SolutionPartner

문서번호	QAE-EF02-101122-PKASM P/N 42T4882	
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" 창의와 자율, 25+1 "

UN Test Report

- ASM P/N 42T4882 (Nom. 63Wh, 11.1V)-

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LG Chem
Mobile Energy Division

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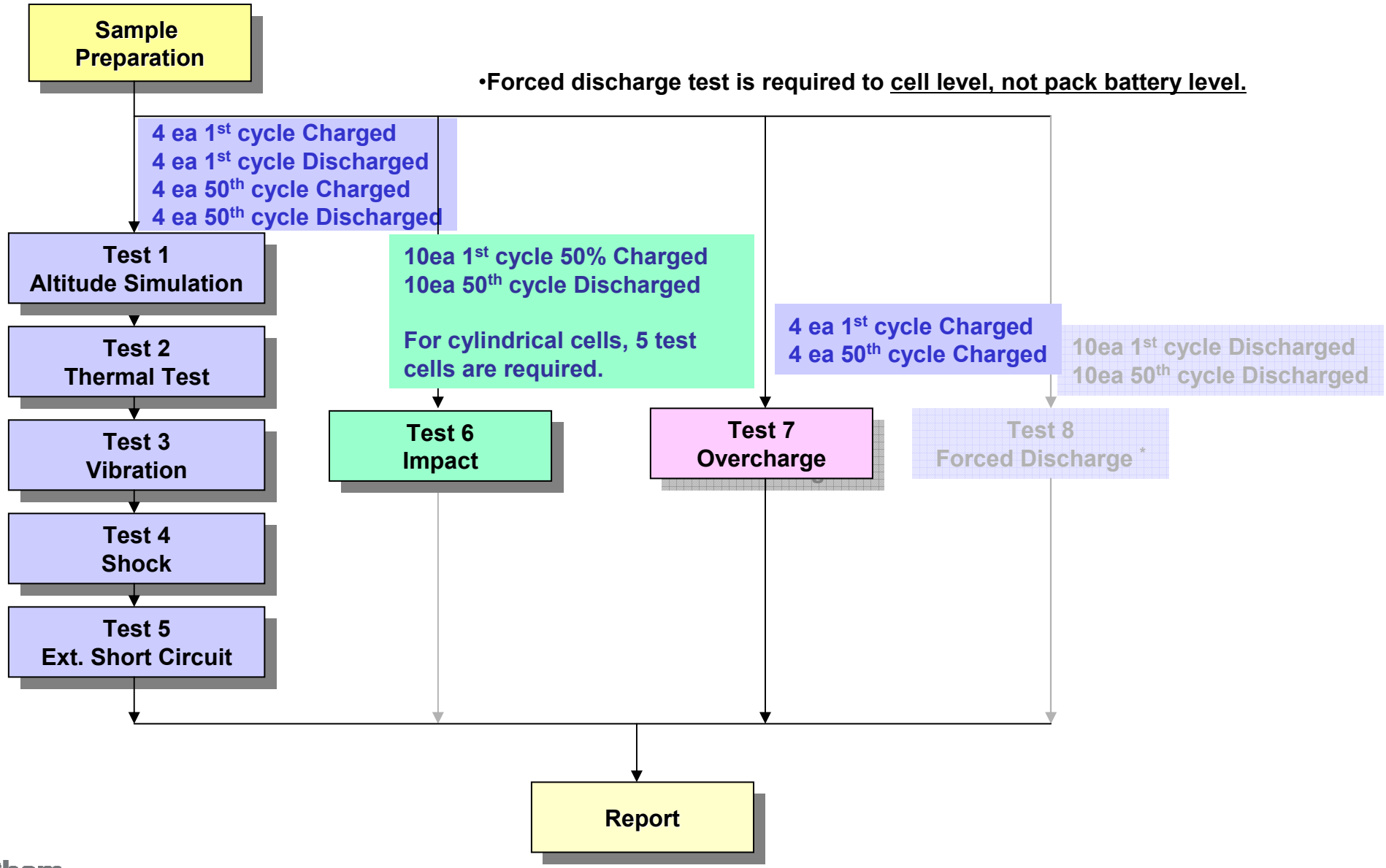
1. UN Transportation Regulation Test

