



中国认可  
国际互认  
检测  
TESTING  
CNAS L3572

REPORT No.: SZ22070273D01

# UN38.3 测试报告

## UN38.3 Test Report

申请商 : 深圳市天珑移动技术有限公司  
APPLICANT : Shenzhen Tinno Mobile Technology Corp.  
产品名称 : 可充电聚合物锂离子电池  
PRODUCT NAME : Rechargeable Li-Polymer Battery  
型号/MODEL NAME : TN-BP4000N2  
商标/TRADE NAME : NOKIA  
品牌/BRAND NAME : NOKIA  
额定值/RATING : 3.85 V, 3900 mA, 15.01 Wh  
接收日期 : 2022-07-28  
RECEIPT DATE :  
测试日期 : 2022-07-29 to 2022-08-18  
TEST DATE :  
签发日期 : 2022-08-23  
ISSUE DATE :

编制  
Edited by:

陈碧莲

签发  
Approved by:

李冬

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MORLAB

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## 测试报告声明 Test Report Declaration

申请商/Applicant	深圳市天珑移动技术有限公司 Shenzhen Tinno Mobile Technology Corp.	
申请商地址 Applicant Address	深圳市南山区西丽街道西丽社区同发南路天珑移动总部大厦南侧 27-001 27-001, South Side of Tianlong Mobile Headquarters Building, Tongfa South Road, Xili Community, Xili Street, Nanshan District, Shenzhen, Guangdong, PRC	
产品名称/ Product Name	可充电聚合物锂离子电池 Rechargeable Li-Polymer Battery	
型号/ Model Name	TN-BP4000N2	
额定值/ Rating	3.85 V, 3900 mA, 15.01 Wh	
制造商信息 Manufacturer information	制造商 Manufacturer	广东风华新能源股份有限公司 Guangdong Fenghua New Energy Co., Ltd.
	制造商地址 Manufacturer Address	中国广东省肇庆市端州区睦岗镇太和路 2 号 No.2 Taihe Road, Mugang Town, Duanzhou District, Zhaoqing, Guangdong Province, China
工厂信息 Factory information	工厂 Factory	广东风华新能源股份有限公司 Guangdong Fenghua New Energy Co., Ltd.
	工厂地址 Factory Address	中国广东省肇庆市端州区睦岗镇太和路 2 号 No.2 Taihe Road, Mugang Town, Duanzhou District, Zhaoqing, Guangdong Province, China
尺寸/Size	81.1*63.8*4.6 mm	
电池信息 Battery information	内含电芯数量/Cells number	1pcs(1S1P)
	电芯型号/Cell model	FHPV456479P
	物理特性/Physical description	棱形固体/ Prismatic solid
检验方法及判定标准 Test Method and Criterion	联合国《关于危险货物运输的建议书试验和标准手册》第七版第38.3节 UNITED NATIONS "Recommendations on the TRANSPORT OF DANGEROUS GOODS, Manual of Tests and Criteria" ST/SG/AC.10/11/Rev.7, section 38.3	
测试项目 Test Items	高度模拟试验; 温度试验; 振动试验; 冲击试验; 外短路试验; 挤压试验; 过充电试验; 强制放电 Altitude simulation, Thermal test, Vibration, Shock, External short circuit, Crush, Overcharge, Force discharge	
测试结论 Conclusion	受检样品通过 UN 38.3 各项检测, 检测结果合格 The sample has passed the test items of UN38.3	
备注/ Remarks	测试结果为临限值时, 我司将出具测量不确定度,并依据 95%的置信区间, 给出判定结果。 When the test result is a critical value, we will use the measurement uncertainty give the judgment result based on the 95% Confidence intervals.	



