



## IEC 61960 Series Test Report

### Secondary cells and batteries containing alkaline or other non-acid electrolytes – Secondary lithium cells and batteries for portable applications

Brand Name	LENOVO	
Customer Name (internal)	Simplo	
Customer Contact Information	471 Pa Teh Rd, Sec 2 Hu Kou Hsinchu Hsien, 303 Taiwan	
Product Description	Rechargeable Li-ion Battery	
Model Name	L20M4P71	
Brand Part Number	SB10T83216	
Manufacturer(s) Name	(1) Simplo Technology (Changshu) Inc. (2) Simplo Technology (Chongqing) Inc. (3) Huapu Technology (Changshu) Inc.	
Manufacturer(s) Address	(1) No. 888 Dongnan Avenue, Chuangshu New & Hi-Tech Industrial Development Zone, Jiangsu, China (2) No.2 Zongbao Avenue, Shapingba District, Chongqing, China (3) 888 Dongnan Avenue, Chuangshu New & Hi-Tech Industrial Development Zone, Jiangsu, China	
Test Laboratory	Simplo Technology Co., Ltd.	
Test Laboratory Address	471 Pa Teh Rd, Sec 2 Hu Kou Hsinchu Hsien, 303 Taiwan	
Test Standard(s)	<input type="checkbox"/> IEC 61960:2011, Ed. 2.0 <input checked="" type="checkbox"/> IEC 61960-3:2017, Ed. 1.0	
Version of Test Report	02	
Issue Date of Test Report	2021-01-22	
Report Prepared by	Evan Chu/ Senior Engineer	Evan Chu/ 01-21
	Name / Position	Signature / Date
Reviewed by	Young Hung / Project manager	 /01-22
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Form No.: W11-0015-B06

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Test Results	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL	
<p>■ The test results are based on whether the measured values/results are within specified limits regardless of the measurement uncertainty unless otherwise specified in the standard or by the customer which will be further evaluated according to the standard or the customer's decision rule.</p> <p>■ The Test Results presented in this report relate only to the test items/samples.</p> <p><input type="checkbox"/> The test results include consideration of measurement uncertainty of the test equipment and methods. (Refer to Report No.:            ).</p>			
<b>Summary of Tests :</b>			
Tested	Subclause	Test Item	Verdict
<input checked="" type="checkbox"/>	7.3.1	Discharge performance at 20 °C (rated capacity)	P
<input type="checkbox"/>	7.3.2	Discharge performance at -20 °C	N/A
<input checked="" type="checkbox"/>	7.3.3	High rate discharge performance at 20 °C	P
<input checked="" type="checkbox"/>	7.4	Charge (capacity) retention and recovery	P
<input checked="" type="checkbox"/>	7.5	Charge (capacity) recovery after long term storage	P
<input checked="" type="checkbox"/>	7.6	Endurance in cycles	P
<input checked="" type="checkbox"/>	7.7	Battery internal resistance	P
<input checked="" type="checkbox"/>	7.8	Electrostatic discharge (ESD)	P
<b>Tests / Verdict Abbreviation :</b>			
<p>P = Meet the requirement; F = Do not meet the requirement; N/C = Not Checked; N/A or -- = Not Applicable; ■ = Chosen; □ = Not Chosen.</p>			
<b>Sample Information :</b>			
Sample No.	Date Received	Model Name / Cell Type	
B20-105-41~43,51~65	2020-07-03	Model Name: L20M4P71	
B20-213-101~103	2020-12-22	Cell Type: 4541A8, made by AMPEREX Technology Ltd.	



<b>Product Specification :</b>	
Model Name	L20M4P71
Pack Configuration	4 Series / 1 Parallel
Cell Type(s)	4541A8, made by AMPEREX Technology Ltd.
Nominal Voltage	15.44V
Rated Capacity	3610mAh
Discharge Current of 0.2 I <sub>t</sub> A	722mA
Charging Method Declared by Manufacturer	17.8V/722mA
Specified End-of-discharge Voltage (EODV)	12V
Maximum Internal a.c. Resistance	Below 280 mΩ
(to add column for other spec. if needed)	--

<b>General / Technical Remarks :</b>	
<input type="checkbox"/>	Only discharge performance at 20 °C was performed to verify the rated capacity of tested samples.
<input type="checkbox"/>	The capacity marking shown on the label can be equal to or lower than the rated capacity which had been verified in this report.
<input type="checkbox"/>	If the OCV of a fully charged battery is significantly less than the value of declared charging voltage, it is caused by turning off of charging MOSFET after the battery is fully charged.
<input checked="" type="checkbox"/>	This report is issued to replace the previous report (Report No.: SA20-61960-005 , Version: 01 ).
<input type="checkbox"/>	This report is supplementary report and shall be used in conjunction with previous report (Report No.: , Version: ).
<input type="checkbox"/>	Only limited test were performed on Model      due to testing previously performed on Model      .
<input type="checkbox"/>	Model      is similar to Model      except for      .



