

地址:中国广州市天河区珠江新城花城大道66号B座 ] 网址:www.iqtc.cn 邮编:510623 Add: Tower B, No.66 Huacheng Avenue, Zhujiang Xincheng, Tianhe District, Guangzhou, China Website:www.iqtc.cn Postcode:510623

No: 01051900007238-1(E) Date: 2020-01-02 Page: 1 of 14

#### UN38.3 报告 UN38.3 Test Report

样品名称: 锂离子蓄电池

Sample Name: Battery-Box Premium Module

委托单位:

深圳比亚迪电子有限公司

**Applicant:** 

#### SHENZHEN BYD ELECTRONIC CO.,LTD





GUANGZHOU CUSTOMS DISTRICT TECHNOLOGY CENTER





地址:中国广州市天河区珠江新城花城大道66号B座 网址:www.iqtc.cn 邮编:510623 Add: Tower B, No.66 Huacheng Avenue, Zhujiang Xincheng, Tianhe District, Guangzhou, China

Website: www.iqtc.cn

Postcode: 510623

No: 01051900007238-1(E) Date: 2020-01-02 Page: 2 of 14

#### 检验证书 TEST REPORT

	ILSI KLI OKI	
样品名称	锂离子蓄电池	NOL
Sample Name	Battery-Box Premium Module	CUM
型号 Model	HVM	ATTER C
委托单位	深圳比亚迪电子有限公司	
Applicant	SHENZHEN BYD ELECTRONIC CO.,LTD	
委托单位地址	深圳市大鹏新区葵涌街道葵涌社区延安路1号比亚迪A-4#	#厂房 301
Applicant Address	Rm301, A-4# Building BYD, No.1, Yan'an Road, Kuichong, dap	peng,Shenzhen,P.R.China
生产单位	深圳比亚迪电子有限公司	CONS 18
Manufacture	SHENZHEN BYD ELECTRONIC CO.,LTD	AN NOV
S.C.	地址:深圳市大鹏新区葵涌街道葵涌社区延安路1号比亚:	迪 A-4#厂房 301
	Address : Rm301, A-4# Building BYD, No.1, Yan'an	
	Road,Kuichong,dapeng,Shenzhen,P.R.China	1th Cult
生产单位联系信息	电话号码: 0755-89888888-62113	
生) 毕位联示信忌 Manufacturer's	Phone number: 0755-89888888-62113	
Contact Information	电子邮箱: wen.yanfang@byd.com	All all
	Email address: wen.yanfang@byd.com	
	网址: http://www.byd.com.cn Website: http://www.byd.com.cn	St. TECHNE
长口从顶上从小		and some
样品外观与性状 Appearance & Odor	银灰色金属外壳 Silver grey metal shell	
	联合国《关于危险货物运输的建议书 试验和标准手册》	ST/SG/AC 10/11/Pay 6/A mand
则试方法和判定标准	38.3	51/50/AC.10/11/Rev.0/Allelid.
Test method and criterion	UNITED NATIONS " Recommendations on the TRANSPO Manual of Tests and Criteria ST/SG/AC.10/11/Rev.6/Amend.1	
接样时间	2019-11-27 测试日期	2019-11-27~2019-12-25
Accepted date	Test date	
测试项目	高度模拟、温度试验、振动、冲击、外部短路、挤压、过	
Test items	Altitude simulation, Thermal test, Vibration, Shock, External	short circuit, Crush, Overcharg
	Forced discharge.	
	经测试,该样品符合联合国《关于危险货物运输的	建议接试验和采准手册
结论	ST/SG/AC.10/11/Rev.6/Amend.1, 38.3 标准要求。	
	[T] 1.1. 1.1. $T$ CIDUTED MATER	
Conclusion	The sample has passed the test items of UNITED NATI	
Conclusion	TRANSPORT OF DANGEROUS GOODS", Man	
LE -	TRANSPORT OF DANGEROUS GOODS", Manu ST/SG/AC.10/11/Rev.6/Amend.1, 38.3.	
备注	TRANSPORT OF DANGEROUS GOODS", Man ST/SG/AC.10/11/Rev.6/Amend.1, 38.3. 检测结果仅对样品有效。	ual 和 Test and Griter 检验检测专用章
LE -	TRANSPORT OF DANGEROUS GOODS", Man ST/SG/AC.10/11/Rev.6/Amend.1, 38.3. 检测结果仅对样品有效。 The test results are only valid for the test samples submitted the	ual Of Test and Oriter 检验检测专用章

GUANGZHOU CUSTOMS DISTRICT TECHNOLOGY CENTER



01051900007238-1(E) e: 2020-01-02 e: 3 of 14

#### 电池组信息:

The batteries information:

电池类型 Battery type	锂离子蓄电池 Battery-Box Premium Module	标称电压 Nominal Voltage	51.2V
额定容量 Rated Capacity	54Ah	总能量 Total Energy	2.7648KWh
充电限制电压 Limited Charge Voltage	57.6V	标准充电电流 Standard Charge Current	10.6A
最大充电电流 Maximum Charge Current	55A	充电截止电流 Charge Cut-off Current	2.75A
标准放电电流 Standard discharge Current	10.6A	最大放电电流 Maximum Discharge Current	100A
放电截止电压 Discharge Cut-off Voltage	40V	尺寸 Overall Dimensions (W×D×H)	690mm×400mm×370mn
电芯数量 Cell Quantity	16 PCS	重量 Mass	38.0 kg
电芯容量 Cell Capacity	55Ah	电芯型号 Cell Model	C17
电芯生产单位 Manufacturer of cell		市比亚迪锂电池有限公司 EN BYD ELECTRONIC CO.,	LTD CALON

