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Certification

C190329-7

model name : CR2025			
<input checked="" type="checkbox"/> Lithium metal cell or battery		<input type="checkbox"/> Lithium-ion cell or battery	
Lithium content		Watt-hour rating	
<input checked="" type="checkbox"/> cell	<input type="checkbox"/> battery(pack)	<input type="checkbox"/> cell	<input type="checkbox"/> battery(pack)
<input checked="" type="checkbox"/> $\leq 0.3g$	<input type="checkbox"/> $\leq 0.3g$	<input type="checkbox"/> $\leq 2.7Wh$	<input type="checkbox"/> $\leq 2.7Wh$
<input type="checkbox"/> $\leq 1g$	<input type="checkbox"/> $\leq 2g$	<input type="checkbox"/> $\leq 20Wh$	<input type="checkbox"/> $\leq 100Wh$
<input type="checkbox"/> $> 1g$	<input type="checkbox"/> $> 2g$	<input type="checkbox"/> $> 20Wh$	<input type="checkbox"/> $> 100Wh$
		Nominal Voltage	V
		Rated Capacity	mAh

Transport tests and results

Test number	Designation	Results	Remarks
T-1	Altitude	Accepted	
T-2	Thermal cycling	Accepted	
T-3	Vibration	Accepted	
T-4	Shock	Accepted	
T-5	External short circuit	Accepted	
T-6	Crush	Accepted	
T-7	Overcharge	Not applicable	for rechargeable battery only
T-8	Forced Discharge	Accepted	

We certify that above results are confirmed in accordance with the Manual of Tests and Criteria of the UN Recommendations on the Transport of Dangerous Goods(5th revised edition Amendment2), Part III, sub-section 38.3




Name / Title of Signatory




Takashi Kimura / Senior Manager, MD Design Dept.




Signature

March 29, 2019




Test No.	C-1804-6																		
Test	T.1: Altitude simulation																		
Item (Status)	CR2025 (Undischarged)					Approved by	Checked by	Prepared by											
Place	Safety test house		Equipment No.		P-23-01		Type	Li content											
Number of test specimen		10					Cell or Battery	0.05 g											
Performed by		Koya nakatani																	
Time and temperature	Test time	Start	2018/4/5 9:15		Finish	2018/4/5 9:15													
	Temperature		20.3°C			20.3°C													
	Observe time	Start	2018/4/5 15:15		Finish	2018/4/5 15:15													
	Temperature		20.3°C			20.3°C													
Test procedure																			
Test cells and batteries shall be stored at a pressure of 11.6 kPa or less for at least 6 hours at ambient temperature (20 ± 5 °C).																			
Requirements																			
There is no leakage (no mass loss), no venting, no disassembly, no rupture and no fire. The open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure.																			
Test result																			
No.		1	2	3	4	5	6	7	8	9	10								
Lot No.			0	0	0	0	0	0	0	0	0								
Test condition		Test time 6 hr Pressure: Less than 11.6kPa																	
Voltage	Pre-test(V ₁) [V]	3.261	3.271	3.267	3.259	3.266	3.256	3.267	3.265	3.258	3.264								
	After-test(V ₂) [V]	3.263	3.262	3.267	3.269	3.264	3.267	3.262	3.265	3.262	3.265								
	Change rate*1 [%]	100	100	100	100	100	100	100	100	100	100								
Mass	Pre-test(M ₁) [g]	2.462	2.455	2.469	2.477	2.472	2.462	2.470	2.465	2.467	2.466								
	After-test(M ₂) [g]	2.462	2.455	2.469	2.477	2.472	2.462	2.470	2.465	2.467	2.466								
	Mass loss*2 [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
After-test Status	Leakage	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.								
	Venting	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.								
	Disassembly	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.								
	Rupture	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.								
	Fire	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.								
<div style="display: flex; justify-content: space-between;"> <div> <p>*1: Change rate[%]=V₂/V₁ x 100 Limit Change rate: 90%</p> </div> <div> <p>*2: Mass loss[%]=(M₁-M₂)/M₁x 100</p> <table border="1"> <tr> <th>Mass M of cell or battery</th><th>Mass loss limit</th></tr> <tr> <td>M < 1g</td><td>0.5%</td></tr> <tr> <td>1g ≤ M ≤ 75g</td><td>0.2%</td></tr> <tr> <td>M > 75g</td><td>0.1%</td></tr> </table> </div> </div>												Mass M of cell or battery	Mass loss limit	M < 1g	0.5%	1g ≤ M ≤ 75g	0.2%	M > 75g	0.1%
Mass M of cell or battery	Mass loss limit																		
M < 1g	0.5%																		
1g ≤ M ≤ 75g	0.2%																		
M > 75g	0.1%																		




