함형우/hwoo.ham/Cell)개발품질그룹/179172162/20140225141020

Revision 06

Model name : **EB-BG900BBE**

Executive Div.	Safety Center	Confidential

	Name / Title	Signature	Date
Reported by	Hamhyungwoo		2014.2.25
Approved by	Jung Min kyu		2014.2.25

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

2011, Rev.5, Amend.1

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SAMSUNG SDI

Energy Business Division

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Product Information

1. Model name: **EB-BG900BBE**

2. Product classification: Li rechargeable battery pack (Single cell battery)

3. Nominal voltage: 3.85V

4. Rated capacity: 2800mAh

5. Wh Capacity: 10.78Wh

6. Weight of product: 45.25g

7. Test Date: 2014.01.24 ~2014.02.17

8. Test Location: SAMSUNG SDI Safety Center, 508 Sungsungdong, Cheonan Chungcheongnamdo, 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	2014.01.24	2014.01.24	Pass
T2	Thermal test	UN Manual of Tests and Criteria, Part Ⅲ, Subsection 38.3.4.2	2014.01.24	2014.01.30	Pass
T3	Vibration	UN Manual of Tests and Criteria, Part Ⅲ, Subsection 38.3.4.3	2014.02.05	2014.02.05	Pass
T4	Shock	UN Manual of Tests and Criteria, Part Ⅲ, Subsection 38.3.4.4	2014.02.11	2014.02.11	Pass
T5	External short circuit	UN Manual of Tests and Criteria, Part Ⅲ, Subsection 38.3.4.5	2014.02.17	2014.02.17	Pass
T6	Impact / Crush	UN Manual of Tests and Criteria, Part Ⅲ, Subsection 38.3.4.6	2014.02.17	2014.02.17	Pass
T7	Overcharge	UN Manual of Tests and Criteria, Part Ⅲ, Subsection 38.3.4.7	2014.02.09	2014.02.17	Pass
T8	Forced discharge	UN Manual of Tests and Criteria, Part Ⅲ, Subsection 38.3.4.8	2014.02.10	2014.02.17	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							T1					
No.	Weight(g)	OCV(V)					Weight(g)	OCV(V)	Mass Loss(%)	Residual OCV(%)	Appearance	Result
1	44.456	4.35					44.454	4.35	0.00	100.00	O	PASS
2	44.456	4.35					44.457	4.35	0.00	100.00	O	PASS
3	44.493	4.35					44.493	4.35	0.00	100.00	O	PASS
4	44.409	4.35					44.407	4.35	0.00	100.00	O	PASS
5	44.454	4.35					44.454	4.35	0.00	100.00	O	PASS
6	44.402	4.35					44.401	4.35	0.00	100.00	O	PASS
7	44.468	4.35					44.465	4.35	0.01	100.00	O	PASS
8	44.544	4.35					44.544	4.35	0.00	100.00	O	PASS
9	44.493	4.35					44.492	4.35	0.00	100.00	O	PASS
10	44.457	4.35					44.456	4.35	0.00	100.00	O	PASS
T2							T3					
No.	Weight(g)	OCV(V)	Mass Loss(%)	Residual OCV(%)	Appearance	Result	Weight(g)	OCV(V)	Mass Loss(%)	Residual OCV(%)	Appearance	Result
1	44.451	4.27	0.01	98.16	O	PASS	44.454	4.27	-0.01	100.00	O	PASS
2	44.456	4.27	0.00	98.16	O	PASS	44.454	4.27	0.00	100.00	O	PASS
3	44.490	4.27	0.01	98.16	O	PASS	44.492	4.27	0.00	100.00	O	PASS
4	44.408	4.27	0.00	98.16	O	PASS	44.408	4.27	0.00	100.00	O	PASS
5	44.450	4.27	0.01	98.16	O	PASS	44.452	4.27	0.00	100.00	O	PASS
6	44.402	4.27	0.00	98.16	O	PASS	44.404	4.27	0.00	100.00	O	PASS
7	44.461	4.27	0.01	98.16	O	PASS	44.463	4.27	0.00	100.00	O	PASS
8	44.543	4.27	0.00	98.16	O	PASS	44.540	4.27	0.01	100.00	O	PASS
9	44.492	4.27	0.00	98.16	O	PASS	44.492	4.27	0.00	100.00	O	PASS
10	44.459	4.27	-0.01	98.16	O	PASS	44.457	4.27	0.00	100.00	O	PASS
T4							T5					
No.	Weight(g)	OCV(V)	Mass Loss(%)	Residual OCV(%)	Appearance	Result	Max T(℃)	Appearance				Result
1	44.453	4.26	0.00	99.77	O	PASS	55	O				PASS
2	44.455	4.26	0.00	99.77	O	PASS	55	O				PASS
3	44.492	4.26	0.00	99.77	O	PASS	57	O				PASS
4	44.405	4.26	0.01	99.77	O	PASS	55	O				PASS
5	44.451	4.26	0.00	99.77	O	PASS	56	O				PASS
6	44.402	4.26	0.00	99.77	O	PASS	55	O				PASS
7	44.460	4.26	0.01	99.77	O	PASS	56	O				PASS
8	44.542	4.26	0.00	99.77	O	PASS	55	O				PASS
9	44.494	4.26	0.00	99.77	O	PASS	56	O				PASS
10	44.454	4.26	0.01	99.77	O	PASS	56	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 greater than 20 mm in diameter