IEC 61960:2011 , IEC 61960-3:2017			
Clause	Requirement	Result-Remark	Verdict
<b>7. Electrical tests</b>			
7.1. General	<p>Unless otherwise stated, all tests that are described in this clause shall be performed in still air (61960). Test samples shall be less than 2 months old from the date of manufacture. (61960-3) Charge and discharge currents for the tests shall be based on the value of the rated capacity (<math>C_5</math> Ah). These currents are expressed as a multiple of <math>I_t A</math>, where: <math>I_t A = C_n Ah/1 h</math>. The minimum values required for each electrical test are stated in Table 5. Sample sizes and sequence of tests are described in annex A.</p>		P
7.2. Charging procedure for test purposes	<p>Prior to charging, the cell or battery shall be discharged at <math>20 \pm 5</math> °C at a constant current of <math>0.2 I_t A</math>, down to a specified EODV (final voltage). Unless otherwise stated in this standard, cells or batteries shall be charged in <math>20 \pm 5</math> °C, using the method declared by the manufacturer.</p>		P
7.3. Discharge performance			--
7.3.1. Discharge performance at 20 °C (rated capacity)	This test verifies the rated capacity of a cell or battery.	See Table 7.3.1	P
7.3.2. Discharge performance at -20 °C	This test determines the capacity of the cell or battery at a low temperature.	<input type="checkbox"/> See Table 7.3.2. <input checked="" type="checkbox"/> The battery is not designed to be discharged at -20 °C.	N/A
7.3.3. High rate discharge performance at 20 °C	This test determines the capacity of a cell or battery when discharged at a high rate. This test is not required if the cell or battery is not designed to be used at this rate.	<input checked="" type="checkbox"/> See Table 7.3.3. <input type="checkbox"/> The battery is not designed to be discharged at $1 I_t A$ .	P



IEC 61960:2011 , IEC 61960-3:2017			
Clause	Requirement	Result-Remark	Verdict
7.4 Charge (capacity) retention and recovery	This test determines firstly the capacity which a cell or battery retains after storage for an extended period of time, and secondly the capacity that can be recovered by a subsequent recharge. The retained capacity and recovery capacity delivered shall be not less than 60 % and 85 % of the rated capacity respectively.	■ See Table 7.4.	P
7.5 Charge (capacity) recovery after long term storage	This test determines the capacity of a cell or battery after extended storage at 50 % state of charge, followed by a subsequent charge. The capacity delivered shall be not less than 50 % of the rated capacity.	■ See Table 7.5.	P
7.6 Endurance in cycles			--
7.6.1 General	This test determines the number of charge/discharge cycles which a cell or battery can endure before its useful capacity has been significantly depleted or the remaining capacity after a specified number of cycles. Charge and discharge shall be carried out in accordance with the conditions specified in either 7.6.2 or 7.6.3.	<input type="checkbox"/> Tested per 7.6.2. ■ Tested per 7.6.3.	P
7.6.2 Endurance in cycles at a rate of 0.2 I <sub>t</sub> A	The total number of cycles obtained when the test is completed shall be not less than 300 cycles.	<input type="checkbox"/> See Table 7.6.2. ■ Test per clause 7.6.3 is conducted as alternative.	N/A
7.6.3 Endurance in cycles at a rate of 0.5 I <sub>t</sub> A (accelerated test procedure)	The remaining capacity obtained when the test is completed shall be not less than 60 % of the rated capacity.	■ See Table 7.6.3.	P