Test No.	C-1804-6																		
Test	T.1: Altitude simulation																		
Item (Status)	CR2025 (Fully discharged)					Approved by	Checked by	Prepared by											
																			
Place	Safety test house		Equipment No.		P-23-01		Type	Li content											
Number of test specimen		10					Cell or Battery	0.05 g											
Performed by		Koya nakatani																	
Time and temperature	Test time	Start	2018/4/5 9:15		Finish	2018/4/5 9:15		20.3°C											
	Temperature		20.3°C																
	Observe time	Start	2018/4/5 15:15		Finish	2018/4/5 15:15		20.3°C											
	Temperature		20.3°C																
Test procedure																			
Test cells and batteries shall be stored at a pressure of 11.6 kPa or less for at least 6 hours at ambient temperature (20 ± 5 °C).																			
Requirements																			
There is no leakage (no mass loss), no venting, no disassembly, no rupture and no fire.																			
Test result																			
No.		1	2	3	4	5	6	7	8	9	10								
Lot No.		0	0	0	0	0	0	0	0	0	0								
Test condition		Test time 6 hr Pressure: Less than 11.6kPa																	
Voltage	Pre-test(V ₁) [V]	-	-	-	-	-	-	-	-	-	-								
	After-test(V ₂) [V]	-	-	-	-	-	-	-	-	-	-								
	Change rate*1 [%]	-	-	-	-	-	-	-	-	-	-								
Mass	Change rate*1 [%]	2.470	2.452	2.450	2.454	2.466	2.481	2.466	2.508	2.453	2.496								
	After-test(M ₂) [g]	2.470	2.452	2.450	2.454	2.466	2.481	2.466	2.508	2.453	2.496								
	Mass loss*2 [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
After-test Status	Leakage	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.								
	Venting	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.								
	Disassembly	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.								
	Rupture	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.								
	Fire	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.								
*1: Change rate[%]=V ₂ /V ₁ x 100 Limit Change rate: 90%																			
*2: Mass loss[%]=(M ₁ -M ₂)/M ₁ x 100																			
<table border="1"> <tr> <td>Mass M of cell or battery</td><td>Mass loss limit</td></tr> <tr> <td>M < 1g</td><td>0.5%</td></tr> <tr> <td>1g ≤ M ≤ 75g</td><td>0.2%</td></tr> <tr> <td>M > 75g</td><td>0.1%</td></tr> </table>												Mass M of cell or battery	Mass loss limit	M < 1g	0.5%	1g ≤ M ≤ 75g	0.2%	M > 75g	0.1%
Mass M of cell or battery	Mass loss limit																		
M < 1g	0.5%																		
1g ≤ M ≤ 75g	0.2%																		
M > 75g	0.1%																		

Test No.	C-1804-6																	
Test	T.2: Thermal test																	
Item (Status)	CR2025 (Undischarged)				Approved by	Checked by			Prepared by									
																		