## 深圳市摩尔环宇通信技术有限公司检验报告

## Shenzhen Morlab Communications Technology Co., Ltd. Test Report

序号 No.	检验项目名称 Name of test items	标准要求或标准款号 Standard Requirement or the Clause Number of Standard	检测结果 Test Result	本项结论 Test Conclusion	备注 Remarks
1	高度模拟试验 Altitude simulation	联合国《关于危险货物运输的建议书 试验和标准手册》(以下简称:试验和标准手册) UN Manual of Tests and Criteria ST/SG/AC.10/11/Rev.7, 38.3 试验 T.1 Test T.1	见附表 1 See Appendix 1	合格 Passed	/
2	温度试验 Thermal Test	试验和标准手册 UN Manual of Tests and Criteria ST/SG/AC.10/11/Rev.7, 38.3 试验 T.2 Test T.2	见附表 2 See Appendix 2	合格 Passed	/
3	振动试验 Vibration	试验和标准手册 UN Manual of Tests and Criteria ST/SG/AC.10/11/Rev.7, 38.3 试验 T.3 Test T.3	见附表 3 See Appendix 3	合格 Passed	/
4	冲击试验 Shock	试验和标准手册 UN Manual of Tests and Criteria ST/SG/AC.10/11/Rev.7, 38.3 试验 T.4 Test T.4	见附表 4 See Appendix 4	合格 Passed	/
5	外短路试验 External short circuit	试验和标准手册 UN Manual of Tests and Criteria ST/SG/AC.10/11/Rev.7, 38.3 试验 T.5 Test T.5	见附表 5 See Appendix 5	合格 Passed	/
6	挤压试验 Crush	试验和标准手册 UN Manual of Tests and Criteria ST/SG/AC.10/11/Rev.7, 38.3 试验 T.6 Test T.6	见附表 6 See Appendix 6	合格 Passed	/
7	过充电试验 Overcharge	试验和标准手册 UN Manual of Tests and Criteria ST/SG/AC.10/11/Rev.7, 38.3 试验 T.7 Test T.7	见附表 7 See Appendix 7	合格 Passed	/
8	强制放电 Force discharge	试验和标准手册 UN Manual of Tests and Criteria ST/SG/AC.10/11/Rev.7, 38.3 试验 T.8 Test T.8	见附表 8 See Appendix 8	合格 Passed	/
检验环境条件 Test Environment Condition		环境温度: 15~25°C Ambient Temperature: 15~25°C			



Change History		
Version	Date	Reason for change
1.0	2022-08-23	First edition



## 检验报告-附件 1

## Test Report-Appendix 1

序号 No.	1	检测项目名称 Name of test items		高度模拟试验 Altitude simulation				
样品 编号 Sample No.	样品状态 Sample Status	试验前 Before		试验后 After		质量损 失 Mass Loss/%	剩余 电压 Residual OCV/%	其他 现象 Other Event
		质量 Weight/g	开路 电压 OCV/V	质量 Weight/g	开路 电压 OCV/V			
1	首次充满 Fully charged at first cycle	53.3014	4.363	53.3004	4.355	0.0019	99.82	O
2	首次充满 Fully charged at first cycle	53.5369	4.365	53.5362	4.358	0.0013	99.84	O
3	首次充满 Fully charged at first cycle	52.9784	4.362	52.9780	4.355	0.0008	99.84	O
4	首次充满 Fully charged at first cycle	53.9056	4.362	53.9047	4.354	0.0017	99.82	O
5	首次充满 Fully charged at first cycle	52.9762	4.364	52.9755	4.357	0.0013	99.84	O
6	25 次循环后充满 Fully charged after 25 cycles	53.3109	4.369	53.3102	4.363	0.0013	99.86	O
7	25 次循环后充满 Fully charged after 25 cycles	53.4338	4.370	53.4332	4.365	0.0011	99.89	O
8	25 次循环后充满 Fully charged after 25 cycles	53.4064	4.372	53.4057	4.367	0.0013	99.89	O
9	25 次循环后充满 Fully charged after 25 cycles	53.1669	4.371	53.1660	4.367	0.0017	99.91	O
10	25 次循环后充满 Fully charged after 25 cycles	53.3358	4.370	53.3353	4.366	0.0009	99.91	O

备注: L-漏液, V-漏气, D-解体, R-破裂, F-起火, O-无漏液, 无解体, 无破裂, 无起火;

Remark: L-Leakage, V-Venting, D-Disassembly, R-Rupture, F-Fire, O-No Leakage, No Venting, No Disassembly, No Rupture, No Fire