IEC 61960:2011 , IEC 61960-3:2017			
Clause	Requirement	Result-Remark	Verdict
7.7 Battery internal resistance			--
7.7.1 General	This test determines the internal resistance of a secondary lithium battery by either the a.c. or the d.c. method.	<input checked="" type="checkbox"/> Tested per a.c. method <input type="checkbox"/> Tested per d.c. method.	P
7.7.2 Measurement of the internal a.c. resistance	The internal a.c. resistance of the battery shall be not greater than declared by the manufacturer.	<input checked="" type="checkbox"/> See Table 7.7.2.	P
7.7.3 Measurement of the internal d.c. resistance	The internal d.c. resistance of the battery shall be not greater than declared by the manufacturer.	<input checked="" type="checkbox"/> The battery is measured per a.c. method.	N/A
7.8 Electrostatic discharge (ESD)			--
7.8.1 General	This test is to evaluate the ability of a battery to withstand electrostatic discharge.	<input checked="" type="checkbox"/> See Table 7.8.	P
7.8.2 Test procedure	This test shall be carried out in accordance with IEC 61000-4-2, which concerns electronic discharge requirements The batteries shall be tested for contact discharge at 4 kV and air discharge at 8 kV.		P
7.8.3 Acceptance criterion	The battery shall operate with all protection circuits operational.		P



Table 7.3.1 Discharge performance at 20 °C (rated capacity)					P
<b>Test Method:</b>					
Conduct all of the following steps at 20 ± 5 °C.					
(1) Charge the battery in accordance with 7.2.					
(2) Store the battery for not less than 1 h and not more than 4 h.					
(3) Record OCV, then discharge the battery at a constant current of 0.2 I <sub>t</sub> A down to the specified EODV .					
(4) Steps 1 to 3 may be repeated up to four additional times, as necessary to satisfy this requirement.					
<b>Criteria:</b> The capacity delivered during step 3 shall be not less than 100 % of the rated capacity declared by the manufacturer.					
<b>Test Result:</b>					
Test Date		2020-07-03~ 2020-07-04			
Test Equipment		ML-106, ML-528, ML-066, ML-069, ML-070, ML-074			
Test Conducted by		Evan Chu			
Storage Duration of Step 2, h		1.07			
Ambient Temperature during All Steps, °C		22.1~23.8			
Sample No.	Cycle No.	Initial OCV, Vdc	Measured EODV, Vdc	Calculated Capacity, mAh	Comments
B20-105-41	1	17.073	12.019	3707	(1)
B20-105-42	1	17.071	12.015	3687	(1)
B20-105-43	1	17.070	12.014	3704	(1)
<b>Comment key:</b>					
(1) = Calculated capacity was greater than or equal to rated capacity.					
(2) = Other: .					



<b>Table 7.3.2</b>	<b>Discharge performance at -20 °C</b>	<b>N/A</b>
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**Test Method:**

Use batteries, which have been subjected to 7.3.1, to conduct all of following steps.

- (1) Charge the battery in accordance with 7.2.
- (2) Store the battery at  $-20 \pm 2$  °C for not less than 16 h and not more than 24 h.
- (3) Record OCV, then discharge the battery at a constant current of  $0.2 I_t$  A, at  $-20 \pm 2$  °C, down to the specified EODV.

**Criteria:** The capacity delivered during step 3 shall be not less than 30 % of the rated capacity declared by the manufacturer.

**Test Result:**

Test Date					
Test Equipment					
Test Conducted by					
Storage Duration of Step 2, h					
Ambient Temperature during Step 1, °C					
Ambient Temperature during Other Steps, °C					
Sample No.	Initial OCV, Vdc	Measured EODV, Vdc	Calculated Capacity, mAh	Calculated Percentage of Rated Capacity, %	Comments
<p><b>Comment key:</b></p> <p>(1) = The capacity at <math>-20 \pm 5</math> °C was greater than or equal to the minimum 30% of rated capacity.</p> <p>(2) = The capacity at <math>-20 \pm 5</math> °C was less than the minimum 30% of the rated capacity.</p> <p>(3) =Other:</p>					

Table 7.3.3 High rate discharge performance at 20 °C					P
<b>Test Method:</b>					
Use batteries, which have been subjected to 7.3.2, to conduct all of following steps at 20 ± 5 °C.					
(1) Charge the battery in accordance with 7.2.					
(2) Store the battery for not less than 1 h and not more than 4 h.					
(3) Record OCV, then discharge the battery at a constant current of 1.0 I <sub>t</sub> A down to the specified EODV.					
<b>Criteria:</b> The capacity delivered during step 3 shall be not less than [ <del>70%</del> ] [60 %] of the rated capacity declared by the manufacturer.					
<b>Test Result:</b>					
Test Date		2020-07-20 ~ 2020-07-21			
Test Equipment		ML-066,069, 074,075, 106, 528			
Test Conducted by		Evan Chu			
Storage Duration of Step 2, h		1.07			
Ambient Temperature during All Steps, °C		21.6~22.7			
Sample No.	Initial OCV, Vdc	Measured EODV, Vdc	Calculated Capacity, mAh	Calculated Percentage of Rated Capacity, %	Comments
B20-150-54	17.062	12.009	3629	100.52	(1)
B20-150-55	17.067	12.005	3643	100.91	(1)
B20-150-56	17.072	12.004	3647	101.02	(1)
<b>Comment key:</b>					
(1) = The high rate discharge capacity of the [eells] [batteries] at 20 ± 5 °C was greater than or equal to the minimum [ <del>70%</del> ] [60 %] of rated capacity.					
(2) = Other: .					



