NTEK北测 ilac-MRA CNAS 中国认可 国际互认 检测 TESTING CNAS L5516

Report No.报告编号: S20021701202001

UN38.3 Test Report

UN38.3 检测报告

Name of Products:	Rechargeable Li-ion Battery GYJS0
产品名称：	可充电锂离子电池组 GYJS0
Applicant:	Chongqing VDL Electronics Co., Ltd.
委托单位：	重庆市紫建电子股份有限公司
Manufacturer:	Chongqing VDL Electronics Co., Ltd.
生产厂商：	重庆市紫建电子股份有限公司
Date of issue： 签发日期：	2020-03-03

Shenzhen NTEK Testing Technology Co., Ltd.

深 圳 市 北 测 检 测 技 术 有 限 公 司

Applicant 委托单位	Chongqing VDL Electronics Co., Ltd. 重庆市紫建电子股份有限公司
Address of Applicant 委托单位地址	Building 1-4, Puli Industrial New Area, Zhaojia Street, Kaizhou District, Chongqing, China 重庆市开州区赵家街道浦里工业新区 1-4 号楼
Manufacturer 生产厂商	Chongqing VDL Electronics Co., Ltd. 重庆市紫建电子股份有限公司
Address of manufacturer 生产厂商地址	Building 1-4, Puli Industrial New Area, Zhaojia Street, Kaizhou District, Chongqing, China 重庆市开州区赵家街道浦里工业新区 1-4 号楼
Name of Products 产品名称	Rechargeable Li-ion Battery 可充电锂离子电池组
Model/type reference 型号	GYJS0

Tested according to 测试依据:

Recommendations on the TRANSPORT OF DANGEROUS GOODS, Manual of Tests and Criteria, PART III, section 38.3 Lithium metal and lithium ion batteries, the sixth revised edition, amendment 1 (ST/SG/AC.10/11/Rev.6/Amend.1).

联合国《关于危险货物运输的建议书，试验和标准手册》，第三部分，38.3 节锂金属和锂离子电池要求，第六修订版修正 1 (ST/SG/AC.10/11/Rev.6/Amend.1)

Tests performed 测试项目:

Test T.1: Altitude simulation 试验 T.1：高度模拟	Test T.5: External short circuit 试验 T.5：外部短路
Test T.2: Thermal Test 试验 T.2：温度试验	Test T.6: Crush 试验 T.6：挤压
Test T.3: Vibration 试验 T.3：振动	Test T.7: Overcharge 试验 T.7：过度充电
Test T.4: Shock 试验 T.4：冲击	Test T.8: Forced discharge 试验 T.8：强制放电

Test Conclusion 试验结论:

The Rechargeable Li-ion Battery submitted by Chongqing VDL Electronics Co., Ltd. is tested according to the *Recommendations on the TRANSPORT OF DANGEROUS GOODS, Manual of Tests and Criteria, PART III, section 38.3 Lithium metal and lithium ion batteries, the sixth revised edition, amendment 1 (ST/SG/AC.10/11/Rev.6/Amend.1).*

Test results: PASS

由重庆市紫建电子股份有限公司提交的可充电锂离子电池组按照联合国《关于危险货物运输的建议书，试验和标准手册》，第三部分，38.3 节锂金属和锂离子电池要求，第六修订版修正 1 (ST/SG/AC.10/11/Rev.6/Amend.1)进行测试。

测试结果：合格

Tested by: 主检人：	James Cai 蔡锦忠	蔡锦忠
Reviewed by: 审核人：	Mumu Huang 黄天生	黄天生
Approved by: 批准人：	Wetow Huang 黄文韬	

Seal of NTEK
报告单位（盖章）

General product information 通用产品信息:			
Nominal Voltage 标称电压	3.7V	Rated Capacity 额定容量	500mAh
Standard Charging Current 标准充电电流	250mA	Nominal energy / Watt-hour rating 额定能量/额定瓦时	1.85Wh
Limited Charging Voltage 充电限制电压	4.2V	Max. Continuous Charging Current 最大持续充电电流	500mA
Standard Discharge Current 标准放电电流	100mA	Cut-off Voltage 放电截止电压	3.0V
Number of cells 电芯数量	Single cell 单电芯	Max. Continuous Discharge Current 最大持续放电电流	500mA
Cell's Max. Continuous Discharge Current 电芯最大持续放电电流	500mA	Rated Capacity of Cell 电芯额定容量	500mAh
Classification 类别	Small Lithium ion Cells 小型锂离子电芯	Dimension (T×W×H) 尺寸	10.58×18.0×31.0mm
Appearance 外观	Silvery and Prismatic 银色、棱柱形		

Date of receipt of test item 接收日期	2020-02-19	Completion Date 完成日期	2020-03-03

Remarks 备注说明:

Batteries of #S200217012005-001 ~ #S200217012005-005 are fully charged at first cycle;

Batteries of #S200217012005-006 ~ #S200217012005-010 are fully charged after 25 cycles;

Component cells of #S200217012005-011 ~ #S200217012005-015 at 50% of the design rated capacity at first cycle;

Component cells of #S200217012005-016 ~ #S200217012005-020 at 50% of the design rated capacity after 25 cycles;

Batteries of #S200217012005-021 ~ #S200217012005-024 are fully charged at first cycle;

Batteries of #S200217012005-025 ~ #S200217012005-028 are fully charged after 25 cycles;

Component cells of #S200217012005-029 ~ #S200217012005-038 are fully discharged at first cycle;

Component cells of #S200217012005-039 ~ #S200217012005-048 are fully discharged after 25 cycles;