## 检验报告-附件 2

### Test Report-Appendix 2

序号 No.	2	检测项目名称 Name of test items		温度试验 Thermal Test				
样品 编号 Sample No.	样品状态 Sample Status	试验前 Before		试验后 After		质量损失 Mass Loss/%	剩余 电压 Residual OCV/%	其他 现象 Other Event
		质量 Weight/g	开路 电压 OCV/V	质量 Weight/g	开路 电压 OCV/V			
1	首次充满 Fully charged at first cycle	53.3004	4.355	53.2920	4.278	0.0158	98.23	O
2	首次充满 Fully charged at first cycle	53.5362	4.358	53.5299	4.283	0.0118	98.28	O
3	首次充满 Fully charged at first cycle	52.9780	4.355	52.9708	4.280	0.0136	98.28	O
4	首次充满 Fully charged at first cycle	53.9047	4.354	53.8961	4.280	0.0160	98.30	O
5	首次充满 Fully charged at first cycle	52.9755	4.357	52.9698	4.281	0.0108	98.26	O
6	25次循环后充满 Fully charged after 25 cycles	53.3102	4.363	53.3033	4.285	0.0129	98.21	O
7	25次循环后充满 Fully charged after 25 cycles	53.4332	4.365	53.4249	4.285	0.0155	98.17	O
8	25次循环后充满 Fully charged after 25 cycles	53.4057	4.367	53.3994	4.288	0.0118	98.19	O
9	25次循环后充满 Fully charged after 25 cycles	53.1660	4.367	53.1607	4.289	0.0100	98.21	O
10	25次循环后充满 Fully charged after 25 cycles	53.3353	4.366	53.3288	4.285	0.0122	98.14	O

备注: L-漏液, V-漏气, D-解体, R-破裂, F-起火, O-无漏液, 无解体, 无破裂, 无起火;  
Remark: L-Leakage, V-Venting, D-Disassembly, R-Rupture, F-Fire, O-No Leakage, No Venting, No Disassembly, No Rupture, No Fire



### 检验报告-附件 3

#### Test Report-Appendix 3

序号 No.	3	检测项目名称 Name of test items		振动试验 Vibration				
样品 编号 Sample No.	样品状态 Sample Status	试验前 Before		试验后 After		质量损 失 Mass Loss/%	剩余 电压 Residual OCV/%	其他 现象 Other Event
		质量 Weight/g	开路 电压 OCV/V	质量 Weight/g	开路 电压 OCV/V			
1	首次充满 Fully charged at first cycle	53.2920	4.278	53.2915	4.277	0.0009	99.98	O
2	首次充满 Fully charged at first cycle	53.5299	4.283	53.5293	4.282	0.0011	99.98	O
3	首次充满 Fully charged at first cycle	52.9708	4.280	52.9701	4.279	0.0013	99.98	O
4	首次充满 Fully charged at first cycle	53.8961	4.280	53.8956	4.278	0.0009	99.95	O
5	首次充满 Fully charged at first cycle	52.9698	4.281	52.9692	4.280	0.0011	99.98	O
6	25次循环后充满 Fully charged after 25 cycles	53.3033	4.285	53.3026	4.283	0.0013	99.95	O
7	25次循环后充满 Fully charged after 25 cycles	53.4249	4.285	53.4241	4.284	0.0015	99.98	O
8	25次循环后充满 Fully charged after 25 cycles	53.3994	4.288	53.3988	4.287	0.0011	99.98	O
9	25次循环后充满 Fully charged after 25 cycles	53.1607	4.289	53.1600	4.287	0.0013	99.95	O
10	25次循环后充满 Fully charged after 25 cycles	53.3288	4.285	53.3280	4.284	0.0015	99.98	O

备注: L-漏液, V-漏气, D-解体, R-破裂, F-起火, O-无漏液, 无解体, 无破裂, 无起火;  
Remark: L-Leakage, V-Venting, D-Disassembly, R-Rupture, F-Fire, O-No Leakage, No Venting, No Disassembly, No Rupture, No Fire