<b>Table 7.4</b>	<b>Charge (capacity) retention and recovery</b>	<b>P</b>
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**Test Method:**

Conduct all of the following steps at  $20 \pm 5$  °C.

- (1) Charge the battery in accordance with 7.2.
- (2) Store the battery for 28 days.
- (3) Record OCV, then discharge the battery at a constant current of  $0.2 I_t$  A down to the specified EODV.
- (4) Charge the battery in accordance with 7.2, within 24 h following the discharge of step 3.
- (5) Store the battery for not less than 1 h and not more than 4 h.
- (6) Record OCV, then discharge the battery at a constant current of  $0.2 I_t$  A down to the specified EODV.

**Criteria:**

The retained capacity delivered during step 3 shall be not less than 60 % of the rated capacity.  
The recovery capacity delivered during step 6 shall be not less than 85 % of the rated capacity.

**Test Result:**

Test Date	2020-08-06 ~ 2020-08-07
Test Equipment	ML-066,069, 075, 106, 528
Test Conducted by	Evan Chu
Storage Date of Step 2	2020-07-09 ~ 2020-08-06
Storage Duration of Step 5, h	1.07
Ambient Temperature during All Steps, °C	22.4 ~ 23.4

Sample No.	Initial OCV in Step 3, Vdc	Measured EODV in Step 3, Vdc	Calculated Capacity, mAh	Calculated Percentage of Rated Capacity, %	Comment
B20-150-51	16.267	12.024	3007	83.29	(1)
B20-150-52	16.289	12.021	3053	84.57	(1)
B20-150-53	16.345	12.021	3072	85.09	(1)
Sample No.	Initial OCV in Step 6, Vdc	Measured EODV in Step 6, Vdc	Calculated Capacity, mAh	Calculated Percentage of Rated Capacity, %	Comment
B20-150-51	17.072	12.015	3664	101.49	(2)
B20-150-52	17.059	12.021	3682	101.99	(2)
B20-150-53	17.068	12.014	3663	101.46	(2)

**Comment key:**

- (1) = The retained capacity delivered during step 3 was not less than 60 % of the rated capacity.
- (2) = The recovery capacity delivered during step 6 was not less than 85 % of the rated capacity.
- (3) = Other: .



Table 7.5		Charge (capacity) recovery after long term storage				P
<b>Test Method:</b>						
(1) Charge the battery in accordance with 7.2.						
(2) Discharge the battery at a constant current of 0.2 I <sub>t</sub> A, at 20 ± 5 °C, for 2.5 h.						
(3) Store the battery at 40 ± 2 °C for 90 days.						
(4) Charge the battery at 20 ± 5 °C using the method declared by the manufacturer.						
(5) Store the battery at 20 ± 5 °C for not less than 1 h and not more than 4 h.						
(6) Record OCV, then discharge the battery at a constant current of 0.2 I <sub>t</sub> A, at 20 ± 5 °C, down to the specified EODV.						
(7) Steps 4 to 6 may be repeated up to four additional times, as necessary to satisfy this requirement.						
<b>Criteria:</b>						
The capacity delivered during step 6 shall be not less than 50 % of the rated capacity.						
<b>Test Result:</b>						
Test Date		2020-07-09 ~ 2020-10-09				
Test Equipment		ML-735, ML-546				
Test Conducted by		Stephy Tseng				
Storage Date of Step 3		2020-07-10 ~ 2020-10-08				
Storage Duration of Step 5, h		1.00				
Ambient Temperature during Step 3, °C		Approx. 40.0				
Ambient Temperature during Other Steps, °C		Approx. 24.8				
Sample No.	Initial OCV, Vdc	Measured EODV, Vdc	Calculated Capacity, mAh	Calculated Percentage of Rated Capacity, %	Comment	
B20-150-57	17.681	12.236	3663	101.47	(1)	
B20-150-58	17.685	12.170	3684	102.05	(1)	
B20-150-59	17.681	12.266	3665	101.52	(1)	
<b>Comment key:</b>						
(1) = The capacity delivered during step 6 was not less than 50 % of the rated capacity.						
(2) = Other: .						



