

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: OSL503759-4.995Wh

Tested by:	JX Zeng, May,16,2009
Checked by:	HJ Cao,May,17,2009
Reviewed by:	SS Yin,May,18,2009

UL Test Center, ShenZhen Oceansun Battery Co. ,Ltd

Test Report

Sample name	Polymer Lithium-ion Battery 503759-4.995Wh		
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	2009/5/13-2009/5/20	Sample NO.	0905130001
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.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	24.201	4.183	24.199	4.182	0.01	99.98	O
2	first fully charged	24.210	4.185	24.210	4.183	0.00	99.95	O
3	first fully charged	24.208	4.184	24.207	4.183	0.00	99.98	O
4	first fully charged	24.229	4.182	24.227	4.181	0.01	99.98	O
5	first discharged	24.176		24.175		0.00		O
6	first discharged	24.224		24.224		0.00		O
7	first discharged	24.189		24.189		0.00		O
8	first discharged	24.211		24.211		0.00		O
9	fully charged 50 cycles	24.207	4.183	24.205	4.181	0.01	99.96	O
10	fully charged 50 cycles	24.226	4.180	24.224	4.179	0.01	99.98	O
11	fully charged 50 cycles	24.196	4.183	24.196	4.180	0.00	99.93	O
12	fully charged 50 cycles	24.205	4.181	24.203	4.181	0.01	100.00	O
13	discharged 50 cycles	24.201		24.199		0.01		O
14	discharged 50 cycles	24.223		24.222		0.00		O
15	discharged 50 cycles	24.188		24.187		0.00		O
16	discharged 50 cycles	24.213		24.212		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				
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	24.199	4.181	24.199	4.180	0.00	99.98	O
2	first fully charged	24.196	4.183	24.195	4.180	0.00	99.93	O
3	first fully charged	24.212	4.184	24.211	4.184	0.00	100.00	O
4	first fully charged	24.234	4.187	24.233	4.185	0.00	99.95	O
5	first fully discharged	24.214		24.213		0.00		O
6	first fully discharged	24.238		24.236		0.01		O
7	first fully discharged	24.213		24.213		0.00		O
8	first fully discharged	24.228		24.227		0.00		O
9	fully charged 50 cycles	24.204	4.180	24.203	4.179	0.00	99.97	O
10	fully charged 50 cycles	24.218	4.186	24.218	4.185	0.00	99.98	O
11	fully charged 50 cycles	24.175	4.186	24.174	4.185	0.00	99.98	O
12	fully charged 50 cycles	24.212	4.187	24.212	4.186	0.00	99.98	O
13	discharged 50 cycles	24.196		24.195		0.00		O
14	discharged 50 cycles	24.202		24.202		0.00		O
15	discharged 50 cycles	24.208		24.206		0.01		O
16	discharged 50 cycles	24.204		24.203		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	24.201	4.182	24.199	4.182	0.01	100.01	O
2	first fully charged	24.213	4.180	24.212	4.180	0.00	100.00	O
3	first fully charged	24.169	4.185	24.169	4.185	0.00	99.99	O
4	first fully charged	24.213	4.184	24.212	4.182	0.00	99.95	O
5	first fully discharged	24.178		24.177		0.00		O
6	first discharged	24.182		24.180		0.01		O
7	first discharged	24.198		24.197		0.00		O
8	first discharged	24.214		24.213		0.00		O
9	fully charged 50 cycles	24.236	4.184	24.236	4.179	0.00	99.88	O
10	fully charged 50 cycles	24.196	4.186	24.196	4.185	0.00	99.97	O
11	fully charged 50 cycles	24.213	4.183	24.212	4.181	0.00	99.95	O
12	fully charged 50 cycles	24.184	4.182	24.183	4.180	0.00	99.95	O
13	discharged 50 cycles	24.209		24.207		0.01		O
14	discharged 50 cycles	24.225		24.224		0.00		O
15	discharged 50 cycles	24.228		24.227		0.00		O
16	discharged 50 cycles	24.204		24.203		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	24.218	4.186	24.218	4.184	0.00	99.95	O
2	first fully charged	24.194	4.185	24.192	4.182	0.01	99.93	O
3	first fully charged	24.192	4.183	24.191	4.183	0.00	100.01	O
4	first fully charged	24.208	4.183	24.206	4.181	0.01	99.95	O
5	first discharged	24.216		24.215		0.00		O
6	first discharged	24.197		24.197		0.00		O
7	first discharged	24.212		24.210		0.01		O
8	first discharged	24.235		24.233		0.01		O
9	fully charged 50 cycles	24.212	4.185	24.212	4.185	0.00	100.01	O
10	fully charged 50 cycles	24.198	4.184	24.198	4.183	0.00	99.98	O
11	fully charged 50 cycles	24.214	4.182	24.214	4.182	0.00	100.01	O
12	fully charged 50 cycles	24.236	4.183	24.235	4.181	0.00	99.96	O
13	discharged 50 cycles	24.213		24.213		0.00		O
14	discharged 50 cycles	24.228		24.227		0.00		O
15	discharged 50 cycles	24.186		24.184		0.01		O
16	discharged 50 cycles	24.188		24.186		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	95.3	O
2	first fully charged	103.1	O
3	first fully charged	96.2	O
4	first fully charged	98.2	O
5	first discharged	53.2	O
6	first discharged	54.1	O
7	first discharged	53.6	O
8	first discharged	52.4	O
9	fully charged 50 cycles	93.2	O
10	fully charged 50 cycles	96.1	O
11	fully charged 50 cycles	94.6	O
12	fully charged 50 cycles	96.5	O
13	discharged 50 cycles	54.8	O
14	discharged 50 cycles	53.4	O
15	discharged 50 cycles	54.6	O
16	discharged 50 cycles	52.0	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	97.1	O
2	first 50% capacity	104.9	O
3	first 50% capacity	98.0	O
4	first 50% capacity	100.0	O
5	first 50% capacity	97.9	O
6	50 cycles discharged	55.0	O
7	50 cycles discharged	55.9	O
8	50 cycles discharged	55.4	O
9	50 cycles discharged	54.2	O
10	50 cycles discharged	53.8	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.	503759-4.995Wh	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	2009-1-12
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