




문서번호	QAE-EF02-150305-PKASM PN SB10H45075	
Prepared	남익현	
	장승현	
Reviewed	남대호	
	정규채	
Approved	김병수	

SolutionPartner

UN Test Report

- ASM P/N SB10H45075(Nom.67Wh, 15.2V)-

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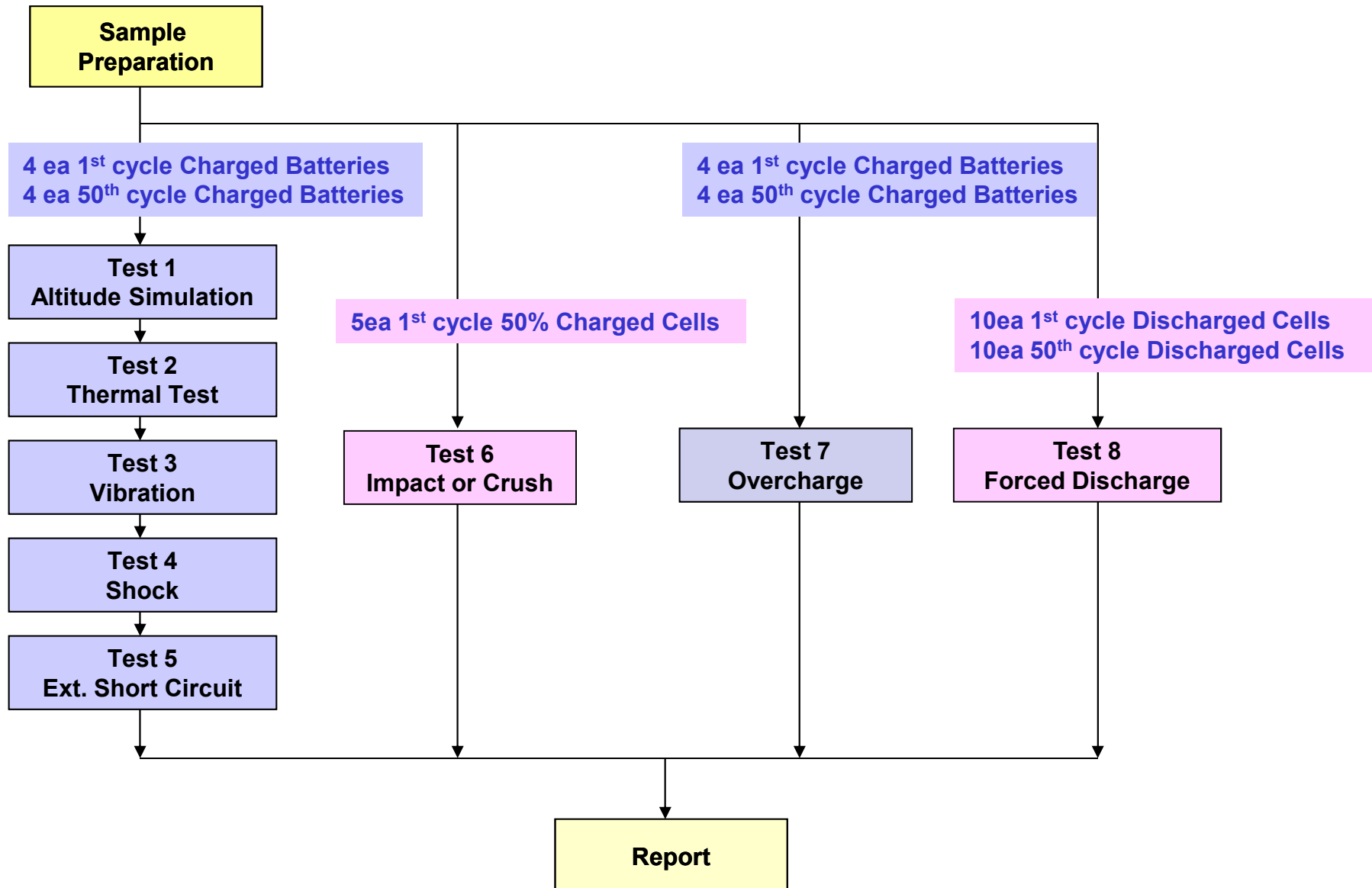
1. UN Transportation Regulation Test

