



UN38.3 试验概要

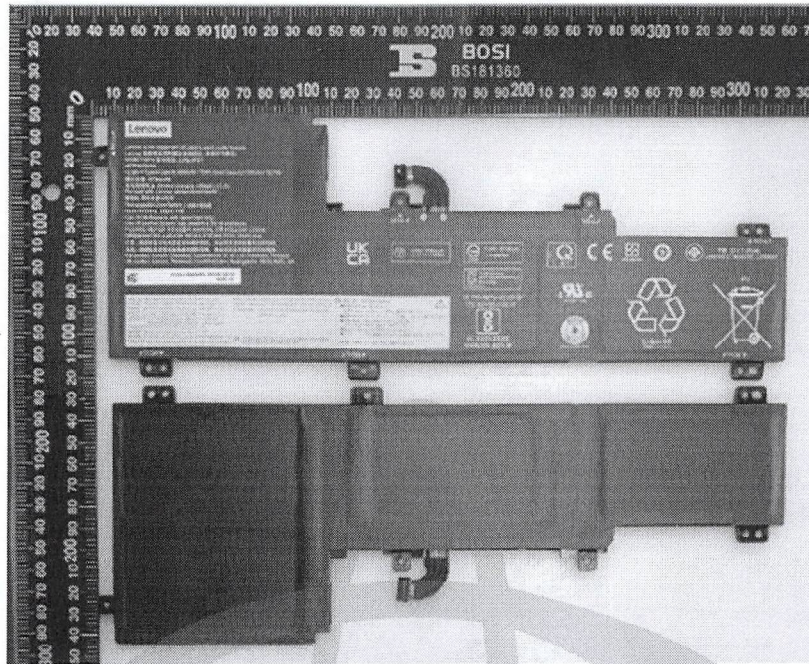
UN38.3 Test Summary



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	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		
电池信息 Battery information			
名称 Name	锂离子电池	品牌 Brand	/
型号 Type	L20L4PE1	原始测试型号 Original tested type	/
标称电压(V) Nominal voltage	15.36	容量/能量 Capacity/energy	Rated: 4734mAh 72.7Wh Typical: 4883mAh 75Wh
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	0.300	外观 Appearance	黑色塑胶及塑料薄膜外壳 Black plastics cement and plastics film shell
测试信息 Test information			
原报告编号 Original test report No.	QDI-201013-B-L20L4PE1	测试报告日期 Date of test report	2020-10-13
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/Amend.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



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 Model Name 型号/型号: L20L4PE1
 4ICP6/55/90
 15.36V --- Typical Capacity 4883mAh / 75Wh, Rated Capacity 4734mAh / 72.7Wh
 额定容量: 4734mAh
 充电限制电压 (limited charging voltage): 17.6V
 For use with Lenovo personal computer
 制造商: 株式会社LG化学
 Rechargeable Li-ion Battery / 锂离子电池组
 Made in China 制造地: 中国



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	王寅 副总工程师 Vice chief engineer	签发日期 Issued date	2020-10-15



-验证码:736261-

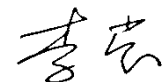
报告结束

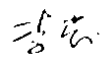


UN38.3 Test Summary

Manufacture'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-201013-B-L20L4PE1	Test 1. Altitude Simulation	Pass
Date of test report	2020.10.13	Test 2. Thermal Test	Pass
Model name	L20L4PE1	Test 3. Vibration	Pass
Nominal voltage (V)	15.36	Test 4. Shock	Pass
Capacity (Nominal Wh)	75.00	Test 5. External Short Circuit	Pass
Weight (g)	300.07	Test 6. Impact or Crush	Pass
Dimensions (mm)	313.58x112.2x6.7	Test 7. Overcharge	Pass
Reference to assembled battery testing requirements	Not applicable	Test 8. Forced Discharge	Pass

Approved By: Ying Li
 Team Leader
 Cyl NPI&CE lab part DQA Team
 LG Chem, Ltd.
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Document Number	QDI-201013-B-L20L4PE1	
Prepared	Jie Ma	
Approved	Ying Li	

UN38.3 Test Report

– L20L4PE1 (Nom. 75.00Wh, 15.36V) –

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3. Sample Image

2020. 10. 13

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 $\sqrt{\frac{100850}{\text{Mass(kg)}}}$ 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℃	- No disassembly, no rupture, no fire within 6 hours after the test - Max. Temp ≤ 170℃	
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 (not less than 18mm diameter)
Test 6. Crush	Crushing rate :1.5cm/s, until 13kN±0.78kN or 100mV drop or 50% deformation		for cylindrical cells (less than 18mm diameter) 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 1/Ω = (max. discharge current) / (12 + Initial OCV)