<b>Table 7.6.2</b>	<b>Endurance in cycles at a rate of 0.2 I<sub>t</sub> A</b>	<b>N/A</b>
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**Test Method:**

Conduct all of the following steps at 20 ± 5 °C.

- (1) Discharge the battery at a constant current of 0.2 I<sub>t</sub> A to the specified EODV.
- (2) Charge the battery using the method declared by the manufacturer.
- (3) Store the battery for 0 to 1 h.
- (4) Discharge the battery at a constant current of 0.2 I<sub>t</sub> A to the specified EODV.
- (5) Repeat steps 2 to 4 until capacity delivered is less than 60 % of the rated capacity. Then record the related information of the last cycle in the below table.

**Criteria:**

The total number of cycles obtained when the test is completed shall be not less than 300 cycles.

**Test Result:**

Test Date						
Test Equipment						
Test Conducted by						
Storage Duration of Step 3, h						
Ambient Temperature during All Steps, °C						
Sample No.	Cycle No.	Initial OCV, Vdc	Measured EODV, Vdc	Calculated Capacity, mAh	Calculated Percentage of Rated Capacity, %	Comment

**Comment key:**

- (1) = The total number of cycles obtained when the test was completed was not less than 300 cycles.
- (2) = Other: .



Table 7.6.3 Endurance in cycles at a rate of 0.5 I <sub>t</sub> A (accelerated test procedure)						P
<b>Test Method:</b>						
Conduct all of the following steps at 20 ± 5 °C.						
(1) Discharge the battery at a constant current of 0.2 I <sub>t</sub> A to the specified EODV.						
(2) Charge the battery using the method declared by the manufacturer.						
(3) Store the battery for 0 to 1 h.						
(4) Discharge the battery at a rate of constant current of 0.5 I <sub>t</sub> A to the specified EODV.						
(5) Repeat steps 2 to 4 until total 300 cycles are completed.						
(6) Measure the remaining capacity according to test method (1) to (3) of Table 7.3,1, then record the related information in the below table.						
<b>Criteria:</b>						
The remaining capacity measured according to test method (1) to (3) of Table 7.3.1 when the test is completed shall be not less than 60 % of the rated capacity.						
<b>Test Result:</b>						
Test Date		2020-07-13 ~ 2020-09-08				
Test Equipment		ML-735, ML-546				
Test Conducted by		Jay Lin				
Storage Duration of Step 3, h		0.33				
Ambient Temperature during All Steps, °C		Approx. 24.8				
Sample No.	Cycle No.	Initial OCV, Vdc	Measured EODV, Vdc	Calculated Capacity, mAh	Calculated Percentage of Rated Capacity, %	Comment
B20-150-60	300	17.536	12.142	3315	91.83	(1)
B20-150-61	300	17.586	12.082	3319	91.94	(1)
B20-150-62	300	17.538	12.285	3313	91.77	(1)
<input type="checkbox"/> Note: The discharge rate (= ) declared by the manufacture of above step ( ) is regarded as a representative condition for the test purpose.						
<b>Comment key:</b> (1) = The remaining capacity obtained when the test was completed was not less than 60 % of the rated capacity. (2) = Other: .						



<b>Table 7.7.2</b>	<b>Measurement of the internal a.c. resistance</b>	<b>P</b>
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**Test Method:**

Conduct all of following steps at  $20 \pm 5$  °C.

- (1) Charge the battery in accordance with 7.2.
- (2) Store the battery for not less than 1 h and not more than 4 h.
- (3) Record OCV. Measure the alternating r.m.s. voltage,  $U_a$ , while applying an alternating r.m.s. current,  $I_a$ , at the frequency of  $1 \text{ kHz} \pm 0.1 \text{ kHz}$ , to the battery, for a period of 1 s to 5 s. Then obtain the internal a.c. resistance by dividing  $U_a$  by  $I_a$ .

A suitable ac resistance meter can be used as alternate for measurement.

**Criteria:**

The internal a.c. resistance of the battery shall be not greater than declared by the manufacturer.

