




문서번호	QAE-EF02-140521-PKASM PN SB10F46446, ASM PN SB10F46452	
Prepared	남익현	
	장승현	
Reviewed	남대호	
	박해나	
Approved	김병수	

SolutionPartner

UN Test Report

-ASM P/N SB10F46446, ASM P/N SB10F46452 (Nom.67Wh, 15.2V)-

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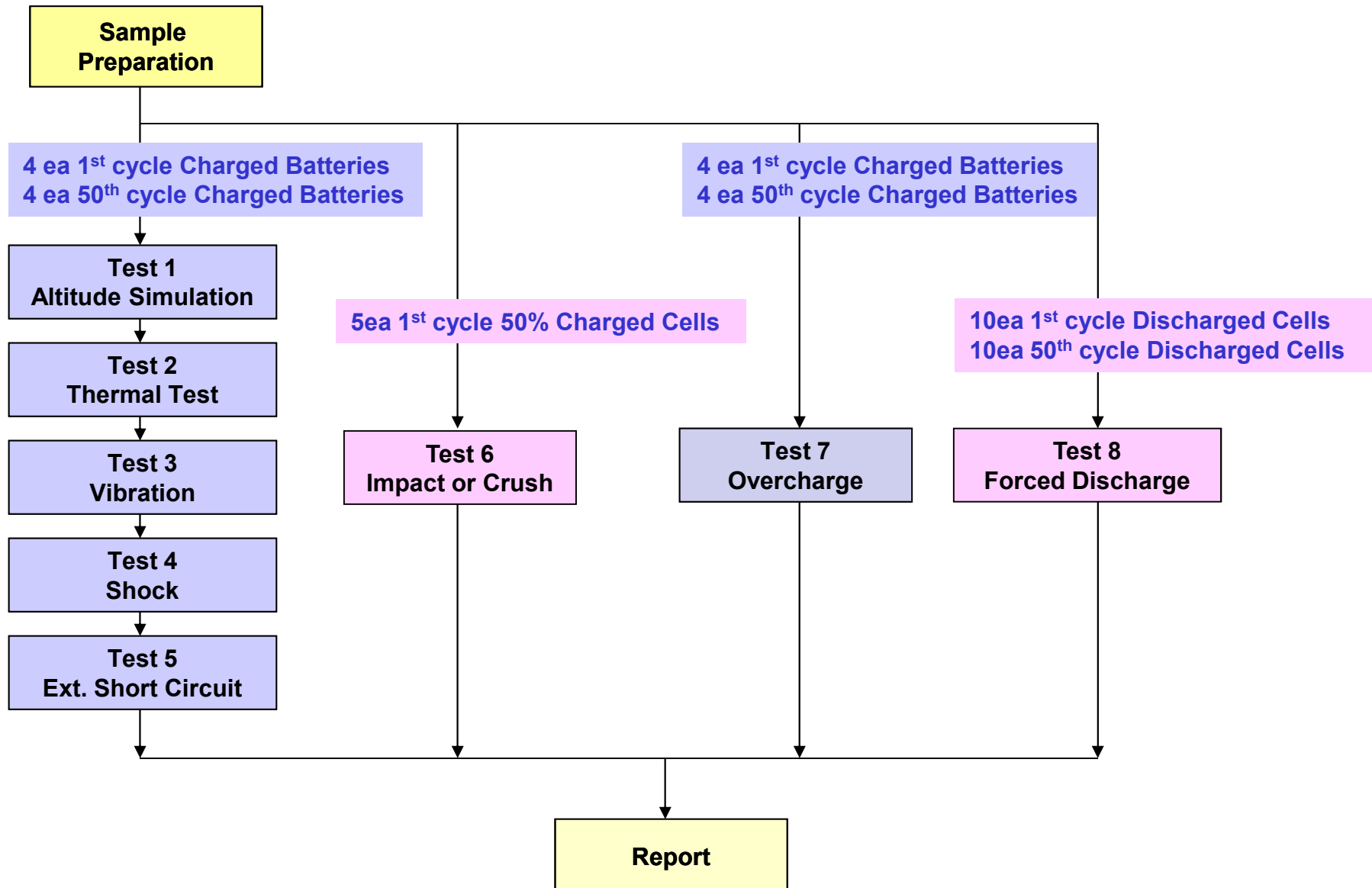
1. UN Transportation Regulation Test