## 检验报告-附件 4

## Test Report-Appendix 4

序号 No.	4	检测项目名称 Name of test items		冲击试验 Shock				
样品 编号 Sample No.	样品状态 Sample Status	试验前 Before		试验后 After		质量损失 Mass Loss/%	剩余 电压 Residual OCV/%	其他 现象 Other Event
		质量 Weight/g	开路 电压 OCV/V	质量 Weight/g	开路 电压 OCV/V			
1	首次充满 Fully charged at first cycle	53.2915	4.277	53.2906	4.275	0.0017	99.95	O
2	首次充满 Fully charged at first cycle	53.5293	4.282	53.5286	4.280	0.0013	99.95	O
3	首次充满 Fully charged at first cycle	52.9701	4.279	52.9693	4.277	0.0015	99.95	O
4	首次充满 Fully charged at first cycle	53.8956	4.278	53.8948	4.277	0.0015	99.98	O
5	首次充满 Fully charged at first cycle	52.9692	4.280	52.9682	4.279	0.0019	99.98	O
6	25 次循环后充满 Fully charged after 25 cycles	53.3026	4.283	53.3020	4.280	0.0011	99.93	O
7	25 次循环后充满 Fully charged after 25 cycles	53.4241	4.284	53.4233	4.281	0.0015	99.93	O
8	25 次循环后充满 Fully charged after 25 cycles	53.3988	4.287	53.3980	4.285	0.0015	99.95	O
9	25 次循环后充满 Fully charged after 25 cycles	53.1600	4.287	53.1592	4.285	0.0015	99.95	O
10	25 次循环后充满 Fully charged after 25 cycles	53.3280	4.284	53.3273	4.282	0.0013	99.95	O

备注: L-漏液, V-漏气, D-解体, R-破裂, F-起火, O-无漏液, 无解体, 无破裂, 无起火;

Remark: L-Leakage, V-Venting, D-Disassembly, R-Rupture, F-Fire, O-No Leakage, No Venting, No Disassembly, No Rupture, No Fire





### 检验报告-附件 5

#### Test Report-Appendix 5

序号 No.	5	检测项目名称 Name of test items	外短路试验 External short circuit
样品编号 Sample No.	样品状态 Sample status	样品表面最高温度 Max. External Test Items / °C	其他现象 Other Event
1	首次充满 Fully charged at first cycle	56.0	O
2	首次充满 Fully charged at first cycle	56.2	O
3	首次充满 Fully charged at first cycle	56.5	O
4	首次充满 Fully charged at first cycle	56.7	O
5	首次充满 Fully charged at first cycle	56.9	O
6	25次循环后充满 Fully charged after 25 cycles	56.0	O
7	25次循环后充满 Fully charged after 25 cycles	56.2	O
8	25次循环后充满 Fully charged after 25 cycles	56.6	O
9	25次循环后充满 Fully charged after 25 cycles	56.6	O
10	25次循环后充满 Fully charged after 25 cycles	56.7	O

备注: D-解体, R-破裂, F-起火, O-无解体, 无破裂, 无起火;  
Remark: D-Disassembly, R-Rupture, F-Fire, O-No Disassembly, No Rupture, No Fire



### 检验报告-附件 6

#### Test Report-Appendix 6

序号 No.	6	检测项目名称 Name of test items	挤压试验 Crush
样品编号 Sample No.	样品状态 Sample status	样品表面最高温度 Max. External Test Items/ °C	其他现象 Other Event
11	首次 50%容量 50% of capacity at first cycle	21.6	O
12	首次 50%容量 50% of capacity at first cycle	21.6	O
13	首次 50%容量 50% of capacity at first cycle	21.5	O
14	首次 50%容量 50% of capacity at first cycle	21.5	O
15	首次 50%容量 50% of capacity at first cycle	21.3	O
16	25 次循环后 50%容量 50% of capacity after25 cycles	21.3	O
17	25 次循环后 50%容量 50% of capacity after25 cycles	21.3	O
18	25 次循环后 50%容量 50% of capacity after25 cycles	21.2	O
19	25 次循环后 50%容量 50% of capacity after25 cycles	21.2	O
20	25 次循环后 50%容量 50% of capacity after25 cycles	21.1	O

备注: D-解体, F-起火, O-无解体, 无起火;  
Remark: D-Disassembly, F-Fire, O-No Disassembly, No Fire



### 检验报告-附件 7

#### Test Report-Appendix 7

序号 No.	7	检测项目名称 Name of test items	过充电试验 Overcharge
样品编号 Sample No.	样品状态 Sample status	其他现象 Other Event	
21	首次充满 Fully charged at first cycle		O
22	首次充满 Fully charged at first cycle		O
23	首次充满 Fully charged at first cycle		O
24	首次充满 Fully charged at first cycle		O
25	25 次循环后充满 Fully charged after 25 cycles		O
26	25 次循环后充满 Fully charged after 25 cycles		O
27	25 次循环后充满 Fully charged after 25 cycles		O
28	25 次循环后充满 Fully charged after 25 cycles		O

