



UN38.3 试验概要

UN38.3 Test Summary

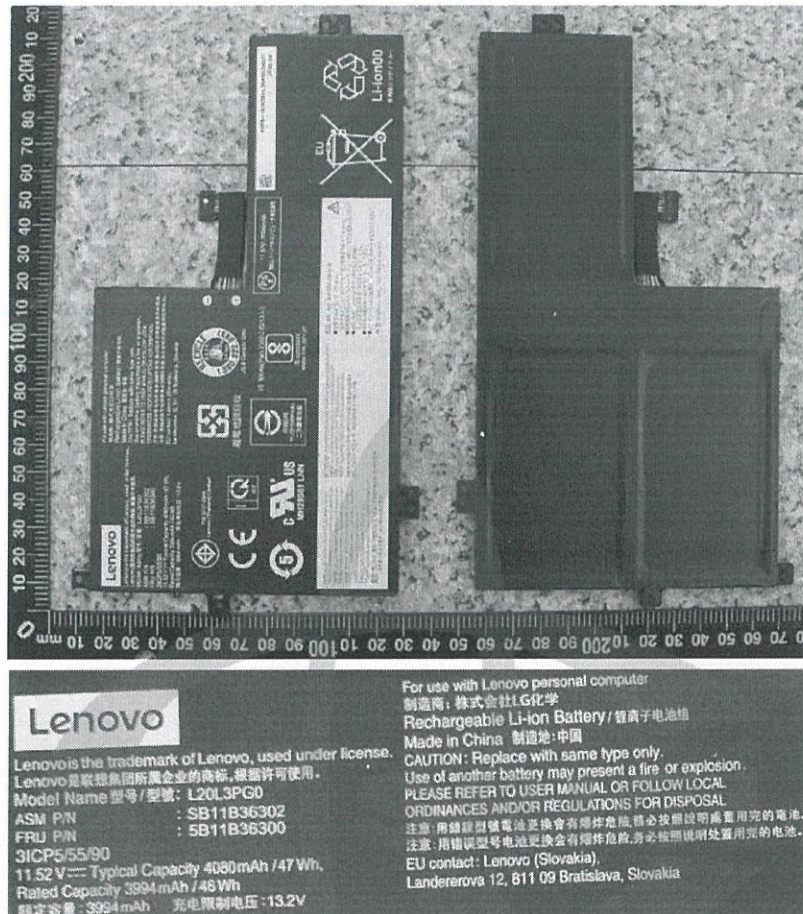


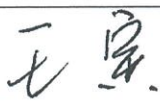
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单位信息 Company information			
委托单位 Consignor	乐金化学(南京)信息电子材料有限公司 LG Chem(Nanjing) I&E Materials Co.,Ltd 南京经济技术开发区恒谊路 17 号 NO 17 HENGYI RD NANJING ECONOMICAL & TECHNICAL DEVELOPMENT ZONE 025-85603000 zhanghonglu@lgchem.com www.lgchem.com		
生产单位 Manufacturer	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/		
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电池信息 Battery information			
名称 Name	锂离子电池	品牌 Brand	/
型号 Type	L20L3PG0	原始测试型号 Original tested type	/
标称电压(V) Nominal voltage	11.52	容量/能量 Capacity/energy	Typical Capacity:4080mAh 47Wh/Rated Capacity:3994mAh 46Wh
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	0.187	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-200803-B-L20L3PG0	测试报告日期 Date of test report	2020-08-03
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



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 2020-08-10

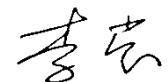
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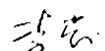
报告结束

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		
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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-2000803-B-L20L3PG0	Test 1. Altitude Simulation	Pass
Date of test report	2020.08.03	Test 2. Thermal Test	Pass
Model name	L20L3PG0	Test 3. Vibration	Pass
Nominal voltage (V)	11.52	Test 4. Shock	Pass
Capacity (Nominal Wh)	47.00	Test 5. External Short Circuit	Pass
Weight (g)	186.42	Test 6. Impact or Crush	Pass
Dimensions (mm)	202X112X5.16	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-200803-B-L20L3PG0	
Prepared	Jie Ma	
Approved	Ying Li	

UN38.3 Test Report

- L20L3PG0 (Nom. 47.00Wh, 11.52V) -

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2. Test Result
3. Sample Image

