



UN38.3 试验概要

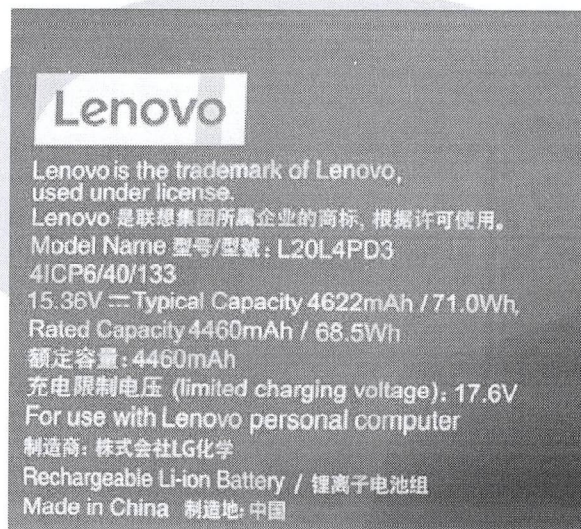
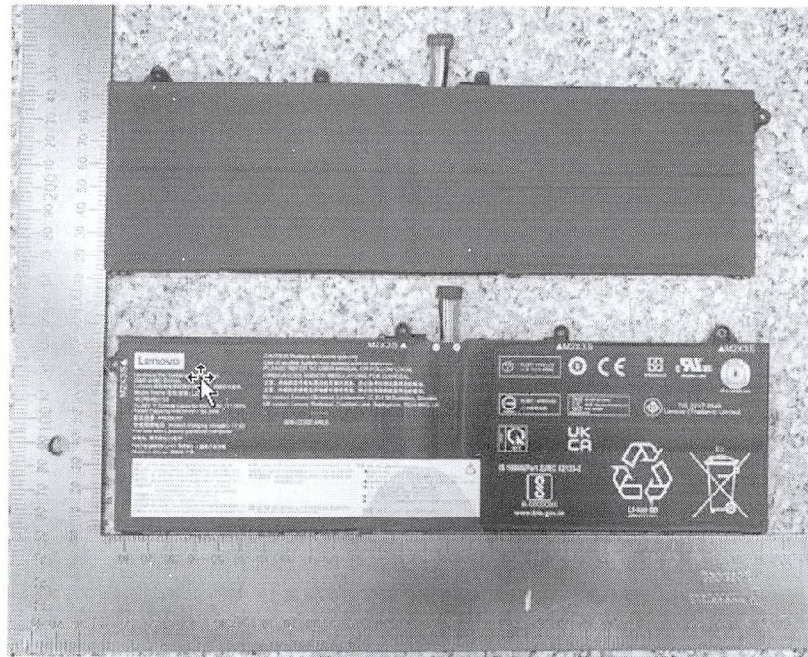
UN38.3 Test Summary

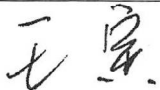


单位信息 Company information			
委托单位 Consignor	乐金化学(南京)信息电子材料有限公司 LG Chem(Nanjing) I&E Materials Co.,Ltd 南京经济技术开发区恒谊路 17 号 NO 17 HENGYI RD NANJING ECONOMICAL & TECHNICAL DEVELOPMENT ZONE 025-85603000 zhanghonglu@lgchem.com www.lgchem.com		
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电池信息 Battery information			
名称 Name	锂离子电池 Lithium Ion battery pack	品牌 Brand	/
型号 Type	L20L4PD3	原始测试型号 Original tested type	/
标称电压(V) Nominal voltage	15.36	容量/能量 Capacity/energy	Typ 4622mAh/71.0Wh Rated 4460mAh/68.5Wh
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	0.275	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-201109-B-L20L4PD3	测试报告日期 Date of test report	2020-11-09
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



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 2020-11-17 

-验证码:843263-

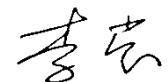
报告结束

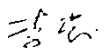


UN38.3 Test Summary

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		
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	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-201109-B-L20L4PD3	Test 1. Altitude Simulation	Pass
Date of test report	2020.11.9	Test 2. Thermal Test	Pass
Model name	L20L4PD3	Test 3. Vibration	Pass
Nominal voltage (V)	15.36	Test 4. Shock	Pass
Capacity (Min Wh)	68.50	Test 5. External Short Circuit	Pass
Weight (g)	274.77	Test 6. Impact or Crush	Pass
Dimensions (mm)	285.00x83.00x5.80	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-201109-B-L20L4PD3	
Prepared	Jie Ma	
Approved	Ying Li	

