

UN38.3 Test Summary

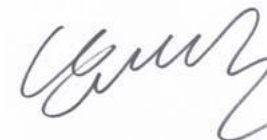
The following product has been evaluated according to the 5th revised edition Amendment 2 of the UN Manual of Tests and Criteria.
We, LG Chem, Ltd., hereby certify that this battery meets the requirements of the regulation for transportation of lithium-ion cells, batteries and single cell batteries.

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Description		List of Test Completed	
Test Report Number	QDI-170104-B-L16L4PB3	Test 1. Altitude Simulation	Pass
Date of test report	2017.01.04	Test 2. Thermal Test	Pass
Model name	L16L4PB3	Test 3. Vibration	Pass
Type	Pouch	Test 4. Shock	Pass
Nominal voltage	7.72 V	Test 5. External Short Circuit	Pass
Capacity	48.0 Wh	Test 6. Impact or Crush	Pass
Weight	191.0 g	Test 7. Overcharge	Pass
Dimensions	242.00mm X 90.00mm X 4.50mm	Test 8. Forced Discharge	Pass

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Document Number	QDI-170104-B-L16L4PB3	
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UN38.3 Test Report

- L16L4PB3 (Nom.48Wh, 7.72V) -

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2017. 01. 04



1. UN38.3 Test Condition

Rev.5 / Amd.2

Test item	Test Condition	Requirements	Etc.
Test 1. Altitude Simulation	Storing at (low pressure)11.6kPa for 6hr at 20+/-5℃	<ul style="list-style-type: none"> - After OCV (%) ≥ 90% - No leakage, no venting, no disassembly, no rupture, no fire - Mass loss limit (leakage) <ol style="list-style-type: none"> 1) If $M < 1g$, less than 0.5%, 2) If $1g \leq M \leq 75g$, less than 0.2%, 3) If $M > 75g$, less than 0.1% 	<p>T1~T5 : Sequence Tests</p> <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 (peak acceleration : 150gn, pulse duration : 6msec) x 6 (±x, y, z), direction x 3 cycle		
Test 5. External Short Circuit	100mΩ ext. short-circuit at 55±2℃ 1hr continue after returning at 55±2℃		
Test 6. Impact	Φ=15.8±0.1mm bar, 9.1±0.1kg mass, 61±2.5cm height	<ul style="list-style-type: none"> - 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)	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - No disassembly, no fire within 7 days after the test 	Resistance of Electric Loader 1/Ω = (max. discharge current) / (12 + Initial OCV)

2. General Information

1. Standard charge / discharge Condition

	Mode	Condition	End Condition
Charge	CC / CV	Current = 4298 mA Voltage = 8.8 V	Current = 308 mA
Discharge	CC	Current = 1228 mA	Voltage = 6.4 V

2. Cycle Condition

	Mode	Condition	End Condition
Charge	CC / CV	Current = 4298 mA Voltage = 8.8 V	Current = 308 mA
Discharge	CC	Current = 1228 mA	Voltage = 6.4 V

3. Test Condition

	Mode	Condition
Test 7. Overcharge	CC / CV	Max. Charge Current = 4298 mA CC/CV 2Imax (8596mA) 17.6 V cut-off 24Hr
Test 8. Forced Discharge	CC	Max. Discharge Current = 3070 mA Duration Time = 60 min

3-1. 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	8.770	191.52	8.763	191.50	99.92	0.009	Pass	8.671	191.48	98.95	0.008	Pass	8.666	191.47	99.94	0.005	Pass	8.665	191.46	99.99	0.009	Pass
2	8.789	191.49	8.785	191.48	99.95	0.009	Pass	8.652	191.46	98.49	0.008	Pass	8.646	191.44	99.93	0.009	Pass	8.635	191.43	99.87	0.008	Pass
3	8.773	191.49	8.765	191.47	99.91	0.008	Pass	8.659	191.46	98.79	0.005	Pass	8.651	191.45	99.91	0.009	Pass	8.625	191.44	99.70	0.004	Pass
4	8.772	191.50	8.766	191.48	99.93	0.009	Pass	8.678	191.47	99.00	0.007	Pass	8.672	191.45	99.93	0.009	Pass	8.647	191.45	99.71	0.004	Pass

B. 50th cycle fully charged state

5	8.776	191.48	8.770	191.47	99.93	0.008	Pass	8.640	191.45	98.52	0.009	Pass	8.632	191.44	99.91	0.006	Pass	8.630	191.43	99.98	0.006	Pass
6	8.774	191.49	8.770	191.49	99.95	0.001	Pass	8.649	191.48	98.62	0.004	Pass	8.647	191.46	99.98	0.008	Pass	8.642	191.45	99.94	0.008	Pass
7	8.773	191.51	8.767	191.50	99.93	0.004	Pass	8.656	191.50	98.73	0.001	Pass	8.648	191.48	99.91	0.008	Pass	8.646	191.47	99.98	0.007	Pass
8	8.787	191.47	8.783	191.45	99.95	0.009	Pass	8.651	191.44	98.50	0.006	Pass	8.649	191.43	99.98	0.003	Pass	8.641	191.42	99.91	0.007	Pass

3-2. T5/T7 Test Result

EXT.Short Circuit (T5)

NO.	Initial OCV(V)	Max. Temp (°C)	Result
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A. 1st cycle fully charged state

1	8.665	55.00	Pass
2	8.635	54.95	Pass
3	8.625	53.56	Pass
4	8.647	53.27	Pass

B. 50th cycle fully charged state

5	8.630	55.15	Pass
6	8.642	56.05	Pass
7	8.646	56.46	Pass
8	8.641	56.65	Pass

Over Charge (T7)

