박명선/msdldi.park/SDI 국내(품질)소형CS그룹/179198143/20170207105908

Model name : : EB-BW627ABE

Revision 09

Executive Div.	Safety Center	Confidential	
	Name / Title	Signature	Date
Reported by	Park Myung Sun		2017. 2. 8
Approved by	Kim Lynn		2017. 2. 8

Test report; UN Manual of Tests and Criteria, Part III, Subsection 38.3

2015, Rev.6

Document No : SDI-UN-P170208-01

SAMSUNG SDI

Energy Business Division

SAMSUNG SDI

본 정보는 삼성SDI 경보자산으로 관리책임자의 허가없이 출력, 배포, 변용을 할 수 없으며, 위규시 관련 법령에 의거하여 인사상 불이익을 받을 수 있습니다.

Product Information

1. Model name: : EB-BW627ABE

2. Product classification: Li rechargeable battery pack (2S-1P)

3. Nominal voltage: 7.6V

4. Rated capacity: 4000mAh

5. Wh Capacity: 30.4Wh

6. Weight of product: 147g

7. Test Date: 2017.01.04 ~ 2017.01.26

8. Test Location: SAMSUNG SDI Safety Center, 467, Beonyeong-ro, Seobuk-gu, Cheonan-si, Chungcheongnam-do, Korea

Test summary

Test No.	Test item	Relating Std.	Test begins on (YYYY/MM/DD)	Test Completed on (YYYY/MM/DD)	Judgment (Pass/Fail)
T1	Altitude simulation	UN Manual of Tests and Criteria, Part Ⅲ, Subsection 38.3.4.1	2017/01/05	2017/01/06	Pass
T2	Thermal test	UN Manual of Tests and Criteria, Part Ⅲ, Subsection 38.3.4.2	2017/01/11	2017/01/17	Pass
T3	Vibration	UN Manual of Tests and Criteria, Part Ⅲ, Subsection 38.3.4.3	2017/01/19	2017/01/20	Pass
T4	Shock	UN Manual of Tests and Criteria, Part Ⅲ, Subsection 38.3.4.4	2017/01/23	2017/01/23	Pass
T5	External short circuit	UN Manual of Tests and Criteria, Part Ⅲ, Subsection 38.3.4.5	2017/01/25	2017/01/26	Pass
T6	Impact / Crush	UN Manual of Tests and Criteria, Part Ⅲ, Subsection 38.3.4.6	2014/02/07	2014/02/07	Pass
T7	Overcharge	UN Manual of Tests and Criteria, Part Ⅲ, Subsection 38.3.4.7	2017/01/09	2017/01/18	Pass
T8	Forced discharge	UN Manual of Tests and Criteria, Part Ⅲ, Subsection 38.3.4.8	2014/02/07	2016/02/14	Pass
Total Judgment(Pass/Fail)					Pass

■ Tests T-1 through T-5 shall be conducted in sequence with the same cell/pack/single cell battery.
■ For test 6, test should be conducted for Li-ion cells or component cell contained in a battery.
■ T7 shall be performed only for Li-ion rechargeable battery or rechargeable single cell battery not cell.
■ T8 should be conducted for Li-ion cells or component cell contained in a battery.

T-1~T-5) Transportation Test (Test Result: Pass)

Fresh pack 100% SOC						
Initial						
No.	Weight(g)	OCV(V)				
1	140.69	8.63				
2	140.47	8.63				
3	140.50	8.63				
4	140.58	8.63				
T1						
No.	Weight(g)	OCV(V)	Mass Loss(%)	Residual OCV(%)	Appearance	Result
1	140.67	8.63	0.01	100.00	O	Pass
2	140.46	8.63	0.01	100.00	O	Pass
3	140.50	8.63	0.00	100.00	O	Pass
4	140.56	8.63	0.01	100.00	O	Pass
T2						
No.	Weight(g)	OCV(V)	Mass Loss(%)	Residual OCV(%)	Appearance	Result
1	140.65	8.30	0.01	96.18	O	Pass
2	140.44	8.29	0.01	96.06	O	Pass
3	140.50	8.29	0.00	96.06	O	Pass
4	140.54	8.28	0.01	95.94	O	Pass
T3						
No.	Weight(g)	OCV(V)	Mass Loss(%)	Residual OCV(%)	Appearance	Result
1	140.65	8.30	0.00	100.00	O	Pass
2	140.43	8.28	0.01	99.88	O	Pass
3	140.48	8.29	0.01	100.00	O	Pass
4	140.54	8.28	0.00	100.00	O	Pass
T4						
No.	Weight(g)	OCV(V)	Mass Loss(%)	Residual OCV(%)	Appearance	Result
1	140.64	8.29	0.01	99.88	O	Pass
2	140.42	8.28	0.01	100.00	O	Pass
3	140.47	8.28	0.01	99.88	O	Pass
4	140.53	8.27	0.01	99.88	O	Pass
T5						
No.	Max T(℃)	Appearance				Result
1	55.3	O				Pass
2	55.0	O				Pass
3	55.2	O				Pass
4	55.4	O				Pass