Test	Condition	Requirements
Test 1. Altitude Simulation	Storing at (low pressure) 11.6kPa for 6hr at 20+/-5℃	<ul style="list-style-type: none"> - Measuring mass before/ after each test (If $M < 1g$, less than 0.5%, If $1g \leq M \leq 75g$, less than 0.2%, If $M > 75g$, less than 0.1%) - Measuring voltage before/ after each test (more than 90%) - No leakage, no venting, no disassembly, no rupture, no fire - No disassembly, no rupture, no fire within 6 hours after the test - Temp. monitoring (max. 170℃) - No disassembly, no fire within 6 hours after the test - Temp. monitoring (max. 170℃) - No disassembly, no fire within 7 days after the test
Test 2. Thermal Test	[72±2℃, 6hr ↔ -40±2℃, 6hr, interval max. 30min] x 10 cycle 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℃	
Test 6. Impact for cylindrical cells (> 18mm diameter)	Φ=15.8mm bar, 9.1kg mass, 61±2.5cm height	
Test 6. Crush for cylindrical cells (≤ 18mm diameter) for prismatic, pouch, coin/button cells	Crushing rate : 1.5cm/s, until 13kN±0.78kN or 100mV drop or 50% deformation	
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)	
Test 8. Forced Discharge	Discharge at max. discharge current (with 12V DC power supply), Duration time = rated capacity/initial test current	

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

* 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.10/11/Rev.5/Amd.2)

2. Test Procedure



3-1. T1-T4 Test Result

Before			Altitude (T1)					Thermal (T2)					Vibration (T3)					Shock (T4)					
	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	17.375	308.938	17.347	308.916	99.84	0.007	Pass	17.097	308.900	98.56	0.005	Pass	17.096	308.884	99.99	0.005	Pass	16.794	308.875	98.23	0.003	Pass
	2	17.350	308.992	17.321	308.992	99.83	0.000	Pass	17.075	308.979	98.58	0.004	Pass	17.073	308.955	99.98	0.008	Pass	16.780	308.945	98.28	0.003	Pass
	3	17.353	308.668	17.319	308.662	99.81	0.002	Pass	17.062	308.643	98.52	0.006	Pass	17.045	308.634	99.90	0.003	Pass	16.740	308.626	98.21	0.002	Pass
	4	17.355	308.017	17.331	308.002	99.86	0.005	Pass	17.088	307.989	98.60	0.004	Pass	17.074	307.986	99.92	0.001	Pass	16.781	307.975	98.28	0.003	Pass
	Ave.	17.358	308.654	17.329	308.643	99.83	0.003	-	17.080	308.628	98.56	0.005	-	17.072	308.615	99.95	0.004	-	16.774	308.605	98.25	0.003	-

B. 50th cycle fully state

Charge	5	17.364	308.782	17.335	308.780	99.83	0.000	Pass	17.079	308.759	98.52	0.007	Pass	17.062	308.757	99.90	0.001	Pass	16.765	308.753	98.26	0.001	Pass
	6	17.364	308.473	17.342	308.466	99.87	0.002	Pass	17.098	308.451	98.59	0.005	Pass	17.083	308.442	99.92	0.003	Pass	16.777	308.422	98.21	0.006	Pass
	7	17.363	308.218	17.335	308.197	99.84	0.007	Pass	17.081	308.195	98.53	0.001	Pass	17.072	308.188	99.95	0.002	Pass	16.780	308.187	98.29	0.000	Pass
	8	17.366	308.454	17.340	308.445	99.85	0.003	Pass	17.091	308.442	98.56	0.001	Pass	17.086	308.437	99.97	0.001	Pass	16.788	308.434	98.26	0.001	Pass
	Ave.	17.364	308.482	17.338	308.472	99.85	0.003	-	17.087	308.462	98.55	0.003	-	17.076	308.456	99.93	0.002	-	16.778	308.449	98.25	0.002	-