**Test Result:**

Test Date	2021-01-07
Test Equipment	ML-928, ML-894
Test Conducted by	Stephy Tseng
Storage Duration of Step 2, h	1.00
Ambient Temperature during All Steps, °C	Approx. 23.9

Sample No.	Initial OCV, Vdc	Measured Internal a.c. Resistance, mΩ	Comment
B20-213-101	17.687	144.15	(1)
B20-213-102	17.690	143.74	(1)
B20-213-103	17.689	144.58	(1)

**Comment key:**

- (1) = The measured internal a.c. resistance was compliant with the manufacturer's declaration.  
 (2) = Other: .



<b>Table 7.8</b>	<b>Electrostatic discharge (ESD)</b>	<b>P</b>
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**Test Method:**

Use batteries, which have been subjected to battery internal resistance measurement, to conduct this test in accordance with IEC 61000-4-2.

- (1) Conduct all of following steps under following climatic conditions.  
Ambient temperature: 15 to 35 °C;  
Relative humidity: 30 to 60 %;  
Atmospheric pressure: 86 kPa (860 mbar) to 106 kPa (1060 mbar).
- (2) Apply contact discharge at ± 4 kV to the battery.
- (3) Apply air discharge at ± 2 kV, ± 4 kV and ± 8 kV to the battery.
- (4) During contact and air discharge, apply 10 single discharges at each polarity, on each pre-selected point respectively. The time interval between successive single discharges is 1 s.
- (5) Verify whether the overvoltage protection, under-voltage protection, over current protection, short circuit protection and temperature protection, if any, remain operational. Verify whether the battery can be charged or discharged normally.

**Acceptance Criterion:**

The battery shall operate with all protection circuits operational.

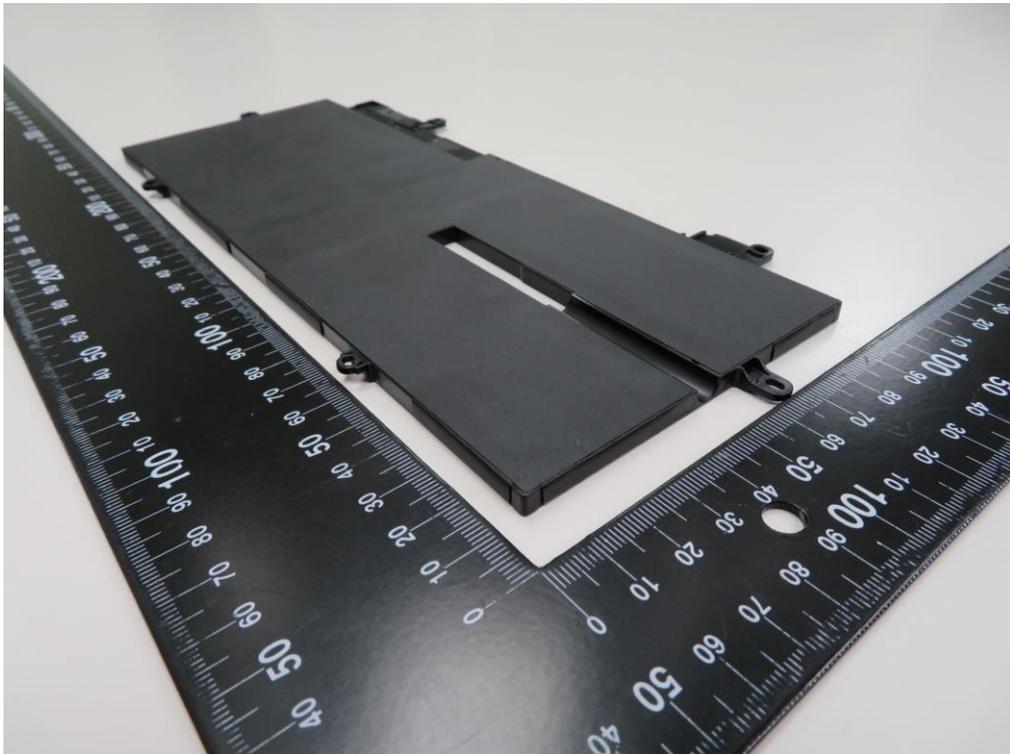
**Test Result:**

Test Date	2020-07-30			
Test Equipment	ML-104, ML-263, ML-307, ML-964			
Test Conducted by	Stephy Tseng			
Ambient Temperature during All Steps, °C	Approx. 24.5			
Relative Humidity during All Steps, %	54			
Atmospheric Pressure during All Steps, kPa	101			
Sample No.	Contact Discharge, kV	Air Discharge, kV	Number of Each Specified Discharge Per Point	Comment
B20-150-63	±4	±2, ±4, ±8	10	(1)
B20-150-64	±4	±2, ±4, ±8	10	(1)
B20-150-65	±4	±2, ±4, ±8	10	(1)

**Comment key:**

- (1) = The battery operated with all protection circuits operational.  
(2) = Other: .