Test	Condition	Requirements	
Test 1. Altitude Simulation	Storing at (low pressure) 11.6kPa for 6hr at 20+/-5℃	- 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	
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℃		- No disassembly, no rupture, no fire within 6 hours after the test - Temp. monitoring (max. 170℃)
Test 6. Impact for cylindrical cells (> 18mm diameter)	Φ=15.8mm bar, 9.1kg mass, 61±2.5cm height		- No disassembly, no fire within 6 hours after the test - Temp. monitoring (max. 170℃)
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)		- No disassembly, no fire within 7 days after the test
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	17.388	332.32	17.386	332.30	99.99	0.006	Pass	17.169	332.27	98.75	0.009	Pass	17.160	332.27	99.95	0.000	Pass	17.157	332.26	99.98	0.003	Pass
	2	17.356	332.38	17.347	332.36	99.95	0.006	Pass	17.123	332.34	98.71	0.006	Pass	17.114	332.32	99.95	0.006	Pass	17.105	332.32	99.95	0.000	Pass
	3	17.350	332.94	17.343	332.94	99.96	0.000	Pass	17.114	332.94	98.68	0.000	Pass	17.112	332.93	99.99	0.003	Pass	17.110	332.93	99.99	0.000	Pass
	4	17.355	332.31	17.346	332.29	99.95	0.006	Pass	17.114	332.28	98.66	0.003	Pass	17.107	332.28	99.96	0.000	Pass	17.100	332.27	99.96	0.003	Pass
	Ave.	17.362	332.49	17.356	332.47	99.96	0.005	-	17.130	332.46	98.70	0.005	-	17.123	332.45	99.96	0.002	-	17.118	332.45	99.97	0.002	-

B. 50th cycle fully charged state

Charge	5	17.364	332.39	17.362	332.36	99.99	0.009	Pass	17.145	332.33	98.75	0.009	Pass	17.140	332.31	99.97	0.006	Pass	17.133	332.30	99.96	0.003	Pass
	6	17.357	332.15	17.355	332.10	99.99	0.015	Pass	17.128	332.08	98.69	0.006	Pass	17.123	332.06	99.97	0.006	Pass	17.120	332.06	99.98	0.000	Pass
	7	17.362	332.39	17.360	332.38	99.99	0.003	Pass	17.146	332.35	98.77	0.009	Pass	17.144	332.34	99.99	0.003	Pass	17.137	332.33	99.96	0.003	Pass
	8	17.365	332.06	17.358	332.06	99.96	0.000	Pass	17.151	332.03	98.81	0.009	Pass	17.142	332.02	99.95	0.003	Pass	17.140	332.01	99.99	0.003	Pass
	Ave.	17.362	332.25	17.359	332.23	99.98	0.007	-	17.143	332.20	98.75	0.008	-	17.137	332.18	99.97	0.005	-	17.133	332.18	99.97	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 charged state

Charge	1	17.157	54.85	Pass
	2	17.105	56.52	Pass
	3	17.110	56.25	Pass
	4	17.100	56.13	Pass
	MAX.	17.157	56.52	-

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 charged state

Charge	9	17.343	24.48	Pass
	10	17.345	24.79	Pass
	11	17.345	25.25	Pass
	12	17.341	24.39	Pass
	MAX.	17.345	25.25	-

Test Condition
- Max. Charge Current : 3010mA - CC/CV 2Imax(6020mA) 22V cut-off 24Hr

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

B. 50th cycle fully charged state

Charge	5	17.133	55.72	Pass
	6	17.120	56.25	Pass
	7	17.137	55.35	Pass
	8	17.140	55.22	Pass
	MAX.	17.140	56.25	-

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 charged state

Charge	13	17.327	23.76	Pass
	14	17.323	25.04	Pass
	15	17.321	25.13	Pass
	16	17.321	25.29	Pass
	MAX.	17.327	25.29	-

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

Flat	C-1	3.811	23.14	Pass
	C-2	3.812	23.13	Pass
	C-3	3.811	22.89	Pass
	C-4	3.811	23.09	Pass
	C-5	3.811	23.11	Pass
MAX.		3.812	23.14	-

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	3.114	58.55	Pass
C-7	3.116	70.51	Pass
C-8	3.123	65.45	Pass
C-9	3.112	74.60	Pass
C-10	3.115	69.05	Pass
C-11	3.117	62.86	Pass
C-12	3.122	60.85	Pass
C-13	3.120	69.97	Pass
C-14	3.125	57.34	Pass
C-15	3.127	71.26	Pass
MAX.	3.127	74.60	-

B. 50th cycle fully discharged state

C-16	3.133	72.87	Pass
C-17	3.139	73.09	Pass
C-18	3.149	67.08	Pass
C-19	3.142	69.67	Pass
C-20	3.164	73.53	Pass
C-21	3.137	55.87	Pass
C-22	3.124	72.61	Pass
C-23	3.147	62.79	Pass
C-24	3.129	74.65	Pass
C-25	3.150	72.98	Pass
MAX.	3.164	74.65	-

Test Condition
- Discharge at max. discharge current (with 12V DC power supply) : 4300mA Duration time: rated capacity (60min)

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