Test environment condition: Room temperature: 15-25°C; Room humidity: 40-70%

电池#S200217012005-001 ~ #S200217012005-005 为首次循环满电状态；

电池#S200217012005-006 ~ #S200217012005-010 为 25 次循环后满电状态；

元件电池芯#S200217012005-011 ~ #S200217012005-015 为首次循环 50%电荷状态；

元件电池芯#S200217012005-016 ~ #S200217012005-020 为 25 次循环后 50%电荷状态；

电池#S200217012005-021 ~ #S200217012005-024 为首次循环满电状态；
电池#S200217012005-025 ~ #S200217012005-028 为 25 次循环后满电状态；
元件电池芯#S200217012005-029 ~ #S200217012005-038 为首次循环完全放电状态；
元件电池芯#S200217012005-039 ~ #S200217012005-048 为 25 次循环后完全放电状态；
试验环境条件：环境温度：15-25°C；环境湿度：40-70%

Summaries of testing 测试摘要:

All rechargeable battery types, including those composed of previously tested cells, shall be subjected to tests T.1 to T.5 and T.7. In addition, rechargeable single cell batteries with overcharge protection shall be subjected to test T.7.

所有可充电的电池组类型，包括由已经通过试验的电芯组成的电池，均须做 T.1 至 T.5 和 T.7 的试验。此外，带有防止过充电保护装置的可充电的单电芯电池也必须承受 T.7 的试验。

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.

电池必须按顺序在相同的一组电池上进行T.1至T.5的试验。T.6和T.8的试验应使用另外未试验过的电池。T.7的试验可以使用先前在T.1至T.5的试验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。

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

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

为了量化质量损失，使用以下公式计算：

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

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 is considered as "no mass loss".

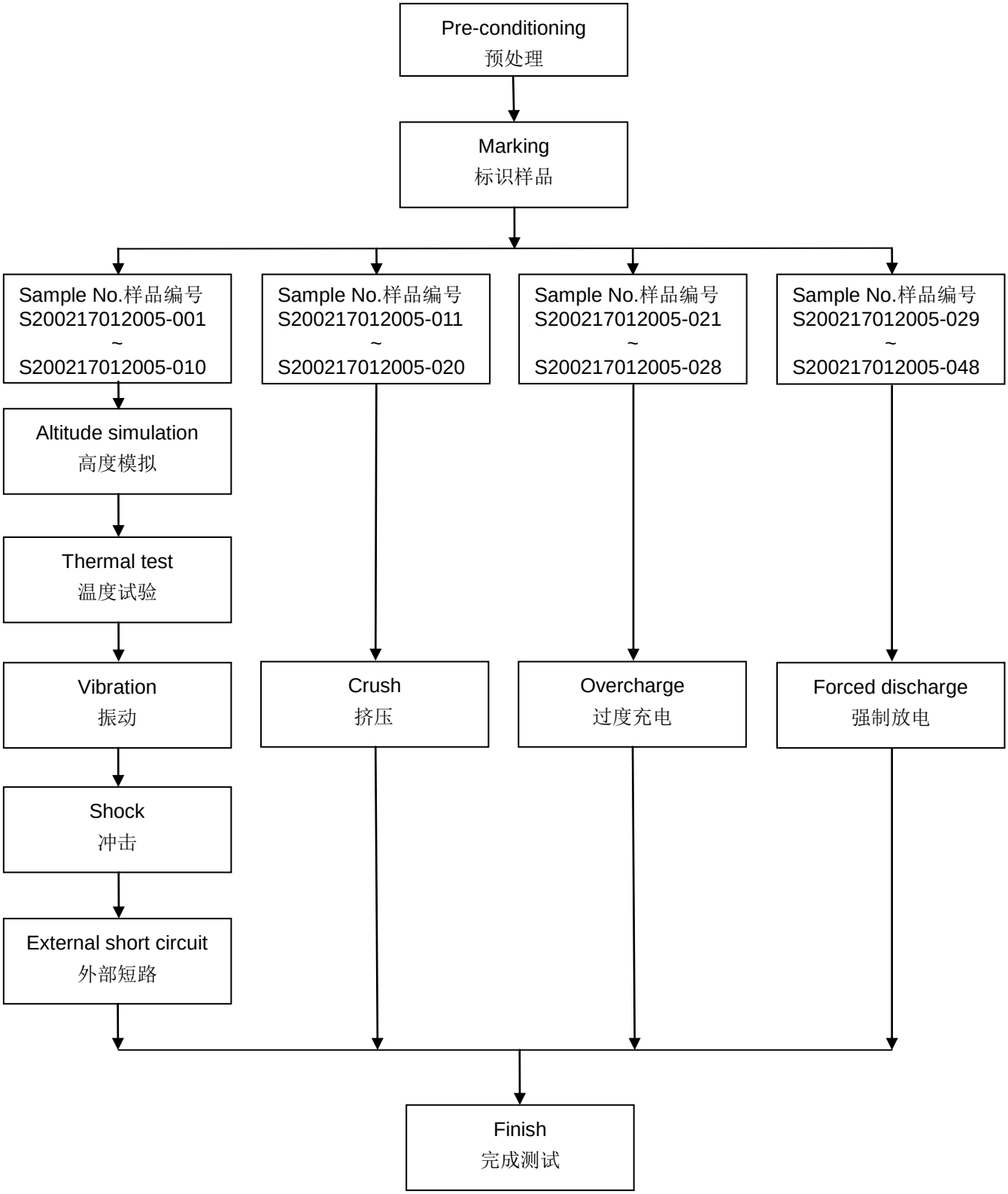
式中：M_1是试验前的质量，M_2是试验后的质量。如果质量损失不超过下表所列的数值，应视为“无质量损失”。