备注: D-解体, F-起火, O-无解体, 无起火;  
Remark: D-Disassembly, F-Fire, O-No Disassembly, No Fire



### 检验报告-附件 8

#### Test Report-Appendix 8

序号 No.	8	检测项目名称 Name of test items	强制放电 Force discharge
样品编号 Sample No.	样品状态 Sample status	放电时间 (H) Discharge time	其他现象 Other Event
29	首次完全放电 Fully discharged at first cycle	1	○
30	首次完全放电 Fully discharged at first cycle	1	○
31	首次完全放电 Fully discharged at first cycle	1	○
32	首次完全放电 Fully discharged at first cycle	1	○
33	首次完全放电 Fully discharged at first cycle	1	○
34	首次完全放电 Fully discharged at first cycle	1	○
35	首次完全放电 Fully discharged at first cycle	1	○
36	首次完全放电 Fully discharged at first cycle	1	○
37	首次完全放电 Fully discharged at first cycle	1	○
38	首次完全放电 Fully discharged at first cycle	1	○
39	25 次循环后完全放电 Fully discharged after 25 cycles	1	○
40	25 次循环后完全放电 Fully discharged after 25 cycles	1	○



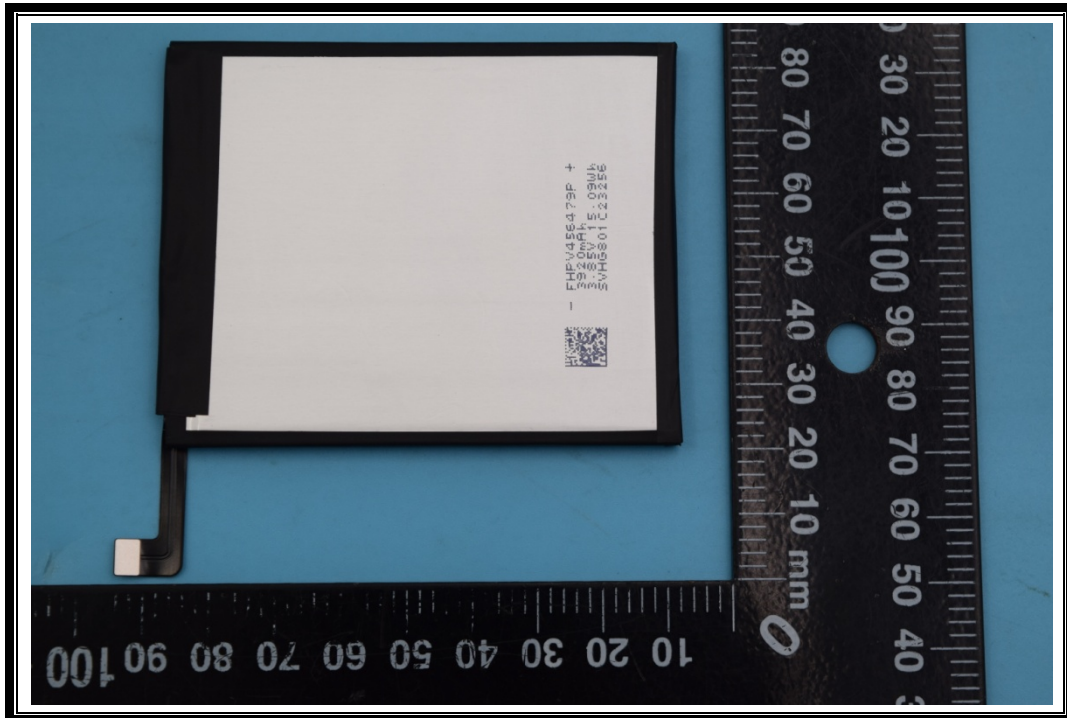
41	25 次循环后完全放电 Fully discharged after 25 cycles	1	O
42	25 次循环后完全放电 Fully discharged after 25 cycles	1	O
43	25 次循环后完全放电 Fully discharged after 25 cycles	1	O
44	25 次循环后完全放电 Fully discharged after 25 cycles	1	O
45	25 次循环后完全放电 Fully discharged after 25 cycles	1	O
46	25 次循环后完全放电 Fully discharged after 25 cycles	1	O
47	25 次循环后完全放电 Fully discharged after 25 cycles	1	O
48	25 次循环后完全放电 Fully discharged after 25 cycles	1	O
备注: D-解体, F-起火, O-无解体, 无起火; Remark: D-Disassembly, F-Fire, O-No Disassembly, No Fire 最大放电电流/ Max Continuous Discharge Current: <u>3920</u> mA			

