




문서번호	QAE-EF02-150108-PKASM PN SB10F46458	
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UN Test Report

- ASM P/N SB10F46458(Nom.53Wh, 11.4V)-

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2015. 01. 08



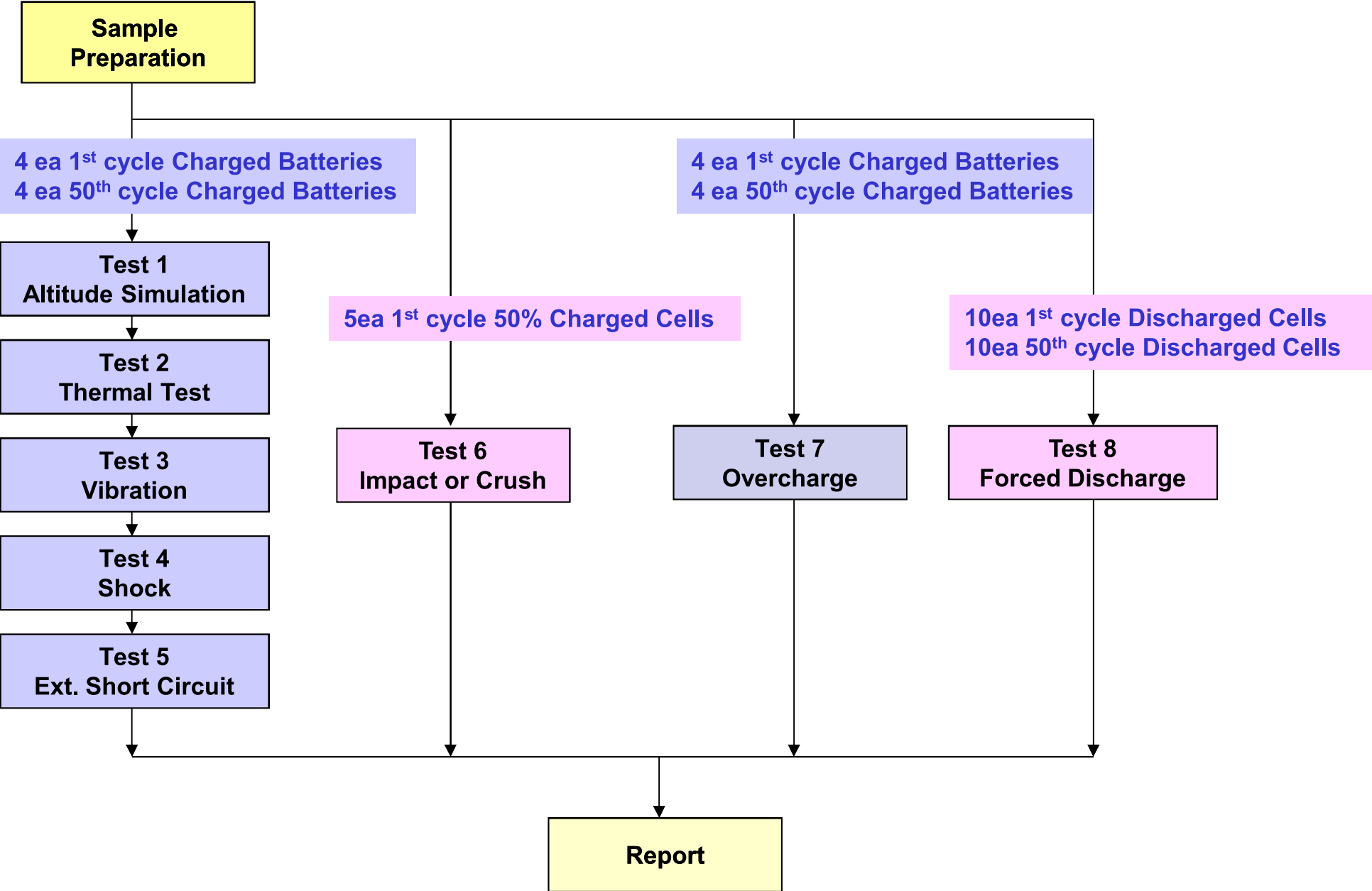
1. UN Transportation Regulation Test

Test	Condition	Requirements
Test 1. Altitude Simulation	Storing at (low pressure) 11.6kPa for 6hr at 20+/-5°C	<ul style="list-style-type: none"> - Measuring mass before/ after each test (If M<1g, less than 0.5%, If 1g≤M≤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°C) - No disassembly, no fire within 6 hours after the test - Temp. monitoring (max. 170°C) - No disassembly, no fire within 7 days after the test
Test 2. Thermal Test	[72±2°C, 6hr ↔ -40±2°C, 6hr, interval max. 30min] x 10 cycle Storing at 20±5°C 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	100m ext. short-circuit at 55±2°C 1hr continue after returning at 55±2°C	
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 charged state

