



UN38.3 试验概要

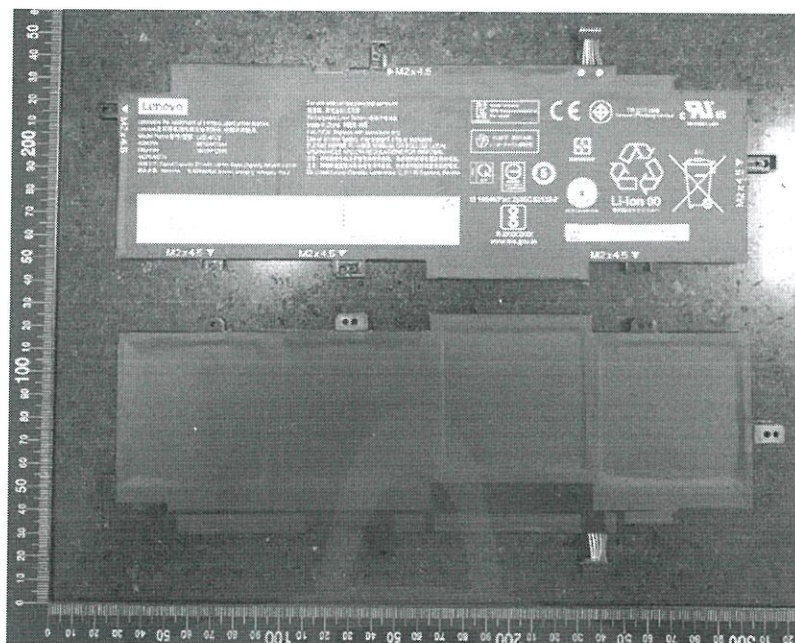
UN38.3 Test Summary



单位信息 Company information			
委托单位 Consignor	乐金化学(南京)信息电子材料有限公司 LG Chem(Nanjing) I&E Materials Co.,Ltd 南京经济技术开发区恒谊路 17 号 NO 17 HENGYI RD NANJING ECONOMICAL & TECHNICAL DEVELOPMENT ZONE 025-85603000 zhanghonglu@lgchem.com www.lgchem.com		
生产单位 Manufacturer	南京莱斯康电子有限公司 Nan Jing Nexcon Electronics Co.,Ltd 南京经济技术开发区栖霞街道刀枪河路 11 号 No.11, Daoqianghe Road, Economic & Technical Development Zone East Side, Qixia Area, Nanjing City, Jiangsu Province, China 15895891460 caolijun132x@nexcontech.net http://www.nexcontech.com/		
测试单位 Test lab	LG Chem, ltd. LG Chem, ltd. 韩国首尔市永登浦区汝矣大道 128 号 128, Yeoui-daero, Yeongdeungpo-gu, Seoul, Republic of Korea 010-77425427 kkammy@lgchem.com www.lgchem.com		
电池信息 Battery information			
名称 Name	锂离子电池	品牌 Brand	/
型号 Type	L20L4P72	原始测试型号 Original tested type	/
标称电压(V) Nominal voltage	15.36	容量/能量 Capacity/energy	Typical Capacity:3711mAh 57Wh/Rated Capacity:3581mAh 55Wh
描述 Description	可充电锂离子电池组 Rechargeable Li-ion battery	锂含量(g) Li content	/
质量(kg) Mass	0.232	外观 Appearance	黑色塑料薄膜外壳 Black plastic film shell
测试信息 Test information			
原报告编号 Original test report No.	QDI-200806-B-L20L4P72	测试报告日期 Date of test report	2020-08-06
测试标准 Test standard	联合国《关于危险货物运输的建议书 试验和标准手册》第 38.3 章 UNITED NATIONS "Recommendations on the TRANSPORT OF DANGEROUS GOODS" Manual of Tests and Criteria 38.3 ST/SG/AC.10/11/Rev.6/Amendment.1		
T.1 高度模拟 Altitude simulation	合格 Passed	T.2 温度测试 Thermal test	合格 Passed
T.3 振动测试 Vibration	合格 Passed	T.4 冲击测试 Shock	合格 Passed
T.5 外部短路 External short circuit	合格 Passed	T.6 挤压 Crush	合格 Passed
T.7 过度充电 Overcharge	合格 Passed	T.8 强制放电 Forced discharge	合格 Passed
38.3.3 (f)	/	38.3.3 (g)	/