样品图片 Photographs of the EUT

1



2





3



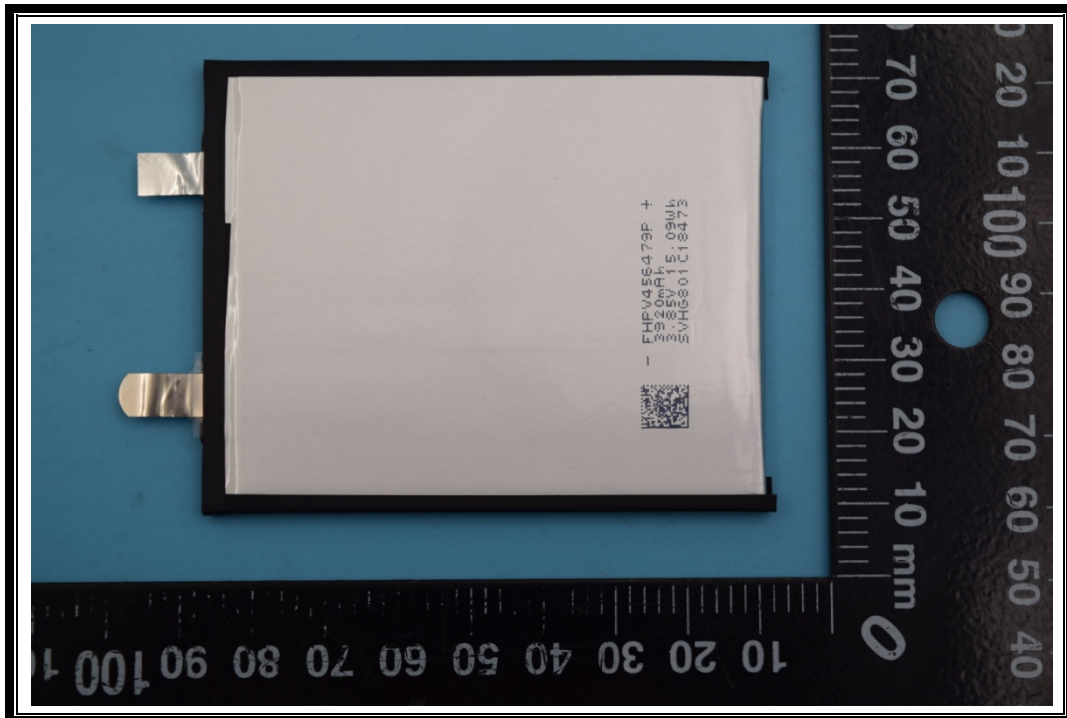
4



5



6







## 仪器设备清单/ List of test equipment used:

条款 Clause	仪器设备名称 equipment	型号 model	系列号 Serial No.	厂商 Manufacturer	校准日期 Calibration date	失效日期 Expiration date
样品预处理 Sample pretreatment	高性能电池检测系统 High-performance battery detection system	CT-4008-5V 6A-S1	T1806-167 542~T1806 -167548	newaretechnology	2022-07-06	2023-07-05
	电子天平 Electronic scale	JM-B30002	370	Zhuji Chaoze Weighing	2021-10-25	2022-10-24
	数据采集仪 Data recorder apparatus (Temperature and Voltage recorder)	GM90PS	S5C08022	YOKOGAWA	2021-10-20	2022-10-19
高度模拟试验 Altitude simulation	低气压箱 Vacuum chamber	CHKX-125	110711	gzgongwen	2022-03-04	2023-03-03
	电子天平 Electronic scale	JM-B30002	370	Zhuji Chaoze Weighing	2021-10-25	2022-10-24
	数据采集仪 Data recorder apparatus (Temperature and Voltage recorder)	GM90PS	S5C08022	YOKOGAWA	2021-10-20	2022-10-19
温度试验 Thermal Test	快速温变箱 Rapid temperature change box	QW1070P6 W15	12174318	ESPEC	2022-03-04	2023-03-03
	电子天平 Electronic scale	JM-B30002	370	Zhuji Chaoze Weighing	2021-10-25	2022-10-24
	数据采集仪 Data recorder apparatus (Temperature and Voltage recorder)	GM90PS	S5C08022	YOKOGAWA	2021-10-20	2022-10-19



