



UN TEST REPORT

Test Summary

Report Number.: SDI-UN-200506-02			
Date of issue.....: 2020.05.06			
Test period: 2020.04.03 ~ 2020.04.28			
Testing Laboratory..... Samsung SDI Co., Ltd			
Address 467, Beonyeong-ro, Seobuk-gu, Cheonan-si, Chungcheongnam-do, Korea			
Contact..... +82-41-560-3114 / http://samsungsdi.co.kr/ lian55.kim@samsung.com			
Manufacturer's name Samsung SDI Co., Ltd			
Address 467, Beonyeong-ro, Seobuk-gu, Cheonan-si, Chungcheongnam-do, Korea			
Contact..... +82-41-560-3114 / http://samsungsdi.co.kr/ lian55.kim@samsung.com			
Test Standard Recommendations on the Transport of Dangerous Goods: Manual of Tests and Criteria, section 38.3 Sixth revised edition Amendment 1			
Physical description..... Mobile phone battery			
Assembled Battery Testing Requirements..... Not Applicable			
Description..... Lithium ion battery (1S -1P)			
Model Name EB-BN985ABY			
Ratings	3.88V	4370mAh (16.96Wh)	Mass 56.0±2.80g

Test Result

No.	Test item	Result	Remark
T-1	Altitude	PASS	
T-2	Thermal Cycling	PASS	
T-3	Vibration	PASS	
T-4	Shock	PASS	
T-5	External Short Circuit	PASS	
T-6	Impact / Crush	PASS	
T-7	Overcharge	PASS	
T-8	Forced Discharge	PASS	

	Name	position	Signature	Date
Reported by	Hamhyungwoo	Engineer		2020.5.6
Approved by	Mung Junsoo	Technical Eng. in-charge		2020.5.6

T1	ALTITUDE SIMULATION TEST	Results
Requirements	No mass loss, no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure.	<input checked="" type="checkbox"/> No leakage, <input checked="" type="checkbox"/> No venting, <input checked="" type="checkbox"/> No disassembly, <input checked="" type="checkbox"/> No rupture, <input checked="" type="checkbox"/> No fire, <input checked="" type="checkbox"/> No mass loss, (Less than 0.2%) <input checked="" type="checkbox"/> No voltage drop (Residual OCV not less than 90%) See below table

Sample No.	Sample Condition	Voltage Before Test(V)	Weight Before Test(g)	Voltage After Test(V)	Weight After Test(g)	Residual OCV(%)	Percent of Weight Loss(%)
1	A	4.422	56.796	4.421	56.795	99.98	0.00
2	A	4.422	56.785	4.421	56.785	99.98	0.00
3	A	4.423	56.690	4.422	56.690	99.98	0.00
4	A	4.423	56.719	4.421	56.719	99.95	0.00
5	A	4.422	56.739	4.421	56.738	99.98	0.00
6	B	4.423	56.758	4.422	56.758	99.98	0.00
7	B	4.421	56.759	4.420	56.758	99.98	0.00
8	B	4.422	56.712	4.420	56.712	99.95	0.00
9	B	4.423	56.710	4.423	56.710	100.00	0.00
10	B	4.421	56.794	4.420	56.794	99.98	0.00

□ Supplementary Information:
 Sample Condition A : at first cycle, in fully charged states(5 pcs)
 Sample Condition B : after 25th cycles ending in fully charged states(5 pcs)

T2	THERMAL TEST	Results
Requirements	No mass loss, no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure.	<input checked="" type="checkbox"/> No leakage, <input checked="" type="checkbox"/> No venting, <input checked="" type="checkbox"/> No disassembly, <input checked="" type="checkbox"/> No rupture, <input checked="" type="checkbox"/> No fire, <input checked="" type="checkbox"/> No mass loss, (Less than 0.2%) <input checked="" type="checkbox"/> No voltage drop (Residual OCV not less than 90%) See below table

Sample No.	Sample Condition	Voltage Before Test(V)	Weight Before Test(g)	Voltage After Test(V)	Weight After Test(g)	Residual OCV(%)	Percent of Weight Loss(%)
1	A	4.421	56.795	4.357	56.791	98.55	0.01
2	A	4.421	56.785	4.356	56.781	98.53	0.01
3	A	4.422	56.690	4.357	56.685	98.53	0.01
4	A	4.421	56.719	4.355	56.714	98.51	0.01
5	A	4.421	56.738	4.354	56.735	98.48	0.01
6	B	4.422	56.758	4.357	56.751	98.53	0.01
7	B	4.420	56.758	4.352	56.755	98.46	0.01
8	B	4.420	56.712	4.354	56.708	98.51	0.01
9	B	4.423	56.710	4.353	56.705	98.42	0.01
10	B	4.420	56.794	4.357	56.791	98.57	0.01

Supplementary Information:
 Sample Condition A : at first cycle, in fully charged states(5 pcs)
 Sample Condition B : after 25th cycles ending in fully charged states(5 pcs)