Requirement

- Measuring mass before/after each test (If $M > 75g$, less than 0.1%, $1g \leq M \leq 75$, less than 0.2%, $M < 1g$, less than 0.5%)
- 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)				
	NO.	Initial OCV(V)	Max. Temp (°C)	Result

A. 1st cycle fully state

Charge	1	16.794	56.46	Pass
	2	16.780	56.04	Pass
	3	16.740	56.18	Pass
	4	16.781	55.05	Pass
	MAX.	16.794	56.46	-

Test Condition
- 100mΩ ext. short-circuit at 55±2°C

Over Charge (T7)				
	NO.	Initial OCV(V)	Max. Temp (°C)	Result

A. 1st cycle fully state

Charge	9	17.350	25.12	Pass
	10	17.340	23.89	Pass
	11	17.341	23.49	Pass
	12	17.342	24.57	Pass
	MAX.	17.350	25.12	-

Test Condition
- Max. Charge Current : 3800mA - CC/CV 2Imax(7600mA) 22V cut-off 24Hr

EXT.Short Circuit (T5)				
	NO.	Initial OCV(V)	Max. Temp (°C)	Result

B. 50th cycle fully state

Charge	5	16.765	55.79	Pass
	6	16.777	55.19	Pass
	7	16.780	56.04	Pass
	8	16.788	55.59	Pass
	MAX.	16.788	56.04	-

Requirement
- Temperature ≤ 170 (°C) - No disassembly, no rupture, no fire within 6 hours after the test

Over Charge (T7)				
	NO.	Initial OCV(V)	Max. Temp (°C)	Result

B. 50th cycle fully state

Charge	13	17.324	25.17	Pass
	14	17.327	23.77	Pass
	15	17.321	24.34	Pass
	16	17.329	24.10	Pass
	MAX.	17.329	25.17	-

Requirement
- No disassembly, no fire within 7 day after the test

3-3. T6/T8 Test Result (ICP575792L1)

Crush (T6)				
Direction	NO.	Initial OCV(V)	Max. Temp (°C)	Result

A. 1st cycle 50% charged state (Direction : Flat)

Flat	C-1	3.819	23.91	Pass
	C-2	3.821	24.54	Pass
	C-3	3.809	24.56	Pass
	C-4	3.813	24.71	Pass
	C-5	3.811	24.59	Pass
MAX.		3.821	24.71	-

Test Condition
- Crushing rate : 1.5cm/s, until 13kN±0.78kN or 100mV drop or 50% deformation

Requirement
- Temperature ≤ 170 (°C)
- No disassembly, no fire within 6 hours after the test

Forced Discharge (T8)			
NO.	Initial OCV(V)	Max. Temp (°C)	Result

A. 1st cycle fully Discharged state

C-6	3.000	38.80	Pass
C-7	3.009	41.30	Pass
C-8	2.979	39.58	Pass
C-9	2.989	42.69	Pass
C-10	2.987	41.06	Pass
C-11	2.991	41.01	Pass
C-12	3.001	41.03	Pass
C-13	2.980	41.09	Pass
C-14	3.012	41.89	Pass
C-15	2.989	42.59	Pass
MAX.	3.012	42.69	-

B. 50th cycle fully discharged state

C-16	3.044	41.19	Pass
C-17	3.100	40.07	Pass
C-18	3.071	39.99	Pass
C-19	3.012	40.10	Pass
C-20	3.091	41.07	Pass
C-21	3.004	42.05	Pass
C-22	3.007	42.00	Pass
C-23	3.047	41.17	Pass
C-24	3.013	42.05	Pass
C-25	3.101	42.31	Pass
MAX.	3.100	42.31	-

Test Condition
- Discharge at max. discharge current (with 12V DC power supply) : 4300mA Duration time: rated capacity (60.0min)

Requirement
- No disassembly, no fire within 7 days after the test

4. Sample Image

