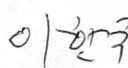
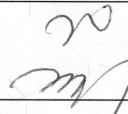


UN TEST REPORT**Test Summary**

Report Number.	: SDI-UN-221213-01
Date of issue.....	: 2022.12.13
Test period	: 2021.01.20 ~ 2021.02.02
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/sm90.yoo@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/sm90.yoo@samsung.com
Test Standard	Recommendations on the Transport of Dangerous Goods: Manual of Tests and Criteria, section 38.3 Seventh revised edition
Description.....	Lithium Ion Cell
Physical description	INR21700-50GB
Model Name	Cylindrical Cell
Ratings	3.63V 4900mAh (17.79Wh)
Mass	Max 71.0g

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	N/A	Battery only
T-8	Forced Discharge	PASS	

	Name	position	Signature	Date
Reported by	Lee Han Guk	Engineer		2022.12.13
Approved by	Yoo Seung Woo	Principal Engineer		2022.12.13

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.	☒ No leakage, ☒ No venting, ☒ No disassembly, ☒ No rupture, ☒ No fire, ☒ No mass loss, (Less than 0.2%) ☒ 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	4.150	70.534	4.147	70.535	99.93	0.00
2	A	4.150	70.610	4.147	70.611	99.93	0.00
3	A	4.150	70.551	4.147	70.552	99.93	0.00
4	A	4.150	70.590	4.148	70.591	99.95	0.00
5	A	4.150	70.563	4.147	70.564	99.93	0.00
6	B	4.167	70.587	4.162	70.588	99.88	0.00
7	B	4.167	70.594	4.162	70.595	99.88	0.00
8	B	4.167	70.574	4.162	70.575	99.88	0.00
9	B	4.167	70.574	4.163	70.566	99.90	0.01
10	B	4.166	70.566	4.162	70.608	99.90	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.	☒ No leakage, ☒ No venting, ☒ No disassembly, ☒ No rupture, ☒ No fire, ☒ No mass loss, (Less than 0.2%) ☒ 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	4.147	70.535	4.105	70.534	98.99	0.00
2	A	4.147	70.611	4.105	70.611	98.99	0.00
3	A	4.147	70.552	4.105	70.552	98.99	0.00
4	A	4.148	70.591	4.105	70.590	98.96	0.00
5	A	4.147	70.564	4.105	70.564	98.99	0.00
6	B	4.162	70.588	4.117	70.588	98.92	0.00
7	B	4.162	70.595	4.116	70.595	98.89	0.00
8	B	4.162	70.575	4.115	70.575	98.87	0.00
9	B	4.163	70.566	4.116	70.567	98.87	0.00
10	B	4.162	70.608	4.115	70.609	98.87	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.	☒ No leakage, ☒ No venting, ☒ No disassembly, ☒ No rupture, ☒ No mass loss, (Less than 0.2%) ☒ 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	4.105	70.534	4.104	70.535	99.98	0.00
2	A	4.105	70.611	4.104	70.611	99.98	0.00
3	A	4.105	70.552	4.104	70.552	99.98	0.00
4	A	4.105	70.590	4.104	70.590	99.98	0.00
5	A	4.105	70.564	4.104	70.563	99.98	0.00
6	B	4.117	70.588	4.116	70.589	99.98	0.00
7	B	4.116	70.595	4.115	70.595	99.98	0.00
8	B	4.115	70.575	4.114	70.574	99.98	0.00
9	B	4.116	70.567	4.115	70.565	99.98	0.00
10	B	4.115	70.609	4.114	70.607	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)							

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.	☒ No leakage, ☒ No venting, ☒ No disassembly, ☒ No rupture, ☒ No fire, ☒ No mass loss, (Less than 0.2%) ☒ 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	4.104	70.535	4.104	70.533	100.00	0.00
2	A	4.104	70.611	4.104	70.610	100.00	0.00
3	A	4.104	70.552	4.103	70.549	99.98	0.00
4	A	4.104	70.590	4.104	70.589	100.00	0.00
5	A	4.104	70.563	4.104	70.561	100.00	0.00
6	B	4.116	70.589	4.115	70.587	99.98	0.00
7	B	4.115	70.595	4.114	70.593	99.98	0.00
8	B	4.114	70.574	4.114	70.571	100.00	0.00
9	B	4.115	70.565	4.114	70.564	99.98	0.00
10	B	4.114	70.607	4.114	70.606	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)							

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.	☒ No disassembly, ☒ No rupture ☒ No fire. ☒ External Temperature did not exceed 170 °C. see below table