[X] Prismatic, Pouch, Cylindrical cells not more than 20 mm in diameter

■ **Test procedure**

[ ] Impact

[X] Crush

Fresh Pack 50% SOC				
	Initial	T6		
No.	OCV(V)	Max Temp(℃)	Appearance	Result
1	3.85	22	O	PASS
2	3.85	22	O	PASS
3	3.85	22	O	PASS
4	3.85	22	O	PASS
5	3.85	22	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: 8.7V / 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 : 4.2A
- Time interval: 40Min

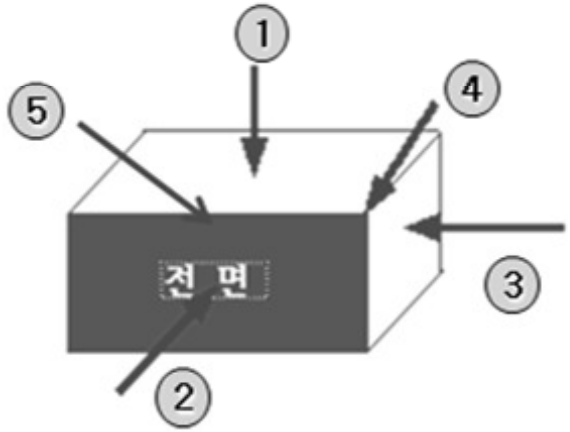
Fresh Pack 0% SOC				50 cycled Pack 0% SOC		
No.	Max. tempe(℃)	Appearance	Result	Max. temp(℃)	Appearance	Result
1	24	O	PASS	24	O	PASS
2	24	O	PASS	24	O	PASS
3	24	O	PASS	24	O	PASS
4	24	O	PASS	24	O	PASS
5	24	O	PASS	24	O	PASS
6	23	O	PASS	23	O	PASS
7	24	O	PASS	24	O	PASS
8	23	O	PASS	23	O	PASS
9	22	O	PASS	24	O	PASS
10	24	O	PASS	24	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	2014 IATA Dangerous Goods Regulations 55th Edition	2014.02.17	2014.02.17	Pass
Total Judgment(Pass/Fail)					Pass

■ Test Method

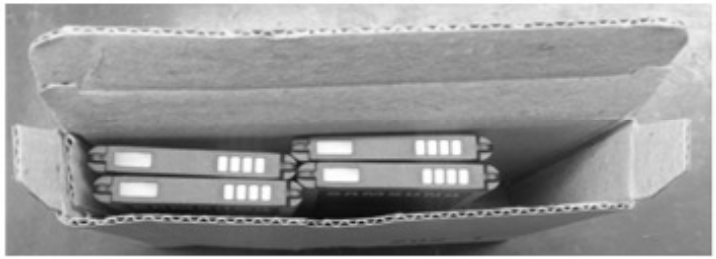
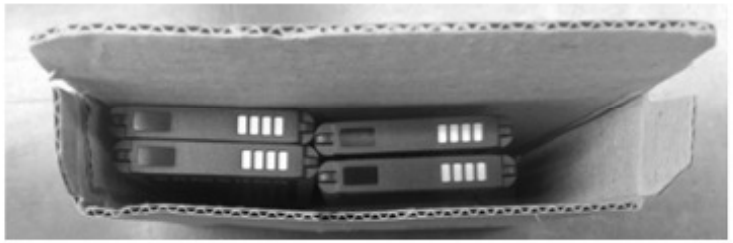


P-1 1.2m Packaging Drop Test (Test Result: Pass)

■ Sample Picture

	Front	Back
Sample Picture		

■ Test result

	Before Test	After Test
Weight (Kg)	0.196	0.196
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.	