NO.	Initial OCV(V)	Max. Temp (°C)	Result
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A. 1st cycle fully charged state

9	8.744	24.68	Pass
10	8.742	25.94	Pass
11	8.745	24.87	Pass
12	8.747	24.77	Pass

Over Charge (T7)

NO.	Initial OCV(V)	Max. Temp (°C)	Result
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B. 50th cycle fully charged state

13	8.629	24.58	Pass
14	8.624	24.80	Pass
15	8.624	25.99	Pass
16	8.629	25.58	Pass

3-3. T6/T8 Test Result (P4043B0A1)

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

A. 1st cycle 50% charged state

C-1	3.862	22.51	Pass
C-2	3.862	22.38	Pass
C-3	3.862	22.68	Pass
C-4	3.863	22.67	Pass
C-5	3.861	22.44	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	3.256	52.88	Pass
C-7	3.266	48.14	Pass
C-8	3.263	51.26	Pass
C-9	3.265	49.82	Pass
C-10	3.269	48.16	Pass
C-11	3.262	45.59	Pass
C-12	3.258	47.68	Pass
C-13	3.266	48.33	Pass
C-14	3.261	48.44	Pass
C-15	3.262	48.23	Pass

B. 50th cycle fully discharged state

C-16	3.263	41.60	Pass
C-17	3.261	42.02	Pass
C-18	3.264	42.49	Pass
C-19	3.268	41.59	Pass
C-20	3.267	40.32	Pass
C-21	3.269	40.19	Pass
C-22	3.267	41.92	Pass
C-23	3.269	41.30	Pass
C-24	3.267	40.31	Pass
C-25	3.262	41.53	Pass

4. Sample Image



Lenovo

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 Rechargeable Li-ion Battery
 锂离子电池组 2ICP4/43/110-2
 Model Name (型号/型号): L16L4PB3
 Manufactured By LGC
 Cell made in China Pack processed in China
 制造地:中国 / 製造地:中国 制造商:LG Chem, Ltd.
 PLEASE REFER TO USER MANUAL OR FOLLOW LOCAL ORDINANCES AND/OR REGULATIONS FOR DISPOSAL
 请参考使用说明或者遵循相关法律法规规定处理废弃电池

CAUTION : Replace with same type only.
 Use of another battery may present a fire or explosion
 Rating: 7.72V ==TYP.6217mAh/48Wh MIN.6046mAh/46Wh
 STORE BETWEEN 0°C-60°C 32°F-140°F
 For use with Lenovo personal computer
 EU contact : Lenovo, Einsteinova 21,
 851 01 Bratislava, Slovakia

PS E 7.72V 6046mAh
 レノボ・ジャパン株式会社
 額定容量: 6046mAh 充电限制电压: 8.8V
 製造者: LG Chem, (Nanjing) I&E Materials Co., Ltd.
 연락처: 1670-0086
 XXXXXXXX-XXXXXX

R39088
 7.72V/6046mAh
 二次鋰電池組



FARE MÅ IKKE ÅRNES ELLER UTSÆTTES FOR VARME OVER 100°C
 PELIGRO NO ABRIRLO EXPONER A TEMPERATURAS SUPERIORES A 100°C
 PERIGRO NÃO ABRIR NEM EXPOR A TEMPERATURAS SUPERIORES A 100°C
 PERIGRO NÃO ABRIR OU EXPOSIÇÃO A AQUECIMENTO ACIMA DE 100°C
 VORSICHT! NICHT REPARIEREN ODER ZERLEGEN MIT WASSER
 IN BERÜHRUNG BRINGEN ODER ÜBER 100°C ERHITZEN
 DANGER DO NOT OPEN OR EXPOSE TO HEAT ABOVE 100°C
 DANGER! NE PAS OUVRIRE NI EXPOSER À PLUS DE 100°C
 GEVAAR! NIET OPENEN, NIET BLOOTSTELLEN AAN TEMPERATUREN BOVEN 100°C

FARLIG MÅ IKKE ÅRNES ELLER UDSÆTTES FOR VARME OVER 100°C
 ATTENZIONE! NON ABRIRE O RISCALDARE AD UNA TEMPERATURA SUPERIORE AI 100°C
 FARA ÖPPNA INTE BATTERIET OCH UTSÄTT DET INTE FÖR VARME ÖVER 100°C
 VAARA ÄLÄÄNÄ AVOLJA ÄLÄÄ KUMIENNA SITTÄ KU HÄI ASTEEN LÄMPÖLÄÄM
 危険 発熱、着火、破裂の恐れがあるため。
 ●衝撃を与えないでください。
 ●衝撃を与えたバッテリーパックは、使用をやめてください。
 ●膨満時間が短くなったバッテリーパックは新しいものと交換してください。
 ●分解・改造、火中への投下・100°C以上の加熱、および高温での使用・放電をしないでください。
 ●指定の充電方法以外で充電しないでください。
 ●バッテリーパックの金属端子をショート(短絡)させないでください。

注意: 用錯誤型號電池更換會有爆炸危險
 務必按照說明書選用電池
 注意: 用錯誤型號電池更換會有爆炸危險
 務必按照說明書選用電池

위험 발열하거나 100°C 이상 가열하지 마십시오.
 危險 禁止拆卸、撞擊、外部短接或投入火中。若出現嚴重鼓脹，請勿繼續使用。
 請勿置于高溫環境中，電池浸水后禁止使用!