

UL Test Center
ShenZhen Oceansun Battery Co. ,Ltd

UN 38.3 Test Report

User:

Product Name: Polymer Lithium-ion Battery

Submittal unit: Central Research Department of Oceansun

Cell Specification: OSL252025-0.296Wh

Tested by:	JX Zeng, Apr,16,2009
Checked by:	HJ Cao, Apr,16,2009
Reviewed by:	SS Yin, Apr,16,2009

UL Test Center, ShenZhen Oceansun Battery Co. ,Ltd

Test Report

Sample name	Polymer Lithium-ion Battery 252025-0.296Wh		
Submittal unit	UL Test Center, ShenZhen Oceansun Battery Co. ,Ltd		
Test method	United Nations Recommendations on the Transport of Dangerous Goods		
Judgment criteria	United Nations Recommendations on the Transport of Dangerous Goods		
Sample appearance	silver square solid		
Date of test	2009/4/8-2009/4/15	Sample NO.	0904080001
Test items	Altitude Simulation, Thermal Test , Vibration Test , Shock Test , External Short Circuit, Impact Test, Overcharge Test, Forced Discharge Test		
Test conclusion	Samples have passed UN38.3 Test, and the test results proved to be qualified.		
Tested by:		Checked by:	Approved by:

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Test Report

NO.	Test items	Criteria requirement or criteria article NO.	Test result	Conclusion	Remark
1	Altitude Simulation Test	United Nations Recommendations on the Transport of Dangerous Goods (4th) thereafter call " Manual of Tests and Criteria UN38.3(4th)" for short, Test T.1	see attached table 1	pass	/
2	Thermal Test	Manual of Tests and Criteria UN38.3(4th) Test T.2	see attached table 2	pass	/
3	Vibration Test	Manual of Tests and Criteria UN38.3(4th)Test T.3	see attached table 3	pass	/
4	Shock Test	Manual of Tests and Criteria UN38.3(4th)Test T.4	see attached table 4	pass	/
5	External Short Circuit	Manual of Tests and Criteria UN38.3(4th) Test T.5	see attached table 5	pass	/
6	Impact Test	Manual of Tests and Criteria UN38.3(4th) Test T.6	see attached table 6	pass	/
7	Forced Discharge Test	Manual of Tests and Criteria UN38.3(4th) Test T.7	see attached table 7	pass	/
8	Drop Test (Full Carton)	Manual of Tests and Criteria UN38.3(4th) Test T.8	see attached table 8	pass	/
Test environment and condition		Ambience temperature: 20 ±5℃			

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Test Report-attached table 1

NO.	1	Name of test item		Altitude Simulation				
				before test		after test		Mass loss/%
		Mass/g	open-circuit voltage/V	Mass/g	open-circuit voltage/V			
1	first fully charged	1.999	4.174	1.998	4.174	0.07	100.00	O
2	first fully charged	2.008	4.176	2.009	4.175	-0.03	99.98	O
3	first fully charged	2.006	4.175	2.006	4.175	0.02	100.00	O
4	first fully charged	2.027	4.173	2.026	4.173	0.07	100.00	O
5	first discharged	1.974		1.974		0.02		O
6	first discharged	2.022		2.023		-0.03		O
7	first discharged	1.987		1.988		-0.03		O
8	first discharged	2.009		2.009		0.02		O
9	fully charged 50 cycles	2.005	4.174	2.004	4.173	0.07	99.99	O
10	fully charged 50 cycles	2.024	4.175	2.023	4.174	0.07	99.97	O
11	fully charged 50 cycles	1.994	4.174	1.995	4.172	-0.03	99.96	O
12	fully charged 50 cycles	2.003	4.172	2.002	4.173	0.07	100.03	O
13	discharged 50 cycles	1.999		1.998		0.07		O
14	discharged 50 cycles	2.021		2.021		0.02		O
15	discharged 50 cycles	1.986		1.986		0.02		O
16	discharged 50 cycles	2.011		2.011		0.02		O

Remark: L-leakage; V- venting ; D-disassembly; R- rupture; F- fire; O-no leakage, no venting, no disassembly, no rupture and no fire.

