

Prüfbericht-Nr.: <i>Test report no.:</i>	CN24QKR9 001	Auftrags-Nr.: <i>Order no.:</i>	48252247	Seite 1 von 17 Page 1 of 17
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	2024-09-12	
Auftraggeber: <i>Client:</i>	Karma Medical Products Co., Ltd. No. 2363, Sec. 2, University Rd. Min-Hsiung Shiang, Chia-yi 621 Taiwan			
Prüfgegenstand: <i>Test item:</i>	Rechargeable Li-Ion Battery			
Bezeichnung / Typ-Nr.: <i>Identification / Type no.:</i>	KLB7S4P			
Auftrags-Inhalt: <i>Order content:</i>	Test Report			
Prüfgrundlage: <i>Test specification:</i>	Manual of Tests and Criteria, Eighth revised edition, Section 38.3			
Wareneingangsdatum: <i>Date of sample receipt:</i>	2024-09-24			
Prüfmuster-Nr.: <i>Test sample no.:</i>	A003827202-14~19,25~34			
Prüfzeitraum: <i>Testing period:</i>	2024-10-24 - 2024-11-21			
Ort der Prüfung: <i>Place of testing:</i>	See following pages			
Prüflaboratorium: <i>Testing laboratory:</i>	Taoyuan Testing Laboratories			
Prüfergebnis*: <i>Test result*:</i>	Pass			
zusammengestellt von: <i>compiled by:</i>	X <u>Eric Li</u>		genehmigt von: <i>authorized by:</i>	X <u>Nick Yang</u>
Datum: <i>Date:</i> 2024-12-05	Signed by: Eric Y. R. Li		Ausstellungsdatum: <i>Issue date:</i> 2024-12-05	Signed by: Nick C. L. Yang
Stellung / Position:	Project engineer		Stellung / Position:	Authorizer
Sonstiges / <i>Other:</i>	X <u></u> Project engineer Signed by: Bruce C.C. Tsai			
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>		Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>		
* Legende: P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet * Legend: P(ass) = passed a.m. test specification(s) F(ail) = failed a.m. test specification(s) N/A = not applicable N/T = not tested Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the above mentioned test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>				

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Test report no.:

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Anmerkungen
Remarks

1	Alle eingesetzten Prüfmittel waren zum angegebenen Prüfzeitraum gemäß eines festgelegten Kalibrierungsprogramms unseres Prüfhauses kalibriert. Sie entsprechen den in den Prüfprogrammen hinterlegten Anforderungen. Die Rückverfolgbarkeit der eingesetzten Prüfmittel ist durch die Einhaltung der Regelungen unseres Managementsystems gegeben. Detaillierte Informationen bezüglich Prüfkonditionen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden. <i>The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system. Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.</i>
2	Wie vertraglich vereinbart, wurde dieses Dokument nur digital unterzeichnet. Der TÜV Rheinland hat nicht überprüft, welche rechtlichen oder sonstigen diesbezüglichen Anforderungen für dieses Dokument gelten. Diese Überprüfung liegt in der Verantwortung des Benutzers dieses Dokuments. Auf Verlangen des Kunden kann der TÜV Rheinland die Gültigkeit der digitalen Signatur durch ein gesondertes Dokument bestätigen. Diese Anfrage ist an unseren Vertrieb zu richten. Eine Umweltgebühr für einen solchen zusätzlichen Service wird erhoben. Informationen zur Verifizierung der Authentizität unserer Dokumente erhalten Sie auf folgender Webseite: go.tuv.com/digital-signature <i>As contractually agreed, this document has been signed digitally only. TUV Rheinland has not verified and unable to verify which legal or other pertaining requirements are applicable for this document. Such verification is within the responsibility of the user of this document. Upon request by its client, TUV Rheinland can confirm the validity of the digital signature by a separate document. Such request shall be addressed to our Sales department. An environmental fee for such additional service will be charged. For information on verifying the authenticity of our documents, please visit the following website: go.tuv.com/digital-signature</i>
3	Prüfklausel mit der Note * wurden an qualifizierte Unterauftragnehmer vergeben und sind unter der jeweiligen Prüfklausel des Berichts beschrieben. Abweichungen von Prüfspezifikation(en) oder Kundenanforderungen sind in der jeweiligen Prüfklausel im Bericht aufgeführt. <i>Test clauses with remark of * are subcontracted to qualified subcontractors and described under the respective test clause in the report.</i> <i>Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.</i>
4	Die Entscheidungsregel für Konformitätserklärungen basierend auf numerischen Messergebnissen in diesem Prüfbericht basiert auf der "Null-Grenzwert-Regel" und der "Einfachen Akzeptanz" gemäß ILAC G8:2019 und IEC Guide 115:2021, es sei denn, in der auf Seite 1 dieses Berichts genannten angewandten Norm ist etwas anderes festgelegt oder vom Kunden gewünscht. Dies bedeutet, dass die Messunsicherheit nicht berücksichtigt wird und daher auch nicht im Prüfbericht angegeben wird. Zu weiteren Informationen bezüglich des Risikos durch diese Entscheidungsregel siehe ILAC G8:2019. <i>The decision rule for statements of conformity, based on numerical measurement results, in this test report is based on the "Zero Guard Band Rule" and "Simple Acceptance" in accordance with ILAC G8:2019 and IEC Guide 115:2021, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account and hence also not declared in the test report. For additional information to the resulting risk based of this decision rule please refer to ILAC G8:2019.</i>