Charge	1	13.029	250.40	13.013	250.37	99.88	0.012	Pass	12.858	250.36	98.81	0.004	Pass	12.855	250.34	99.98	0.008	Pass	12.852	250.33	99.98	0.004	Pass
	2	12.999	250.57	12.981	250.56	99.86	0.004	Pass	12.808	250.54	98.67	0.008	Pass	12.805	250.53	99.98	0.004	Pass	12.799	250.52	99.95	0.004	Pass
	3	12.996	250.90	12.976	250.88	99.85	0.008	Pass	12.809	250.85	98.71	0.012	Pass	12.808	250.85	99.99	0.000	Pass	12.805	250.84	99.98	0.004	Pass
	4	12.993	250.68	12.972	250.65	99.84	0.012	Pass	12.818	250.64	98.81	0.004	Pass	12.814	250.63	99.97	0.004	Pass	12.813	250.62	99.99	0.004	Pass
	Ave.	13.004	250.64	12.986	250.62	99.86	0.009	-	12.823	250.60	98.75	0.007	-	12.821	250.59	99.98	0.004	-	12.817	250.58	99.97	0.004	-

B. 50th cycle fully charged state

Charge	5	13.007	250.69	12.988	250.69	99.85	0.000	Pass	12.820	250.68	98.71	0.004	Pass	12.819	250.67	99.99	0.004	Pass	12.816	250.66	99.98	0.004	Pass
	6	13.013	250.39	12.993	250.38	99.85	0.004	Pass	12.818	250.35	98.65	0.012	Pass	12.817	250.33	99.99	0.008	Pass	12.817	250.32	100.00	0.004	Pass
	7	13.015	250.13	13.001	250.12	99.89	0.004	Pass	12.838	250.09	98.75	0.012	Pass	12.833	250.09	99.96	0.000	Pass	12.827	250.09	99.95	0.000	Pass
	8	13.001	250.00	12.985	249.97	99.88	0.012	Pass	12.811	249.95	98.66	0.008	Pass	12.810	249.95	99.99	0.000	Pass	12.807	249.94	99.98	0.004	Pass
	Ave.	13.009	250.30	12.992	250.29	99.87	0.005	-	12.822	250.27	98.69	0.009	-	12.820	250.26	99.98	0.003	-	12.817	250.25	99.98	0.003	-

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
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A. 1st cycle fully charged state

Charge	1	12.852	55.96	Pass
	2	12.799	56.43	Pass
	3	12.805	55.26	Pass
	4	12.813	55.76	Pass
	MAX.	12.852	56.43	-

Test Condition

- 100mΩ ext. short-circuit at 55±2°C

Over Charge (T7)

	NO.	Initial OCV(V)	Max. Temp (°C)	Result
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A. 1st cycle fully charged state

Charge	9	12.994	24.07	Pass
	10	12.997	23.40	Pass
	11	12.993	25.13	Pass
	12	12.996	25.10	Pass
	MAX.	12.997	25.13	-

Test Condition

- Max. Charge Current : 4500mA
- CC/CV 2Imax(9000mA) 22V cut-off 24Hr

EXT.Short Circuit (T5)

	NO.	Initial OCV(V)	Max. Temp (°C)	Result
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B. 50th cycle fully charged state

Charge	5	12.816	54.76	Pass
	6	12.817	55.18	Pass
	7	12.827	56.34	Pass
	8	12.807	56.15	Pass
	MAX.	12.827	56.34	-

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
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B. 50th cycle fully charged state

Charge	13	12.978	24.80	Pass
	14	12.971	24.72	Pass
	15	12.979	23.42	Pass
	16	12.978	25.15	Pass
	MAX.	12.979	25.15	-

Requirement

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

3-3. T6/T8 Test Result (ICP595490A1)

Crush (T6)

Direction	NO.	Initial OCV(V)	Max. Temp (°C)	Result
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A. 1st cycle 50% charged state

Flat	C-1	3.851	23.09	Pass
	C-2	3.852	23.04	Pass
	C-3	3.849	23.05	Pass
	C-4	3.851	23.13	Pass
	C-5	3.852	23.09	Pass
MAX.		3.852	23.13	-

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
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A. 1st cycle fully discharged state

C-6	3.012	46.32	Pass
C-7	3.010	45.74	Pass
C-8	3.009	44.21	Pass
C-9	3.015	47.13	Pass
C-10	3.009	48.21	Pass
C-11	3.014	47.56	Pass
C-12	3.008	47.46	Pass
C-13	3.014	47.20	Pass
C-14	3.010	46.49	Pass
C-15	3.014	47.32	Pass
MAX.	3.015	48.21	-

B. 50th cycle fully discharged state

C-16	3.121	44.84	Pass
C-17	3.122	44.26	Pass
C-18	3.118	43.21	Pass
C-19	3.120	44.56	Pass
C-20	3.117	45.26	Pass
C-21	3.123	45.52	Pass
C-22	3.119	46.79	Pass
C-23	3.120	44.52	Pass
C-24	3.122	44.62	Pass
C-25	3.116	42.69	Pass
MAX.	3.123	46.79	-

Test Condition

- Discharge at max. discharge current (with 12V DC power supply) : 4500mA
Duration time: rated capacity (61min)

Requirement

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

4. Sample Image