GUANGZHOU CUSTOMS DISTRICT TECHNOLOGY CENTER

地址:中国广州市天河区珠江新城花城大道66号B座 网址:www.iqtc.cn 邮编:510623 Add: Tower B, No.66 Huacheng Avenue, Zhujiang Xincheng, Tianhe District, Guangzhou, China Website: www.iqtc.cn Postcode: 510623

01051900007238-1(E) No: Date: 2020-01-02 Page: 4 of 14

序号 No.	测试项目名称 Name of test	Stand requirement or	衣标准条款号 r the clause number of ndard	测试结果 Test result	本项结论 Test conclusion	备注 Remar
1	高空模拟 Altitude simulation	和标准手册》UN	物运输的建议书 试验 Manual of Tests and C.10/11/Rev.6/Amend.1	d 见附衣 I	合格 Passed	1
2	温度循环 Thermal test	和标准手册》UN	物运输的建议书 试验 Manual of Tests and C.10/11/Rev.6/Amend.1	d 见附衣 2	合格 Passed	LECT.
3	振动 Vibration	和标准手册》UN	物运输的建议书 试验 Manual of Tests and C.10/11/Rev.6/Amend.1	d 见附衣 3	合格 Passed	AHOY OL
4	冲击 Shock	和标准手册》UN	物运输的建议书 试验 Manual of Tests and C.10/11/Rev.6/Amend.1	d 见附衣 4	合格 Passed	
5	外部短路 External short circuit	和标准手册》UN	物运输的建议书 试验 Manual of Tests and C.10/11/Rev.6/Amend.1	d See	合格 Passed	3 1
6	挤压 Crush	和标准手册》UN	物运输的建议书 试验 Manual of Tests and C.10/11/Rev.6/Amend.1	d 见附衣 6	合格 Passed	COMS DI
7	过度充电 Overcharge	和标准手册》UN	物运输的建议书 试验 Manual of Tests and C.10/11/Rev.6/Amend.1	d 见附衣 /	不适用 Not applicable	/
8	强制放电 Forced discharge	和标准手册》UN	物运输的建议书 试验 Manual of Tests and C.10/11/Rev.6/Amend.1	d See	合格 Passed	
Test e	测试环境 《》 nvironment condition		意温度: 20℃-25℃; IJ mperature: 20℃-25℃, J			820°.
	A. A	测试项目 Test items		OSTR	STOMST	
Subco	分包测试情况 ntracted test condition	分包实验室 Subcontracted Laboratory	名称 Name 地址	1	邮编 Post code 电话	JANGY

#### GUANGZHOU CUSTOMS DISTRICT TECHNOLOGY CENTER



地址:中国广州市天河区珠江新城花城大道66号B座 网址:www.iqtc.cn 邮编: 510623 Add: Tower B, No.66 Huacheng Avenue, Zhujiang Xincheng, Tianhe District, Guangzhou, China Website:www.iqtc.cn Postcode: 510623

01051900007238-1(E) : 2020-01-02 : 5 of 14

0	2	.0	.0	22	12		- 6	
序号 No.		附表 1测试项目名称Appendix 1Name of test				高空模拟 Altitude simulation		
标准要求 Requirement of Standard 样品状态 Sample status	池组应无重量 在试验后的开 组除外)。 Test cells and temperature 20 venting, no dis battery after te requirement re b1#~b2#: 第- b1#~b2#: 第: b3#~b4#: 第二	损失、无渗漏、 路电压不少于 batteries shall be 0±5℃. Cells and cassembly, no rug sting is not less	、无排气、无; 其在进行这一 e stored at a pre batteries meet pture and no fit than 90% of its is not applicat E 电的电池; charged states; 至全充电的电池	解体、无破裂 试验前电压的 essure of 11.6k this requireme re and if the op voltage immed ble to test cells	和无燃烧, 90% (完全方 Pa or less for a nt if there is n en circuit volt diately prior to	F放至少 6h。试 并且每个试验电 故电状态的试验 at least six hours to mass loss, no l rage of each test of this procedure. at fully discharge	池或电池维 电池或电池 at ambient leakage, no cell or The	
样品编号	测试前	Before	测试后	É After	质量损失	剩余电压	测试结果	
件 品 细 与 Sample No.	电池质量 m <sub>1</sub> (kg)	开路电压 v <sub>1</sub> (v)	电池质量 m <sub>2</sub> (kg)	开路电压 V2(V)	Mass loss (%)	Residual OCV(%)	则试结为 Test resu	
b1#	37.95	54.70	37.95	54.70	0.00	100.00	0	
b2#	37.91	54.58	37.91	54.58	0.00	100.00	0	
b3#	37.86	54.67	37.86	54.67	0.00	100.00	0	
b4#	37.87	54.71	37.87	54.71	0.00	100.00	s 0	
e .	ONS	NCS -	NGLY	63	18-	, CET		

注: L-泄漏; V-排气; D-解体; R-破裂; F-起火; O-无泄漏、无排气、 无解体、无破裂、无起火。 Note: L-Leakage, V-Venting, D-Disassembly, R-Rupture, F-Fire, O- No Leakage, No Venting, No Disassembly, No Rupture & No Fire.