50 cycled pack 100% SOC						
Initial						
No.	Weight(g)	OCV(V)				
1	140.64	8.63				
2	140.09	8.63				
3	140.57	8.63				
4	140.57	8.63				
T1						
No.	Weight(g)	OCV(V)	Mass Loss(%)	Residual OCV(%)	Appearance	Result
1	140.63	8.63	0.01	100.00	O	Pass
2	140.06	8.63	0.02	100.00	O	Pass
3	140.54	8.63	0.02	100.00	O	Pass
4	140.56	8.63	0.01	100.00	O	Pass
T2						
No.	Weight(g)	OCV(V)	Mass Loss(%)	Residual OCV(%)	Appearance	Result
1	140.61	8.30	0.01	96.18	O	Pass
2	140.03	8.29	0.02	96.06	O	Pass
3	140.51	8.30	0.02	96.18	O	Pass
4	140.50	8.30	0.04	96.18	O	Pass
T3						
No.	Weight(g)	OCV(V)	Mass Loss(%)	Residual OCV(%)	Appearance	Result
1	140.61	8.25	0.00	99.40	O	Pass
2	140.01	8.24	0.01	99.40	O	Pass
3	140.51	8.30	0.00	100.00	O	Pass
4	140.47	8.29	0.02	99.88	O	Pass
T4						
No.	Weight(g)	OCV(V)	Mass Loss(%)	Residual OCV(%)	Appearance	Result
1	140.60	8.24	0.01	99.88	O	Pass
2	140.00	8.23	0.01	99.88	O	Pass
3	140.50	8.29	0.01	99.88	O	Pass
4	140.47	8.29	0.00	100.00	O	Pass
T5						
No.	Max T(℃)	Appearance				Result
1	55.9	O				Pass
2	55.5	O				Pass
3	55.7	O				Pass
4	55.9	O				Pass

[Appearance] O-No Leakage, No Venting, No Disassembly, No Rupture, No Fire / L-Leakage / V-Venting / D-Disassembly / R-Rupture / F-Fire

[Criteria] T1~T4: No Leakage / No Venting / No Disassembly / No Rupture / No Fire / Residual OCV not less than 90%
T5: External temperature does not exceed 170℃, no disassembly, no rupture, and no fire within 6 hours of this test

T-6) Impact/Crush Test (Test Result: Pass)

■ **Cell type**

[ ] Cylindrical cells not less than 20.0 mm in diameter

[X] Prismatic, Pouch, Cylindrical cells less than 20.0 mm in diameter

■ **Test procedure**

[ ] Impact

[X] Crush

Fresh Cell 50% SOC				
	Initial	T6		
No.	OCV(V)	Max Temp(℃)	Appearance	Result
1	3.84	23	O	Pass
2	3.84	23	O	Pass
3	3.84	23	O	Pass
4	3.84	23	O	Pass
5	3.84	23	O	Pass
[Appearance] O-No Disassembly, No Fire / D-Disassembly / F-Fire				
[Criteria] External temperature does not exceed 170℃, no disassembly, and no fire within 6 hours of this test.				

T-7) Over charge Test (Test Result: Pass)

■ **Test condition: 17.4V / 5.6A / 24Hr**

Fresh Pack 100% SOC			50 cycled Pack 100% SOC	
No.	**Appearance**	**Result**	**Appearance**	**Result**
1	O	Pass	O	Pass
2	O	Pass	O	Pass
3	O	Pass	O	Pass
4	O	Pass	O	Pass
[Appearance] O-No Disassembly, No Fire / D-Disassembly / F-Fire				
[Criteria] No disassembly and no fire within 7 days of the test				

T-8) Forced discharge Test (Test Result: Pass)

■ **Test condition:**

- Initial test current: 6A

- Time interval: 40min

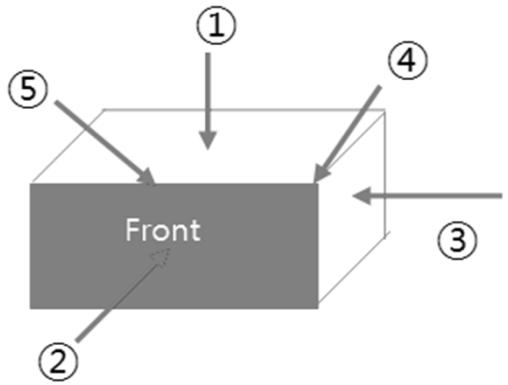
Fresh Cell 0% SOC				50 cycled Cell 0% SOC		
No.	**Max. tempe(℃)**	**Appearance**	**Result**	**Max. tempe(℃)**	**Appearance**	**Result**
1	65	O	Pass	65	O	Pass
2	62	O	Pass	61	O	Pass
3	66	O	Pass	66	O	Pass
4	63	O	Pass	63	O	Pass
5	63	O	Pass	60	O	Pass
6	65	O	Pass	59	O	Pass
7	62	O	Pass	63	O	Pass
8	66	O	Pass	63	O	Pass
9	62	O	Pass	66	O	Pass
10	62	O	Pass	60	O	Pass
[Appearance] O-No Disassembly, No Fire / D-Disassembly / F-Fire						
[Criteria] No disassembly and no fire within 7 days of the test						

Annex 1 - 1.2m Packaging Drop Test

■ Test Summary

Test No.	Test item	Relating Std.	Test begins on (YYYY/MM/DD)	Test Completed on (YYYY/MM/DD)	Judgment (Pass/Fail)
P1	Packaging Drop	IATA Dangerous Goods Regulations	2017/01/31	2017/01/31	Pass
Total Judgment(Pass/Fail)					Pass

■ Test Method



P-1 1.2m Packaging Drop Test (Test Result: Pass)

■ **Sample Information**

	Front	Back
Picture		

Battery Qty per box (EA)	Battery weight (kg)	Net weight per box (kg)
60	0.14	8.4

P-1 1.2m Packaging Drop Test (Test Result: Pass)

■ **Test result**

	Before Test	After Test
Weight (Kg)	**9.8**	**9.8**
Test Result		
Remark	Outer packaging is damaged but samples inside the package remain intact and no damage, no shifting, no release of contents for samples inside the package.	
Criteria	- Without damage to cells or batteries contained therein. - Without shifting of the contents so as to allow battery to battery(or Cell to cell) contact. - Without release of contents.	