TEST REPORT	
Test item description	Rechargeable Li-Ion Battery
Trade Mark	Karma
Manufacturer	Full Power Electronics Co., Ltd. No. 6, Shinjan Rd. Chien-Chen Dist., Kaohsiung City 806034 Taiwan Website: www.battery-wayphone.com Email: full.powers@msa.hinet.net Phone number: +886 7 8230198
Model/Type reference	KLB7S4P
Ratings	DC 25.2V, Capacity: 11.5Ah, 289.8Wh

List of Attachments (including a total number of pages in each attachment):

- N/A

Summary of testing:				
Tests performed (name of test and test clause):				Testing location:
Test	Results			TÜV Rheinland Taiwan Ltd., Taoyuan Testing Laboratories 4F-1, No. 38, Huaya 1st Road, Guishan District, Taoyuan City 333 Taiwan
	Pass	Fail	N/A	
T.1: Altitude simulation	☒	☐	☐	
T.2: Thermal Test	☒	☐	☐	
T.3: Vibration	☒	☐	☐	
T.4: Shock	☒	☐	☐	
T.5: External short circuit	☒	☐	☐	
T.6: Impact / Crush	☐	☐	☒	
T.7: Overcharge	☒	☐	☐	
T.8: Forced discharge	☐	☐	☒	
☐ 38.3.3 (f) applied ☐ 38.3.3 (g) applied				

Test item particulars		☒ Lithium ion ☐ Lithium metal ☐ Sodium ion ☐ Large cell ☐ Small cell ☐ Large battery ☒ Small battery ☐ Single cell battery ☒ Multi-cell battery ☐ Battery assembly										
Weight of cell or battery		See General product information for details										
Lithium equivalent content		☒ ≤ 500 g ☐ more than 500 g										
Nominal energy.....		☒ ≤ 6200 Wh ☐ more than 6200 Wh										
Number of series connected cells		See General product information for details										
EODV		See General product information for details										
Possible test case verdicts:												
- test case does not apply to the test object..... : N/A												
- test object does meet the requirement : P (Pass)												
- test object does not meet the requirement..... : F (Fail)												
Testing												
Date of receipt of test item		See page 1										
Date (s) of performance of tests.....		See page 1										
General remarks:												
The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory. "(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report. Throughout this report a point is used as the decimal separator.												
Abbreviations used in the report: <table border="0"> <tr> <td>ND: No disassembly</td> <td>NT: No excessive temperature rise, the external case temperature of the test cell or battery does not exceed 170°C</td> </tr> <tr> <td>NE: No explosion</td> <td>NV: No venting</td> </tr> <tr> <td>NF: No fire</td> <td>NC: 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.</td> </tr> <tr> <td>NL: No leakage and no mass loss</td> <td></td> </tr> <tr> <td>NR: No rupture</td> <td></td> </tr> </table>			ND: No disassembly	NT: No excessive temperature rise, the external case temperature of the test cell or battery does not exceed 170°C	NE: No explosion	NV: No venting	NF: No fire	NC: 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.	NL: No leakage and no mass loss		NR: No rupture	
ND: No disassembly	NT: No excessive temperature rise, the external case temperature of the test cell or battery does not exceed 170°C											
NE: No explosion	NV: No venting											
NF: No fire	NC: 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.											
NL: No leakage and no mass loss												
NR: No rupture												