地址:中国广州市天河区珠江新城花城大道66号B座 网址:www.iqtc.cn 邮编: 510623 Add: Tower B, No.66 Huacheng Avenue, Zhujiang Xincheng, Tianhe District, Guangzhou, China Website:www.iqtc.cn Postcode: 510623

01051900007238-1(E) e: 2020-01-02 e: 6 of 14

		1		~	OC.	.0	1
序号 No.		表 2 ndix 2		l试项目名称 Name of test	510	温度循 Thermal	
标准要求 Requirement of Standard	验电池或电池	h。两个极端说 组在环境温度 体、无破裂和 试验前电压的 and batteries and ed by storage for interval betwee es, after which $0\pm5$ °C). Cells and disassembly, not ting is not less	式验温度之间的 20±5℃下存放 无燃烧,并且4 90%(完全放 re to be stored f or at least 12 ho en test temperat all test cells and batteries mee o rupture and no than 90% of its	b最大时间间隔 24h。试验电言 每个试验电池耳 电状态的试验 or at least 12 hours at a test ten ure extremes is d batteries are t et this requirem o fire and if the voltage immed	局为 30min。重 地或电池组应 或电池组在试 电池或电池组 ours at a test to nperature equa 30 minutes. To o be stored for ent if there is p open circuit ve liately prior to	重复 10 次, 平 无重量损失、 验后的开路电 1除外 )。 emperature eq d to -40 $\pm$ 2℃. This procedure r 24 hours at a no mass loss, r oltage of each this procedure	F将所有试、 无添漏、 已压不少于 ual to The is to be mbient no leakage, test cell or e. The
样品状态 Sample status	b1#~b2#:第- b1#~b2#:firs b3#~b4#:第二 b3#~b4#:afte	t cycle in fully 二十五个循环完	charged states;		CUANCE SENT	¢.	LOGY CENTR
Sample status	b1#~b2#: firs b3#~b4#: 第二	t cycle in fully 二十五个循环完 er 25 cycles end	charged states; 已全充电的电池 ling in fully cha		质量损失	剩余申压	Contraction of the
Sample	b1#~b2#: firs b3#~b4#: 第二 b3#~b4#: afte	t cycle in fully 二十五个循环完 er 25 cycles end	charged states; 已全充电的电池 ling in fully cha	rged states.	质量损失 Mass loss (%)	剩余电压 Residual OCV(%)	测试结 JTest resu
Sample status 样品编号	b1#~b2#: firs b3#~b4#: 第二 b3#~b4#: afte 测试前 电池质量	t cycle in fully 二十五个循环完 er 25 cycles end Before 开路电压	charged states; 已全充电的电池 ling in fully cha 测试后 电池质量	rged states. After 开路电压	Mass loss	Residual	
Sample status 样品编号 Sample No.	b1#~b2#: firs b3#~b4#: 第二 b3#~b4#: afte 测试前 电池质量 m <sub>1</sub> (kg)	t cycle in fully 二十五个循环党 er 25 cycles end Before 开路电压 v <sub>1</sub> (v)	charged states; E全充电的电池 ling in fully cha 测试后 电池质量 m <sub>2</sub> (kg)	rged states. F After 开路电压 v <sub>2</sub> (v)	Mass loss (%)	Residual OCV(%)	Test resu
Sample status 样品编号 Sample No. b1#	b1#~b2#: firs b3#~b4#: 第二 b3#~b4#: afte 测试前 电池质量 m <sub>1</sub> (kg) 37.95	t cycle in fully 二十五个循环完 er 25 cycles end Before 开路电压 v <sub>1</sub> (v) 54.70	charged states; E全充电的电池 ling in fully cha 测试后 电池质量 m <sub>2</sub> (kg) 37.95	rged states. After 开路电压 v <sub>2</sub> (v) 54.63	Mass loss (%) 0.00	Residual OCV(%) 99.87	Test resu O

注: L-泄漏; V-排气; D-解体; R-破裂; F-起火; O-尤泄漏、尤排气、 尤解体、尤破裂、尤起火。 Note: L-Leakage, V-Venting, D-Disassembly, R-Rupture, F-Fire, O- No Leakage, No Venting, No Disassembly, No Rupture & No Fire.





地址:中国广州市天河区珠江新城花城大道66号B座 网址:www.iqtc.cn 邮编: 510623 Add: Tower B, No.66 Huacheng Avenue, Zhujiang Xincheng, Tianhe District, Guangzhou, China Website:www.iqtc.cn Postcode: 510623

