

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: OSL383562-3.40Wh

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 383562-3.40Wh		
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.	0902050001
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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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.8	see attached table 8	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				
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	17.001	4.180	16.998	4.179	0.02	99.99	O
2	first fully charged	17.010	4.181	17.009	4.181	0.00	100.01	O
3	first fully charged	17.008	4.182	17.006	4.180	0.01	99.95	O
4	first fully charged	17.029	4.178	17.026	4.177	0.02	99.99	O
5	first discharged	16.976		16.974		0.01		O
6	first discharged	17.024		17.023		0.00		O
7	first discharged	16.989		16.988		0.00		O
8	first discharged	17.011		17.010		0.00		O
9	fully charged 50 cycles	17.007	4.177	17.004	4.177	0.02	100.01	O
10	fully charged 50 cycles	17.026	4.182	17.023	4.180	0.02	99.95	O
11	fully charged 50 cycles	16.996	4.178	16.995	4.178	0.00	100.00	O
12	fully charged 50 cycles	17.005	4.176	17.002	4.175	0.02	99.98	O
13	discharged 50 cycles	17.001		16.998		0.02		O
14	discharged 50 cycles	17.023		17.021		0.01		O
15	discharged 50 cycles	16.988		16.986		0.01		O
16	discharged 50 cycles	17.013		17.011		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 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	16.999	4.176	16.998	4.175	0.00	99.99	O
2	first fully charged	16.996	4.180	16.994	4.179	0.01	99.98	O
3	first fully charged	17.012	4.182	17.010	4.180	0.01	99.95	O
4	first fully charged	17.034	4.188	17.032	4.185	0.01	99.94	O
5	first fully discharged	17.014		17.012		0.01		O
6	first fully discharged	17.038		17.035		0.02		O
7	first fully discharged	17.013		17.012		0.00		O
8	first fully discharged	17.028		17.026		0.01		O
9	fully charged 50 cycles	17.004	4.174	17.002	4.173	0.01	99.98	O
10	fully charged 50 cycles	17.018	4.186	17.017	4.185	0.00	99.99	O
11	fully charged 50 cycles	16.975	4.185	16.973	4.185	0.01	100.02	O
12	fully charged 50 cycles	17.012	4.188	17.011	4.187	0.00	99.99	O
13	discharged 50 cycles	16.996		16.994		0.01		O
14	discharged 50 cycles	17.002		17.001		0.00		O
15	discharged 50 cycles	17.008		17.005		0.02		O
16	discharged 50 cycles	17.004		17.002		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 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	17.001	4.181	16.998	4.179	0.02	99.97	O
2	first fully charged	17.013	4.177	17.011	4.175	0.01	99.97	O
3	first fully charged	16.969	4.184	16.968	4.182	0.00	99.95	O
4	first fully charged	17.013	4.182	17.011	4.179	0.01	99.94	O
5	first fully discharged	16.978		16.976		0.01		O
6	first discharged	16.982		16.979		0.02		O
7	first discharged	16.998		16.996		0.01		O
8	first discharged	17.014		17.012		0.01		O
9	fully charged 50 cycles	17.036	4.182	17.035	4.179	0.00	99.93	O
10	fully charged 50 cycles	16.996	4.182	16.995	4.181	0.00	100.00	O
11	fully charged 50 cycles	17.013	4.180	17.011	4.177	0.01	99.95	O
12	fully charged 50 cycles	16.984	4.177	16.982	4.175	0.01	99.97	O
13	discharged 50 cycles	17.009		17.006		0.02		O
14	discharged 50 cycles	17.025		17.023		0.01		O
15	discharged 50 cycles	17.028		17.026		0.01		O
16	discharged 50 cycles	17.004		17.002		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 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	17.018	4.184	17.017	4.183	0.00	100.00	O
2	first fully charged	16.994	4.180	16.991	4.179	0.02	100.00	O
3	first fully charged	16.992	4.183	16.990	4.181	0.01	99.97	O
4	first fully charged	17.008	4.180	17.005	4.179	0.02	99.98	O
5	first discharged	17.016		17.014		0.01		O
6	first discharged	16.997		16.996		0.00		O
7	first discharged	17.012		17.009		0.02		O
8	first discharged	17.035		17.032		0.02		O
9	fully charged 50 cycles	17.012	4.186	17.011	4.185	0.00	100.00	O
10	fully charged 50 cycles	16.998	4.181	16.997	4.181	0.00	100.02	O
11	fully charged 50 cycles	17.014	4.180	17.013	4.179	0.00	100.00	O
12	fully charged 50 cycles	17.036	4.180	17.034	4.180	0.01	100.01	O
13	discharged 50 cycles	17.013		17.012		0.00		O
14	discharged 50 cycles	17.028		17.026		0.01		O
15	discharged 50 cycles	16.986		16.983		0.02		O
16	discharged 50 cycles	16.988		16.985		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 5

NO.	5	Name of test item	External Short Circuit
Sample No.	Sample state	External highest temperature/ °C	other phenomenon
1	first fully charged	87.3	O
2	first fully charged	86.7	O
3	first fully charged	85.1	O
4	first fully charged	89.0	O
5	first discharged	45.4	O
6	first discharged	44.7	O
7	first discharged	45.1	O
8	first discharged	47.6	O
9	fully charged 50 cycles	87.7	O
10	fully charged 50 cycles	85.2	O
11	fully charged 50 cycles	88.9	O
12	fully charged 50 cycles	88.2	O
13	discharged 50 cycles	44.9	O
14	discharged 50 cycles	47.6	O
15	discharged 50 cycles	48.9	O
16	discharged 50 cycles	49.6	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	91.0	O
2	first 50% capacity	91.8	O
3	first 50% capacity	96.1	O
4	first 50% capacity	95.4	O
5	first 50% capacity	91.5	O
6	50 cycles discharged	52.4	O
7	50 cycles discharged	50.9	O
8	50 cycles discharged	52.8	O
9	50 cycles discharged	53.3	O
10	50 cycles discharged	52.2	O

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

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Test Report-attached table 8

NO.	8	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.	383562-3.4Wh	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	2009-2-8
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