Place	Safety test house		Equipment No.		A-02-01		Type	Li content										
Number of test specimen		10				Cell or Battery		0.05 g										
Performed by		Koya nakatani																
Time and temperature	Test time	Start	2018/4/6 13:00		Finish	2018/4/11 15:15		21.0°C										
	Temperature		-															
	Observe time	Start	2018/4/11 18:00		Finish	2018/4/12 18:45		21.2°C										
	Temperature		21.2°C															
Test procedure																		
<p>Test cells and batteries are to be stored for at least 6 hours at a test temperature equal to $72 \pm 2^\circ\text{C}$, followed by storage for at least 6 hours at a test temperature equal to $-40 \pm 2^\circ\text{C}$. The maximum time interval between test temperature extremes is 30 minutes. This procedure is to be repeated until 10 total cycles are complete, after which all test cells and batteries are to be stored for 24 hours at ambient temperature ($20 \pm 5^\circ\text{C}$).</p>																		
Requirements																		
<p>There is no leakage (no mass loss), no venting, no disassembly, no rupture and no fire. The open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure.</p>																		
Test result																		
No.		1	2	3	4	5	6	7	8	9	10							
Lot No.		0	0	0	0	0	0	0	0	0	0							
Test condition		Setting temperature: $72^\circ\text{C}/-40^\circ\text{C}$ Setting time: 6h Setting cycle: 10																
Voltage	Pre-test(V_1) [V]	3.267	3.262	3.260	3.263	3.268	3.271	3.268	3.256	3.270	3.261							
	After-test(V_2) [V]	3.263	3.264	3.263	3.268	3.266	3.264	3.265	3.262	3.264	3.269							
	Change rate ^{*1} [%]	100	100	100	100	100	100	100	100	100	100							
Mass	Pre-test(M_1) [g]	2.480	2.465	2.474	2.472	2.472	2.471	2.469	2.469	2.472	2.466							
	After-test(M_2) [g]	2.480	2.465	2.475	2.472	2.472	2.471	2.469	2.469	2.472	2.467							
	Mass loss ^{*2} [%]	0.00	0.00	-0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00							
After-test Status	Leakage	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.							
	Venting	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.							
	Disassembly	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.							
	Rupture	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.							
	Fire	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.							
<div style="display: flex; justify-content: space-between;"> <div> <p>*1: Change rate[%]=$V_2/V_1 \times 100$ Limit Change rate: 90%</p> </div> <div> <p>*2: Mass loss[%]=$(M_1-M_2)/M_1 \times 100$</p> <table border="1"> <tr> <th>Mass M of cell or battery</th><th>Mass loss limit</th></tr> <tr> <td>$M < 1\text{g}$</td><td>0.5%</td></tr> <tr> <td>$1\text{g} \leq M \leq 75\text{g}$</td><td>0.2%</td></tr> <tr> <td>$M > 75\text{g}$</td><td>0.1%</td></tr> </table> </div> </div>											Mass M of cell or battery	Mass loss limit	$M < 1\text{g}$	0.5%	$1\text{g} \leq M \leq 75\text{g}$	0.2%	$M > 75\text{g}$	0.1%
Mass M of cell or battery	Mass loss limit																	
$M < 1\text{g}$	0.5%																	
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$M > 75\text{g}$	0.1%																	




Test No.	C-1804-6																		
Test	T.2: Thermal test																		
Item (Status)	CR2025 (Fully discharged)					Approved by	Checked by	Prepared by											
																			