01051900007238-1(E) e: 2020-01-02 e: 7 of 14

/						6 M	
序号 No.		十表 3 endix 3		则试项目名称 Name of test		振动 Vibrat	
标准要求 Requirement of Standard	将大型电池或目 1gn的最大加速 速度达到 2gn(步 的电池或电池线 损失、无渗漏、 电压不少于其不 The large Cells distorting the ce sinusoidal wave until 18Hz is rea frequency increa of 2gn is then ma times for a total of the directions	度,直到 18Hz。 预率约为 25Hz) 组安装方向的每 无排气、无解 生进行这一试验 and batteries ard form with a log ached. The amp ased until a peal aintained until t of 3 hours for e	然后将振幅保 .将最大加速度 手个方向重复进 体、无破裂和; 会前电压的 90% e firmly secured unner as to faithf arithmic sweep litude is then ma k acceleration of he frequency is each of three mu	特在 0.8mm( 保持在 $2g_n$ 直 行 $12$ 次, 一 无燃烧, 并且 5 (完全放电: to the platfor fully transmit from 7Hz to a aintained at 0. f $2g_n$ occurs ( <i>a</i> increased to 2 tually perpend	(总偏移 1.6m (到频率增加 共振动 3h。 每个试验电 状态的试验电 m of the vibra the vibration. peak acceler 8mm (1.6mm approximately 200Hz. This c dicular mount	um),并增加频率 到 200Hz。对 试验电池或电注 池或电池组在i 包池或电池组路 ation machine w The vibration s ration of 1gn is r total excursion y 25Hz). A peak ycle shall be rep	▲ 直到最大加 三个互相垂〕 也组应无重量 式验后的开 分)。 vithout hall be a naintained and the acceleration peated 12 The cell. On
	requirement if the open circul immediately pri- and batteries at the second sec	here is no mass hit voltage of eac or to this proced	loss, no leakage ch test cell or ba dure. The requir	, no venting, i attery after test	no disassembl ting is not les	s than 90% of it	nd no fire an ts voltage
样品状态 Sample status	requirement if th if the open circu immediately pri- and batteries at b1#~b2#: 第一 b1#~b2#: first b3#~b4#: 第二	here is no mass nit voltage of eac or to this proceed fully discharged 个循环完全充 cycle in fully c 十五个循环完	loss, no leakage ch test cell or ba dure. The requir l states. 电的电池;	, no venting, 1 ittery after test ement relating	no disassembl ting is not les	s than 90% of it	nd no fire an ts voltage
Sample status	requirement if th if the open circu immediately pri- and batteries at b1#~b2#: 第一 b1#~b2#: first b3#~b4#: 第二	here is no mass nit voltage of eac or to this proced fully discharged 个循环完全充 cycle in fully c 十五个循环完 r 25 cycles endi	loss, no leakage ch test cell or ba dure. The require l states. 电的电池; harged states; 全充电的电池。	, no venting, 1 attery after test ement relating ged states.	no disassembl ting is not les	s than 90% of it	nd no fire an is voltage to test cells
Sample	requirement if th if the open circu immediately pri- and batteries at b1#~b2#: 第一 b1#~b2#: first b3#~b4#: 第二 b3#~b4#: after	here is no mass nit voltage of eac or to this proced fully discharged 个循环完全充 cycle in fully c 十五个循环完 r 25 cycles endi	loss, no leakage ch test cell or ba dure. The require l states. 电的电池; harged states; 全充电的电池。 ng in fully charg	, no venting, 1 attery after test ement relating ged states.	no disassembl ting is not les g to voltage is	s than 90% of it not applicable	nd no fire an ts voltage
Sample status 样品编号	requirement if the open circul immediately pri- and batteries at 1 b1#~b2#: 第一 b1#~b2#: first b3#~b4#: 第二 b3#~b4#: after 测试前 I 电池质量	here is no mass nit voltage of eac or to this proceed fully discharged 个循环完全充 cycle in fully c 十五个循环完 r 25 cycles endi Before 开路电压	loss, no leakage ch test cell or ba dure. The require l states. 电的电池; harged states; 全充电的电池。 ng in fully charg 测试后 电池质量	, no venting, i attery after test ement relating ged states. After 开路电压	no disassembl ting is not les g to voltage is 质量损失 Mass loss	s than 90% of it not applicable 剩余电压 Residual	nd no fire an s voltage to test cells 则试结果
Sample status 样品编号 Sample No.	requirement if the open circul immediately pri- and batteries at 1 b1#~b2#: 第一 b1#~b2#: first b3#~b4#: 第二 b3#~b4#: after 测试前 I 电池质量 m <sub>1</sub> (kg)	here is no mass nit voltage of eac or to this proceed fully discharged 个循环完全充 cycle in fully c 十五个循环完 r 25 cycles endi Before 开路电压 v1(v)	loss, no leakage ch test cell or ba dure. The require l states. 电的电池; harged states; 全充电的电池。 ng in fully charg 测试后 电池质量 m <sub>2</sub> (kg)	, no venting, n ittery after test ement relating ged states. After 开路电压 v2(v)	no disassembl ting is not les g to voltage is 质量损失 Mass loss (%)	s than 90% of it not applicable 剩余电压 Residual OCV(%)	nd no fire an s voltage to test cells 测试结界 Test resu
Sample status 样品编号 Sample No. b1#	requirement if the open circui immediately privand batteries at 1 b1#~b2#: 第一 b1#~b2#: first b3#~b4#: 第二 b3#~b4#: after 测试前 I 电池质量 m <sub>1</sub> (kg) 37.95	here is no mass nit voltage of ead or to this proced fully discharged 个循环完全充 cycle in fully c 十五个循环完 r 25 cycles endi Before 开路电压 v1(v) 54.70	loss, no leakage ch test cell or ba dure. The require l states. 电的电池; harged states; 全充电的电池。 ng in fully charg 测试后 电池质量 m <sub>2</sub> (kg) 37.95	no venting, i ittery after test ement relating ged states. After 开路电压 v2(v) 54.68	no disassembliting is not les g to voltage is 质量损失 Mass loss (%) 0.00	s than 90% of it not applicable 剩余电压 Residual OCV(%) 99.96	nd no fire an s voltage to test cells 测试结果 Test resul

注: L-泄漏; V-排气; D-解体; R-破裂; F-起火; O-无泄漏、无排气、 无解体、无破裂、无起火。 Note: L-Leakage, V-Venting, D-Disassembly, R-Rupture, F-Fire, O- No Leakage, No Venting, No Disassembly, No Rupture & No Fire.