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Test Report-attached table 2

NO.	2	Name of test item		Thermal Test				
Sample No.	Sample state	before test		after test		Mass loss/%	residual voltage/%	other phenomention
		Mass/g	open-circuit voltage/V	Mass/g	open-circuit voltage/V			
1	first fully charged	1.101	4.172	1.998	4.172	-81.46	100.00	O
2	first fully charged	1.994	4.174	1.994	4.172	0.02	99.96	O
3	first fully charged	2.010	4.175	2.010	4.176	0.02	100.03	O
4	first fully charged	2.032	4.178	2.032	4.177	0.02	99.98	O
5	first fully discharged	2.012		2.012		0.02		O
6	first fully discharged	2.036		2.035		0.07		O
7	first fully discharged	2.011		2.012		-0.03		O
8	first fully discharged	2.026		2.026		0.02		O
9	fully charged 50 cycles	2.002	4.171	2.002	4.170	0.02	99.97	O
10	fully charged 50 cycles	2.016	4.177	2.017	4.177	-0.03	100.00	O
11	fully charged 50 cycles	1.973	4.180	1.973	4.179	0.02	99.97	O
12	fully charged 50 cycles	2.010	4.178	2.011	4.178	-0.03	100.00	O
13	discharged 50 cycles	1.994		1.994		0.02		O
14	discharged 50 cycles	2.000		2.001		-0.03		O
15	discharged 50 cycles	2.006		2.005		0.07		O
16	discharged 50 cycles	2.002		2.002		0.02		O

Remark: L-leakage; V- venting ; D-disassembly; R- rupture; F- fire; O-no leakage, no venting, no disassembly, no rupture and no fire.

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Test Report-attached table 3

NO.	3	Name of test item		Vibration Test				
Sample No.	Sample state	before test		after test		Mass loss/%	residual voltage/%	other phenom on
		Mass/g	open-circuit voltage/V	Mass/g	open-circuit voltage/V			
1	first fully charged	1.999	4.178	1.998	4.174	0.07	99.91	O
2	first fully charged	2.011	4.171	2.011	4.172	0.02	100.03	O
3	first fully charged	1.967	4.176	1.968	4.176	-0.03	99.99	O
4	first fully charged	2.011	4.175	2.011	4.174	0.02	99.98	O
5	first fully discharged	1.976		1.976		0.02		O
6	first discharged	1.980		1.979		0.07		O
7	first discharged	1.996		1.996		0.02		O
8	first discharged	2.012		2.012		0.02		O
9	fully charged 50 cycles	2.034	4.175	2.035	4.175	-0.03	99.99	O
10	fully charged 50 cycles	1.994	4.177	1.995	4.177	-0.03	99.99	O
11	fully charged 50 cycles	2.011	4.174	2.011	4.173	0.02	99.98	O
12	fully charged 50 cycles	1.982	4.173	1.982	4.172	0.02	99.98	O
13	discharged 50 cycles	2.007		2.006		0.07		O
14	discharged 50 cycles	2.023		2.023		0.02		O
15	discharged 50 cycles	2.026		2.026		0.02		O
16	discharged 50 cycles	2.002		2.002		0.02		O

Remark: L-leakage; V- venting ; D-disassembly; R- rupture; F- fire; O-no leakage, no venting, no disassembly, no rupture and no fire.

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Test Report-attached table 4

NO.	4	Name of test item		Shock Test				
Sample No.	Sample state	before test		after test		Mass loss/%	residual voltage/%	other phenomention
		Mass/g	open-circuit voltage/V	Mass/g	open-circuit voltage/V			
1	first fully charged	2.016	4.177	2.017	4.176	-0.03	99.98	O
2	first fully charged	1.992	4.176	1.991	4.174	0.07	99.96	O
3	first fully charged	1.990	4.178	1.990	4.178	0.02	99.99	O
4	first fully charged	2.006	4.174	2.005	4.174	0.07	99.99	O
5	first discharged	2.014		2.014		0.02		O
6	first discharged	1.995		1.996		-0.03		O
7	first discharged	2.010		2.009		0.07		O
8	first discharged	2.033		2.032		0.07		O
9	fully charged 50 cycles	2.010	4.178	2.011	4.177	-0.03	99.98	O
10	fully charged 50 cycles	1.996	4.177	1.997	4.175	-0.03	99.96	O
11	fully charged 50 cycles	2.012	4.177	2.013	4.175	-0.03	99.94	O
12	fully charged 50 cycles	2.034	4.175	2.034	4.173	0.02	99.96	O
13	discharged 50 cycles	2.011		2.012		-0.03		O
14	discharged 50 cycles	2.026		2.026		0.02		O
15	discharged 50 cycles	1.984		1.983		0.07		O
16	discharged 50 cycles	1.986		1.985		0.07		O

Remark: L-leakage; V- venting ; D-disassembly; R- rupture; F- fire; O-no leakage, no venting, no disassembly, no rupture and no fire.