Place	Safety test house			Equipment No.	A-02-01		Type	Li content											
Number of test specimen		10					Cell or Battery	0.05 g											
Performed by		Koya nakatani																	
Time and temperature	Test time	Start	2018/4/6 13:00		Finish	2018/4/11 15:15		21.0°C											
	Temperature		-																
	Observe time	Start	2018/4/11 18:00		Finish	2018/4/12 18:45		21.2°C											
	Temperature		21.2°C																
Test procedure																			
<p>Test cells and batteries are to be stored for at least 6 hours at a test temperature equal to $72 \pm 2^\circ\text{C}$, followed by storage for at least six hours at a test temperature equal to $-40 \pm 2^\circ\text{C}$. The maximum time interval between test temperature extremes is 30 minutes. This procedure is to be repeated until 10 total cycles are complete, after which all test cells and batteries are to be stored for 24 hours at ambient temperature ($20 \pm 5^\circ\text{C}$).</p>																			
Requirements																			
There is no leakage (no mass loss), no venting, no disassembly, no rupture and no fire.																			
Test result																			
No.		1	2	3	4	5	6	7	8	9	10								
Lot No.		0	0	0	0	0	0	0	0	0	0								
Test condition		Setting temperature: $72^\circ\text{C}/-40^\circ\text{C}$ Setting time: 6h Setting cycle: 10																	
Voltage	Pre-test(V_1) [V]	-	-	-	-	-	-	-	-	-	-								
	After-test(V_2) [V]	-	-	-	-	-	-	-	-	-	-								
	Change rate ^{*1} [%]	-	-	-	-	-	-	-	-	-	-								
Mass	Pre-test(M_1) [g]	2.485	2.460	2.471	2.494	2.470	2.488	2.474	2.505	2.493	2.495								
	After-test(M_2) [g]	2.485	2.460	2.471	2.494	2.470	2.488	2.474	2.505	2.493	2.495								
	Mass loss ^{*2} [%]	0.00	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
After-test Status	Leakage	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.								
	Venting	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.								
	Disassembly	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.								
	Rupture	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.								
	Fire	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.								
<div style="display: flex; justify-content: space-between;"> <div> <p>*1: Change rate[%]=$V_2/V_1 \times 100$ Limit Change rate: 90%</p> </div> <div> <p>*2: Mass loss[%]=$(M_1-M_2)/M_1 \times 100$</p> <table border="1"> <tr> <th>Mass M of cell or battery</th><th>Mass loss limit</th></tr> <tr> <td>$M < 1\text{g}$</td><td>0.5%</td></tr> <tr> <td>$1\text{g} \leq M \leq 75\text{g}$</td><td>0.2%</td></tr> <tr> <td>$M > 75\text{g}$</td><td>0.1%</td></tr> </table> </div> </div>												Mass M of cell or battery	Mass loss limit	$M < 1\text{g}$	0.5%	$1\text{g} \leq M \leq 75\text{g}$	0.2%	$M > 75\text{g}$	0.1%
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Test No.	C-1804-6																																																																																																																																																																						
Test	T.3: Vibration																																																																																																																																																																						
Item (Status)	CR2025 (Undischarged)					Approved by	Checked by	Prepared by																																																																																																																																																															
Place	Safety test house		Equipment No.		A-07-01		Type	Li content																																																																																																																																																															
Number of test specimen		10					Cell or Battery	0.05 g																																																																																																																																																															
Performed by		Koya nakatani																																																																																																																																																																					
Time and temperature	Test time	Start	2018/4/24 9:00		Finish	2018/4/24 18:00																																																																																																																																																																	
	Temperature		20.9°C			21.2°C																																																																																																																																																																	
	Observe time	Start	2018/4/24 18:00		Finish	2018/4/24 18:45																																																																																																																																																																	
	Temperature		21.2°C			20.9°C																																																																																																																																																																	
Test procedure																																																																																																																																																																							
<p>Cells and batteries are firmly secured to the platform of the vibration machine without distorting the cells in such a manner as to faithfully transmit the vibration. The vibration shall be a sinusoidal waveform with a logarithmic sweep between 7 Hz and 200 Hz and back to 7 Hz traversed in 15 minutes. This cycle shall be repeated 12 times for a total of 3 hours for each of three mutually perpendicular mounting positions of the cell. One of the directions of vibration must be perpendicular to the terminal face.</p> <p>The logarithmic frequency sweep is as follows: from 7 Hz a peak acceleration of 1 gn is maintained until 18 Hz is reached. The amplitude is then maintained at 0.8 mm (1.6 mm total excursion) and the frequency increased until a peak acceleration of 8 gn occurs (approximately 50 Hz). A peak acceleration of 8 gn is then maintained until the frequency is increased to 200 Hz.</p>																																																																																																																																																																							
Requirements																																																																																																																																																																							
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Test No.	C-1804-6																	
Test	T.3: Vibration																	
Item (Status)	CR2025 (Fully discharged)				Approved by	Checked by	Prepared by											
																		
Place	Safety test house		Equipment No.		A-07-01		Type	Li content										
Number of test specimen		10				Cell or Battery		0.05 g										
Performed by		Koya nakatani																
Time and temperature	Test time	Start	2018/4/24 9:00		Finish	2018/4/24 18:00												
	Temperature		20.9°C			21.2°C												
	Observe time	Start	2018/4/24 18:00		Finish	2018/4/24 18:45												
	Temperature		21.2°C			20.9°C												
Test procedure																		
<p>Cells and batteries are firmly secured to the platform of the vibration machine without distorting the cells in such a manner as to faithfully transmit the vibration. The vibration shall be a sinusoidal waveform with a logarithmic sweep between 7 Hz and 200 Hz and back to 7 Hz traversed in 15 minutes. This cycle shall be repeated 12 times for a total of 3 hours for each of three mutually perpendicular mounting positions of the cell. One of the directions of vibration must be perpendicular to the terminal face.</p> <p>The logarithmic frequency sweep is as follows: from 7 Hz a peak acceleration of 1 gn is maintained until 18 Hz is reached. The amplitude is then maintained at 0.8 mm (1.6 mm total excursion) and the frequency increased until a peak acceleration of 8 gn occurs (approximately 50 Hz). A peak acceleration of 8 gn is then maintained until the frequency is increased to 200 Hz.</p>																		
Requirements																		
There is no leakage (no mass loss), no venting, no disassembly, no rupture and no fire.																		
Test result																		
No.		1	2	3	4	5	6	7	8	9	10							
Lot No.		0	0	0	0	0	0	0	0	0	0							
Test condition		Vibration : 7Hz -200Hz-7Hz Test time: 3 hours for each direction(x, y, z); total 9 hours																
Voltage	Pre-test(V ₁) [V]	-	-	-	-	-	-	-	-	-	-							
	After-test(V ₂) [V]	-	-	-	-	-	-	-	-	-	-							
	Change rate*1 [%]	-	-	-	-	-	-	-	-	-	-							
Mass	Pre-test(M ₁) [g]	2.476	2.458	2.479	2.465	2.476	2.461	2.437	2.480	2.444	2.461							
	After-test(M ₂) [g]	2.476	2.458	2.479	2.465	2.476	2.461	2.437	2.480	2.444	2.461							
	Mass loss*2 [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00							
After-test Status	Leakage	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.							
	Venting	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.							
	Disassembly	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.							
	Rupture	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.							
	Fire	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.							
<p>*1: Change rate[%]=V₂/V₁ x 100 Limit Change rate: 90%</p> <p>*2: Mass loss[%]=(M₁-M₂)/M₁x 100</p> <table border="1"> <tr> <td>Mass M of cell or battery</td> <td>Mass loss limit</td> </tr> <tr> <td>M < 1g</td> <td>0.5%</td> </tr> <tr> <td>1g ≤ M ≤ 75g</td> <td>0.2%</td> </tr> <tr> <td>M > 75g</td> <td>0.1%</td> </tr> </table>											Mass M of cell or battery	Mass loss limit	M < 1g	0.5%	1g ≤ M ≤ 75g	0.2%	M > 75g	0.1%
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1g ≤ M ≤ 75g	0.2%																	
M > 75g	0.1%																	