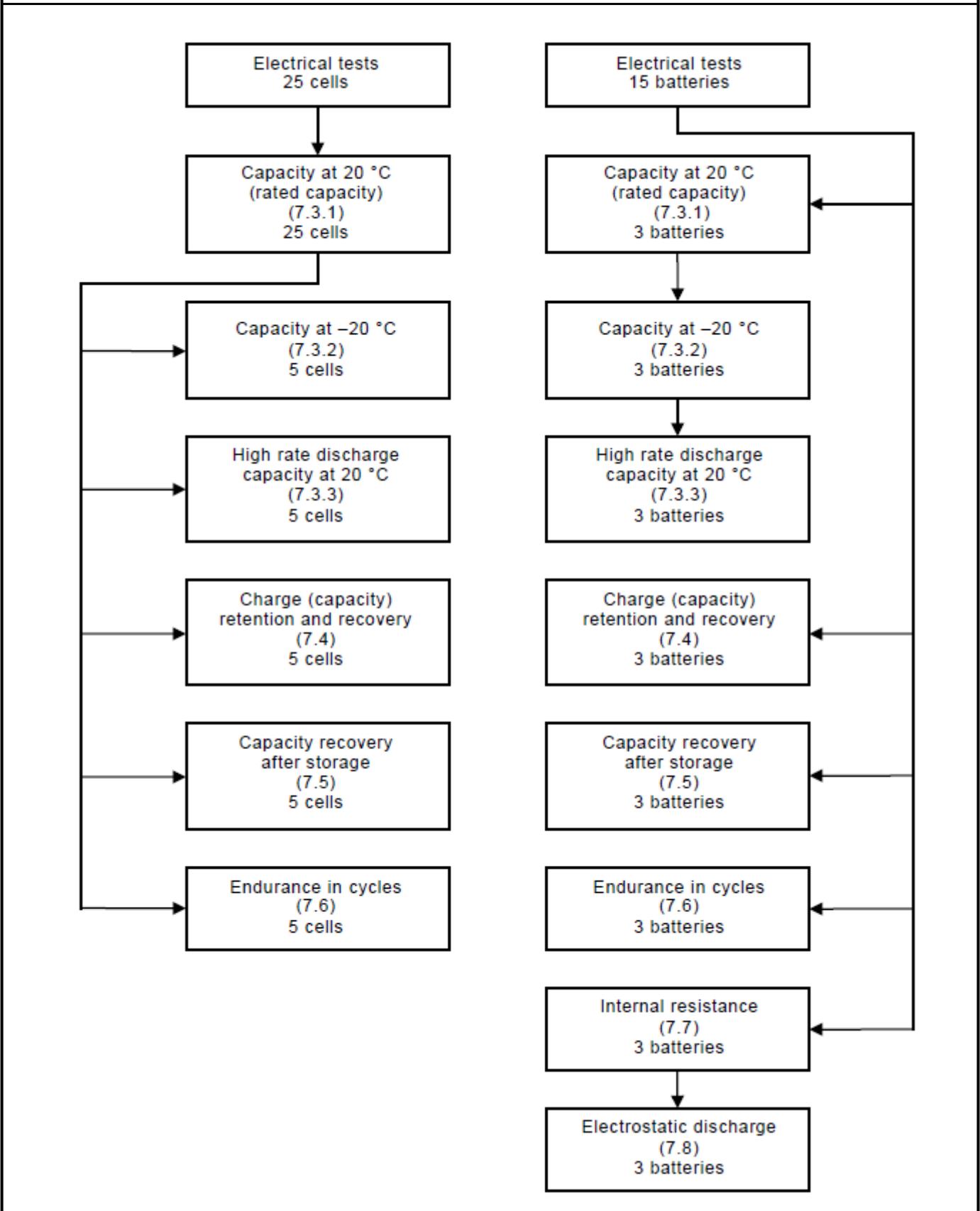
Product Photo(s)



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Annex A: Sample sizes and sequence of tests



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Table 5:

**Table 5 – Minimum requirements for each type of standard secondary lithium cells and batteries**

Parameter	Reference subclause	Acceptance criteria – cells	Acceptance criteria – batteries
Capacity at 20 °C ± 5 °C (rated capacity)	7.3.1	100 % C <sub>5</sub> Ah	100 % C <sub>5</sub> Ah
Capacity at -20 °C ± 2 °C	7.3.2	30 % C <sub>5</sub> Ah	30 % C <sub>5</sub> Ah
High rate discharge capacity at 20 °C ± 5 °C	7.3.3	70 % C <sub>5</sub> Ah	60 % C <sub>5</sub> Ah
Charge (capacity) retention	7.4	70 % C <sub>5</sub> Ah	60 % C <sub>5</sub> Ah
Charge (capacity) recovery	7.4	85 % C <sub>5</sub> Ah	85 % C <sub>5</sub> Ah
Capacity recovery after storage	7.5	50 % C <sub>5</sub> Ah	50 % C <sub>5</sub> Ah
Endurance in cycles	7.6.2	400 cycles	300 cycles
Endurance in cycles (accelerated)	7.6.3	60 % C <sub>5</sub> Ah	60 % C <sub>5</sub> Ah
Electrostatic discharge	7.8	n.a.	Operational



## Test Equipment List

Item	Equipment ID	Equipment Name	Type	Range Used	Manufacturer	Calibration Date Last	Calibration Due Date Next	Remarks
X	ML-892	DC Electronic Load	3311C-3302C	60V,60A, 300W	PRODIGIT	2020-02-20	2021-03-20	
X	ML-106	Temp & Humidity Recorder	TH-27R	T: 15 to 35 °C; RH: 30 to 80 %	ISUZU	2020-07-02	2021-08-02	
X	ML-928	DC Power Supply	E3633A	20V,10A/8V,20A	KEYSIGHT	2021-01-04	2022-02-04	
X	ML-104	DC Electronic Load	3311C-3302C	60V,60A, 300W	PRODIGIT	2020-01-20	2021-02-20	
X	ML-263	DC Power Supply	E3633A	20V,10A/8V,20A	Agilent	2019-11-29	2020-12-29	
X	ML-307	ESD Simulator	ESS-2000	Contact: ±2kV to ±8kV; Air: ±2kV to ±15kV	Noiseken	2020-04-15	2021-05-15	
X	ML-894	AC mΩ Tester	3562	10 mΩ - 200 mΩ; 1 Ω - 300 Ω	HIOKI	2020-06-09	2021-07-09	
X	ML-066	Data Acquisition	MX100	1-100 Vdc, 0 to 200 °C	Yokogawa	2019-08-15	2020-09-15	MX100-1
X	ML-066	Data Acquisition	MX100	1-100 Vdc, 0 to 200 °C	Yokogawa	2020-08-10	2021-09-10	MX100-1
X	ML-069	Data Acquisition	MX100	1-100 Vdc, 0 to 200 °C	Yokogawa	2019-08-15	2020-09-15	MX100-3
X	ML-069	Data Acquisition	MX100	1-100 Vdc, 0 to 200 °C	Yokogawa	2020-08-10	2021-09-10	MX100-3
X	ML-070	Data Acquisition	MX100	1-100 Vdc, 0 to 200 °C	Yokogawa	2019-08-15	2020-09-15	MX100-2
X	ML-070	Data Acquisition	MX100	1-100 Vdc, 0 to 200 °C	Yokogawa	2020-08-10	2021-09-10	MX100-2
X	ML-074	Power Load Modules	GBT-2010-35-1	Note 4	GW	2020-02-21	2021-03-21	Bank2 (Ch09-16)
X	ML-075	Power Load Modules	GBT-2010-35-1	Note 4	GW	2020-02-21	2021-03-21	Bank1 (Ch01-08)
X	ML-528	Clock	QUARTZ	Full range	FRANCO	2020-03-04	2021-04-04	
X	ML-546	Chamber	GCT-125-20-TR-SP	T: -20 to 100 °C	Giant Force	2020-05-08	2021-06-08	
X	ML-735	Learning Machine	715	Charge: 18V/8A	SMP	2020-05-08	2021-06-08	

Form No.: W11-0015-B06

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				Discharge: 16V/10A				
X	ML-964	Micro-manometer	MP55	750 to 1095 hPa	KIMO	2020-07-03	2021-08-03	

Note 4: Charge: 2.2-19.9Vdc, 0.11-9.9A; Discharge: 0.5-19.9Vdc, 0.11-9.9A

# End of Test Report

Form No.: W11-0015-B06

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