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%

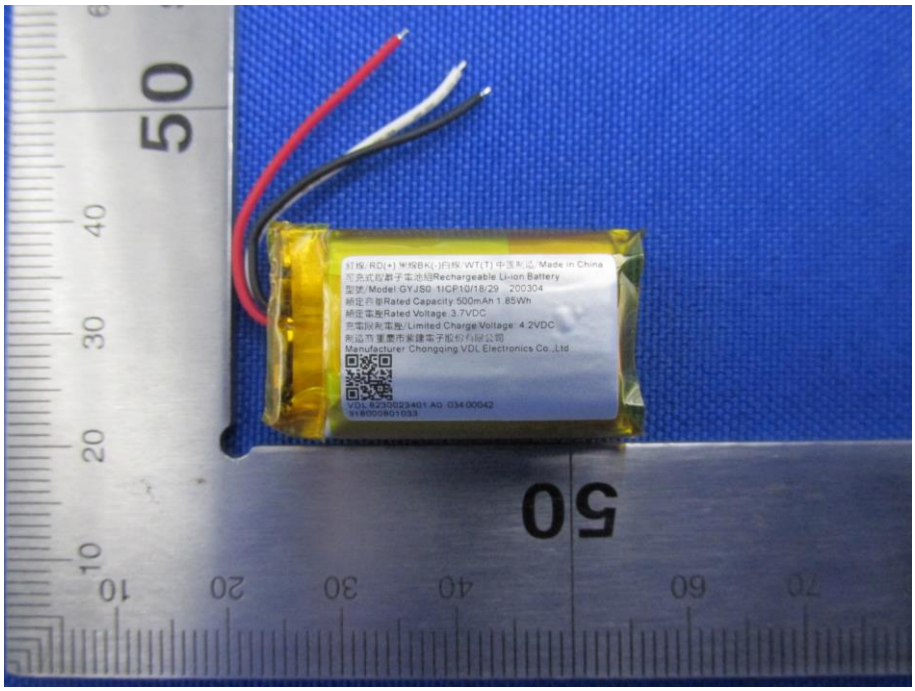
In tests T.1 to T.4, batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test battery after testing is not less than 90% of its voltage immediately prior to this procedure.

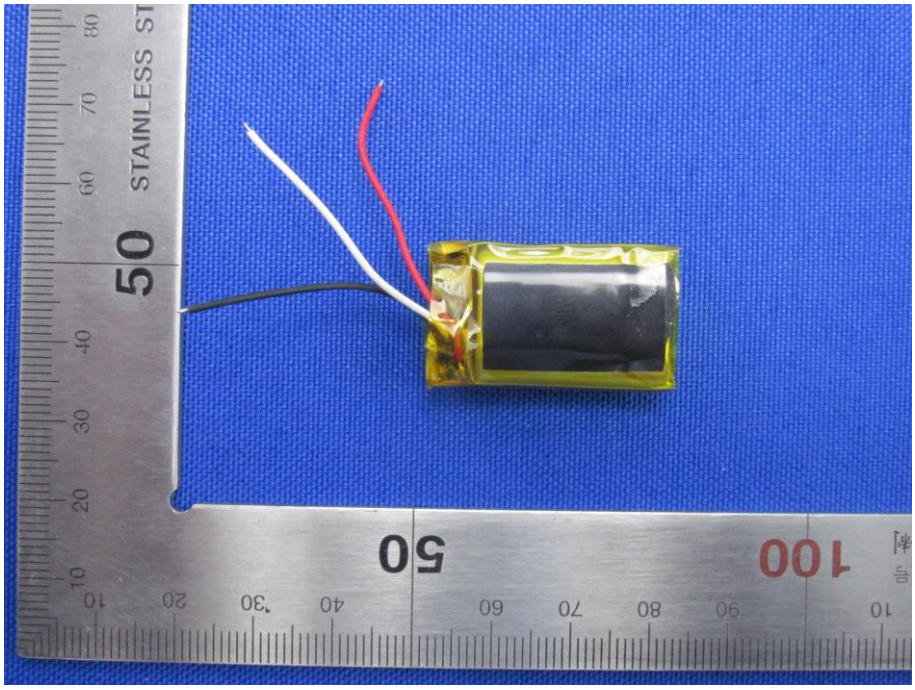
在T.1至T.4的试验中，电池须满足无渗漏、无泄气、无解体、无破裂和无起火，并且每个试验电池在试验后的开路电压不小于其在进行这一试验前电压的90%。