Test No.	C-1804-6																		
Test	T.4: Shock																		
Item (Status)	CR2025 (Undischarged)					Approved by	Checked by	Prepared by											
																			
Place	Safety test house		Equipment No.		A-08-01		Type	Li content											
Number of test specimen		10					Cell or Battery	0.05 g											
Performed by		Koya nakatani																	
Time and temperature	Test time	Start	2018/4/19 14:15		Finish	2018/4/19 15:15		20.1°C											
	Temperature		20.1°C																
	Observe time	Start	2018/4/19 15:15		Finish	2018/4/19 15:45		20.1°C											
	Temperature		20.1°C																
Test procedure																			
<p>Test cells and batteries shall be secured to the testing machine by means of a rigid mount which will support all mounting surfaces of each test battery. Each cell or battery shall be subjected to a half-sine shock of peak acceleration of 150 gn and pulse duration of 6 milliseconds. Each cell or battery shall be subjected to three shocks in the positive direction followed by three shocks in the negative direction of three mutually perpendicular mounting positions of the cell or battery for a total of 18 shocks.</p>																			
Requirements																			
<p>There is no leakage (no mass loss), no venting, no disassembly, no rupture and no fire. The open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure.</p>																			
Test result																			
No.		1	2	3	4	5	6	7	8	9	10								
Lot No.		0	0	0	0	0	0	0	0	0	0								
Test condition		Peak acceleration: 150 gn Pulse duration: 6 ms																	
Voltage	Pre-test(V ₁) [V]	3.280	3.281	3.280	3.282	3.280	3.281	3.281	3.278	3.280	3.283								
	After-test(V ₂) [V]	3.282	3.287	3.281	3.287	3.285	3.287	3.283	3.288	3.286	3.288								
	Change rate*1 [%]	100	100	100	100	100	100	100	100	100	100								
Mass	Pre-test(M ₁) [g]	2.468	2.468	2.469	2.468	2.469	2.471	2.467	2.474	2.472	2.471								
	After-test(M ₂) [g]	2.468	2.468	2.469	2.468	2.469	2.471	2.467	2.474	2.472	2.471								
	Mass loss*2 [%]	0.00	0.00	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
After-test Status	Leakage	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.								
	Venting	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.								
	Disassembly	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.								
	Rupture	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.								
	Fire	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.								
<p>*1: Change rate[%]=V₂/V₁ x 100 Limit Change rate: 90%</p> <p>*2: Mass loss[%]=(M₁-M₂)/M₁x 100</p> <table border="1"> <tr> <td>Mass M of cell or battery</td><td>Mass loss limit</td></tr> <tr> <td>M < 1g</td><td>0.5%</td></tr> <tr> <td>1g ≤ M ≤ 75g</td><td>0.2%</td></tr> <tr> <td>M > 75g</td><td>0.1%</td></tr> </table>												Mass M of cell or battery	Mass loss limit	M < 1g	0.5%	1g ≤ M ≤ 75g	0.2%	M > 75g	0.1%
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M < 1g	0.5%																		
1g ≤ M ≤ 75g	0.2%																		
M > 75g	0.1%																		