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Test Report-attached table 5

NO.	5	Name of test item	External Short Circuit
Sample No.	Sample state	External highest temperature/ ℃	other phenomenon
1	first fully charged	67.4	O
2	first fully charged	66.8	O
3	first fully charged	65.2	O
4	first fully charged	69.1	O
5	first discharged	25.5	O
6	first discharged	24.8	O
7	first discharged	25.2	O
8	first discharged	27.7	O
9	fully charged 50 cycles	67.8	O
10	fully charged 50 cycles	65.3	O
11	fully charged 50 cycles	69.0	O
12	fully charged 50 cycles	68.3	O
13	discharged 50 cycles	25.0	O
14	discharged 50 cycles	27.7	O
15	discharged 50 cycles	29.0	O
16	discharged 50 cycles	29.7	O

Remark: D-disassembly; R- rupture; F- fire; O-no disassembly, no rupture and no fire.

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Test Report-attached table 6

NO.	6	Name of test item	Impact Test
Sample No.	Sample state	External Highest Temperature/℃	other phenomenon
1	first 50% capacity	71.1	O
2	first 50% capacity	71.9	O
3	first 50% capacity	67.6	O
4	first 50% capacity	60.1	O
5	first 50% capacity	62.7	O
6	50 cycles discharged	32.5	O
7	50 cycles discharged	31.0	O
8	50 cycles discharged	32.9	O
9	50 cycles discharged	33.4	O
10	50 cycles discharged	32.3	O

Remark: D-disassembly; F- fire; O-no disassembly, and no fire.

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Test Report-attached table 7

NO.	7	Name of test item	Forced Discharge Test
Sample No.	Sample state	test phenomenon	
1	first fully charged		O
2	first fully charged		O
3	first fully charged		O
4	first fully charged		O
5	first fully discharged		O
6	first discharged		O
7	first discharged		O
8	first discharged		O
9	fully charged 50 cycles		O
10	fully charged 50 cycles		O
11	fully charged 50 cycles		O
12	fully charged 50 cycles		O
13	discharged 50 cycles		O
14	discharged 50 cycles		O
15	discharged 50 cycles		O
16	discharged 50 cycles		O

Remark: D-disassembly; F- fire; O-no disassembly, and no fire.

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Test Report-attached table 8

Test condition:

Charged cell to 4.2V,fill in the carton package,drop from 120cm from X,Y,Z direction,once/side,total 6 drops.

Sample name & NO.	252025-0.296Wh	Storage condition	Room temperature
Test Item	Drop from a height of 1.2 m	Apparatus name	Drop test-bed
Temperature (°C)	22.9	Test basis	United Nations Recommendations on the Transport of Dangerous Goods- Manual of Tests and Criteria
Humidity(%)	47	Test date	2009-4-8
Inner packing	PET box	Outer packing	Carton

NO.	8	Name of test item	Drop Test (Full Carton)
Sample No.	Sample state	test phenomenon	
1	fully charged	no fire;no leakage;cell/carton no damage	
2	fully charged	no fire;no leakage;cell/carton no damage	
3	fully charged	no fire;no leakage;cell/carton no damage	
4	fully charged	no fire;no leakage;cell/carton no damage	
5	fully charged	no fire;no leakage;cell/carton no damage	
6	fully charged	no fire;no leakage;cell/carton no damage	
7	fully charged	no fire;no leakage;cell/carton no damage	
8	fully charged	no fire;no leakage;cell/carton no damage	
9	fully charged	no fire;no leakage;cell/carton no damage	
10	fully charged	no fire;no leakage;cell/carton no damage	

Conclusion: Pass