Test	Condition	Requirements
Test 1. Altitude Simulation	Storing at (low pressure)11.6kPa for 6hr at 20+/-5℃	- Measuring mass before/ after each test (If M>5g, less than 0.1%) - Measuring voltage before/ after each test (more than 90%) - No leakage, no venting, no disassembly, no rupture, no fire
Test 2. Thermal Test	[75±2℃,6hr ↔ -40±2℃,6hr,interval max. 30min] x 10cycle Storing at 20±5℃ for 24h	
Test 3. Vibration	[7Hz↔200Hz↔7Hz, in 15min] x 12 times x 3 direction 1) sinusoidal waveform with a logarithmic sweep 2) 7Hz 18Hz (maintaining 1gn) app. 50Hz (until 8gn) 200Hz (maintaining 8gn), 1.6mm total excursion	
Test 4. Shock	Half sine shock (peak acceleration : 150gn, pulse duration : 6msec) x 6 (±x, y, z) direction x 3 cycle	
Test 5. External Short Circuit	100mΩ ext. short-circuit at 55±2℃ 1hr continue after returning at 55±2℃	- No disassembly, no rupture, no fire (after 6 hours) - Temp. monitoring (max. 170℃)
Test 6. Impact	Φ=15.8mm bar, 9.1kg mass, 61±2.5cm height	
Test 7. Overcharge	Current = Manufacturer's recommended max. continuous charge current X 2 Voltage 1.If charge voltage ≤ 18V, V (min.) = 2 x (max. charge voltage) or V (min.) = 22V. 2.If charge voltage > 18V, V (min.) = 1.2 x (max. charge voltage)	- No disassembly, no fire (after 7 days)
Test 8. Forced Discharge	Only for Cell, not battery.	- No disassembly, no fire (after 7 days)

* Tests through T1-T5 shall be conducted in sequence with the same battery.

* We declare that the above-mentioned test is the result of being checked according to UN Test (Manual of Test and Criteria ST/SG/AC.10/27/Add.2)

2. Test Procedure



3-1. T1-T4 Test Result

Before				Altitude (T1)					Thermal (T2)					Vibration (T3)					Shock (T4)				
	Pack NO.	OCV	Mass	OCV	Mass	Residual OCV(%)	Mass Loss(%)	Result	OCV	Mass	Residual OCV(%)	Mass Loss(%)	Result	OCV	Mass	Residual OCV(%)	Mass Loss(%)	Result	OCV	Mass	Residual OCV(%)	Mass Loss(%)	Result
A. 1st cycle fully state																							
Charge	1	11.361	375.130	11.349	375.121	99.89	0.002	Pass	11.331	375.109	99.84	0.003	Pass	11.321	375.078	99.91	0.008	Pass	11.319	375.053	99.98	0.007	Pass
	2	11.412	374.971	11.304	374.967	99.05	0.001	Pass	11.291	374.966	99.88	0.000	Pass	11.277	374.955	99.88	0.003	Pass	11.251	374.949	99.77	0.002	Pass
	3	11.371	375.971	11.341	375.960	99.74	0.003	Pass	11.331	375.944	99.91	0.004	Pass	11.291	375.933	99.65	0.003	Pass	11.279	375.921	99.89	0.003	Pass
	4	11.398	373.487	11.381	373.477	99.85	0.003	Pass	11.369	373.461	99.89	0.004	Pass	11.349	373.441	99.82	0.005	Pass	11.331	373.422	99.84	0.005	Pass
	Ave.	11.386	374.890	11.344	374.881	99.63	0.002	-	11.331	374.870	99.88	0.003	-	11.310	374.852	99.81	0.005	-	11.295	374.836	99.87	0.004	-
Dis charge	5	10.120	375.998	-	375.971	-	0.007	Pass	-	375.961	-	0.003	Pass	-	375.949	-	0.003	Pass	-	375.939	-	0.003	Pass
	6	10.098	374.091	-	374.069	-	0.006	Pass	-	374.061	-	0.002	Pass	-	374.041	-	0.005	Pass	-	374.039	-	0.001	Pass
	7	10.088	375.998	-	375.971	-	0.007	Pass	-	375.966	-	0.001	Pass	-	375.944	-	0.006	Pass	-	375.938	-	0.002	Pass
	8	10.092	376.191	-	376.169	-	0.006	Pass	-	376.151	-	0.005	Pass	-	376.148	-	0.001	Pass	-	376.139	-	0.002	Pass
	Ave.	10.100	375.570	-	375.545	-	0.007	-	-	375.535	-	0.003	-	-	375.521	-	0.004	-	-	375.514	-	0.002	-
B. 50th cycle fully state																							
Charge	9	11.713	377.571	11.702	377.566	99.91	0.001	Pass	11.698	377.560	99.97	0.002	Pass	11.691	377.551	99.94	0.002	Pass	11.681	377.544	99.91	0.002	Pass
	10	11.881	376.185	11.877	376.166	99.97	0.005	Pass	11.871	376.162	99.95	0.001	Pass	11.810	376.159	99.49	0.001	Pass	11.801	376.148	99.92	0.003	Pass
	11	11.689	374.910	11.679	374.899	99.91	0.003	Pass	11.671	374.889	99.93	0.003	Pass	11.661	374.881	99.91	0.002	Pass	11.651	374.877	99.91	0.001	Pass
	12	11.791	374.129	11.779	374.121	99.90	0.002	Pass	11.763	374.113	99.86	0.002	Pass	11.755	374.108	99.93	0.001	Pass	11.749	374.099	99.95	0.002	Pass
	Ave.	11.769	375.699	11.759	375.688	99.92	0.003	-	11.751	375.681	99.93	0.002	-	11.729	375.675	99.82	0.002	-	11.721	375.667	99.93	0.002	-
Dis charge	13	10.102	373.917	-	373.900	-	0.005	Pass	-	373.889	-	0.003	Pass	-	373.871	-	0.005	Pass	-	373.867	-	0.001	Pass
	14	10.019	374.817	-	374.811	-	0.002	Pass	-	374.801	-	0.003	Pass	-	374.789	-	0.003	Pass	-	374.781	-	0.002	Pass
	15	10.098	375.791	-	375.788	-	0.001	Pass	-	375.781	-	0.002	Pass	-	375.771	-	0.003	Pass	-	375.761	-	0.003	Pass
	16	10.074	377.902	-	377.898	-	0.001	Pass	-	377.889	-	0.002	Pass	-	377.869	-	0.005	Pass	-	377.866	-	0.001	Pass
	Ave.	10.073	375.607	-	375.599	-	0.002	-	-	375.590	-	0.002	-	-	375.575	-	0.004	-	-	375.569	-	0.002	-