Test No.	C-1804-6																	
Test	T.4: Shock																	
Item (Status)	CR2025 (Fully discharged)				Approved by	Checked by	Prepared by											
Place	Safety test house		Equipment No.		A-08-01		Type	Li content										
Number of test specimen		10				Cell or Battery		0.05 g										
Performed by		Koya nakatani																
Time and temperature	Test time	Start	2018/4/19 14:15		Finish	2018/4/19 15:15		20.1°C										
	Temperature		20.1°C															
	Observe time	Start	2018/4/19 15:15		Finish	2018/4/19 15:45		20.1°C										
	Temperature		20.1°C															
Test procedure																		
<p>Test cells and batteries shall be secured to the testing machine by means of a rigid mount which will support all mounting surfaces of each test battery. Each cell or battery shall be subjected to a half-sine shock of peak acceleration of 150 gn and pulse duration of 6 milliseconds. Each cell or battery shall be subjected to three shocks in the positive direction followed by three shocks in the negative direction of three mutually perpendicular mounting positions of the cell or battery for a total of 18 shocks.</p>																		
Requirements																		
There is no leakage (no mass loss), no venting, no disassembly, no rupture and no fire.																		
Test result																		
No.		1	2	3	4	5	6	7	8	9	10							
Lot No.		0	0	0	0	0	0	0	0	0	0							
Test condition		Peak acceleration: 150 gn Pulse duration: 6 ms																
Voltage	Pre-test(V ₁) [V]	-	-	-	-	-	-	-	-	-	-							
	After-test(V ₂) [V]	-	-	-	-	-	-	-	-	-	-							
	Change rate*1 [%]	-	-	-	-	-	-	-	-	-	-							
Mass	Pre-test(M ₁) [g]	2.466	2.479	2.486	2.492	2.481	2.440	2.480	2.460	2.477	2.486							
	After-test(M ₂) [g]	2.466	2.479	2.486	2.492	2.481	2.440	2.480	2.460	2.477	2.486							
	Mass loss*2 [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00							
After-test Status	Leakage	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.							
	Venting	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.							
	Disassembly	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.							
	Rupture	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.							
	Fire	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.							
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Mass M of cell or battery	Mass loss limit																	
M < 1g	0.5%																	
1g ≤ M ≤ 75g	0.2%																	
M > 75g	0.1%																	

Test No.	C-1804-6										
Test	T.5: External short circuit										
Item (Status)	CR2025 (Undischarged)					Approved by	Checked by	Prepared by			
											
Place	Safety test house		Equipment No.	A-02-30		Type	Li content				
Number of test specimen	10					Cell or Battery	0.05 g				
Performed by	Koya nakatani										
Time and temperature	Test time	Start	2018/4/24 9:00		Finish	2018/4/24 16:00					
	Temperature		20.9°C			21.2°C					
	Observe time	Start	2018/4/24 16:00		Finish	2018/4/25 9:00					
	Temperature		21.2°C			21.3°C					
Test procedure											
<p>The cell or battery to be tested shall be temperature stabilized so that its external case temperature reaches 55 ± 2 °C and then the cell or battery shall be subjected to a short circuit condition with a total external resistance of less than 0.1 ohm at 55 ± 2 °C. This short circuit condition is continued for at least one hour after the cell or battery external case temperature has returned to 55 ± 2 °C. The cell or battery must be observed for a further six hours for the test to be concluded.</p>											
Requirements											
Cells and batteries meet this requirement if their external temperature does not exceed 170 °C and there is no disassembly, no rupture and no fire within six hours of this test.											
Test result											
No.	1	2	3	4	5	6	7	8	9	10	
Lot No.	0	0	0	0	0	0	0	0	0	0	
Test condition	Setting Temperature of chamber: 55°C Resistance: Less than 0.1ohm										
Voltage	Pre-test [V]	3.291	3.285	3.288	3.281	3.281	3.286	3.284	3.290	3.283	3.286
Mass	Pre-test [g]	2.462	2.473	2.465	2.463	2.472	2.459	2.459	2.462	2.464	2.468
Max. Temperature (°C)		57.1	57.5	57.8	57.5	57.4	57.3	55.9	56.8	57.0	56.5
After-test Status	Leakage	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Venting	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Disassembly	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
	Rupture	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.
	Fire	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.