### 州海关技术中





地址:中国广州市天河区珠江新城花城大道66号B座 网址:www.iqtc.cn 邮编:510623 Add: Tower B, No.66 Huacheng Avenue, Zhujiang Xincheng, Tianhe District, Guangzhou, China No: Date: 8 of 14 Page: Website: www.iqtc.cn Postcode: 510623

01051900007238-1(E) 2020-01-02

6							
序号 No.		竹表 4 pendix 4	TO ME	测试项目名 Name of te		冲 Sho	
标准要求 Requirement of Standard	将电池或电池 $g_n = \sqrt{30000 / m}$ 其正负极各冲 解体、无破裂和 验前电压的 90 Test cells and b support all mou shock of peak a milliseconds. Ea by three shocks or battery for a leakage, no ven cell or battery a requirement rela	hass) 中较小者 击 3 次, 共冲 市 无燃烧, 并且 % (完全放电: atteries shall be nting surfaces of cceleration of 5 ach cell or batte in the negative total of 18 shoc ting, no disasse fter testing is no ating to voltage	的正弦波冲击 击 18 次。各试 每个试验电池 状态的试验电 secured to the of each test batt Ogn or accelera ery shall be sub direction of th ks. Cells and b mbly, no ruptu ot less than 909 is not applicab	,脉冲持续时 验电池或电池 或电池组在 testing machin ery. Each Larg tion $(g_n) = \sqrt{(30)}$ jected to three ree mutually per atteries meet th re and no fire a 6 of its voltage	间 11ms, 按三 组应无重量损 验后的开路电 外)。 e by means of a <u>e batteries shall</u> 0000 / mass) an shocks in the po erpendicular mo is requirement i nd if the open c	个相互垂直的 失、无渗漏、 压不少于其在 a rigid mount v be subjected in d pulse durat ositive directio punting positio if there is no n circuit voltage rior to this pro-	的轴向分别双 无排气、升 E进行这一证 which will to a half-sine ion of 11 n followed ns of the cell nass loss, no of each test cedure. The
	states.( NOTE:	Mass is express	s in kilograms)				
样品状态 Sample status	states.( NOTE: b1#~b2#: 第一 b1#~b2#: first b3#~b4#: 第二	-个循环完全充 t cycle in fully c	电的电池; charged states; 全充电的电池		GUN CENT	er teonit	LOGT CENTLY
Sample status	states.( NOTE: b1#~b2#: 第一 b1#~b2#: first b3#~b4#: 第二	个循环完全充 cycle in fully c 十五个循环完 r 25 cycles end	电的电池; charged states; 全充电的电池 ing in fully cha		质量损失	剩余电压	测试结果
Sample	states.( NOTE: b1#~b2#: 第一 b1#~b2#: first b3#~b4#: 第二 b3#~b4#: afte	个循环完全充 cycle in fully c 十五个循环完 r 25 cycles end	电的电池; charged states; 全充电的电池 ing in fully cha	rged states.	质量损失 Mass loss (%)	剩余电压 Residual OCV(%)	测试结果 Test resul
Sample status 样品编号	states.(NOTE: b1#~b2#: 第一 b1#~b2#: first b3#~b4#: 第二 b3#~b4#: afte 测试前: 电池质量	个循环完全充 cycle in fully c 十五个循环完 r 25 cycles end Before 开路电压	E电的电池; charged states; 全充电的电池 ing in fully cha 测试后 电池质量	rged states. f After 开路电压	Mass loss	Residual	
Sample status 样品编号 Sample No.	states.(NOTE: b1#~b2#: 第一 b1#~b2#: first b3#~b4#: 第二 b3#~b4#: afte 测试前: 电池质量 m <sub>1</sub> (kg)	个循环完全充 cycle in fully c 十五个循环完 r 25 cycles end Before 开路电压 v <sub>1</sub> (v)	eb的电池; charged states; 全充电的电池 ing in fully cha 测试后 电池质量 m <sub>2</sub> (kg)	rged states. After 开路电压 v <sub>2</sub> (v)	Mass loss (%)	Residual OCV(%)	Test resu
Sample status 样品编号 Sample No. b1#	states.(NOTE: b1#~b2#: 第一 b1#~b2#: first b3#~b4#: 第二 b3#~b4#: afte 测试前 电池质量 m <sub>1</sub> (kg) 37.95	个循环完全充 cycle in fully c 十五个循环完 r 25 cycles end Before 开路电压 v <sub>1</sub> (v) 54.70	电的电池; charged states; 全充电的电池 ing in fully cha 测试后 电池质量 m <sub>2</sub> (kg) 37.95	rged states. 在After 开路电压 v <sub>2</sub> (v) 54.70	Mass loss (%) 0.00	Residual OCV(%) 100.00	Test resu O

Note: L-Leakage, V-Venting, D-Disassembly, R-Rupture, F-Fire, O- No Leakage, No Venting, No Disassembly, No Rupture & No Fire.

#### 州海关技术中





地址:中国广州市天河区珠江新城花城大道66号B座 网址:www.iqtc.en 邮编:510623 No: Date: Add: Tower B, No.66 Huacheng Avenue, Zhujiang Xincheng, Tianhe District, Guangzhou, China Page: 9 of 14 Website: www.iqtc.cn Postcode: 510623