Test Procedure 测试程序

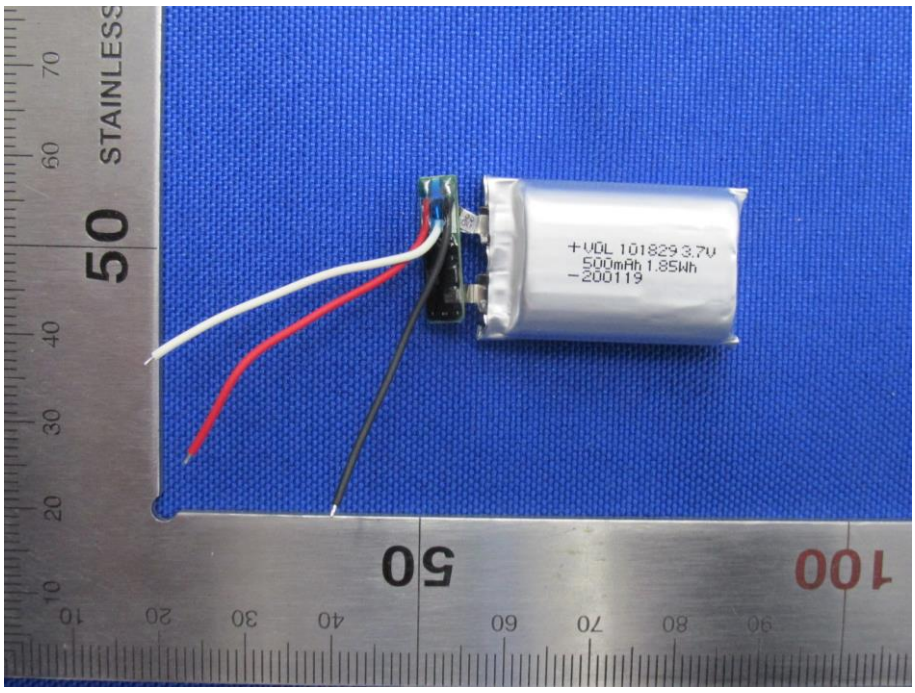


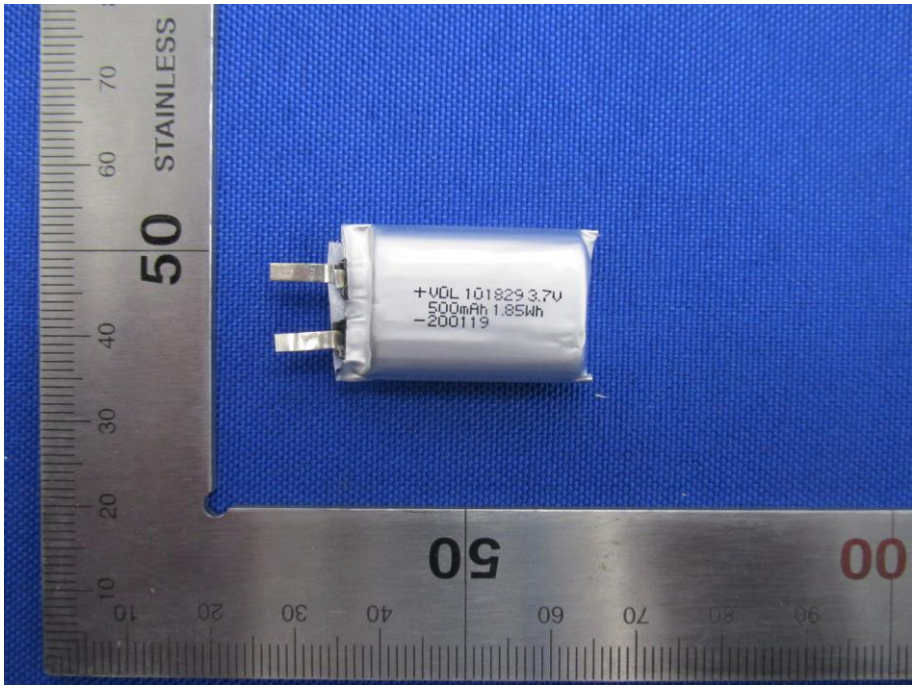
Photos of sample 样品照片



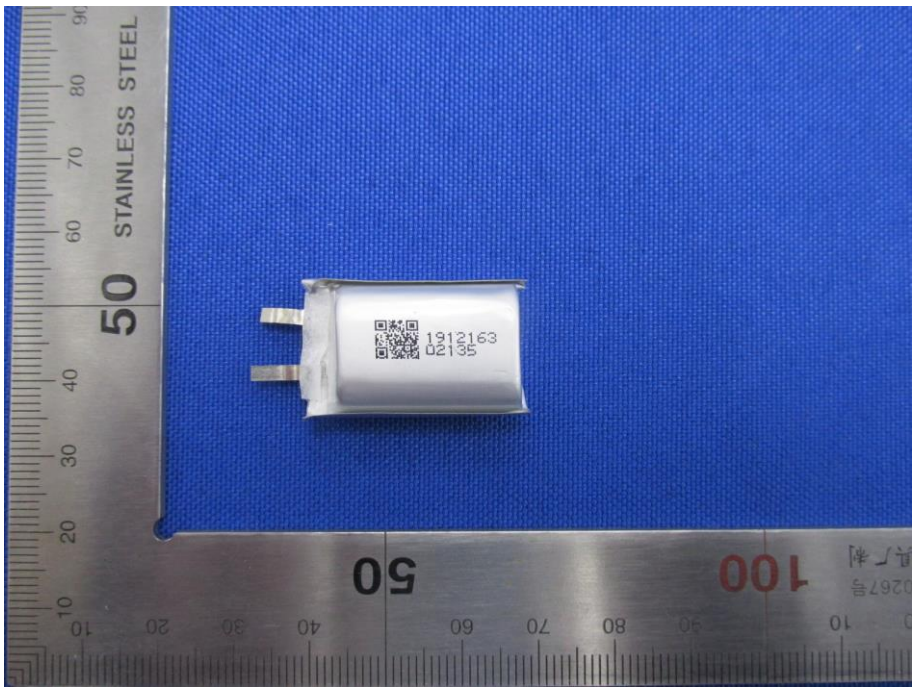


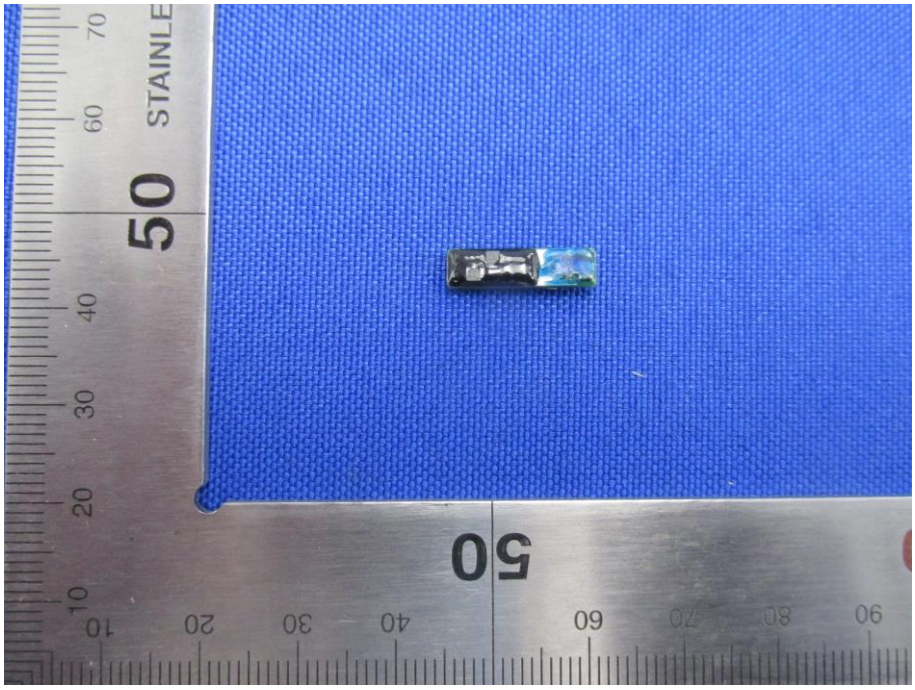
Photos of sample 样品照片



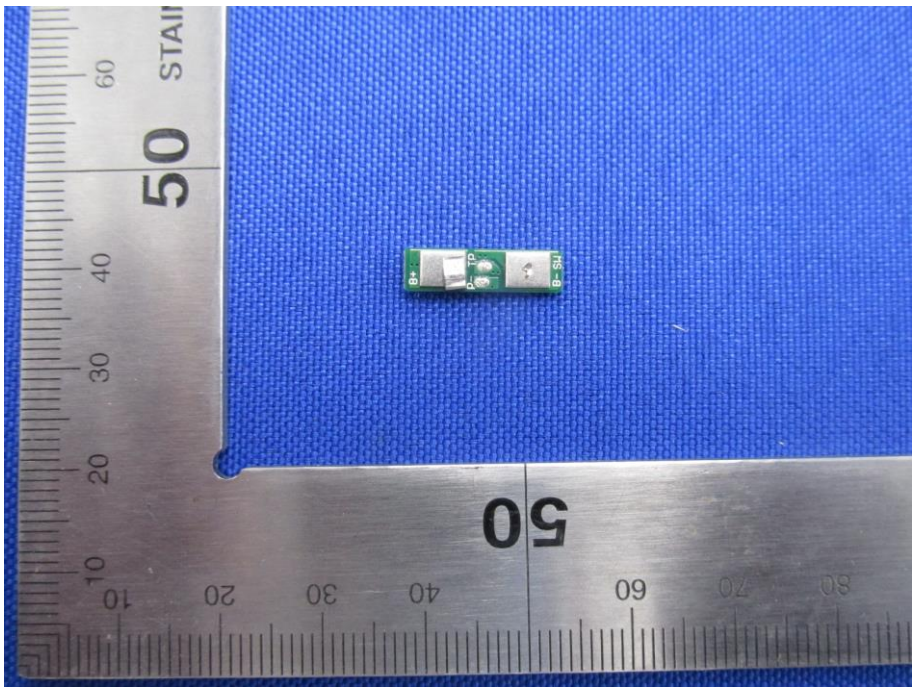


Photos of sample 样品照片





Photos of sample 样品照片



Test results 测试结果:

Test T.1: Altitude simulation 试验T.1：高度模拟

Test method 测试方法

Batteries are stored at a pressure of 11.6 kPa or less for at least six hours at ambient temperature (20 ± 5°C).
试验电池被放置在压力等于或低于11.6 kPa和环境温度(20±5°C)下存放至少6小时。

Requirement 要求

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.
电池须无渗漏、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%。

Test Data showed in table below 测试数据见下表

State of samples 样品状态	No. 编号	Prior to test 试验前		After test 试验后		Mass loss 质量损失 (%)	Voltage after test/ voltage prior to test 试验后电压/试验前电压 (%)	Results 结果
		Mass 质量 (g)	Voltage 电压 (V)	Mass 质量 (g)	Voltage 电压 (V)			
At first cycle, in fully charged states 首次循环满电状态	S20021701 2005-001	9.2913	4.179	9.2913	4.179	0.000	100.0	PASS 合格
	S20021701 2005-002	9.3416	4.182	9.3416	4.182	0.000	100.0	PASS 合格