Test No.	C-1804-6										
Test	T.5: External short circuit										
Item (Status)	CR2025 (Fully discharged)					Approved by	Checked by	Prepared by			
											
Place	Safety test house		Equipment No.		A-02-30		Type	Li content			
Number of test specimen		10					Cell or Battery	0.05 g			
Performed by		Koya nakatani									
Time and temperature	Test time	Start	2018/4/24 9:00		Finish	2018/4/24 16:00					
	Temperature		20.9°C			21.2°C					
	Observe time	Start	2018/4/24 16:00		Finish	2018/4/25 9:00					
	Temperature		21.2°C			21.3°C					
Test procedure											
<p>The cell or battery to be tested shall be temperature stabilized so that its external case temperature reaches 55 ± 2 °C and then the cell or battery shall be subjected to a short circuit condition with a total external resistance of less than 0.1 ohm at 55 ± 2 °C. This short circuit condition is continued for at least one hour after the cell or battery external case temperature has returned to 55 ± 2 °C. The cell or battery must be observed for a further six hours for the test to be concluded.</p>											
Requirements											
Cells and batteries meet this requirement if their external temperature does not exceed 170 °C and there is no disassembly, no rupture and no fire within six hours of this test.											
Test result											
No.		1	2	3	4	5	6	7	8	9	10
Lot No.		0	0	0	0	0	0	0	0	0	0
Test condition		Setting Temperature of chamber: 55°C Resistance: Less than 0.1ohm									
Voltage	Pre-test(V ₁) [V]	-	-	-	-	-	-	-	-	-	-
Mass	Pre-test(M ₁) [g]	2.464	2.474	2.504	2.470	2.462	2.488	2.451	2.451	2.486	2.472
Max. Temperature (°C)		55.5	55.4	55.1	55.8	55.5	55.4	55.2	55.5	55.6	55.2
After-test Status	Leakage	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Venting	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Disassembly	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
	Rupture	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.
	Fire	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.

Test	T.6: Crush																																																																																																																																																																																												
Item (Status)	CR2025 (Undischarged)					Approved by	Checked by	Prepared by																																																																																																																																																																																					
																																																																																																																																																																																													
Place	Safety test house					Nominal Voltage		Rated Capacity																																																																																																																																																																																					
Number of test specimen	5					3.0V		170mAh																																																																																																																																																																																					
Performed by	Atsushi Yamano																																																																																																																																																																																												
Time and temperature	Test time	Start	2013/12/2 11:45			Finish	2013/12/2 12:15																																																																																																																																																																																						
	Temperature		22.0°C				21.5°C																																																																																																																																																																																						
	Observe time	Start	2013/12/2 12:15			Finish	2013/12/2 18:15																																																																																																																																																																																						
	Temperature		21.5°C				19.5°C																																																																																																																																																																																						
Test procedure <p>A cell or component cell is to be crushed between two flat surfaces. The crushing is to be gradual with a speed of approximately 1.5 cm/s at the first point of contact. The crushing is to be continued until the first of the three options below is reached.</p> <p>(a) The applied force reaches 13 kN \pm 0.78 kN; (b) The voltage of the cell drops by at least 100 mV; or (c) The cell is deformed by 50% or more of its original thickness.</p> <p>Once the maximum pressure has been obtained, the voltage drops by 100 mV or more, or the cell is deformed by at least 50% of its original thickness, the pressure shall be released.</p> <p>A prismatic or pouch cell shall be crushed by applying the force to the widest side. A button/coin cell shall be crushed by applying the force on its flat surfaces. For cylindrical cells, the crush force shall be applied perpendicular to the longitudinal axis. Each test cell or component cell is to be subjected to one crush only. The test sample shall be observed for a further 6 h. The test shall be conducted using test cells or component cells that have not previously been subjected to other tests.</p>																																																																																																																																																																																													
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Performed by	Atsushi Yamano																																																																																																																																																																																												
Time and temperature	Test time	Start	2013/12/1 13:00			Finish	2013/12/1 13:30																																																																																																																																																																																						
	Temperature		21.0°C				21.0°C																																																																																																																																																																																						
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	After-test(V ₂) [V]	2.827	2.801	2.836	2.801	2.855																																																																																																																																																																																							
	Drop*1 [V]	0.014	0.014	0.009	0.010	0.010																																																																																																																																																																																							
Mass	Pre-test [g]	-	-	-	-	-																																																																																																																																																																																							
Thick-ness	Pre-test(T ₁) [mm]	2.431	2.429	2.444	2.461	2.471																																																																																																																																																																																							
	After-test(T ₂) [mm]	2.441	2.438	2.451	2.479	2.484																																																																																																																																																																																							
	Change rate*2 [%]	100%	100%	100%	101%	101%																																																																																																																																																																																							
Max. Temperature (°C)		30°C <	30°C <	30°C <	30°C <	30°C <																																																																																																																																																																																							
After-test Status	Leakage	N/A	N/A	N/A	N/A	N/A																																																																																																																																																																																							
	Venting	N/A	N/A	N/A	N/A	N/A																																																																																																																																																																																							
	Disassembly	N.D.	N.D.	N.D.	N.D.	N.D.																																																																																																																																																																																							
	Rupture	N/A	N/A	N/A	N/A	N/A																																																																																																																																																																																							
	Fire	N.F.	N.F.	N.F.	N.F.	N.F.																																																																																																																																																																																							
<div style="display: flex; justify-content: space-between;"> *1: Drop*1 [V]=V₁-V₂ *2: Change rate[%]=T₂/T₁ x 100 </div>																																																																																																																																																																																													

