

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: OSL503562-4.66Wh

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 503562-4.66Wh		
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	2009/2/5-2009/2/14	Sample NO.	0902050002
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.		

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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	20.799	4.179	20.798	4.179	0.01	100.00	O
2	first fully charged	20.808	4.181	20.809	4.181	0.00	100.00	O
3	first fully charged	20.806	4.180	20.806	4.180	0.00	99.99	O
4	first fully charged	20.827	4.178	20.826	4.177	0.01	99.98	O
5	first discharged	20.774		20.774		0.00		O
6	first discharged	20.822		20.823		0.00		O
7	first discharged	20.787		20.788		0.00		O
8	first discharged	20.809		20.810		0.00		O
9	fully charged 50 cycles	20.805	4.181	20.804	4.181	0.01	99.99	O
10	fully charged 50 cycles	20.824	4.180	20.823	4.180	0.01	99.99	O
11	fully charged 50 cycles	20.794	4.179	20.795	4.178	0.00	99.97	O
12	fully charged 50 cycles	20.803	4.177	20.802	4.175	0.01	99.95	O
13	discharged 50 cycles	20.799		20.798		0.01		O
14	discharged 50 cycles	20.821		20.821		0.00		O
15	discharged 50 cycles	20.786		20.786		0.00		O
16	discharged 50 cycles	20.811		20.811		0.00		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				
				before test		after test		Mass loss/%
		Mass/g	open-circuit voltage/V	Mass/g	open-circuit voltage/V			
1	first fully charged	20.797	4.177	20.798	4.175	0.00	99.95	O
2	first fully charged	20.794	4.179	20.794	4.179	0.00	99.99	O
3	first fully charged	20.810	4.180	20.810	4.180	0.00	99.99	O
4	first fully charged	20.832	4.183	20.832	4.183	0.00	99.99	O
5	first fully discharged	20.812		20.812		0.00		O
6	first fully discharged	20.836		20.835		0.01		O
7	first fully discharged	20.811		20.812		0.00		O
8	first fully discharged	20.826		20.826		0.00		O
9	fully charged 50 cycles	20.802	4.176	20.802	4.176	0.00	99.99	O
10	fully charged 50 cycles	20.816	4.182	20.817	4.185	0.00	100.07	O
11	fully charged 50 cycles	20.773	4.185	20.773	4.185	0.00	100.00	O
12	fully charged 50 cycles	20.810	4.183	20.811	4.187	0.00	100.10	O
13	discharged 50 cycles	20.794		20.794		0.00		O
14	discharged 50 cycles	20.800		20.801		0.00		O
15	discharged 50 cycles	20.806		20.805		0.01		O
16	discharged 50 cycles	20.802		20.802		0.00		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	20.799	4.183	20.798	4.183	0.01	99.99	O
2	first fully charged	20.811	4.176	20.811	4.175	0.00	99.98	O
3	first fully charged	20.767	4.181	20.768	4.182	0.00	100.02	O
4	first fully charged	20.811	4.180	20.811	4.179	0.00	99.98	O
5	first fully discharged	20.776		20.776		0.00		O
6	first discharged	20.780		20.779		0.01		O
7	first discharged	20.796		20.796		0.00		O
8	first discharged	20.812		20.812		0.00		O
9	fully charged 50 cycles	20.834	4.180	20.835	4.179	0.00	99.97	O
10	fully charged 50 cycles	20.794	4.182	20.795	4.181	0.00	99.98	O
11	fully charged 50 cycles	20.811	4.179	20.811	4.177	0.00	99.95	O
12	fully charged 50 cycles	20.782	4.178	20.782	4.175	0.00	99.93	O
13	discharged 50 cycles	20.807		20.806		0.01		O
14	discharged 50 cycles	20.823		20.823		0.00		O
15	discharged 50 cycles	20.826		20.826		0.00		O
16	discharged 50 cycles	20.802		20.802		0.00		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	20.816	4.182	20.817	4.183	0.00	100.03	O
2	first fully charged	20.792	4.181	20.791	4.179	0.01	99.95	O
3	first fully charged	20.790	4.183	20.790	4.181	0.00	99.95	O
4	first fully charged	20.806	4.179	20.805	4.177	0.01	99.95	O
5	first discharged	20.814		20.814		0.00		O
6	first discharged	20.795		20.796		0.00		O
7	first discharged	20.810		20.809		0.01		O
8	first discharged	20.833		20.832		0.01		O
9	fully charged 50 cycles	20.810	4.183	20.811	4.183	0.00	99.99	O
10	fully charged 50 cycles	20.796	4.182	20.797	4.181	0.00	99.98	O
11	fully charged 50 cycles	20.812	4.182	20.813	4.179	0.00	99.93	O
12	fully charged 50 cycles	20.834	4.180	20.834	4.177	0.00	99.93	O
13	discharged 50 cycles	20.811		20.812		0.00		O
14	discharged 50 cycles	20.826		20.826		0.00		O
15	discharged 50 cycles	20.784		20.783		0.01		O
16	discharged 50 cycles	20.786		20.785		0.01		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/ °C	other phenomenon
1	first fully charged	85.3	O
2	first fully charged	84.7	O
3	first fully charged	83.1	O
4	first fully charged	87.0	O
5	first discharged	43.4	O
6	first discharged	42.7	O
7	first discharged	43.1	O
8	first discharged	45.6	O
9	fully charged 50 cycles	85.7	O
10	fully charged 50 cycles	83.2	O
11	fully charged 50 cycles	86.9	O
12	fully charged 50 cycles	86.2	O
13	discharged 50 cycles	42.9	O
14	discharged 50 cycles	45.6	O
15	discharged 50 cycles	46.9	O
16	discharged 50 cycles	47.6	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	89.1	O
2	first 50% capacity	89.9	O
3	first 50% capacity	85.5	O
4	first 50% capacity	78.0	O
5	first 50% capacity	80.6	O
6	50 cycles discharged	50.5	O
7	50 cycles discharged	49.0	O
8	50 cycles discharged	50.9	O
9	50 cycles discharged	51.4	O
10	50 cycles discharged	50.3	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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Drop 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.	503562-4.66Wh	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	2009-1-5
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