	S20021701 2005-003	9.4414	4.181	9.4414	4.181	0.000	100.0	PASS 合格
	S20021701 2005-004	9.3651	4.179	9.3651	4.179	0.000	100.0	PASS 合格
	S20021701 2005-005	9.4014	4.179	9.4014	4.179	0.000	100.0	PASS 合格
After 25 cycles ending in fully charged states 25 次循环后满电状态	S20021701 2005-006	9.4455	4.180	9.4455	4.180	0.000	100.0	PASS 合格
	S20021701 2005-007	9.4219	4.177	9.4219	4.177	0.000	100.0	PASS 合格
	S20021701 2005-008	9.3210	4.179	9.3210	4.179	0.000	100.0	PASS 合格
	S20021701 2005-009	9.3712	4.179	9.3712	4.179	0.000	100.0	PASS 合格
	S20021701 2005-010	9.4627	4.179	9.4627	4.179	0.000	100.0	PASS 合格

Notes 注释:

After the test, there is no leakage, no venting, no disassembly, no rupture and no fire.
测试后，电池未渗漏、未泄气、未解体、未破裂和未起火。

Room temperature 环境温度: 20.1°C

Test T.2: Thermal test 试验T.2：温度试验

Test method 测试方法

Batteries are to be stored for at least six hours at a test temperature equal to 72 ± 2°C, followed by storage for at least six hours at a test temperature equal to -40 ± 2°C. The maximum time interval between test temperature extremes is 30 minutes. This procedure is to be repeated 10 times, after which all test batteries are to be stored for 24 hours at ambient temperature (20 ± 5°C).