Test No.	C-1804-6																																																																																																																				
Test	T.8: Forced discharge																																																																																																																				
Item (Status)	CR2025 (Fully discharged)					Approved by	Checked by	Prepared by																																																																																																													
Place	Safety test house		Equipment No.		E-07-27		Type	Li content																																																																																																													
Number of test specimen		10					Cell or Battery	0.05 g																																																																																																													
Performed by		Koya nakatani																																																																																																																			
Time and temperature	Test time	Start	2018/4/24		9:30		Finish	2018/4/25		10:30																																																																																																											
	Temperature		21.1°C		20.5°C																																																																																																																
	Observe time	Start	2018/4/25		10:30		Finish	2018/5/7		9:00																																																																																																											
	Temperature		20.5°C		21.0°C																																																																																																																
Test procedure Each cell shall be forced discharged at ambient temperature by connecting it in series with a 12 V D.C. power supply at an initial current equal to the maximum discharge current specified by the manufacturer. The specified discharge current is to be obtained by connecting a resistive load of the appropriate size and rating in series with the test cell. Each cell shall be forced discharged for a time interval (in hours) equal to its rated capacity divided by the initial test current(in Ampere).																																																																																																																					
Requirements There is no disassembly and no fire during the test and within seven days of the test.																																																																																																																					
Test result <table border="1"> <tr> <td>No.</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> <tr> <td>Lot No.</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr> <td colspan="2">Test condition</td><td colspan="9">Discharge current: 7mA Forced discharge time: 25h</td></tr> <tr> <td>Voltage</td><td>Pre-test [V]</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr> <td>Mass</td><td>Pre-test [g]</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr> <td rowspan="5">After-test Status</td><td>Leakage</td><td>N/A</td><td>N/A</td><td>N/A</td><td>N/A</td><td>N/A</td><td>N/A</td><td>N/A</td><td>N/A</td><td>N/A</td></tr> <tr> <td>Venting</td><td>N/A</td><td>N/A</td><td>N/A</td><td>N/A</td><td>N/A</td><td>N/A</td><td>N/A</td><td>N/A</td><td>N/A</td></tr> <tr> <td>Disassembly</td><td>N.D.</td><td>N.D.</td><td>N.D.</td><td>N.D.</td><td>N.D.</td><td>N.D.</td><td>N.D.</td><td>N.D.</td><td>N.D.</td></tr> <tr> <td>Rupture</td><td>N/A</td><td>N/A</td><td>N/A</td><td>N/A</td><td>N/A</td><td>N/A</td><td>N/A</td><td>N/A</td><td>N/A</td></tr> <tr> <td>Fire</td><td>N.F.</td><td>N.F.</td><td>N.F.</td><td>N.F.</td><td>N.F.</td><td>N.F.</td><td>N.F.</td><td>N.F.</td><td>N.F.</td></tr> </table>												No.	1	2	3	4	5	6	7	8	9	10	Lot No.	0	0	0	0	0	0	0	0	0	0	Test condition		Discharge current: 7mA Forced discharge time: 25h									Voltage	Pre-test [V]	-	-	-	-	-	-	-	-	-	Mass	Pre-test [g]	-	-	-	-	-	-	-	-	-	After-test Status	Leakage	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Venting	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Disassembly	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	Rupture	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Fire	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.
No.	1	2	3	4	5	6	7	8	9	10																																																																																																											
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	Fire	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.																																																																																																											