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	17.3452	299.98	16.9217	299.97	97.56	0.003	Pass	17.0573	299.87	100.00	0.033	Pass	17.0563	299.89	99.99	0.000	Pass	17.0486	299.89	99.95	0.000	Pass
2	17.3406	299.20	16.9260	299.19	97.61	0.003	Pass	17.0506	299.10	100.00	0.030	Pass	17.0492	299.11	99.99	0.000	Pass	17.0416	299.10	99.96	0.003	Pass
3	17.3502	300.07	16.9208	300.05	97.53	0.007	Pass	17.0583	299.97	100.00	0.027	Pass	17.0567	299.99	99.99	0.000	Pass	17.0489	299.94	99.95	0.017	Pass
4	17.3409	299.35	16.9233	299.34	97.59	0.003	Pass	17.0503	299.24	100.00	0.033	Pass	17.0487	299.26	99.99	0.000	Pass	17.0410	299.25	99.95	0.003	Pass

B. 25th cycle fully charged state

5	17.0465	299.61	17.0453	299.60	99.99	0.003	Pass	16.7112	299.53	98.04	0.023	Pass	16.6310	299.54	99.52	0.000	Pass	16.3464	299.53	98.29	0.003	Pass
6	17.4095	299.98	16.9903	299.97	97.59	0.003	Pass	16.6893	299.93	98.23	0.013	Pass	16.6138	299.92	99.55	0.003	Pass	16.3329	299.91	98.31	0.003	Pass
7	17.3981	299.11	16.9792	299.11	97.59	0.000	Pass	16.6805	299.04	98.24	0.023	Pass	16.6042	299.06	99.54	0.000	Pass	16.3266	299.04	98.33	0.007	Pass
8	17.3974	299.41	16.9797	299.41	97.60	0.000	Pass	16.6817	299.33	98.24	0.027	Pass	16.6023	299.35	99.52	0.000	Pass	16.3169	299.34	98.28	0.003	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	17.0486	58.35	Pass
2	17.0416	58.39	Pass
3	17.0489	58.09	Pass
4	17.0410	58.84	Pass

B. 25th cycle fully charged state

5	16.3464	58.83	Pass
6	16.3329	58.73	Pass
7	16.3266	57.90	Pass
8	16.3169	57.98	Pass

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

A. 1st cycle fully charged state

9	17.3375	25.12	Pass
10	17.3453	24.86	Pass
11	17.3395	24.92	Pass
12	17.3374	24.72	Pass

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

B. 25th cycle fully charged state

13	17.0493	24.88	Pass
14	17.0446	24.52	Pass
15	17.0483	24.68	Pass
16	17.4218	24.45	Pass

2-3. T6/T8 Test Result (P595490E1)

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

A. 1st cycle 50% charged state

C-1	3.8446	20.22	Pass
C-2	3.8446	21.44	Pass
C-3	3.8441	20.63	Pass
C-4	3.8438	20.82	Pass
C-5	3.8434	21.34	Pass

B. 25st cycle 50% charged state

C-6	3.8526	21.11	Pass
C-7	3.8533	21.25	Pass
C-8	3.8529	21.43	Pass
C-9	3.8530	21.40	Pass
C-10	3.8502	21.38	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	3.4360	77.16	Pass
C-7	3.4318	78.62	Pass
C-8	3.4379	79.36	Pass
C-9	3.4358	81.00	Pass
C-10	3.4340	83.50	Pass
C-11	3.4362	79.35	Pass
C-12	3.4392	78.72	Pass
C-13	3.4389	77.61	Pass
C-14	3.4380	76.63	Pass
C-15	3.4359	72.98	Pass

B. 25th cycle fully discharged state

C-16	3.4474	78.20	Pass
C-17	3.4349	74.99	Pass
C-18	3.4367	75.95	Pass
C-19	3.4364	76.59	Pass
C-20	3.4458	79.39	Pass
C-21	3.4419	76.88	Pass
C-22	3.4395	76.78	Pass
C-23	3.4482	78.44	Pass
C-24	3.4362	78.62	Pass
C-25	3.4662	77.42	Pass

Document Number	QDI-200930-B-L20L4PE1-D1	
Prepared	Jie Ma	
Approved	Ying Li	

1.2m Drop Test Report

– L20L4PE1 (Nom. 75.00Wh, 15.36V) –

2020. 09. 30



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	385*285*175 mm	Battery Quantity	26 pcs/Box
Gross weight	9.440 kg	Net Weight of Batteries	7.791 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.