电池放置在试验温度等于72±2°C的条件下存放至少6小时，接着再在试验温度等于-40±2°C的条件下存放至少6小时。两个极端试验温度之间的最大时间间隔为30分钟。此程序重复进行，共完成10次，接着将所有试验电池在环境温度(20±5°C)下存放24小时。

Requirement 要求

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.

电池须无渗漏、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%。

Test Data showed in table below 测试数据见下表

State of samples 样品状态	No. 编号	Prior to test 试验前		After test 试验后		Mass loss 质量损失 (%)	Voltage after test/ voltage prior to test 试验后电压/试验前电压 (%)	Results 结果
		Mass 质量 (g)	Voltage 电压 (V)	Mass 质量 (g)	Voltage 电压 (V)			
At first cycle, in fully charged states 首次循环满电状态	S20021701 2005-001	9.2913	4.179	9.2871	4.141	0.045	99.09	PASS 合格
	S20021701 2005-002	9.3416	4.182	9.3359	4.144	0.061	99.09	PASS 合格
	S20021701 2005-003	9.4414	4.181	9.4365	4.145	0.052	99.14	PASS 合格
	S20021701 2005-004	9.3651	4.179	9.3613	4.145	0.041	99.19	PASS 合格
	S20021701 2005-005	9.4014	4.179	9.3967	4.142	0.050	99.11	PASS 合格
After 25 cycles ending in fully charged states 25 次循环后满电状态	S20021701 2005-006	9.4455	4.180	9.4404	4.140	0.054	99.04	PASS 合格
	S20021701 2005-007	9.4219	4.177	9.4179	4.142	0.042	99.16	PASS 合格
	S20021701 2005-008	9.3210	4.179	9.3175	4.143	0.038	99.14	PASS 合格
	S20021701 2005-009	9.3712	4.179	9.3674	4.144	0.041	99.16	PASS 合格
	S20021701 2005-010	9.4627	4.179	9.4572	4.139	0.058	99.04	PASS 合格

Notes 注释:
After the test, there is no leakage, no venting, no disassembly, no rupture and no fire.
测试后，电池未渗漏、未泄气、未解体、未破裂和未起火。
Room temperature 环境温度: 21.0°C

Test T.3: Vibration 试验T.3：振动

Test method 测试方法
Batteries are firmly secured to the platform of the vibration machine without distorting the cells in such a manner as to faithfully transmit the vibration. The vibration shall be a sinusoidal waveform with a logarithmic sweep between 7 Hz and 200 Hz and back to 7 Hz traversed in 15 minutes. This cycle shall be repeated 12 times for a total of 3 hours for each of three mutually perpendicular mounting positions of the cell. One of the directions of vibration must be perpendicular to the terminal face.
The logarithmic frequency sweep is as follows: from 7 Hz a peak acceleration of 1 g_n 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 g_n occurs (approximately 50 Hz). A peak acceleration of 8 g_n is then maintained until the frequency is increased to 200 Hz.
电池紧固于振动台台面，但不得造成电芯变形，并能准确可靠地传播振动。振动应是正弦波形，对数扫描频率在7 Hz和200 Hz之间，再回到7 Hz，1次循环时间为15分钟。这一振动过程须对三个互相垂直的电芯安装方位的每一方向重复进行12次，总共为时3小时。其中一个振动方向必须与端面垂直。
对数扫频方式：从7 Hz开始，保持1 g_n的最大加速度，直到频率达到18 Hz。然后将振幅保持在0.8mm（总位移1.6mm），并增加频率直到峰值加速度达到8 g_n（频率约为50 Hz）。将峰值加速度保持在8 g_n直到频率增加到200 Hz。
Requirement 要求
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 battery directly after testing in its third perpendicular mounting position is not less than 90% of its voltage immediately prior to this procedure.
测试中和测试后电池须无渗漏、无泄气、无解体、无破裂和无起火，并且每个试验电池在第三个垂直安装方位上的试验后立即测得的开路电压不小于在进行这一试验前电压的90%。

Test Data showed in table below 测试数据见下表

State of samples 样品状态	No. 编号	Prior to test 试验前		After test 试验后		Mass loss 质量损失 (%)	Voltage after test/ voltage prior to test 试验后电压/试验前电压 (%)	Results 结果
		Mass 质量 (g)	Voltage 电压 (V)	Mass 质量 (g)	Voltage 电压 (V)			
At first cycle, in fully charged states 首次循环满电状态	S20021701 2005-001	9.2871	4.141	9.2871	4.141	0.000	100.0	PASS 合格
	S20021701 2005-002	9.3359	4.144	9.3359	4.144	0.000	100.0	PASS 合格
	S20021701 2005-003	9.4365	4.145	9.4365	4.145	0.000	100.0	PASS 合格