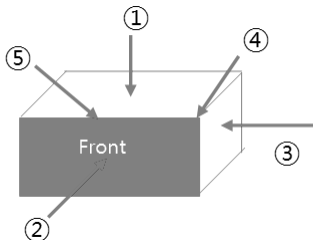
Sample No.	Sample Condition	Maximum Temperature(°C)	Test result
1	A	82.2	O
2	A	87.1	O
3	A	95.3	O
4	A	113.1	O
5	A	91.6	O
6	B	91.5	O
7	B	91.6	O
8	B	103.4	O
9	B	98.3	O
10	B	124.4	O
☐ Supplementary Information: Sample Condition A : at first cycle, in fully charged states(5 pcs) Sample Condition B : after 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	☒ Impact / ☐ Crush	Results
Requirements	Cells and component cells meet this requirement if their external temperature does not exceed 170℃ and there is no disassembly and no fire during the test and within six hours after this test.	☒ External temperature did not exceed 170℃, ☒ no disassembly, ☒ no fire during test and within 6 hours after test See below table

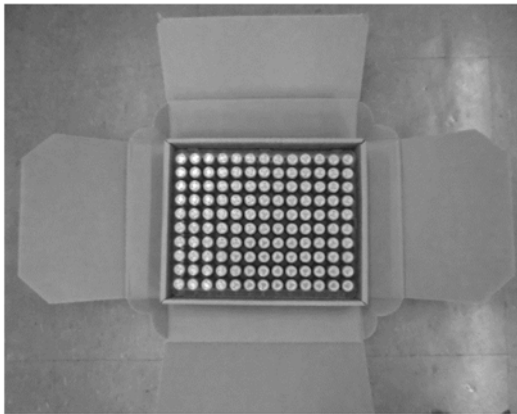
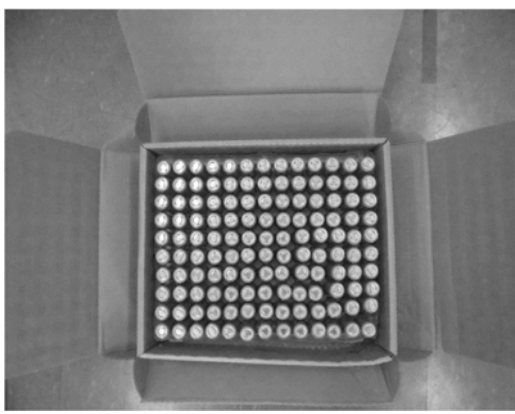
Sample No.	Sample Condition	Voltage Before Test(V)	Maximum Temperature(℃)	Test result
T6-1	C	3.752	19.5	O
T6-2	C	3.752	21.1	O
T6-3	C	3.752	21.8	O
T6-4	C	3.751	20.8	O
T6-5	C	3.752	21.1	O
T6-6	D	3.751	20.9	O
T6-7	D	3.752	20.9	O
T6-8	D	3.752	20.6	O
T6-9	D	3.751	21.6	O
T6-10	D	3.751	22.5	O
☐ Supplementary 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				

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.	☒ No disassembly, ☒ no rupture, ☒ no fire during the test and within seven days after the test. See below table

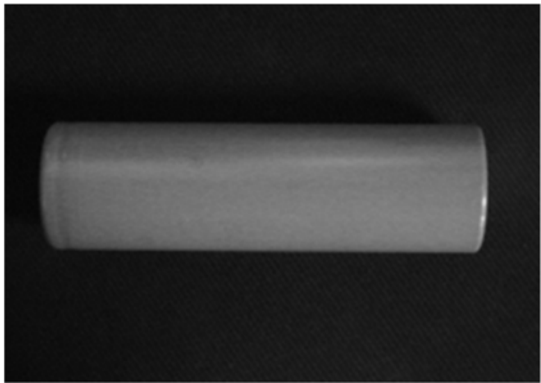
Sample No.	Sample Condition	Test result	Sample No.	Sample Condition	Test result
T8-1	E	O	T8-11	F	O
T8-2	E	O	T8-12	F	O
T8-3	E	O	T8-13	F	O
T8-4	E	O	T8-14	F	O
T8-5	E	O	T8-15	F	O
T8-6	E	O	T8-16	F	O
T8-7	E	O	T8-17	F	O
T8-8	E	O	T8-18	F	O
T8-9	E	O	T8-19	F	O
T8-10	E	O	T8-20	F	O
□ Supplementary Information: Sample 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 : 1.47A, Test duration : 20min					

P1	Package Drop Test	Results
Procedure	IATA Dangerous Goods Regulations Each package must be capable of withstanding a 1.2m drop test in any orientation 	☒ 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 See below photo

Cell Qty per box	Cell weight (kg)	Net weight per box (kg)
130	0.07	9.10

	Before Test	After Test
Weight (kg)	9.78	9.78
Test result		

Sample Photo

front	back
	

- End of Report -