




문서번호	QDI-160719-B-SB10K97589	
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UN38.3 Test Report

- SB10K97589 (Nom.51.0Wh, 15.2V) -

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2016. 07. 19

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) <ul 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 = 3330 mA Voltage = 17.4 V	Current = 166 mA
Discharge	CC	Current = 662 mA	Voltage = 12.0 V

2. Cycle Condition

	Mode	Condition	End Condition
Charge	CC / CV	Current = 3330 mA Voltage = 17.4 V	Current = 166 mA
Discharge	CC	Current = 662 mA	Voltage = 12.0 V

3. Test Condition

	Mode	Condition
Test 7. Overcharge	CC / CV	Max. Charge Current = 3630 mA CC/CV 2Imax (7260mA) 22 V cut-off 24Hr
Test 8. Forced Discharge	CC	Max. Discharge Current = 3310 mA Duration Time = 66 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	17.387	244.45	17.387	244.45	100.00	0.000	Pass	17.168	244.44	98.74	0.004	Pass	17.166	244.44	99.99	0.000	Pass	17.164	244.44	99.99	0.000	Pass
2	17.348	244.34	17.345	244.34	99.98	0.000	Pass	17.146	244.33	98.85	0.004	Pass	17.137	244.32	99.95	0.004	Pass	17.137	244.31	100.00	0.004	Pass
3	17.343	244.33	17.34	244.32	99.98	0.004	Pass	17.127	244.29	98.77	0.012	Pass	17.118	244.27	99.95	0.008	Pass	17.115	244.27	99.98	0.000	Pass
4	17.353	244.46	17.35	244.45	99.99	0.004	Pass	17.127	244.42	98.71	0.012	Pass	17.124	244.41	99.98	0.004	Pass	17.122	244.41	99.99	0.000	Pass

B. 50th cycle fully charged state

5	17.354	244.54	17.345	244.54	99.95	0.000	Pass	17.132	244.52	98.77	0.008	Pass	17.123	244.50	99.95	0.008	Pass	17.116	244.50	99.96	0.000	Pass
6	17.359	244.15	17.359	244.14	100.00	0.004	Pass	17.144	244.11	98.76	0.012	Pass	17.141	244.09	99.98	0.008	Pass	17.139	244.08	99.99	0.004	Pass
7	17.370	244.34	17.365	244.32	99.97	0.008	Pass	17.165	244.30	98.85	0.008	Pass	17.165	244.29	100.00	0.004	Pass	17.156	244.29	99.95	0.000	Pass
8	17.361	243.99	17.356	243.97	99.97	0.008	Pass	17.127	243.97	98.68	0.000	Pass	17.118	243.96	99.95	0.004	Pass	17.115	243.96	99.98	0.000	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	17.164	244.44	Pass
2	17.137	244.31	Pass
3	17.115	244.27	Pass
4	17.122	244.41	Pass

B. 50th cycle fully charged state

5	17.116	244.50	Pass
6	17.139	244.08	Pass
7	17.156	244.29	Pass
8	17.115	243.96	Pass

Over Charge (T7)

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

9	17.347	24.13	Pass
10	17.343	24.88	Pass
11	17.347	25.00	Pass
12	17.350	24.07	Pass

Over Charge (T7)

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

13	17.327	24.01	Pass
14	17.329	24.66	Pass
15	12.529	24.89	Pass
16	12.528	24.35	Pass

3-3. T6/T8 Test Result (ICP445388A1)

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

A. 1st cycle 50% charged state

C-1	3.851	23.09	Pass
C-2	3.852	23.04	Pass
C-3	3.849	23.05	Pass
C-4	3.851	23.13	Pass
C-5	3.852	23.09	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	3.012	46.32	Pass
C-7	3.010	45.74	Pass
C-8	3.009	44.21	Pass
C-9	3.015	47.13	Pass
C-10	3.009	48.21	Pass
C-11	3.014	47.56	Pass
C-12	3.008	47.46	Pass
C-13	3.014	47.20	Pass
C-14	3.010	46.49	Pass
C-15	3.014	47.32	Pass

B. 50th cycle fully discharged state

C-16	3.121	44.84	Pass
C-17	3.122	44.26	Pass
C-18	3.118	43.21	Pass
C-19	3.120	44.56	Pass
C-20	3.117	45.26	Pass
C-21	3.123	45.52	Pass
C-22	3.119	46.79	Pass
C-23	3.120	44.52	Pass
C-24	3.122	44.62	Pass
C-25	3.116	42.69	Pass

3. Sample Image



Lenovo
 Lenovo, ThinkPad 是联想集团所属企业的商标。根据许可使用。
 Rechargeable Li-ion Battery Pack/충전식 리튬 이온 배터리
 NOM 15.2 V \approx 3.36Ah/51Wh 锂离子电池组
 额定容量:3260mAh 充电限制电压: 17.4V
 ASM P/N 型号 SB10K97589
 FRU P/N 01AV432
 4ICP5/54/88
 For use with ThinkPad
 Cell made in China Pack processed in China
 制造地: 中国 / 制造地: 中国
 制造商: LG Chem, Ltd.