	S20021701 2005-004	9.3613	4.145	9.3613	4.145	0.000	100.0	PASS 合格
	S20021701 2005-005	9.3967	4.142	9.3967	4.142	0.000	100.0	PASS 合格
After 25 cycles ending in fully charged states 25 次循环后满电状态	S20021701 2005-006	9.4404	4.140	9.4404	4.140	0.000	100.0	PASS 合格
	S20021701 2005-007	9.4179	4.142	9.4179	4.142	0.000	100.0	PASS 合格
	S20021701 2005-008	9.3175	4.143	9.3175	4.143	0.000	100.0	PASS 合格
	S20021701 2005-009	9.3674	4.144	9.3674	4.144	0.000	100.0	PASS 合格
	S20021701 2005-010	9.4572	4.139	9.4572	4.139	0.000	100.0	PASS 合格

Notes 注释:
During and after the test, there is no leakage, no venting, no disassembly, no rupture and no fire.
测试中和测试后，电池未渗漏、未泄气、未解体、未破裂和未起火。
Room temperature 环境温度: 24.0°C

Test T.4: Shock 试验 T.4：冲击

Test method 测试方法
Batteries are secured to the testing machine by means of a rigid mount which will support all mounting surfaces of each test battery. Each battery is subjected to a half-sine shock of peak acceleration of 150 g_n and pulse duration of 6 milliseconds. Each battery is subjected to three shocks in the positive direction followed by three shocks in the negative direction of three mutually perpendicular mounting positions of the battery for a total of 18 shocks.
试验电池用刚性支架紧固在试验装置上，支架支撑着每个试验电池的所有安装面。每个电池须经受峰值加速度150 gn和脉冲持续时间6 ms的半正弦波冲击。每个电池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。
Requirement 要求
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.
电池须无渗漏、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%。

Test Data showed in table below 测试数据见下表

State of samples 样品状态	No. 编号	Prior to test 试验前		After test 试验后		Mass loss 质量损失 (%)	Voltage after test/ voltage prior to test 试验后电压/试验前电压 (%)	Results 结果
		Mass 质量 (g)	Voltage 电压 (V)	Mass 质量 (g)	Voltage 电压 (V)			
At first cycle, in fully charged states 首次循环满电状态	S20021701 2005-001	9.2871	4.141	9.2871	4.141	0.000	100.0	PASS 合格
	S20021701 2005-002	9.3359	4.144	9.3359	4.144	0.000	100.0	PASS 合格
	S20021701 2005-003	9.4365	4.145	9.4365	4.145	0.000	100.0	PASS 合格
	S20021701 2005-004	9.3613	4.145	9.3613	4.145	0.000	100.0	PASS 合格
	S20021701 2005-005	9.3967	4.142	9.3967	4.142	0.000	100.0	PASS 合格
After 25 cycles ending in fully charged states 25 次循环后满电状态	S20021701 2005-006	9.4404	4.140	9.4404	4.140	0.000	100.0	PASS 合格
	S20021701 2005-007	9.4179	4.142	9.4179	4.142	0.000	100.0	PASS 合格
	S20021701 2005-008	9.3175	4.143	9.3175	4.143	0.000	100.0	PASS 合格
	S20021701 2005-009	9.3674	4.144	9.3674	4.144	0.000	100.0	PASS 合格
	S20021701 2005-010	9.4572	4.139	9.4572	4.139	0.000	100.0	PASS 合格

Notes 注释:

After the test, there is no leakage, no venting, no disassembly, no rupture and no fire.

测试后，电池未渗漏、未泄气、未解体、未破裂和未起火。

Room temperature 环境温度: 24.2°C

Test T.5: External short circuit 试验T.5：外部短路

Test method 测试方法

Batteries to be tested are 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 battery and is assessed and documented. Then the battery at 57 ± 4 °C is subjected to one short circuit condition with a total external resistance of less than 0.1 ohm.

This short circuit condition is continued for at least one hour after the battery external case temperature has returned to 57 ± 4 °C.

The short circuit and cooling down phases are conducted at least at ambient temperature.

试验电池首先被加热或恒定一段时间，使其达到57 ± 4 °C并使其外表面温度均匀恒定在57 ± 4 °C。该加热时间或热恒定时间的长短取决于该电池的尺寸和设计，并同时加以评估及提供文件证明。然后该电池在57 ± 4 °C的条件下承受一个外部总阻抗小于0.1Ω的短路条件。

该短路测试持续到电池外表面温度返回至57 ± 4 °C后再保持至少1小时。
该短路和冷却阶段均被执行在57 ± 4 °C的环境温度下。

Requirement 要求

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 test.
电池外壳温度不超过170°C，并且在试验过程中及试验后6小时内无解体、无破裂，无起火。

Test data showed in table below 测试数据见下表

State of samples 样品状态	No. 编号	Maximum outer casing temperature 电池表面最高温度 (°C)	Results 结果
At first cycle, in fully charged states 首次循环满电状态	S200217012005-001	57.8	PASS 合格
	S200217012005-002	57.7	PASS 合格
	S200217012005-003	58.1	PASS 合格
	S200217012005-004	58.2	PASS 合格
	S200217012005-005	57.4	PASS 合格
After 25 cycles ending in fully charged states 25 次循环后满电状态	S200217012005-006	58.5	PASS 合格
	S200217012005-007	57.9	PASS 合格
	S200217012005-008	58.3	PASS 合格
	S200217012005-009	57.5	PASS 合格
	S200217012005-010	57.4	PASS 合格

Notes 注释:

There is no disassembly, no rupture and no fire during the test and within six hours after test.
电池在测试中和测试后 6 小时内未解体、未破裂，未起火。

Room temperature 环境温度: 24.0°C

Test T.6: Crush 试验T.6：挤压

Test method 测试方法

A 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 ± 0.78 kN;
(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 is 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.
Each component cell is to be subjected to one crush only. The test sample is observed for a further 6 h. The test is conducted using component cells that have not previously been subjected to other tests.
将元件电池芯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 cm/s。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 13 kN ± 0.78 kN；

(b) 电芯的电压下降至少 100mV；或

(c) 电芯形变达原始厚度的 50%或更多。

一旦达到最大压力、电压下降 100mV 或更多，或电芯形变至少达原厚度的 50%，即可解除压力。

棱柱形或袋装电芯须从最宽的面施压。扣式或币式电芯，须施加挤压力在它的扁平面之间。圆柱形电芯，挤压力须施加于垂直于电芯纵轴的方向上。

每个试样元件电池芯只做一次挤压试验。试样须继续观察 6 小时。试验须使用之前未做过其他试验的元件电池芯进行。

Requirement 要求

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 the test.

