



UN TEST REPORT

Test Summary

Report Number.....	SDI-UN-200721-02
Date of issue.....	2020.07.21
Test period	2020.06.18 ~ 2020.07.10
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-BA426ABY
Ratings	3.86V 4860mAh (18.76Wh) Mass Max 69.84g

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	How hyungho	Engineer		2020.7.21
Approved by	Kim Jung P.1	Technician / Engineer		2020.7.21

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	4.373	66.688	4.372	66.688	99.98	0.00
2	A	4.375	66.736	4.374	66.736	99.98	0.00
3	A	4.374	66.653	4.372	66.652	99.95	0.00
4	A	4.374	66.596	4.372	66.596	99.95	0.00
5	A	4.376	66.522	4.373	66.521	99.93	0.00
6	B	4.373	66.648	4.371	66.648	99.95	0.00
7	B	4.374	66.764	4.372	66.762	99.95	0.00
8	B	4.379	66.694	4.378	66.694	99.98	0.00
9	B	4.374	66.576	4.373	66.576	99.98	0.00
10	B	4.374	66.789	4.374	66.789	100.00	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	4.372	66.688	4.292	66.685	98.17	0.00
2	A	4.374	66.736	4.294	66.733	98.17	0.00
3	A	4.372	66.652	4.292	66.650	98.17	0.00
4	A	4.372	66.596	4.293	66.593	98.19	0.00
5	A	4.373	66.521	4.293	66.518	98.17	0.00
6	B	4.371	66.648	4.292	66.644	98.19	0.01
7	B	4.372	66.762	4.291	66.759	98.15	0.00
8	B	4.378	66.694	4.298	66.691	98.17	0.00
9	B	4.373	66.576	4.293	66.574	98.17	0.00
10	B	4.374	66.789	4.295	66.786	98.19	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)

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	4.292	66.685	4.291	66.685	99.98	0.00
2	A	4.294	66.733	4.294	66.732	100.00	0.00
3	A	4.292	66.650	4.292	66.650	100.00	0.00
4	A	4.293	66.593	4.293	66.593	100.00	0.00
5	A	4.293	66.518	4.293	66.518	100.00	0.00
6	B	4.292	66.644	4.291	66.642	99.98	0.00
7	B	4.291	66.759	4.291	66.759	100.00	0.00
8	B	4.298	66.691	4.298	66.691	100.00	0.00
9	B	4.293	66.574	4.293	66.574	100.00	0.00
10	B	4.295	66.786	4.295	66.786	100.00	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	4.291	66.685	4.290	66.684	99.98	0.00
2	A	4.294	66.732	4.293	66.732	99.98	0.00
3	A	4.292	66.650	4.291	66.650	99.98	0.00
4	A	4.293	66.593	4.292	66.594	99.98	0.00
5	A	4.293	66.518	4.291	66.518	99.95	0.00
6	B	4.291	66.642	4.290	66.642	99.98	0.00
7	B	4.291	66.759	4.290	66.758	99.98	0.00
8	B	4.298	66.691	4.295	66.690	99.93	0.00
9	B	4.293	66.574	4.291	66.574	99.95	0.00
10	B	4.295	66.786	4.293	66.786	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	3.752	22	O
T6-2	C	3.750	22	O
T6-3	C	3.752	22	O
T6-4	C	3.752	22	O
T6-5	C	3.751	22	O
T6-6	D	3.750	22	O
T6-7	D	3.751	22	O
T6-8	D	3.750	22	O
T6-9	D	3.750	22	O
T6-10	D	3.750	22	O

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	4.373	O
T7-2	A	4.372	O
T7-3	A	4.372	O
T7-4	A	4.371	O
T7-5	B	4.372	O
T7-6	B	4.374	O
T7-7	B	4.374	O
T7-8	B	4.372	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 : 8.86V, Charge current : 11.44A, 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:

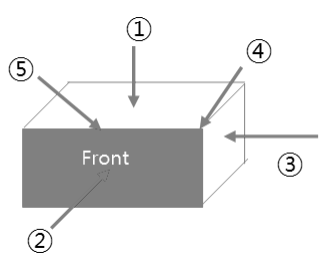
Sample Condition E : at first cycle, in fully discharged states (10 pcs)

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

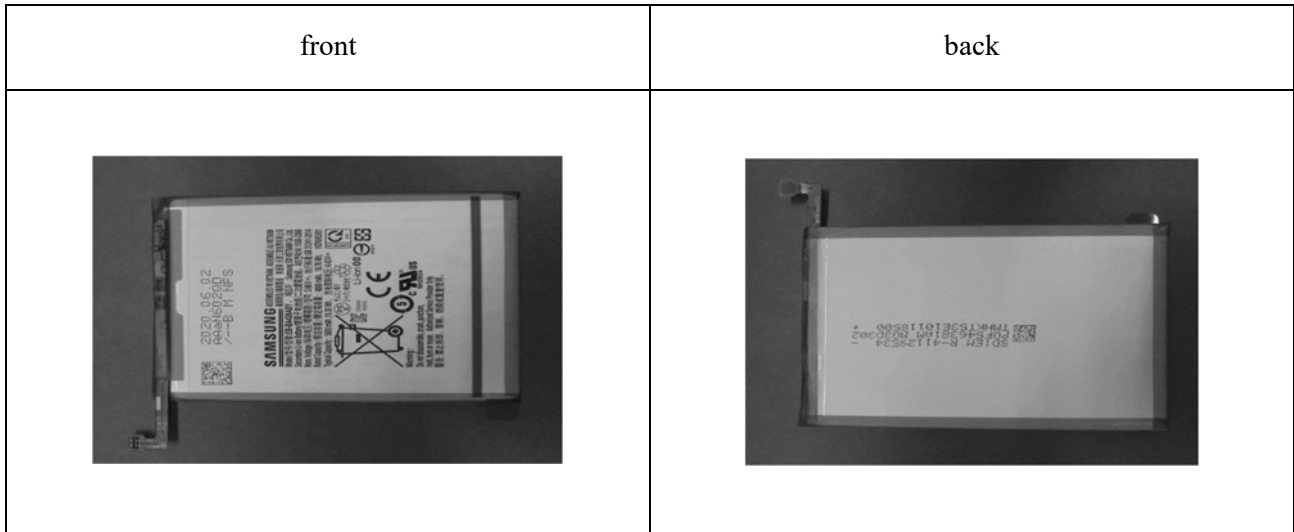
Initial test current : 4.86A, Test duration : 1Hr

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> 	<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</p> <p>See below photo</p>

Battery Qty per box	Battery weight (kg)	Net weight per box (kg)
136	0.066	8.97

	Before Test	After Test
Weight (kg)	10.57	10.57
Test result		

Sample Photo



- End of Report -