01051900007238-1(E) 2020-01-02

序号 No.	附表 5 Appendix 5	测试项目名称 Name of test	外部短路 External short circuit
标准要求 Requirement of Standard	待试验电池或电池组的外壳温度和 小于 $0.1\Omega$ 的短路条件,当电池或 再观察电池或电池组 6h 才结束试 6h 内应无解体、无破裂和无燃烧 The cell or battery to be tested shall reaches $57\pm4$ °C and then the cell or external resistance of less than 0.1 c least one hour after the cell or batter battery must be observed for a furth this requirement if their external ten rupture and no fire within six hours	法电池组外壳温度回到 57±4℃后 试验。电池或电池组的外壳温度, 。 be temperature stabilized so that r battery shall be subjected to a sh ohm at 57±4℃. This short circuit of ry external case temperature has re- ter six hours for the test to be concomperature does not exceed 170℃	继续至少 1h, 然后短路断开 应不超过 170℃, 并且试验后 its external case temperature ort circuit condition with a tota condition is continued for at eturned to 57±4℃. The cell or cluded. Cells and batteries mee
样品状态 Sample status	b1#~b2#: 第一个循环完全充电的 b1#~b2#: first cycle in fully charg b3#~b4#: 第二十五个循环完全充 b3#~b4#: after 25 cycles ending in	ged states; 5电的电池。	HO' GUNT OF Y
	b1#~b2#: first cycle in fully charg b3#~b4#: 第二十五个循环完全充	ged states; E电的电池。 n fully charged states. 测试结果	备注 Remark
Sample status 样品编号	b1#~b2#: first cycle in fully charg b3#~b4#: 第二十五个循环完全充 b3#~b4#: after 25 cycles ending in 样品表面最高温度	ged states; E电的电池。 n fully charged states. 测试结果	备注 Remark
Sample status 样品编号 Sample No.	b1#~b2#: first cycle in fully charg b3#~b4#: 第二十五个循环完全充 b3#~b4#: after 25 cycles ending in 样品表面最高温度 Max External Temperature(	ged states; E电的电池。 n fully charged states. (°C) 测试结果 Test result	备注 Remark / /
Sample status 样品编号 Sample No. b1#	b1#~b2#: first cycle in fully charg b3#~b4#: 第二十五个循环完全充 b3#~b4#: after 25 cycles ending in 样品表面最高温度 Max External Temperature( 60.1	ged states; E电的电池。 n fully charged states. (℃)    测试结果 Test result	备注 Remark / / / /

Note: D-Disassembly, R-Rupture, F-Fire, O-No Disassembly, No Rupture & No Fire.





地址:中国广州市天河区珠江新城花城大道66号B座 网址:www.iqtc.cn 邮编: 510623 Add: Tower B, No.66 Huacheng Avenue, Zhujiang Xincheng, Tianhe District, Guangzhou, China Website:www.iqtc.cn Postcode: 510623

b: 01051900007238-1(E) tte: 2020-01-02 ge: 10 of 14

					- CJ .		
序号 No.	附表 6 Appendiz		. Chi	测试项目 Name of		挤压 Crush	GUA
orthan one of	(适用于棱柱形、) 将电池或元件电池 为1.5cm/s。挤压持	放在两个平 续进行,直	面之间挤度 [到出现一	玉,挤压力度:	逐渐加大,在第一		的速度大
	<ul> <li>(a)施加的力量达到</li> <li>(b)电池的电压下降</li> <li>(c)电池变形量达原;</li> </ul>	至少 100 毫	伏; 或	•			
	棱柱形或袋装电池) 与纵轴垂直的方向;	施压。每个	电池只做-	一次挤压试验	• <u> </u>		
标准要求 Requirement	试验电池或电池组的 无解体、无破裂、		外部温度	不超过170℃,	,并且在试验过程;	中和试验后 €	5小时内
of Standard	Crush (applicable to diameter): A cell or of gradual with a speed continued until the fi (a)The applied force	prismatic, p component c of approxin irst of the the reaches 13k	cell is to be nately 1.5c ree options N±0.78kN	crushed betwo m/s at the first below is reach ;	een two flat surfaces point of contact. Th	. The crushin	g is to b
	(b)The voltage of the (c)The cell is deform				ckness.		
SURACE	(c)The cell is deform Once the maximum p cell is deformed by a Each test cell or com this requirement if th no fire during the test	hed by 50% of pressure has at least 50% aponent cell heir external	or more of been obtai of its origin is to be sub temperatur	its original thi ned, the voltag nal thickness, to bjected to one of re does not exc	ge drops by at least 1 the pressure shall be crush only. Cells and	released. l component o	cells me
样品状态 Sample status	(c)The cell is deform Once the maximum p cell is deformed by a Each test cell or com this requirement if th	hed by 50% of pressure has at least 50% aponent cell heir external at and within 盾环 50% 的 cle at 50% of 五个循环 5	or more of been obtai of its origin is to be sub temperatur six hours a 额定容量的 f the design 0%的额定	its original thi ned, the voltag nal thickness, to jected to one of re does not exc after this test. 为电芯。 n rated capacity 容量的电芯。	ge drops by at least 1 the pressure shall be crush only. Cells and ceed 170°C and ther y of cell.	released. l component o	cells me
	(c)The cell is deform Once the maximum p cell is deformed by a Each test cell or com this requirement if th no fire during the tess C1#~C5#: 第一个很 C1#~C5#: first cyc C6#~C10#: 第二十	hed by 50% of pressure has at least 50% aponent cell heir external at and within 盾环 50% 的 cle at 50% of 五个循环 5	or more of been obtai of its origin is to be sub temperatur six hours a 额定容量的 f the desigr 0%的 额定 60% of the 备注	its original thi ned, the voltag nal thickness, to jected to one of re does not exc after this test. 为电芯。 n rated capacity 容量的电芯。	ge drops by at least 1 the pressure shall be crush only. Cells and ceed 170°C and ther y of cell.	released. l component o e is no disasso	cells mee embly an 备注
Sample status 样品编号	(c)The cell is deform Once the maximum p cell is deformed by a Each test cell or com this requirement if th no fire during the tess C1#~C5#: 第一个征 C1#~C5#: first cyc C6#~C10#: 第二十 C6#~C10#: after 2: 样品表面最高温度 Max External	hed by 50% of pressure has it least 50% iponent cell heir external at and within 盾环 50% by hele at 50% of 五个循环 5 5 cycles at 5 测试结果	or more of been obtai of its origin is to be sub temperatur six hours a 额定容量的 f the desigr 0%的 额定 60% of the 备注	its original thi ned, the voltagen al thickness, to ojected to one of the does not exc after this test. 为电芯。 nated capacity 容量的电芯。 design rated ca 样品编号	ge drops by at least 1 the pressure shall be crush only. Cells and ceed 170℃ and ther y of cell. apacity of cell. 样品表面最高温月 Max External	released. I component of e is no disasso 夏 測试结果	cells mee embly an 备注
Sample status 样品编号 Sample No.	(c)The cell is deform Once the maximum p cell is deformed by a Each test cell or com this requirement if th no fire during the tess C1#~C5#: 第一个征 C1#~C5#: first cyc C6#~C10#: 第二十 C6#~C10#: after 2. 样品表面最高温度 Max External Temperature(℃)	ed by 50% of pressure has at least 50% aponent cell heir external at and within 盾环 50% 的 上自 at 50% of 五个循环 5 5 cycles at 5 测试结果 Test result	or more of been obtai of its origin is to be sub temperatur six hours a 额定容量的 f the desigr 0%的 额定 60% of the 备注	its original thi ned, the voltag nal thickness, to jected to one of the does not exc after this test. 为电芯。 n rated capacity 容量的电芯。 design rated ca 样品编号 Sample No.	ge drops by at least 1 the pressure shall be crush only. Cells and ceed 170℃ and ther y of cell. 样品表面最高温质 Max External Temperature(℃)	released. l component of e is no disasso	cells me embly an 备注
Sample status 样品编号 Sample No. C1#	(c)The cell is deform Once the maximum p cell is deformed by a Each test cell or com this requirement if th no fire during the tess C1#~C5#: 第一个初 C1#~C5#: first cyc C6#~C10#: 第二十 C6#~C10#: after 2 样品表面最高温度 Max External Temperature(℃) 26.0	ed by 50% of pressure has at least 50% of pressure has at least 50% of ponent cell heir external at and within 循环 50% of 五个循环 55 cycles at 55 cycles at 55 测试结果 Test result O	or more of been obtai of its origin is to be sub temperatur six hours a 额定容量的 f the desigr 0%的 额定 60% of the 备注	its original thi ned, the voltag nal thickness, to jected to one of the does not exc after this test. 为电芯。 nated capacity 容量的电芯。 design rated ca 样品编号 Sample No. C6#	ge drops by at least 1 the pressure shall be crush only. Cells and ceed 170°C and ther y of cell. 样品表面最高温月 Max External Temperature(℃) 24.8	released. l component of e is no disasso	cells me embly an 备注
Sample status 样品编号 Sample No. C1# C2#	<ul> <li>(c)The cell is deform Once the maximum p cell is deformed by a Each test cell or com this requirement if th no fire during the tess</li> <li>C1#~C5#: 第一个初 C1#~C5#: 第二十 C6#~C10#: 第二十 C6#~C10#: after 2.</li> <li>样品表面最高温度 Max External Temperature(℃)</li> <li>26.0</li> </ul>	ned by 50% of pressure has it least 50% iponent cell neir external it and within 盾环 50% by cle at 50% of 五个循环 5 5 cycles at 5 测试结果 Test result O	or more of been obtai of its origin is to be sub temperatur six hours a 额定容量的 f the design 0% of the 备注 Remark /	its original thi ned, the voltag nal thickness, to ojected to one of re does not exc after this test. 为电芯。 n rated capacity 容量的电芯。 design rated ca 样品编号 Sample No. C6#	ge drops by at least 1 the pressure shall be crush only. Cells and ceed 170°C and ther y of cell. 样品表面最高温度 Max External Temperature(°C) 24.8 25.0	released. l component of e is no disasso	cells med embly an 备注 Reman /