元件电池芯外壳温度不超过170°C，并且在试验过程中及试验后6小时内无解体，无起火。

Test data showed in table below 测试数据见下表

State of samples 样品状态	No. 编号	Maximum outer casing temperature 电池芯表面最高温度 (°C)	Results 结果
At first cycle at 50% of the design rated capacity.首次循环50%电荷状态	S200217012005-011	25.0	PASS 合格
	S200217012005-012	25.7	PASS 合格
	S200217012005-013	26.2	PASS 合格
	S200217012005-014	25.2	PASS 合格
	S200217012005-015	26.0	PASS 合格
After 25 cycles ending at 50% of the design rated capacity. 25 次循环后 50%电荷状态	S200217012005-016	31.6	PASS 合格
	S200217012005-017	25.1	PASS 合格
	S200217012005-018	25.8	PASS 合格
	S200217012005-019	25.6	PASS 合格
	S200217012005-020	25.8	PASS 合格

Notes 注释:

There is no disassembly, no rupture and no fire during the test and within six hours after test.

元件电池芯在测试中和测试后 6 小时内未解体、未起火。

Room temperature 环境温度: 23.2°C

Test T.7: Overcharge 试验 T.7：过度充电

Test method 测试方法

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

☒ When the manufacturer's recommended charge voltage is not more than 18V, the minimum voltage of the test is the lesser of two times the maximum charge voltage of the battery or 22V.

☐ 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 is 24 hours.

充电电流为制造商建议的最大持续充电电流的两倍。试验的最小电压如下：

☒ 制造商建议的充电电压不大于18V时，试验的最小电压应是电池最大充电电压的两倍或22伏两者中的较小者。

☐ 制造商建议的充电电压大于18V时，试验的最小电压应是电池组最大充电电压的1.2倍。

试验在环境温度下进行。试验时间为24小时。

Requirement 要求

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

电池在试验过程中和试验后7天内无解体，无起火。

Test data showed in table below 测试数据见下表

Overcharge current 过充电电流(mA).....:	2×500=1000mA
Overcharge voltage 过充电电压(Vdc).....:	2×4.2=8.4V
Duration of the test 过充试验时间(hours) .....:	24 hours

State of samples 样品状态	No.编号	Results 结果
At first cycle, in fully charged states 首次循环满电状态	S200217012005-021	PASS 合格
	S200217012005-022	PASS 合格
	S200217012005-023	PASS 合格
	S200217012005-024	PASS 合格
After 25 cycles ending in fully charged states 25 次循环后满电状态	S200217012005-025	PASS 合格
	S200217012005-026	PASS 合格
	S200217012005-027	PASS 合格
	S200217012005-028	PASS 合格

Notes 注释:

There is no disassembly and no fire during the test and within seven days after the test.

电池在测试中和测试后 7 天内未解体，未着火。

Room temperature 环境温度: 24.2°C

Test T.8: Forced discharge 试验 T.8：强制放电

Test method 测试方法

Each component cell is 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 is forced discharged for a time interval (in hours) equal to its rated capacity divided by the initial test current (in ampere).

每个元件电池芯在环境温度下与 12V 直流电电源串联在起始电流等于制造商给定的最大放电电流的条件下强制放电。

电芯与一个适当大小的电阻负载串联以调节到规定大小的放电电流。每块电芯的放电时间（单位为 h）等于电芯的额定容量除以试验初始放电电流（单位 A）。

Requirement 要求

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

元件电池芯在试验过程中和试验后 7 天内无解体，无起火。

Test data showed in table below 测试数据见下表

Initial current 初始电流(mA).....:	500mA
Supply voltage 试验电压(Vdc) .....:	12Vdc
Time interval 试验时间(Minutes).....:	60 Minutes

State of samples 样品状态	No.编号	Results 结果
At first cycle, in fully discharged states 首次循环完全放电状态	S200217012005-029	PASS 合格
	S200217012005-030	PASS 合格
	S200217012005-031	PASS 合格
	S200217012005-032	PASS 合格
	S200217012005-033	PASS 合格
	S200217012005-034	PASS 合格
	S200217012005-035	PASS 合格
	S200217012005-036	PASS 合格
	S200217012005-037	PASS 合格
	S200217012005-038	PASS 合格
After 25 cycles ending in fully discharged states 25 次循环后完全放电状态	S200217012005-039	PASS 合格
	S200217012005-040	PASS 合格
	S200217012005-041	PASS 合格
	S200217012005-042	PASS 合格
	S200217012005-043	PASS 合格
	S200217012005-044	PASS 合格
	S200217012005-045	PASS 合格
	S200217012005-046	PASS 合格
	S200217012005-047	PASS 合格
	S200217012005-048	PASS 合格

Notes 注释:

There is no disassembly and no fire during the test and within seven days after the test.

元件电池芯在测试中和测试后 7 天内未解体，未着火。

Room temperature 环境温度: 20.9°C

*********End of Test Report 检测报告结束*********

Important Notice

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