Requirement	- Measuring mass before/after each test (If M>5g, less than 0.1%) - Measuring voltage before/after each test (more than 90%, only charged samples) - No leakage, no venting, no disassembly, no rupture, no fire

3-2. T5/T7 Test Result

EXT.Short Circuit (T5)				
	Pack NO.	Initial OCV(V)	Max. Temp (℃)	Result
A. 1st cycle fully state				
Charge	1	11.319	55.98	Pass
	2	11.251	56.11	Pass
	3	11.279	55.81	Pass
	4	11.331	55.77	Pass
	MAX.	11.331	56.11	-
Dis charge	5	9.880	55.12	Pass
	6	9.791	55.91	Pass
	7	9.812	55.31	Pass
	8	9.779	54.99	Pass
	MAX.	9.880	55.91	-

EXT.Short Circuit (T5)				
	Pack NO.	Initial OCV(V)	Max. Temp (℃)	Result
B. 50th cycle fully state				
Charge	9	11.681	54.29	Pass
	10	11.801	55.19	Pass
	11	11.651	54.90	Pass
	12	11.749	55.25	Pass
	MAX.	11.801	55.25	-
Dis charge	13	9.881	55.12	Pass
	14	9.814	54.99	Pass
	15	9.815	55.98	Pass
	16	9.771	54.12	Pass
	MAX.	9.881	55.98	-

Test Condition

- 100mΩ ext. short-circuit at 55±2℃

Requirement

- Temperature < 170 (℃)
- No disassembly, no rupture, no fire within 6 hours

Over Charge (T7)				
	Pack NO.	Initial OCV(V)	Max. Temp (℃)	Result
A. 1st cycle fully state				
Charge	17	11.891	25.12	Pass
	18	11.791	24.11	Pass
	19	11.889	24.98	Pass
	20	11.781	24.71	Pass
	MAX.	11.891	25.12	-

Over Charge (T7)				
	Pack NO.	Initial OCV(V)	Max. Temp (℃)	Result
B. 50th cycle fully state				
Charge	21	11.891	24.89	Pass
	22	11.881	24.91	Pass
	23	11.769	25.11	Pass
	24	11.870	24.90	Pass
	MAX.	11.891	25.11	-

Test Condition

- Max. Charge Current : 3800 mA
- CC/CV 2Imax(7600mA) 16.8V cut-off 24Hr

Requirement

- No disassembly, no fire within 7 day

3-3. T6 Test Result (ICR18650C2)

Impact (T6)			
Pack NO.	Initial OCV(V)	Max. Temp (℃)	Result
A. 1st cycle 50% charge state			
21	3.807	25.43	**Pass**
22	3.807	108.50	**Pass**
23	3.806	24.36	**Pass**
24	3.806	24.79	**Pass**
25	3.806	114.39	**Pass**
MAX.	3.807	114.39	-
B. 50th cycle fully discharge state			
26	3.351	24.83	**Pass**
27	3.362	46.43	**Pass**
28	3.387	49.26	**Pass**
29	3.369	49.90	**Pass**
30	3.353	47.55	**Pass**
MAX.	3.387	49.90	-
Test Condition			
- Φ=15.8mm bar, 9.1kg mass, 61±2.5cm height			
Requirement			
- Temperature < 170 (℃) - No disassembly, no rupture, no fire within 6 hours			

4. Sample Image