

Executive Div.	Safety Center	Confidential	
	Name / Title	Signature	Date
Reported by	HW Ham / Technician		2010.05.27
Approved by	JH Kim / Senior manager		2010.05.27

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

2009, 5th Revision

Document No : MT0023964

SAMSUNG SDI
Energy Business Division



Product Information

1. Model name: **BL1830**
2. Product classification: **Li rechargeable battery pack (5S-2P)**
3. Nominal voltage: **18 V**
4. Rated capacity: **3000 mAh**
5. Wh Capacity: **54 Wh**
6. Weight of product: **≤ 600g**
7. Test Date: **2010. 05. 05 ~ 2010. 05. 22**
8. Test Location: **SAMSUNG SDI Safety Center, 508 Sungsungdong, Cheonan
Chungcheongnamdo, Korea**

Test summary

Test No.	Test item	Relating Std.	Test begins on	Test Completed on	Judgment
T1	Altitude simulation	UN Manual of Tests and Criteria, Part III, Subsection 38.3.4.1	2010. 05. 05	2010. 05. 05	Pass
T2	Thermal test	UN Manual of Tests and Criteria, Part III, Subsection 38.3.4.2	2010. 05. 05	2010. 05. 11	Pass
T3	Vibration	UN Manual of Tests and Criteria, Part III, Subsection 38.3.4.3	2010. 05. 17	2010. 05. 17	Pass
T4	Shock	UN Manual of Tests and Criteria, Part III, Subsection 38.3.4.4	2010. 05. 21	2010. 05. 21	Pass
T5	External short circuit	UN Manual of Tests and Criteria, Part III, Subsection 38.3.4.5	2010. 05.22	2010. 05. 22	Pass
T6	Impact	UN Manual of Tests and Criteria, Part III, Subsection 38.3.4.6	2010. 05. 21	2010. 05. 21	Pass
T7	Overcharge	UN Manual of Tests and Criteria, Part III, Subsection 38.3.4.7	2010. 05. 08	2010. 05. 16	Pass
T8	Forced discharge	UN Manual of Tests and Criteria, Part III, Subsection 38.3.4.8	N/A	N/A	N/A
P1	Packaging Drop	2009 IATA Dangerous Goods Regulations 50 th Edition	2010. 05. 21	2010. 05. 21	Pass

- Tests T-1 through T-5 shall be conducted in sequence with the same call
- For test 6, test should be conducted for cells in a pack
- T7 shall be performed only for Li-rechargeable battery not Li-ion cell.
- T8 shall be performed only for Li-ion cell not Li-rechargeable battery.

T-1~T-5) Transportation Test: Pass

Frech battery pack 100% SOC											
	Initial		T1		T2		T3		T4		T5
Sample No.	Weight(g)	OCV(V)	Weight(g)	OCV(V)	Weight(g)	OCV(V)	Weight(g)	OCV(V)	Weight(g)	OCV(V)	Max Temperature(°C)
1	595.92	20.73	595.89	20.72	595.81	20.41	595.93	20.39	595.93	20.38	57.9
2	596.93	20.73	596.91	20.72	596.81	20.41	596.93	20.39	596.92	20.38	61.3
3	596.14	20.71	596.11	20.70	596.02	20.41	596.14	20.39	596.14	20.38	76.4
4	596.50	20.73	596.47	20.72	596.38	20.42	596.52	20.39	596.51	20.38	92.7
Avg.	596.3725	20.725	596.345	20.715	596.255	20.4125	596.38	20.39	596.375	20.38	72.1
Max.	596.93	20.73	596.91	20.72	596.81	20.42	596.93	20.39	596.92	20.38	92.7
Min.	595.92	20.71	595.89	20.7	595.81	20.41	595.93	20.39	595.93	20.38	57.9

50 cycled battery pack 100% SOC											
	Initial		T1		T2		T3		T4		T5
Sample No.	Weight(g)	OCV(V)	Weight(g)	OCV(V)	Weight(g)	OCV(V)	Weight(g)	OCV(V)	Weight(g)	OCV(V)	Max Temperature(°C)
1	596.11	20.83	596.13	20.66	596.07	19.79	596.20	19.42	596.20	19.18	57.7
2	596.29	20.84	596.30	20.82	596.25	20.50	596.36	20.47	596.38	20.46	71.6
3	596.88	20.82	596.89	20.80	596.82	20.48	596.94	20.45	596.93	20.44	78.3
4	597.04	20.82	597.06	20.65	596.98	19.78	597.13	19.40	597.12	19.18	76.1
Avg.	596.58	20.8275	596.595	20.7325	596.53	20.1375	596.6575	19.935	596.6575	19.815	70.9
Max.	597.04	20.84	597.06	20.82	596.98	20.5	597.13	20.47	597.12	20.46	78.3
Min.	596.11	20.82	596.13	20.65	596.07	19.78	596.2	19.4	596.2	19.18	57.7

T-6) Impact Test (INR18650-15Q): Pass

	Initial	T6
Sample No.	OCV(V)	Max Temp
Fresh cell 50% SOC	1	26.5
	2	26.5
	3	25.8
	4	26.4
	5	24.8
50 Cycled cell 0% SOC	6	24.3
	7	24.8
	8	25.1
	9	26.1
	10	24.8
Avg.	3.39	25.51
Max.	3.84	26.50
Min.	2.93	24.30

■ T1~T5: Tests were performed in sequence with same samples

■ T6: Prismatic type cell test condition;

- From sample no.1~5: Wide side impact

- From sample no.6~10: Narrow side impact

Other type cells

- Only 5 samples shall be tested.

T-7) Over charge Test: Pass

- Test Condition: 25.2V / 24A / 24Hr

	Fresh cell 100% SOC	50 Cycled cell 100% SOC
Sample No.	Max. temperature	Max. temperature
1	43.2	43.0
2	57.7	26.3
3	43.6	41.5
4	56.5	41.8
Avg.	50.25	38.15
Max.	57.7	43
Min.	43.2	26.3

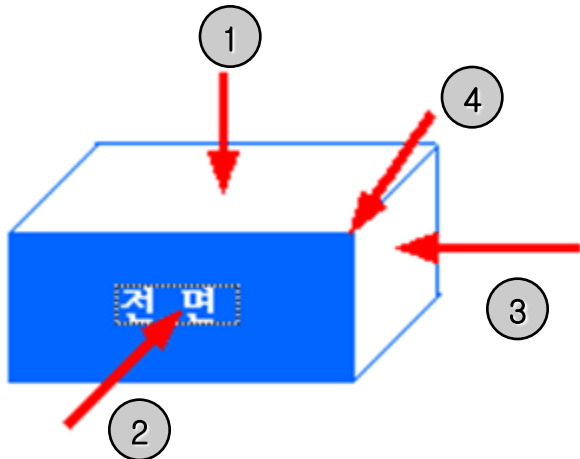
T-8) Forced discharge Test: N/A

- Test condition: N/A

P-1) Packaging Drop Test: Pass

	Before test	After test
Weight (Kg)	7.201	7.200
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.	

■ Test Method



■ Sample picture