注: D-解体; R-破裂; F-起火; O-无解体、无破裂、无起火。

Note: D-Disassembly, R-Rupture, F-Fire, O-No Disassembly, No Rupture & No Fire.

#### GUANGZHOU CUSTOMS DISTRICT TECHNOLOGY CENTER



地址:中国广州市天河区珠江新城花城大道66号B座 网址:www.iqtc.cn 邮编: 510623 Add: Tower B, No.66 Huacheng Avenue, Zhujiang Xincheng, Tianhe District, Guangzhou, China Website:www.iqtc.cn Postcode: 510623

15		,0,	.02	10		
序号 No.	附表 7 Appendix 7	测试项目名 Name of te		CUSTOR	过度充电 Overcharge	CUAN
标准要求 Requirement of Standard	<ul> <li>(a)制造商建议 倍或 22V 两者中</li> <li>(b)制造商建议 可再充电电池:</li> <li>The charge current current. The minii (a) When the man voltage of the test 22V.</li> <li>(b) When the man</li> </ul>	制造商建议的最大连续的充电电压不大于 18 的充电电压大于 18 的充电电压大于 18V 和 组在环境温度下试验 24 t shall be twice the manu num voltage of the test s ufacturer's recommended shall be the lesser of two ufacturer's recommended 1.2 times the maximum	V 时,试验的最 时,试验的最 h。试样在试 ufacturer's reco hall be as folle l charge voltag o times the ma d charge voltag	为最小电压应是引 小电压应是引 验后7天内) ommended ma ows: ge is not more ximum chargo ge is more tha	是电池组最大充 最大充电电压的 立无解体和无燃; aximum continuou than 18V, the mi e voltage of the ba	电电压的可 1.2 倍。 烧。 us charge nimum attery or
	Tests are to be c	conducted at ambient te	mperature. Th	ne duration o		
样品状态 Sample status	Tests are to be c Rechargeable batt days of the test. b1#~b2#: 第一个 b1#~b2#: first c b3#~b4#: 第二十	conducted at ambient te teries meet this requiren 你循环完全充电的电池; ycle in fully charged stat 五个循环完全充电的电	mperature. Thent if there is es; 王池。	ne duration o s no disassem		
Sample	Tests are to be c Rechargeable batt days of the test. b1#~b2#: 第一个 b1#~b2#: first c b3#~b4#: 第二十	conducted at ambient te eries meet this requiren 価环完全充电的电池; ycle in fully charged state	mperature. Thent if there is es; 王池。	ne duration o s no disassem		
Sample status 样品编号	Tests are to be c Rechargeable batt days of the test. b1#~b2#: 第一个 b1#~b2#: first c b3#~b4#: 第二十	conducted at ambient te erries meet this requirem 価环完全充电的电池; ycle in fully charged statt 五个循环完全充电的电 25 cycles ending in fully 测试结果	mperature. Thennent if there is es; 已池。 charged states 未安装 在另一	ne duration o s no disassen 过度充电保:	ibly and no fire, 备注	within seve 要求只能用 池组或设备