2020. 08. 03



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 (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	13.0468	186.05	13.0429	186.05	99.97	0.000	Pass	12.8083	186.01	98.20	0.021	Pass	12.8066	186.03	99.99	0.000	Pass	12.8049	186.02	99.99	0.005	Pass
2	13.0456	186.42	13.0427	186.43	99.98	0.000	Pass	12.8065	186.38	98.19	0.027	Pass	12.8055	186.38	99.99	0.000	Pass	12.8037	186.38	99.99	0.000	Pass
3	13.0443	186.17	13.0414	186.17	99.98	0.000	Pass	12.8072	186.15	98.20	0.011	Pass	12.8059	186.15	99.99	0.000	Pass	12.8046	186.14	99.99	0.005	Pass
4	13.0469	186.09	13.0441	186.06	99.98	0.016	Pass	12.8103	186.03	98.21	0.016	Pass	12.8085	186.04	99.99	0.000	Pass	12.8070	186.04	99.99	0.000	Pass

B. 25th cycle fully charged state

5	13.0771	186.30	13.0753	186.30	99.99	0.000	Pass	12.8442	186.28	98.23	0.011	Pass	12.8426	186.28	99.99	0.000	Pass	12.8412	186.28	99.99	0.000	Pass
6	13.0733	186.33	13.0712	186.32	99.98	0.005	Pass	12.8437	186.28	98.26	0.021	Pass	12.8421	186.30	99.99	0.000	Pass	12.8409	186.30	99.99	0.000	Pass
7	13.0735	186.28	13.0724	186.28	99.99	0.000	Pass	12.8604	186.25	98.38	0.016	Pass	12.8591	186.26	99.99	0.000	Pass	12.8576	186.26	99.99	0.000	Pass
8	13.0722	186.46	13.0703	186.43	99.99	0.016	Pass	12.8387	186.40	98.23	0.016	Pass	12.8376	186.43	99.99	0.000	Pass	12.8362	186.43	99.99	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	12.8049	58.35	Pass
2	12.8037	58.38	Pass
3	12.8046	57.31	Pass
4	12.8070	57.24	Pass

B. 25th cycle fully charged state

5	12.8412	57.43	Pass
6	12.8409	58.40	Pass
7	12.8576	58.27	Pass
8	12.8362	57.49	Pass

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

A. 1st cycle fully charged state

9	12.6410	26.63	Pass
10	12.6403	26.36	Pass
11	12.6467	26.33	Pass
12	12.6414	26.03	Pass

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

B. 25th cycle fully charged state

13	12.6607	25.99	Pass
14	12.6575	25.73	Pass
15	12.6666	25.69	Pass
16	13.0727	25.46	Pass

2-3. T6/T8 Test Result (P485490B1)

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

A. 1st cycle 50% charged state

C-1	3.8451	21.69	Pass
C-2	3.8429	22.12	Pass
C-3	3.8433	21.72	Pass
C-4	3.8446	20.67	Pass
C-5	3.8436	21.85	Pass

B. 25st cycle 50% charged state

C-6	3.8682	21.60	Pass
C-7	3.8687	22.18	Pass
C-8	3.8651	22.17	Pass
C-9	3.8639	22.45	Pass
C-10	3.8659	22.68	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	3.4392	84.08	Pass
C-7	3.4352	83.85	Pass
C-8	3.4382	84.20	Pass
C-9	3.4365	83.33	Pass
C-10	3.4358	82.47	Pass
C-11	3.4383	70.79	Pass
C-12	3.4369	84.90	Pass
C-13	3.4352	78.15	Pass
C-14	3.4365	85.90	Pass
C-15	3.4382	83.00	Pass

B. 25th cycle fully discharged state

C-16	3.5052	75.99	Pass
C-17	3.5110	85.09	Pass
C-18	3.5159	77.14	Pass
C-19	3.5036	89.94	Pass
C-20	3.5092	78.10	Pass
C-21	3.5210	81.13	Pass
C-22	3.5134	78.04	Pass
C-23	3.5096	86.53	Pass
C-24	3.5110	80.34	Pass
C-25	3.5151	82.91	Pass

Document Number	QDI-200827-B-L20L3PG0-D2	
Prepared	Jie Ma	
Approved	Ying Li	

1.2m Drop Test Report

- L20L3PG0 (Nom. 47Wh, 11.52V) -

2020. 08. 27



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	382*290*167mm	Battery Quantity	34pcs/Box
Gross weight	8.020 kg	Net Weight of Batteries	6.330 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.