T3	VIBRATION TEST	Results
Requirements	No mass loss, no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure.	<input checked="" type="checkbox"/> No leakage, <input checked="" type="checkbox"/> No venting, <input checked="" type="checkbox"/> No disassembly, <input checked="" type="checkbox"/> No rupture, <input checked="" type="checkbox"/> No mass loss, (Less than 0.2%) <input checked="" type="checkbox"/> No voltage drop (Residual OCV not less than 90%) See below table

Sample No.	Sample Condition	Voltage Before Test(V)	Weight Before Test(g)	Voltage After Test(V)	Weight After Test(g)	Residual OCV(%)	Percent of Weight Loss(%)
1	A	4.357	56.791	4.355	56.790	99.95	0.00
2	A	4.356	56.781	4.355	56.781	99.98	0.00
3	A	4.357	56.685	4.354	56.685	99.93	0.00
4	A	4.355	56.714	4.354	56.712	99.98	0.00
5	A	4.354	56.735	4.352	56.735	99.95	0.00
6	B	4.357	56.751	4.352	56.751	99.89	0.00
7	B	4.352	56.755	4.351	56.754	99.98	0.00
8	B	4.354	56.708	4.351	56.708	99.93	0.00
9	B	4.353	56.705	4.352	56.705	99.98	0.00
10	B	4.357	56.791	4.355	56.791	99.95	0.00

Supplementary Information:
 Sample Condition A : at first cycle, in fully charged states(5 pcs)
 Sample Condition B : after 25th cycles ending in fully charged states(5 pcs)

T4	SHOCK	Results
Requirements	No mass loss, no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure.	<input checked="" type="checkbox"/> No leakage, <input checked="" type="checkbox"/> No venting, <input checked="" type="checkbox"/> No disassembly, <input checked="" type="checkbox"/> No rupture, <input checked="" type="checkbox"/> No fire, <input checked="" type="checkbox"/> No mass loss, (Less than 0.2%) <input checked="" type="checkbox"/> No voltage drop (Residual OCV not less than 90%) See below table

Sample No.	Sample Condition	Voltage Before Test(V)	Weight Before Test(g)	Voltage After Test(V)	Weight After Test(g)	Residual OCV(%)	Percent of Weight Loss(%)
1	A	4.355	56.790	4.354	56.792	99.98	0.00
2	A	4.355	56.781	4.354	56.781	99.98	0.00
3	A	4.354	56.685	4.353	56.685	99.98	0.00
4	A	4.354	56.712	4.352	56.711	99.95	0.00
5	A	4.352	56.735	4.351	56.735	99.98	0.00
6	B	4.352	56.751	4.351	56.750	99.98	0.00
7	B	4.351	56.754	4.351	56.752	100.00	0.00
8	B	4.351	56.708	4.351	56.708	100.00	0.00
9	B	4.352	56.705	4.351	56.705	99.98	0.00
10	B	4.355	56.791	4.353	56.790	99.95	0.00

Supplementary Information:
 Sample Condition A : at first cycle, in fully charged states(5 pcs)
 Sample Condition B : after 25th cycles ending in fully charged states(5 pcs)

T5	EXTERNAL SHORT-CIRCUIT	Results
Requirements	External temperature does not exceed 170 °C and there is no disassembly, no rupture and no fire within six hours of this test.	<input checked="" type="checkbox"/> No disassembly, <input checked="" type="checkbox"/> No rupture <input checked="" type="checkbox"/> No fire. <input checked="" type="checkbox"/> External Temperature did not exceed 170 °C. see below table

Sample No.	Sample Condition	Maximum Temperature(°C)	Test result
1	A	57	O
2	A	57	O
3	A	57	O
4	A	57	O
5	A	57	O
6	B	57	O
7	B	57	O
8	B	57	O
9	B	57	O
10	B	57	O

Supplementary Information:

Sample Condition A : at first cycle, in fully charged states(5 pcs)

Sample Condition B : after 25th cycles ending in fully charged states(5 pcs)

Test result : O-No Disassembly, No Rupture, No Fire / D-Disassembly / R-Rupture / F-Fire

T6	<input type="checkbox"/> Impact / <input checked="" type="checkbox"/> Crush	Results
Requirements	Cells and component cells meet this requirement if their external temperature does not exceed 170°C and there is no disassembly and no fire during the test and within six hours after this test.	<input checked="" type="checkbox"/> External temperature did not exceed 170°C, <input checked="" type="checkbox"/> no disassembly, <input checked="" type="checkbox"/> no fire during test and within 6 hours after test See below table

Sample No.	Sample Condition	Voltage Before Test(V)	Maximum Temperature(°C)	Test result
T6-1	C	3.780	22	O
T6-2	C	3.780	22	O
T6-3	C	3.780	22	O
T6-4	C	3.780	22	O
T6-5	C	3.781	22	O
T6-6	D	3.780	22	O
T6-7	D	3.781	22	O
T6-8	D	3.780	22	O
T6-9	D	3.780	22	O
T6-10	D	3.780	22	O

<input type="checkbox"/> Supplementary Information: Sample Condition C : at first cycle, in 50% charged states(5 pcs) Sample Condition D : at 25th cycle, in 50% charged states(5 pcs) Test result : O-No Disassembly, No Fire / D-Disassembly / F-Fire

