液、无漏气、无解体、无破裂以及无起火现象

**Test T.3: Vibration 振动****Test procedure 测试程序:**

1. Cells and batteries are firmly secured to the platform of the vibration machine /样品牢固地安装在振动台（的台面）上。
2. The vibration: a sinusoidal waveform with a logarithmic sweep between 7Hz and 200Hz and back to 7Hz traversed in 15 minutes/振动以正弦波形式，对数扫描频率从7Hz增加至200Hz，然后再回到7Hz，一个循环持续15分钟。
3. the logarithmic frequency sweep is as follows: from 7 Hz a peak acceleration of 1 gn is maintained until 18 Hz is reached, The amplitude is then maintained at 0.8mm (1.6 mm total excursion) and the frequency increased until a peak acceleration of 8 gn occurs (approximately 50Hz), A peak acceleration of 8 gn is then maintained until the frequency is increased to 200 Hz/对数扫频为:从7 赫兹开始保持1gn 的最大加速度直到频率为18 赫兹，然后将振幅保持在0.8 毫米（总偏移1.6 毫米）并增加频率直到最大加速度达到8gn（频率约为50 赫兹），将最大加速度保持在8gn 直到频率增加到200 赫兹。
4. This cycle repeated 12 times for a total of 3 hours for each of three mutually perpendicular mounting position of the cell /每个样品从三个互相垂直的方向上循环12 次，共3 个小时。

Requirement 要求

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.
要求样品无漏液、无漏气、无解体、无破裂以及无起火，且样品试验后开路电压应不低于试验前开路电压的90%。

Data 数据:

Ambient temperature 环境温度: 23.7°C.

No. 编号	Pre-test 测试前		After test 测试后		Mass loss 质量损失 (%)	Voltage loss 电压损失 (%)	Verdict# (判定#)
	Mass(g) 质量(g)	Voltage(V) 电压(V)	Mass(g) 质量(g)	Voltage(V) 电压(V)			
B01	850.759	5.05	850.677	5.05	0.010	0.00	PASS/合格
B02	850.699	5.04	850.699	5.03	0.000	0.20	PASS/合格
B03	850.716	5.06	850.606	5.06	0.013	0.00	PASS/合格
B04	850.788	5.05	850.788	5.04	0.000	0.20	PASS/合格
B05	850.757	5.05	850.667	5.05	0.011	0.00	PASS/合格
B06	850.624	5.06	850.624	5.06	0.000	0.00	PASS/合格
B07	850.748	5.04	850.748	5.04	0.000	0.00	PASS/合格
B08	850.697	5.04	850.697	5.03	0.000	0.20	PASS/合格

#: No leakage, No venting, No disassembly No rupture and no fire

#: 无漏液、无漏气、无解体、无破裂以及无起火现象

**Test T4: Shock 冲击****Test procedure 测试程序:**

1. 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.

2. Each cell or battery shall be subjected to a half sine shock of peak acceleration of 150gn and pulse duration of 6 milliseconds. Alternatively, large cells and large batteries may be subjected to a half-sine shock of peak acceleration of 50gn and pulse duration of 11 milliseconds.

3. Each cell or battery shall be subjected to a half-sine shock of peak acceleration depending on the mass of the battery. The pulse duration shall be 6 milliseconds for small batteries and 11 milliseconds for large batteries.

The formulas below are provided to calculate the appropriate minimum peak accelerations

以稳固的托架固定住每个样品的安装表面。对每个电样品以峰值为150gn 的半正弦的加速度冲击，脉冲持续6 毫秒，大型电池和大型电池组须经受最大加速度50gn 和脉冲持续时间11 毫秒的半正弦波冲击。每个样品必须经受根据其质量峰值加速度的半正弦震荡。小型电池脉冲持续时间应为6毫秒为和大容量电池脉冲持续时间应为11毫秒。下面的公式供计算相应最小峰值加速度，每个样品须在三个互相垂直的样品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。

Battery	Minimum peak acceleration	Pulse duration
Small batteries	150 g _n or result of formula $\text{Acceleration}(g_n) = \sqrt{\left(\frac{100850}{\text{mass}^*}\right)}$ whichever is smaller	6 ms
Large batteries	50 g _n or result of formula $\text{Acceleration}(g_n) = \sqrt{\left(\frac{30000}{\text{mass}^*}\right)}$ whichever is smaller	11 ms

Requirement 要求:

Cells and 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 cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure.