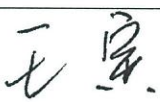
样品图片 Sample Picture



Lenovo

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Model Name型号/型号: L20L4P72
 ASM P/N : SB10W51914
 FRU P/N : 5B10W13976
 4ICP5/68/70
 15.36 V ~ Typical Capacity 3711mAh / 57 Wh, Rated Capacity 3581mAh / 55 Wh
 额定容量: 3581mAh 充电限制电压 (limited charging voltage): 17.6 V

结论 Conclusion	测试样品符合联合国《关于危险货物运输的建议书试验和标准手册》ST/SG/AC.10/11/Rev.6/Amend.1 38.3 标准要求。The tested samples meet the requirements of test items of the UNITED NATIONS "Recommendations on the TRANSPORT OF DANGEROUS GOODS" Manual of Tests and Criteria ST/SG/AC.10/11/Rev.6/Amend.1 38.3		
备注 Remark	/		
签名 Signature 职务 Title	 王黄 副总工程师 Vice chief engineer	 签发日期 Issued date	2020-08-19

-验证码:828373-

报告结束

UN38.3 Test Summary

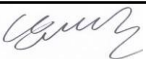
Manufacturer's contact information	LG Chem, Ltd. 128 Yeoui-Daero, Yeongdeungpo-gu, SEOUL, 150-721, REPUBLIC OF KOREA Telephone : +82-10-7742-5427 E-mail : kkammy@lgchem.com Website : www.lgchem.com		
Test Laboratory information	LG Chem, Ltd. / RESEARCH PARK 188 Munjiro, Yuseong-gu, Daejeon, 305-738, REPUBLIC OF KOREA Telephone : +82-10-3099-3724 E-mail : juhongpark@lgchem.com Website : www.lgchem.com		
	LG Chem (Nanjing) I&E Materials Co., Ltd NO.17 Hengyi Road, Nanjing Economic & Technological Development Zone, Nanjing, Jiangsu, China Telephone : +86-025-85603000-8231 E-mail : njliying@lgchem.com Website : www.lgchem.com		
Description		List of Test Completed	
Cell/Battery Type (Physical Description)	Lithium Ion battery pack (Pouch)	Revised edition	Revision 6 Amendment 1
Test Report Number	QDI-200806-B-L20L4P72	Test 1. Altitude Simulation	Pass
Date of test report	2020.08.06	Test 2. Thermal Test	Pass
Model name	L20L4P72	Test 3. Vibration	Pass
Nominal voltage (V)	15.36	Test 4. Shock	Pass
Capacity (Nominal Wh)	57.00	Test 5. External Short Circuit	Pass
Weight (g)	231.0	Test 6. Impact or Crush	Pass
Dimensions (mm)	288.88 X 50.35 X 5.59	Test 7. Overcharge	Pass
Reference to assembled battery testing requirements	Not applicable	Test 8. Forced Discharge	Pass

Reviewed By: Juhong Park
 IT & New Application Part Leader
 Global Standard Certification Team
 LG Chem, Ltd.
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 Team Leader
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Document Number	QDI-200806-B-L20L4P72	
Prepared	Taecheon Kim	
Reviewed	Juhong Park	
Approved	DaeHo Nam	