注: D-解体; R-破裂; F-起火; O-无解体、无破裂、无起火。 Note: D-Disassembly, R-Rupture, F-Fire, O-No Disassembly, No Rupture & No Fire.



#### GUANGZHOU CUSTOMS DISTRICT TECHNOLOGY CENTER

地址:中国广州市天河区珠江新城花城大道66号B座 网址:www.iqtc.cn 邮编: 510623 Add: Tower B, No.66 Huacheng Avenue, Zhujiang Xincheng, Tianhe District, Guangzhou, China Website:www.iqtc.cn Postcode: 510623

No: 01051900007238-1(E) Date: 2020-01-02 Page: 12 of 14

序号	附表 8	10114	测试项目名		强制放电
No.	Appendix	8	Name of t	est	Forced discharge
标准要求 Requirement of Standard	试验原电池或可再3 定的最大放电电流的 燃烧。 Each cell shall be for D.C. power supply at manufacturer. The sp appropriate size and interval (in hours) eq or rechargeable cells of the test.	的条件下强制放 ced discharged a t an initial currer pecified discharg rating in series v ual to its rated c	电。原电池或可存 at ambient tempera at equal to the max e current is to be of vith the test cell. Ea apacity divided by	再充电电池在试验后 ture by connecting it imum discharge curre btained by connecting ach cell shall be force the initial test current	7 天内应无解体和 in series with a 12V ent specified by the g a resistive load of t d discharged for a tin t (in Ampere). Prima
样品状态 Sample status	C11#~C20#:第一个 C11#~C20#:first cyc C21#~C30#:第二一 C21#~C30#:after 25	cle in fully disch 十五个循环完全	arged states; 放电的电芯。	NS V UNNELHOUGHS	GUANGLIN
样品编号 Sample No.	测试结果 Test result	备注 Remark	样品编号 Sample No.	测试结果 Test result	备注 Remark
C11#	0 0	/	C21#	0	ECHINE /
C12#	0		C22#	0	and I was
C13#	0 6	5 / 2C	C23#	0	J.
C14#	0	10	C24#	0	athow /
C15#	0	15DIS I	C25#	0	
C16#	Sole O	on /	C26#	0	A P
C17#	0,000	Sumo	C27#	0	
C18#	0	/	C28#	0	
C19#	0	1 2	C29#	0	509
C20#	0	JOHN STATE	C30#	0	×OM.

注: D-解体; R-破裂; F-起火; O-无解体、无破裂、无起火。 Note: D-Disassembly, R-Rupture, F-Fire, O-No Disassembly, No Rupture & No Fire.

#### GUANGZHOU CUSTOMS DISTRICT TECHNOLOGY CENTER

地址:中国广州市天河区珠江新城花城大道66号B座 网址:www.iqtc.cn 邮编:510623 Add:Tower B, No.66 Huacheng Avenue, Zhujiang Xincheng, Tianhe District, Guangzhou, China Website:www.iqtc.cn Postcode:510623

No: 01051900007238-1(E) Date: 2020-01-02 Page: 13 of 14





GUANGZHOU CUSTOMS DISTRICT TECHNOLOGY CENTER

地址:中国广州市天河区珠江新城花城大道66号B座 网址:www.iqtc.cn 邮编:510623 Add:Tower B, No.66 Huacheng Avenue, Zhujiang Xincheng, Tianhe District, Guangzhou, China Website:www.iqtc.cn Postcode:510623

No: 01051900007238-1(E) Date: 2020-01-02 Page: 14 of 14

#### 声明 Statement

1.本报告无检验单位公章无效。

The test report is invalid without the official stamp of IQTC.

2本报告无批准人、审核人及主检人签名无效。

The test report is invalid without the signatures of Approver, Checker and Appraiser.

3.本报告涂改无效。未经本实验室书面同意,不得部分地复制本报告。

The test report is invalid if altered. Nobody is allowed to photocopy or partly photocopy this report without written permission of IQTC

4.客户必须如实提供样品及资料,并保证申报品名和样品以及运输货物相同,否则本检测单位不 承担任何相关责任。

The client should provide samples and relevant data, at the same time, they should guarantee the consistence of the product's name they declared, the samples they provided and the goods to be transported. Otherwise we will not bear any relevant responsibilities.

5.对检验报告若有异议,应于收到报告之日起十五天内向检验单位提出。

Objection to the test report must be submitted to IQTC within 15 days

6.本报告仅对送检样品负责。

The test report is valid for the tested samples only.

7.检验地址:广东省广州市科学城南翔支路1号C102房(轻工科学城实验室)

Inspection Address: Room C102, No,1 Nanxiangzhi Road, Science City, Guangzhou, Guangdong, China (Light Industry Testing Laboratory in Science City)

电话(Tel): 020-38669019

电子邮箱(E-mail): itl@iqtc.cn

\* \* 报告结束 End of report \* \* \*