

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: OSL443441-2.33Wh

Tested by:	JX Zeng, Feb,14,2009
Checked by:	HJ Cao, Feb,14,2009
Reviewed by:	SS Yin, Feb,16,2009

UL Test Center, ShenZhen Oceansun Battery Co. ,Ltd

Test Report

Sample name	Polymer Lithium-ion Battery 443441-2.33Wh		
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	2009/2/5-2009/2/15	Sample NO.	0902050004
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	11.599	4.176	11.595	4.176	0.03	100.00	O
2	first fully charged	11.608	4.180	11.606	4.178	0.02	99.95	O
3	first fully charged	11.606	4.178	11.603	4.177	0.02	99.97	O
4	first fully charged	11.627	4.174	11.623	4.174	0.03	100.00	O
5	first discharged	11.574		11.571		0.02		O
6	first discharged	11.622		11.620		0.02		O
7	first discharged	11.587		11.585		0.02		O
8	first discharged	11.609		11.607		0.02		O
9	fully charged 50 cycles	11.605	4.176	11.601	4.174	0.03	99.96	O
10	fully charged 50 cycles	11.624	4.178	11.620	4.177	0.03	99.97	O
11	fully charged 50 cycles	11.594	4.176	11.592	4.175	0.02	99.97	O
12	fully charged 50 cycles	11.603	4.172	11.599	4.172	0.03	99.99	O
13	discharged 50 cycles	11.599		11.595		0.03		O
14	discharged 50 cycles	11.621		11.618		0.02		O
15	discharged 50 cycles	11.586		11.583		0.02		O
16	discharged 50 cycles	11.611		11.608		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	11.597	4.172	11.595	4.172	0.02	100.00	O
2	first fully charged	11.594	4.176	11.591	4.176	0.02	99.99	O
3	first fully charged	11.610	4.178	11.607	4.177	0.02	99.97	O
4	first fully charged	11.632	4.184	11.629	4.182	0.02	99.95	O
5	first fully discharged	11.612		11.609		0.02		O
6	first fully discharged	11.636		11.632		0.03		O
7	first fully discharged	11.611		11.609		0.02		O
8	first fully discharged	11.626		11.623		0.02		O
9	fully charged 50 cycles	11.602	4.170	11.599	4.170	0.02	99.99	O
10	fully charged 50 cycles	11.616	4.182	11.614	4.182	0.02	100.00	O
11	fully charged 50 cycles	11.573	4.181	11.570	4.182	0.02	100.03	O
12	fully charged 50 cycles	11.610	4.184	11.608	4.184	0.02	100.00	O
13	discharged 50 cycles	11.594		11.591		0.02		O
14	discharged 50 cycles	11.600		11.598		0.02		O
15	discharged 50 cycles	11.606		11.602		0.03		O
16	discharged 50 cycles	11.602		11.599		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 phenomention
		Mass/g	open-circuit voltage/V	Mass/g	open-circuit voltage/V			
1	first fully charged	11.599	4.177	11.595	4.176	0.03	99.98	O
2	first fully charged	11.611	4.173	11.608	4.172	0.02	99.98	O
3	first fully charged	11.567	4.180	11.565	4.179	0.02	99.97	O
4	first fully charged	11.611	4.178	11.608	4.176	0.02	99.95	O
5	first fully discharged	11.576		11.573		0.02		O
6	first discharged	11.580		11.576		0.03		O
7	first discharged	11.596		11.593		0.02		O
8	first discharged	11.612		11.609		0.02		O
9	fully charged 50 cycles	11.634	4.178	11.632	4.176	0.02	99.94	O
10	fully charged 50 cycles	11.594	4.178	11.592	4.178	0.02	100.01	O
11	fully charged 50 cycles	11.611	4.176	11.608	4.174	0.02	99.96	O
12	fully charged 50 cycles	11.582	4.173	11.579	4.172	0.02	99.98	O
13	discharged 50 cycles	11.607		11.603		0.03		O
14	discharged 50 cycles	11.623		11.620		0.02		O
15	discharged 50 cycles	11.626		11.623		0.02		O
16	discharged 50 cycles	11.602		11.599		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	11.616	4.180	11.614	4.180	0.02	100.01	O
2	first fully charged	11.592	4.176	11.588	4.176	0.03	100.01	O
3	first fully charged	11.590	4.179	11.587	4.178	0.02	99.98	O
4	first fully charged	11.606	4.176	11.602	4.174	0.03	99.95	O
5	first discharged	11.614		11.611		0.02		O
6	first discharged	11.595		11.593		0.02		O
7	first discharged	11.610		11.606		0.03		O
8	first discharged	11.633		11.629		0.03		O
9	fully charged 50 cycles	11.610	4.182	11.608	4.182	0.02	100.01	O
10	fully charged 50 cycles	11.596	4.177	11.594	4.178	0.02	100.03	O
11	fully charged 50 cycles	11.612	4.176	11.610	4.176	0.02	100.01	O
12	fully charged 50 cycles	11.634	4.176	11.631	4.174	0.02	99.96	O
13	discharged 50 cycles	11.611		11.609		0.02		O
14	discharged 50 cycles	11.626		11.623		0.02		O
15	discharged 50 cycles	11.584		11.580		0.03		O
16	discharged 50 cycles	11.586		11.582		0.03		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	82.1	O
2	first fully charged	81.5	O
3	first fully charged	79.9	O
4	first fully charged	83.8	O
5	first discharged	40.2	O
6	first discharged	39.5	O
7	first discharged	39.9	O
8	first discharged	42.4	O
9	fully charged 50 cycles	82.5	O
10	fully charged 50 cycles	80.0	O
11	fully charged 50 cycles	83.7	O
12	fully charged 50 cycles	83.0	O
13	discharged 50 cycles	39.7	O
14	discharged 50 cycles	42.4	O
15	discharged 50 cycles	43.7	O
16	discharged 50 cycles	44.4	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/ °C	other phenomenon
1	first 50% capacity	85.9	O
2	first 50% capacity	86.7	O
3	first 50% capacity	91.0	O
4	first 50% capacity	90.3	O
5	first 50% capacity	86.4	O
6	50 cycles discharged	47.3	O
7	50 cycles discharged	45.8	O
8	50 cycles discharged	47.7	O
9	50 cycles discharged	48.2	O
10	50 cycles discharged	47.1	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.	443441-2.33Wh	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	2009-2-5
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