UN38.3 Test Report

- L20L4P72 (Nom.57.00Wh, 15.36V) -

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2020. 08. 06



1. UN38.3 Test Condition

Rev.6 Amendment 1

Test item	Test Condition	Requirements	Etc.
Test 1. Altitude Simulation	Storing at (low pressure) 11.6kPa for 6hr at 20+/-5℃	- After OCV (%) ≥ 90% - No leakage, no venting, no disassembly, no rupture, no fire - Mass loss limit (leakage) 1) If M<1g, less than 0.5%, 2) If 1g≤M≤75g, less than 0.2%, 3) If M>75g, less than 0.1%	T1~T5 : Sequence Tests <pre> graph TD T1[Test 1 Altitude Simulation] --> T2[Test 2 Thermal Test] T2 --> T3[Test 3 Vibration] T3 --> T4[Test 4 Shock] T4 --> T5[Test 5 Ext. Short Circuit] </pre>
Test 2. Thermal Test	[72±2℃, 6hr ↔ -40±2℃, 6hr, interval max. 30min] x 10cycle Storing at 20±5℃ for 24h		
Test 3. Vibration	[7Hz↔200Hz↔7Hz, in 15min] x 12 times x 3 direction 1) sinusoidal waveform with a logarithmic sweep 2) 7Hz 18Hz (maintaining 1gn) app. 50Hz (until 8gn) 200Hz (maintaining 8gn), 1.6mm total excursion		
Test 4. Shock	Half sine shock 1) Peak acceleration - For cells & single cell batteries : 150gn - For batteries (whichever is smaller) : 150gn or $\sqrt{\frac{100850}{Mass(kg)}} gn$ 2) Pulse duration : 6msec 3) 6 direction (±x, y, z) x 3 cycle		
Test 5. External Short Circuit	1) Samples to be heated to 57±4℃ in chamber (Measured on external case) 2) Less than 0.1Ω, ext. short-circuit at 57±4℃ 3) 1hr continue after returning to 57±4℃		
Test 6. Impact	Φ=15.8±0.1mm bar, 9.1±0.1kg mass, 61±2.5cm height	- No disassembly, no fire within 6 hours after the test - Max. Temp ≤ 170℃	for cylindrical cells (dia ≥ 18mm)
Test 6. Crush	Crushing rate : 1.5cm/s, until 13kN±0.78kN or 100mV drop or 50% deformation		for cylindrical cells (dia < 18mm) for prismatic, pouch, coin/button cells
Test 7. Overcharge	Current = Manufacturer's recommended max. continuous charge current X 2 Voltage 1. If charge voltage ≤ 18V, V (min.) = 2 x (max. charge voltage) or 22V. 2. If charge voltage > 18V, V (min.) = 1.2 x (max. charge voltage)	- No disassembly, no fire within 7 days after the test	Only for Single Cell Battery / Battery
Test 8. Forced Discharge	Discharge at max. discharge current (connecting in series with 12V DC power supply), Duration time = rated capacity/initial test current	- No disassembly, no fire within 7 days after the test	Resistance of Electric Loader $R_t = \frac{12V + V_c}{Max\ discharge\ current}$ - Rc-Rw

2-1. T1-T4 Test Result

Before			Altitude (T1)					Thermal (T2)					Vibration (T3)					Shock (T4)				
NO.	OCV	Mass (g)	After OCV (V)	Mass (g)	After OCV(%)	Mass Loss(%)	Result	After OCV (V)	Mass (g)	After OCV(%)	Mass Loss(%)	Result	After OCV (V)	Mass (g)	After OCV(%)	Mass Loss(%)	Result	After OCV (V)	Mass (g)	After OCV(%)	Mass Loss(%)	Result

A. 1st cycle fully charged state

1	17.424	231.26	17.424	231.26	100.00	0.000	Pass	17.140	231.26	98.37	0.000	Pass	17.139	231.26	99.99	0.000	Pass	17.139	231.26	100.00	0.000	Pass
2	17.371	231.25	17.371	231.25	100.00	0.000	Pass	16.810	231.25	96.77	0.000	Pass	16.810	231.25	100.00	0.000	Pass	16.810	231.25	100.00	0.000	Pass
3	17.174	231.13	17.174	231.13	100.00	0.000	Pass	16.686	231.13	97.16	0.000	Pass	16.686	231.13	100.00	0.000	Pass	16.686	231.13	100.00	0.000	Pass
4	17.370	231.04	17.370	231.04	100.00	0.000	Pass	16.812	231.04	96.79	0.000	Pass	16.811	231.04	99.99	0.000	Pass	16.811	231.04	100.00	0.000	Pass

B. 25th cycle fully charged state

5	17.436	231.17	17.436	231.17	100.00	0.000	Pass	16.855	231.17	96.67	0.000	Pass	16.853	231.17	99.99	0.000	Pass	16.853	231.17	100.00	0.000	Pass
6	17.241	231.06	17.241	231.06	100.00	0.000	Pass	16.629	231.06	96.45	0.000	Pass	16.628	231.06	99.99	0.000	Pass	16.628	231.06	100.00	0.000	Pass
7	17.428	231.12	17.428	231.12	100.00	0.000	Pass	16.828	231.12	96.56	0.000	Pass	16.828	231.12	100.00	0.000	Pass	16.828	231.12	100.00	0.000	Pass
8	17.434	231.08	17.434	231.08	100.00	0.000	Pass	16.832	231.08	96.55	0.000	Pass	16.832	231.08	100.00	0.000	Pass	16.832	231.08	100.00	0.000	Pass