要求样品无漏液、无漏气、无解体、无破裂以及无起火, 且样品试验后开路电压应不低于试验前开路电压的90%。

Data 数据:

Ambient temperature 环境温度: 23.9°C。

No. 编号	Pre-test 测试前		After test 测试后		Mass loss 质量损失 (%)	Voltage loss 电压损失 (%)	Verdict# (判定#)
	Mass(g) 质量(g)	Voltage(V) 电压(V)	Mass(g) 质量(g)	Voltage(V) 电压(V)			
B01	850.677	5.05	850.677	5.05	0.000	0.00	PASS/合格
B02	850.699	5.03	850.611	5.03	0.010	0.00	PASS/合格
B03	850.606	5.06	850.606	5.05	0.000	0.20	PASS/合格
B04	850.788	5.04	850.685	5.04	0.012	0.00	PASS/合格
B05	850.667	5.05	850.667	5.04	0.000	0.20	PASS/合格
B06	850.624	5.06	850.624	5.05	0.000	0.20	PASS/合格
B07	850.748	5.04	850.658	5.04	0.011	0.00	PASS/合格
B08	850.697	5.03	850.697	5.03	0.000	0.00	PASS/合格

#: No leakage, No venting, No disassembly No rupture and no fire

#: 无漏液、无漏气、无解体、无破裂以及无起火现象

**Test T.5: External short circuit 外短路测试****Test method 测试方法:**

The cell or battery to be tested shall be heated for a period of time necessary to reach a homogeneous stabilized temperature of 57 ± 4 °C, measured on the external case. This period of time depends on the size and design of the cell or battery and should be assessed and documented. If this assessment is not feasible, the exposure time shall be at least 6 hours for small cells and small batteries, and 12 hours for large cells and large batteries. Then the cell or battery at 57 ± 4 °C shall be subjected to one short circuit condition with a total external resistance of less than 0.1 ohm.

测试样品的外壳温度达到恒温 57 ± 4 °C 后, 再进行外部短路。短路的时间取决于样品的尺寸和设计, 并需被评估和记录。如果这个评估无法进行, 那么小电芯和小电池短路时间至少 6 小时, 大电芯和大电池短路时间至少 12 小时。然后样品在 57 ± 4 °C 环境下经受一个阻值小于 0.1Ω 的外部电路短路。

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, or in the case of the large batteries, has decreased by half of the maximum temperature increase observed during the test and remains below that value.

样品温度到 57 ± 4 °C 之后, 短路时间需持续 1 小时, 大型电池短路温度下降到最大温升的一半或低于 57 ± 4 °C。

Requirement 要求:

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.

要求样品外表面温度不超过 170 °C, 且试验后 6 小时内无解体, 无破裂, 无起火。

Data 数据:

Ambient temperature 环境温度: 57.2 °C。

No. 编号	Peak temperature(°C) 最高温度	No disassembly, No rupture and no fire 无解体、无破裂和无起火
B01	57.5	PASS/合格
B02	58.2	PASS/合格
B03	57.9	PASS/合格
B04	57.6	PASS/合格
B05	57.7	PASS/合格
B06	58.1	PASS/合格
B07	57.8	PASS/合格
B08	58.2	PASS/合格



Test T.6: Impact (applicable to cylindrical cells not less than 18 mm in diameter) / Crush (applicable to prismatic, pouch, coin/button cells and cylindrical cells less than 18 mm in diameter) 撞击(适用于直径不小于18毫米的圆柱形电池)/挤压(适用于棱柱形、袋装、硬币/纽扣电池和直径小于18毫米的圆柱形电池)

Test procedure 测试程序– Impact 撞击:

The sample cell or component cell is to be placed on a flat smooth surface. A 15.8 mm $\pm$ 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 Centre of the sample. A 9.1 kg $\pm$ 0.1 kg mass is to be dropped from a height of 61 $\pm$ 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.