T7	OVERCHARGE	Results
Requirements	Rechargeable batteries meet this requirement if there is no disassembly and no fire during the test and within seven days after the test.	<input checked="" type="checkbox"/> No disassembly, <input checked="" type="checkbox"/> no rupture, <input checked="" type="checkbox"/> no fire during the test and within seven days after the test. See below table

Sample No.	Sample Condition	Voltage Before Test(V)	Test result
T7-1	A	4.422	O
T7-2	A	4.422	O
T7-3	A	4.421	O
T7-4	A	4.422	O
T7-5	B	4.422	O
T7-6	B	4.422	O
T7-7	B	4.423	O
T7-8	B	4.422	O

Supplementary Information:

Sample Condition A : at first cycle, in fully charged states(4 pcs)

Sample Condition B : after 25th cycles ending in fully charged states(4 pcs)

Test result : O-No Disassembly, No Fire / D-Disassembly / F-Fire

Test Conditions

Charge voltage : 8.94V, Charge current : 11.362A, Test time : 24Hr

T8	FORCED DISCHARGE	Results
Requirements	Rechargeable cells meet this requirement if there is no disassembly and no fire during the test and within seven days after the test.	<input checked="" type="checkbox"/> No disassembly, <input checked="" type="checkbox"/> no rupture, <input checked="" type="checkbox"/> no fire during the test and within seven days after the test. See below table

Sample No.	Sample Condition	Test result	Sample No.	Sample Condition	Test result
T8-1	E	O	T8-11	F	O
T8-2	E	O	T8-12	F	O
T8-3	E	O	T8-13	F	O
T8-4	E	O	T8-14	F	O
T8-5	E	O	T8-15	F	O
T8-6	E	O	T8-16	F	O
T8-7	E	O	T8-17	F	O
T8-8	E	O	T8-18	F	O
T8-9	E	O	T8-19	F	O
T8-10	E	O	T8-20	F	O

Supplementary Information:

Sample Condition E : at first cycle, in fully discharged states (10 pcs)

Sample Condition F : after 25th cycles ending in fully discharged states(10 pcs)

Test result : O-No Disassembly, No Fire / D-Disassembly / F-Fire

Test Conditions

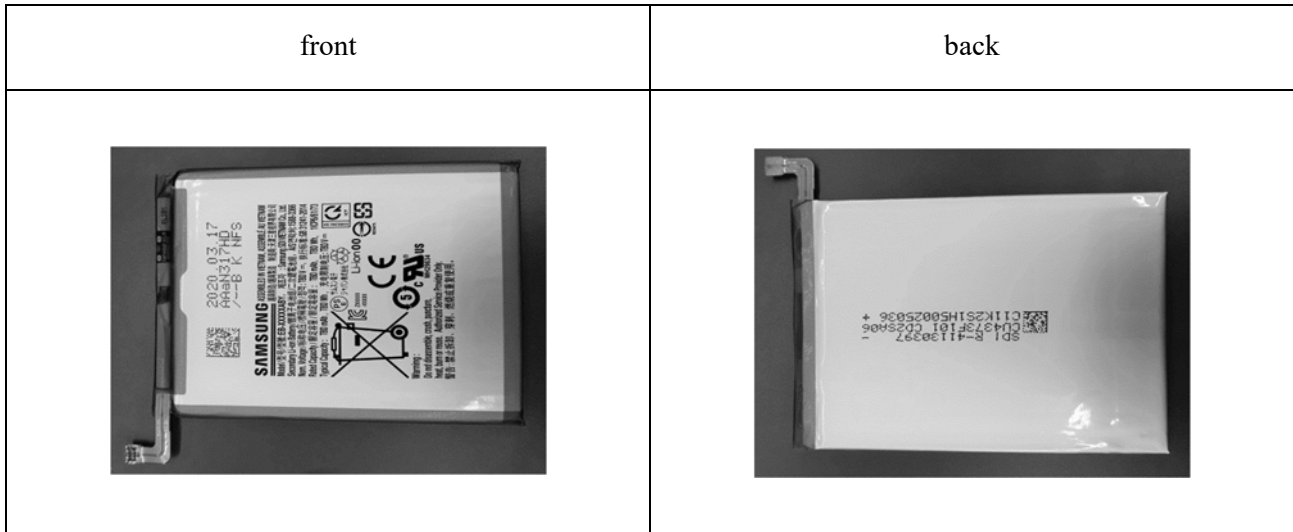
Initial test current : 4.37A, Test duration : 60Min

P1	Package Drop Test	Results
Procedure	<p>IATA Dangerous Goods Regulations Each package must be capable of withstanding a 1.2m drop test in any orientation</p>	<input checked="" type="checkbox"/> Without damage to cells or batteries contained therein, <input checked="" type="checkbox"/> Without shifting of the contents so as to allow battery to battery(or Cell to cell) contact. <input checked="" type="checkbox"/> Without release of contents See below photo

Battery Qty per box	Battery weight (kg)	Net weight per box (kg)
144	0.056	8.06

	Before Test	After Test
Weight (kg)	8.72	8.72
Test result		

Sample Photo



- End of Report -