UN38.3 Test Report

– L20L4PD3 (Min.68.50Wh, 15.36V)–

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2020. 11. 09



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℃	- 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 (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 $Rt = \frac{12V + Vc}{Max\ discharge\ current}$ - 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	17.4407	274.39	17.4388	274.38	99.99	0.004	Pass	17.1057	274.31	98.09	0.026	Pass	17.1035	274.35	99.99	0.000	Pass	17.1017	274.35	99.99	0.000	Pass
2	17.0540	274.52	17.0454	274.51	99.95	0.004	Pass	16.7038	274.47	98.00	0.015	Pass	16.7005	274.48	99.98	0.000	Pass	16.6978	274.47	99.98	0.004	Pass
3	17.0478	274.77	17.0369	274.77	99.94	0.000	Pass	17.0981	274.72	100.00	0.018	Pass	17.0960	274.74	99.99	0.000	Pass	17.0939	274.74	99.99	0.000	Pass
4	17.0448	274.36	17.4369	274.35	100.00	0.004	Pass	17.0946	274.30	98.04	0.018	Pass	17.0925	274.32	99.99	0.000	Pass	17.0901	274.32	99.99	0.000	Pass

B. 25th cycle fully charged state

5	17.4541	273.92	17.4526	273.91	99.99	0.004	Pass	16.7136	273.88	95.77	0.011	Pass	16.6130	273.88	99.40	0.000	Pass	16.5113	273.89	99.39	0.000	Pass
6	17.4662	274.59	17.4644	274.58	99.99	0.004	Pass	16.7204	274.54	95.74	0.015	Pass	16.6203	274.56	99.40	0.000	Pass	16.5212	274.54	99.40	0.007	Pass
7	17.4636	274.68	17.4618	274.68	99.99	0.000	Pass	16.7148	274.65	95.72	0.011	Pass	16.6155	274.67	99.41	0.000	Pass	16.5155	274.67	99.40	0.000	Pass
8	17.0758	274.69	17.4658	274.68	100.00	0.004	Pass	16.7174	274.64	95.72	0.015	Pass	16.6197	274.67	99.42	0.000	Pass	16.5187	274.66	99.39	0.004	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	17.1017	58.54	Pass
2	16.6978	58.19	Pass
3	17.0939	57.41	Pass
4	17.0901	57.71	Pass

B. 25th cycle fully charged state

5	16.5113	58.34	Pass
6	16.5212	58.45	Pass
7	16.5155	57.40	Pass
8	16.5187	57.89	Pass

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

A. 1st cycle fully charged state

9	17.4389	25.52	Pass
10	17.4489	25.45	Pass
11	17.4466	25.42	Pass
12	17.4451	25.22	Pass

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

B. 25th cycle fully charged state

13	17.4579	25.28	Pass
14	17.0656	25.02	Pass
15	17.4672	25.08	Pass
16	17.4633	25.05	Pass

2-3. T6/T8 Test Result (P5140D3A1)

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

A. 1st cycle 50% charged state

C-1	3.8577	22.36	Pass
C-2	3.8574	22.60	Pass
C-3	3.8576	23.10	Pass
C-4	3.8578	24.77	Pass
C-5	3.8578	24.56	Pass

B. 25st cycle 50% charged state

C-6	3.8638	22.32	Pass
C-7	3.8654	22.99	Pass
C-8	3.8656	22.66	Pass
C-9	3.8648	22.47	Pass
C-10	3.8660	22.54	Pass

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

A. 1st cycle fully discharged state

C-6	3.4806	83.60	Pass
C-7	3.4799	89.80	Pass
C-8	3.4879	85.82	Pass
C-9	3.4815	87.59	Pass
C-10	3.4803	84.48	Pass
C-11	3.4804	78.92	Pass
C-12	3.4800	90.22	Pass
C-13	3.4805	78.56	Pass
C-14	3.4799	80.88	Pass
C-15	3.4792	81.76	Pass

B. 25th cycle fully discharged state

C-16	3.4726	88.49	Pass
C-17	3.4748	84.55	Pass
C-18	3.4735	78.65	Pass
C-19	3.4740	84.93	Pass
C-20	3.4726	78.46	Pass
C-21	3.4748	90.67	Pass
C-22	3.4758	85.96	Pass
C-23	3.4780	88.16	Pass
C-24	3.4728	82.64	Pass
C-25	3.4752	86.15	Pass

Document Number	QDI-201114-B-L20L4PD3-D1	
Prepared	Jie Ma	
Approved	Ying Li	

1.2m Drop Test Report

- L20L4PD3 (Min. 68.50Wh, 15.36V) -

2020. 11. 14



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 x 285 x 175 mm	Battery Quantity	32 pcs/Box
Gross weight	10.440kg	Net Weight of Batteries	8.784kg

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.