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 $\pm$ 0.1mm diameter curved surface lying across the Centre of the test sample. Each sample is to be subjected to only a single impact.

将试验样品放在平坦光滑平面上，将一根长度不少于7cm的316型不锈钢棒横放在试样中心后，将一质量为9.1kg的物体从61 $\pm$ 2.5cm的高度落向样品。待测试电池纵轴与平面平行，与横放在试样中心的直径15.8 $\pm$ 0.1毫米弯曲表面的纵轴垂直。每个样品只经受一次撞击。

Test Procedure 测试程序– Crush 挤压:

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.

(a) The applied force reaches 13 KN $\pm$ 0.78 KN;

Example: The force shall be applied by a hydraulic ram with a 32 mm diameter piston until a pressure of 17 MPa is reached on the hydraulic ram.

(b) The voltage of the cell drops by at least 100 mV; or

(c) The cell is deformed by 50% or more of its original thickness.

Once the maximum pressure has been obtained, the voltage drops by 100 mV or more, or the cell is deformed by at least 50% of its original thickness, the pressure shall be released.

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.

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1.5厘米/秒。挤压持续进行，直到出现以下三种情况之一：

(a)施加的力量达到13KN $\pm$ 0.78KN;

(b)样品的电压下降至少100毫伏;

(c)样品变形达原始厚度的50%或以上。

棱柱形或袋装样品应从最宽的一面施压，纽扣/硬币形样品应从其平坦表面施压，圆柱形样品应从与纵轴垂直的方向施压。每个样品只经受一次挤压。

Requirement 要求:

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.

要求样品的最高表面温度不超过170℃，且试验后6个小时之内试验样品无解体和无起火。

**Data数据 (Crush挤压) :**

Ambient temperature 环境温度: 23.5°C。

No.编号	Peak temperature 最高温度(°C)	No disassembly, No fire 无解体、无起火
C01	23.9	PASS/合格
C02	23.7	PASS/合格
C03	24.1	PASS/合格
C04	23.8	PASS/合格
C05	24.4	PASS/合格
C06	23.7	PASS/合格
C07	24.3	PASS/合格
C08	23.8	PASS/合格
C09	23.6	PASS/合格
C10	24.1	PASS/合格

**Test T.7: Overcharge 过度充电****Test procedure 测试程序:**

The charge current shall be twice the manufacturer's recommended maximum continuous charge current. The minimum voltage of the test shall be as follows:

(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.

(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.

Tests are to be conducted at ambient temperature. The duration of the test shall be 24 hours.

以2倍制造厂推荐的最大持续充电电流对样品充电，本测试最小电压为：

(a)如果厂家推荐的充电电压不超过18V，本测试的最小充电电压应该小于两倍的厂家标定最大充电电压或者是22V

(b)如果厂家推荐的充电电压超过18V，本测试的最小充电电压应该1.2倍的厂家标定最大充电电压20±5℃的环境温度下，试验持续24小时。

Requirement 要求:

Rechargeable batteries meet this requirement if there is no disassembly and no fire during the test and within seven days after the test.

要求样品在试验中和试验后7天内无解体和无起火。

Data数据:

Ambient temperature 环境温度: 23.4°C。

No. 编号	No disassembly, No fire 无解体、无起火
B09	PASS/合格
B10	PASS/合格
B11	PASS/合格
B12	PASS/合格
B13	PASS/合格
B14	PASS/合格
B15	PASS/合格
B16	PASS/合格

**Test T.8: Forced discharge (for cell)强制放电****Test procedure测试程序:**

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.

