



# UN TEST REPORT

## Test Summary

Report Number.....: SDI-UN-200615-01	
Date of issue.....: 2020.06.15	
Test period.....: 2020.06.02 ~ 2020.06.14	
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-BN980ABY	
Ratings.....	3.88V 4170mAh (16.18Wh)      Mass      56±9.20g

**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	Ham hyung hwa	Engineer		2020.6.15
Approved by	Hong Jans P. 1	Technical Engineer		2020.6.15

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	4.400	53.980	4.400	53.980	100.00	0.00
2	A	4.397	53.905	4.397	53.904	100.00	0.00
3	A	4.396	53.907	4.396	53.907	100.00	0.00
4	A	4.396	53.779	4.395	53.779	99.98	0.00
5	A	4.396	53.890	4.396	53.890	100.00	0.00
6	B	4.396	53.787	4.396	53.787	100.00	0.00
7	B	4.395	53.776	4.395	53.776	100.00	0.00
8	B	4.395	53.895	4.394	53.894	99.98	0.00
9	B	4.395	53.900	4.395	53.900	100.00	0.00
10	B	4.396	53.861	4.396	53.861	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	4.400	53.980	4.333	53.976	98.48	0.01
2	A	4.397	53.904	4.329	53.901	98.45	0.01
3	A	4.396	53.907	4.330	53.904	98.50	0.01
4	A	4.395	53.779	4.330	53.775	98.52	0.01
5	A	4.396	53.890	4.330	53.887	98.50	0.01
6	B	4.396	53.787	4.330	53.784	98.50	0.01
7	B	4.395	53.776	4.329	53.772	98.50	0.01
8	B	4.394	53.894	4.327	53.891	98.48	0.01
9	B	4.395	53.900	4.328	53.896	98.48	0.01
10	B	4.396	53.861	4.328	53.857	98.45	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	4.333	53.976	4.332	53.977	99.98	0.00
2	A	4.329	53.901	4.328	53.901	99.98	0.00
3	A	4.330	53.904	4.330	53.904	100.00	0.00
4	A	4.330	53.775	4.330	53.774	100.00	0.00
5	A	4.330	53.887	4.330	53.887	100.00	0.00
6	B	4.330	53.784	4.330	53.784	100.00	0.00
7	B	4.329	53.772	4.328	53.771	99.98	0.00
8	B	4.327	53.891	4.327	53.891	100.00	0.00
9	B	4.328	53.896	4.328	53.896	100.00	0.00
10	B	4.328	53.857	4.328	53.857	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	4.332	53.977	4.330	53.975	99.95	0.00
2	A	4.328	53.901	4.326	53.901	99.95	0.00
3	A	4.330	53.904	4.327	53.904	99.93	0.00
4	A	4.330	53.774	4.328	53.772	99.95	0.00
5	A	4.330	53.887	4.328	53.887	99.95	0.00
6	B	4.330	53.784	4.328	53.784	99.95	0.00
7	B	4.328	53.771	4.325	53.770	99.93	0.00
8	B	4.327	53.891	4.325	53.891	99.95	0.00
9	B	4.328	53.896	4.325	53.896	99.93	0.00
10	B	4.328	53.857	4.327	53.855	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)

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	3.776	22	O
T6-2	C	3.776	22	O
T6-3	C	3.776	22	O
T6-4	C	3.776	22	O
T6-5	C	3.776	22	O
T6-6	D	3.776	22	O
T6-7	D	3.775	22	O
T6-8	D	3.776	22	O
T6-9	D	3.774	22	O
T6-10	D	3.776	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	4.400	O
T7-2	A	4.401	O
T7-3	A	4.400	O
T7-4	A	4.400	O
T7-5	B	4.401	O
T7-6	B	4.400	O
T7-7	B	4.402	O
T7-8	B	4.401	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 : 10.842A, 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

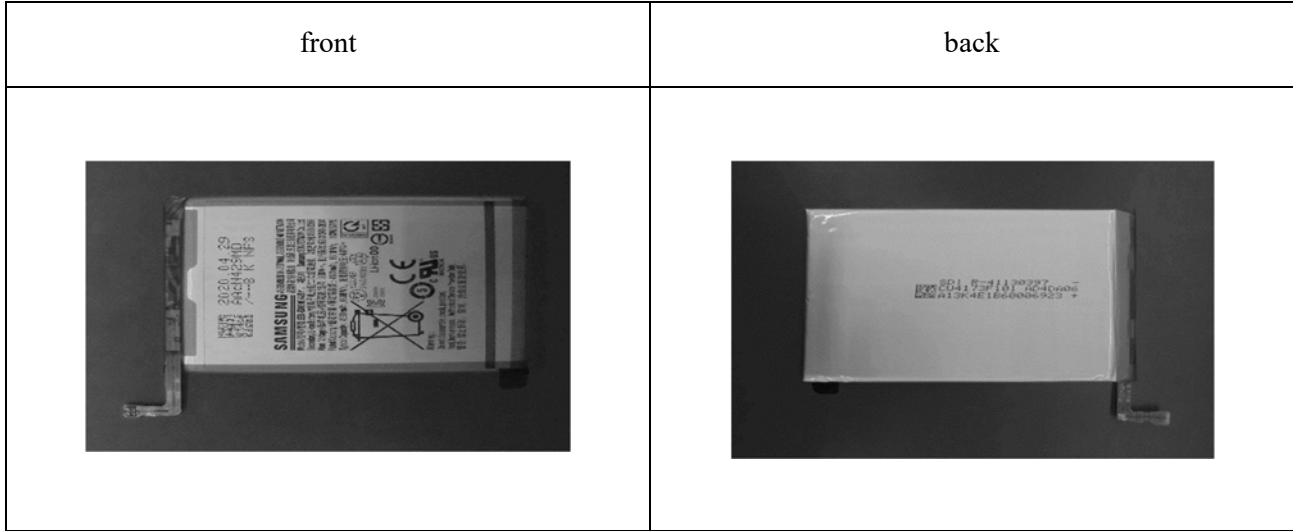
Initial test current : 4.17A, Test duration : 1Hr

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)
144	0.053	7.63

	Before Test	After Test
Weight (kg)	9.20	9.20
Test result		

Sample Photo



- End of Report -