振动试验 Vibration	振动试验台 Vibration test bench	ES-30-370	D1203045	donglingtech	2021-10-20	2022-10-19
	电子天平 Electronic scale	JM-B30002	370	Zhuji Chaoze Weighing	2021-10-25	2022-10-24
	数据采集仪 Data recorder apparatus (Temperature and Voltage recorder)	GM90PS	S5C08022	YOKOGAWA	2021-10-20	2022-10-19
冲击试验 Shock	冲击碰撞试验台 Shock Test System	SY11-50	5120315/J1 20315	donglingtech	2022-03-04	2023-03-03
	电子天平 Electronic scale	JM-B30002	370	Zhuji Chaoze Weighing	2021-10-25	2022-10-24
	数据采集仪 Data recorder apparatus (Temperature and Voltage recorder)	GM90PS	S5C08022	YOKOGAWA	2021-10-20	2022-10-19
外短路试验 External short circuit	防爆温箱 explosion-proof oven	DE207C	A08351	Chongqing Hanba	2022-06-02	2023-06-01
	微电阻测试仪 Milliohm-meter	TOS8010	TM200445	TOSSTAR	2022-03-04	2023-03-03
	短路器 Short circuit	MORLAB-B 01	/	/	2022-04-05	2022-10-04
	数据采集仪 Data recorder apparatus (Temperature and Voltage recorder)	GM90PS	S5C08022	YOKOGAWA	2021-10-20	2022-10-19



☑ 挤压试验 Crush ☐ 撞击试验 Impact	☑ 挤压试验机 Crush Apparatus	BE-6045-2T	2018111300 1	DongGuan Bell	2021-10-20	2022-10-19
	☐ 电池冲击试验机 Battery impact Apparatus	BE-5066	2008091034 6	DongGuan Bell	2022-03-04	2023-03-03
	数据采集仪 Data recorder apparatus (Temperature and Voltage recorder)	GM90PS	S5C08022	YOKOGAWA	2021-10-20	2022-10-19
过充电试验 Overcharge	电池充放电系统 Battery Testing System	BTS-30V20 A-8CH	19ME19040 8006	BETTATEQ	2022-07-06	2023-07-05
	防爆温箱 explosion-proof oven	DE207C	A08351	Chongqing Hanba	2022-06-02	2023-06-01
	数据采集仪 Data recorder apparatus (Temperature and Voltage recorder)	GM90PS	S5C08022	YOKOGAWA	2021-10-20	2022-10-19
强制放电 Force discharge	直流电源 DC power supply	KXN-6050D	18K6050D0 40094	zhaoxinpowe r	2021-10-20	2022-10-19
	电子负载 Electronic load	IT8512A+	8021430107 37010063	ITECH	2022-07-06	2023-07-05
	数据采集仪 Data recorder apparatus (Temperature and Voltage recorder)	GM90PS	S5C08022	YOKOGAWA	2021-10-20	2022-10-19



## Testing Laboratory Information

## 1. Identification of the Responsible Testing Laboratory

<b>Laboratory Name:</b>	Shenzhen Morlab Communications Technology Co., Ltd.
<b>Laboratory Address:</b>	FL1-3, Building A, FeiYang Science Park, No.8 LongChang Road, Block67, BaoAn District, ShenZhen, Guangdong Province, P. R. China
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## 2. Identification of the Responsible Testing Location

<b>Name:</b>	Shenzhen Morlab Communications Technology Co., Ltd.
<b>Address:</b>	FL1-3, Building A, FeiYang Science Park, No.8 LongChang Road, Block67, BaoAn District, ShenZhen, Guangdong Province, P. R. China

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