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).

20±5℃的环境温度下，将样品连接在12V的直流电源上进行强制放电，此直流电源提供给每个试验样品初始电流为制造商指定的最大放电电流。

对于指定的放电电流则需要和测试样品串联一个匹配的电阻，每一个样品的强制放电时间等于额容量除以初始的测试电流。

Requirement要求

Primary or rechargeable cells meet this requirement if there is no disassembly and no fire during the test and within seven days after the test.

要求样品在试验中和试验后7天内无解体和无起火。

Data数据:

Ambient temperature 环境温度: 23.7℃.

No. 编号	No disassembly and no fire 无解体、无起火
C11	PASS/合格
C12	PASS/合格
C13	PASS/合格
C14	PASS/合格
C15	PASS/合格
C16	PASS/合格
C17	PASS/合格
C18	PASS/合格
C19	PASS/合格
C20	PASS/合格
C21	PASS/合格
C22	PASS/合格
C23	PASS/合格
C24	PASS/合格
C25	PASS/合格
C26	PASS/合格
C27	PASS/合格
C28	PASS/合格
C29	PASS/合格
C30	PASS/合格

IV、THE PHOTO OF SAMPLE 样品图片



Figure 1

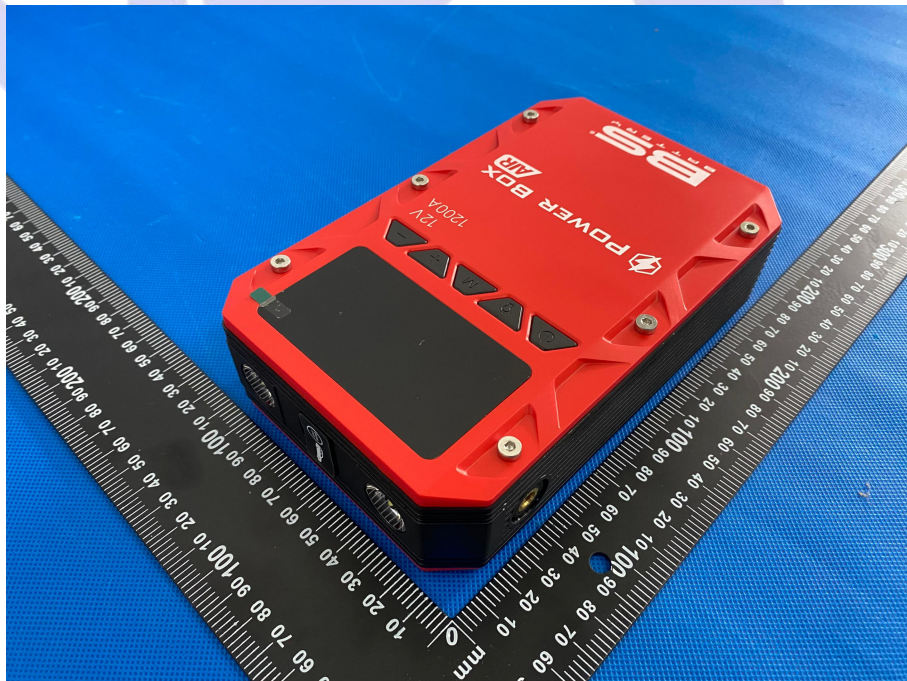


Figure 2



Figure 3

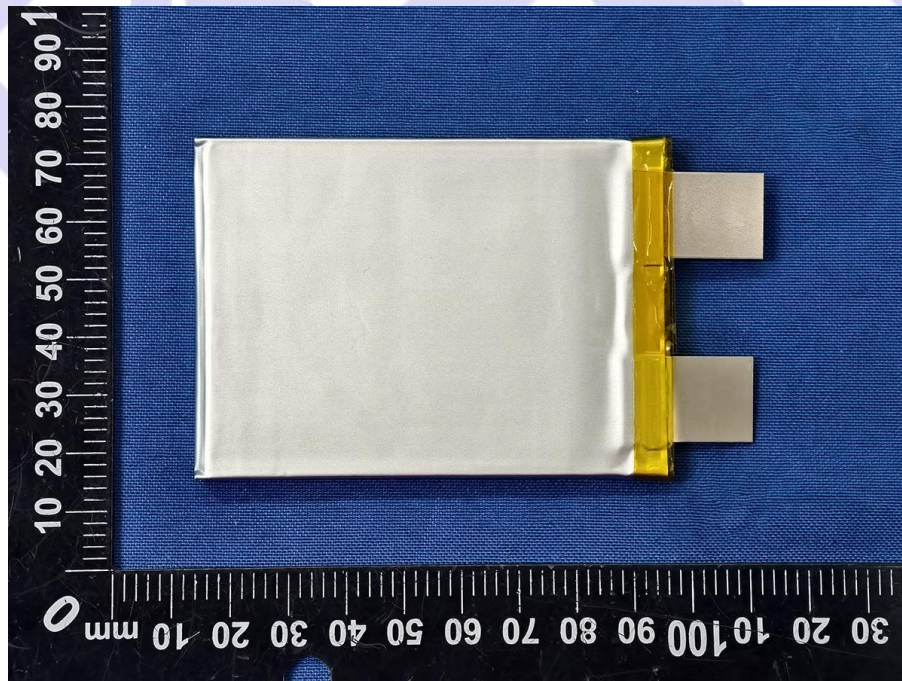


Figure 4

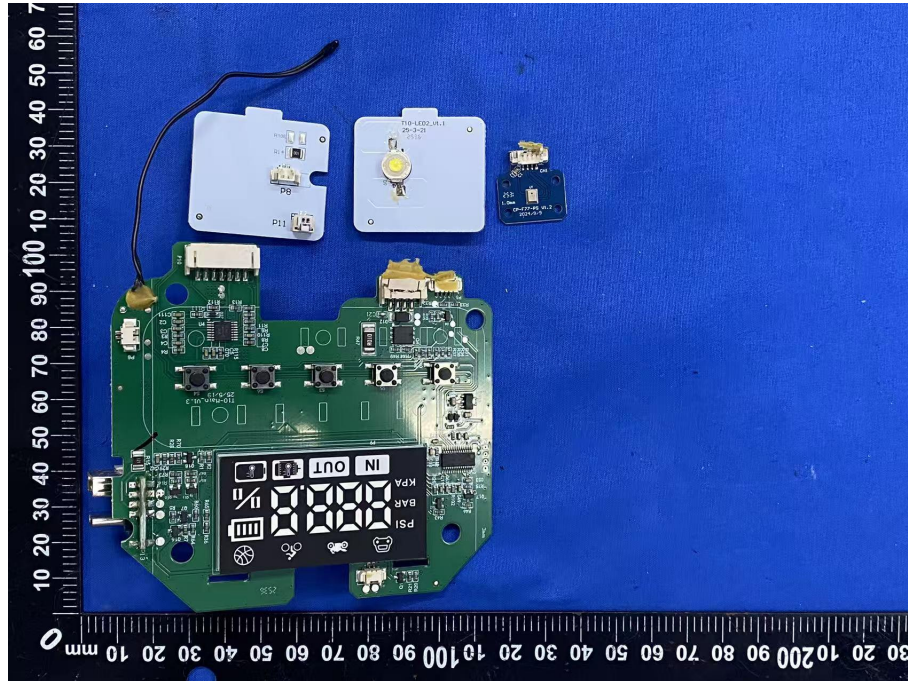


Figure 5

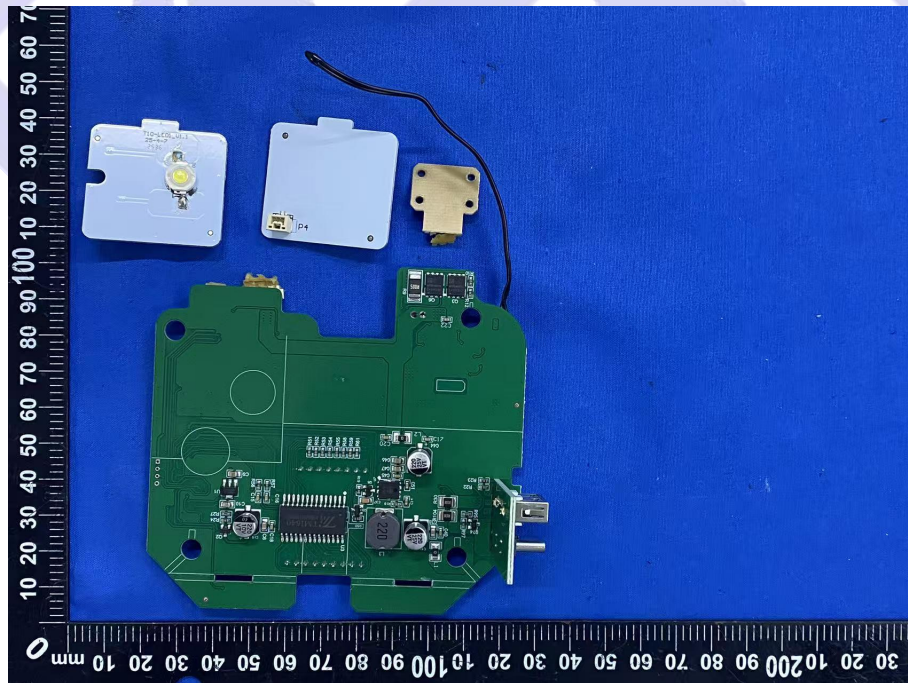


Figure 6

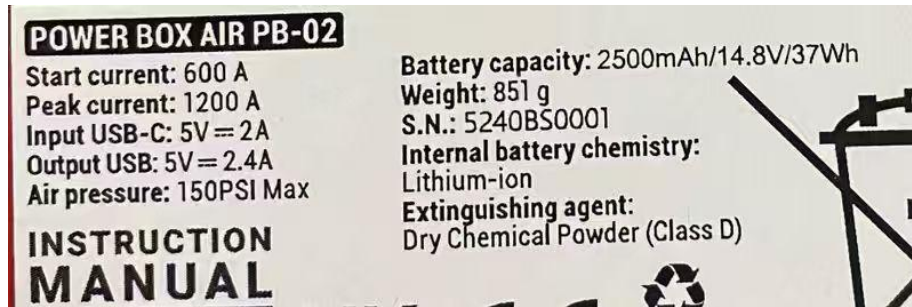


Figure 7



注意事项

Important Notice

1. The test report is invalid without the official stamp of ECT.

本报告书无ECT盖章无效。

2. The test report is invalid without the signatures of Ratifier, Reviewer and Testing engineer.

本报告书无批准人、审核人、及主检人签名无效。

3. Nobody is allowed to partly photocopy this test report without written permission of ECT.

未经ECT书面同意，不得部分地复制本报告书。

4. The report is invalid when anything of following happens – illegal transfer, reproduce, embezzlement, imposture, modification or tampering in any media form.

私自转让、复制、盗用、冒用、涂改、或以任何媒体形式篡改的报告书无效。

5. Product information and customer information provided by the applicant, we are not responsible for its authenticity.

产品信息和客户信息由申请人提供，我们不对其真实性负责。

6. The test report is valid for the tested samples only.

本报告仅对本次测试样品有效。

7. The Chinese contents in this report are only for reference.

本报告中的中文内容仅供参考。

8. Objections to the test report must be submitted to ECT within 15 days.

对报告书若有异议，应于收到报告之日起15天内向本公司提出。

End of report