2-2. T5/T7 Test Result

EXT.Short Circuit (T5)			
NO.	Initial OCV(V)	Max. Temp (°C)	Result

A. 1st cycle fully charged state

1	17.139	56.23	Pass
2	16.810	57.38	Pass
3	16.686	56.30	Pass
4	16.811	56.66	Pass

B. 25th cycle fully charged state

5	16.853	56.91	Pass
6	16.628	56.68	Pass
7	16.828	56.62	Pass
8	16.832	56.64	Pass

Over Charge (T7)			
NO.	Initial OCV(V)	Max. Temp (°C)	Result

A. 1st cycle fully charged state

9	17.352	21.48	Pass
10	17.393	21.61	Pass
11	17.280	21.51	Pass
12	17.595	21.69	Pass

Over Charge (T7)			
NO.	Initial OCV(V)	Max. Temp (°C)	Result

B. 25th cycle fully charged state

13	17.379	21.86	Pass
14	17.394	21.45	Pass
15	17.388	21.50	Pass
16	17.368	22.48	Pass

2-3. T6/T8 Test Result (P496769A1)

Crush (T6)			
NO.	Initial OCV(V)	Max. Temp (°C)	Result

A. 1st cycle 50% charged state

C-1	3.853	21.93	Pass
C-2	3.852	22.33	Pass
C-3	3.853	22.32	Pass
C-4	3.851	22.02	Pass
C-5	3.853	21.85	Pass

B. 25st cycle 50% charged state

C-6	3.863	22.10	Pass
C-7	3.861	22.04	Pass
C-8	3.861	22.10	Pass
C-9	3.861	22.44	Pass
C-10	3.861	21.86	Pass

Forced Discharge (T8)							
NO.	Initial OCV(V)	Max. Temp (°C)	Result	NO.	Initial OCV(V)	Max. Temp (°C)	Result

A. 1st cycle fully discharged state

C-6	3.443	64.83	Pass
C-7	3.435	65.94	Pass
C-8	3.424	62.04	Pass
C-9	3.416	66.53	Pass
C-10	3.443	66.11	Pass
C-11	3.442	67.05	Pass
C-12	3.437	61.81	Pass
C-13	3.433	66.28	Pass
C-14	3.442	63.38	Pass
C-15	3.430	68.66	Pass

B. 25th cycle fully discharged state

C-16	3.456	58.19	Pass
C-17	3.450	54.02	Pass
C-18	3.457	63.77	Pass
C-19	3.454	59.82	Pass
C-20	3.462	62.09	Pass
C-21	3.461	60.37	Pass
C-22	3.448	60.13	Pass
C-23	3.458	68.32	Pass
C-24	3.452	60.58	Pass
C-25	3.455	70.94	Pass

3. Sample Image



Document Number	QDI-200806-B-L20L4P72-D1	
Prepared	Jie Ma	
Approved	Ying Li	

1.2m Drop Test Report

– L20L4P72 (Nom. 57Wh, 15.36V) –

2020. 08. 06



1.2m Drop Test Report

A. Test Information

Standard requirement or The Clause Number of Standard	Test Condition	Requirement
UNITED NATIONS “Recommendations on the TRANSPORT OF DANGEROUS GOODS” Model Regulations(18 th) special provisions 188	1.2m Box Drop - 1st drop : corner - 2nd drop : flat on the bottom - 3rd drop : flat on the top - 4th drop : flat on the long side - 5th drop : flat on the short side 	Without ; - Damage to cells or batteries contained therein - Shifting of the contents so as to allow battery to battery (or cell to cell) contact - Release of contents

B. Box Information

Dimensions	380*290*170mm	Battery Quantity	34pcs/Box
Gross weight	9.660 kg	Net Weight of Batteries	7.953 kg

C. Image

Image-1	Image-2
	

D. Test Result

Result	Result Detail
PASS	The box was not cracked, the contents were not damaged and not shifted.