General product information:

- The equipment under test (EUT) is a Rechargeable Li-Ion Battery, which is constructed tested cell and has overcharge, over-discharge, overcurrent protection and temperature sensor.
- The top and bottom enclosure are secured together by screws.

Product specification:

Manufacturer:	Full Power Electronics Co., Ltd.
Model:	KLB7S4P
Nominal voltage (Vdc):	25.2
Nominal capacity (mAh):	11.5
End of discharge voltage (EODV) (Vdc):	17.5
Standard charge voltage (Vdc):	28.7
Maximum charge voltage (Vdc):	29.4
Standard charge current (A):	5
Maximum charge current (A):	6
Standard discharge current (A):	14.5
Maximum discharge current (A):	32
Dimension (L x W x H, mm):	approx. 324* 154 * 77
Mass of equipment (kg) (Nominal):	approx. 3.0

Engineering Considerations:

- The component cell used within this battery is a tested component which was investigated according to the standard of earlier version. The component information as described below:

Object/part no.	Manufacturer/ trademark	Type/model	Technical data	Standard	Remark
Rechargeable Lithium ion Cells (7S4P)	Samsung SDI CO., LTD	INR18650-35E	DC 3.6V, 3400mAh.	ST/SG/AC.10/ 11/Rev.5, Amend. 2 Part III, sub-section 38.3	Test report no.: SDI-UN- 141218-01 issued by SAMSUNG SDI Energy Business Devision

Manual of Tests and Criteria, Eighth revised edition, Section 38.3			
Clause	Requirement + Test	Result - Remark	Verdict
38.3.3	TEST METHODS AND REQUIREMENTS		P
	Pre-discharge and pre-cycling	See supplementary information in following appended tables for details.	P
38.3.4	Procedure		P
38.3.4.1	Test T.1: Altitude simulation		P
	Cells or batteries are stored at a pressure of 11.6 kPa or less for at least 6 h at ambient temperature (20 ± 5 °C).	Test according to this requirement.	P
	Results: no leakage, no venting, no disassembly, no rupture and no fire during this test. 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.	See appended Table T.1 NL, NV, ND, NR, NF, NC.	P
38.3.4.2	Test T.2: Thermal test		P
	Cells or batteries previously subjected to altitude simulation test.		P
	Cells or batteries are stored for at least 6 h at a test temperature of 72 ± 2 °C, followed by storage for at least 6 h at a test temperature of -40 ± 2 °C. Maximum time for transfer is 30 minutes. This procedure is executed 10 times.	Test according to this requirement.	P
	For large cells or batteries the duration of exposure to the test temperatures is at least 12 h instead of 6 h.		N/A
	Storage for at least 24 h at ambient temperature (20 ± 5 °C).		P
	Results: no leakage, no venting, no disassembly, no rupture and no fire during this test. 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.	See appended Table T.2 NL, NV, ND, NR, NF, NC.	P
38.3.4.3	Test T.3: Vibration		P
	Cells or batteries previously subjected to thermal test		P
	Cells or batteries are subjected to sinusoidal waveform of vibration with a logarithmic sweep between 7 Hz and 200 Hz and back to 7 Hz traversed in 15 minutes.	Test according to this requirement.	P
	Cycle is repeated 12 times for a total of 3 h for each of three mutually perpendicular mounting positions. One of the directions is perpendicular to the terminal face.	Test according to this requirement.	P

Manual of Tests and Criteria, Eighth revised edition, Section 38.3			
Clause	Requirement + Test	Result - Remark	Verdict
	Results: no leakage, no venting, no disassembly, no rupture and no fire during this test. 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.	See appended Table T.3 NL, NV, ND, NR, NF, NC.	P
38.3.4.4	Test T.4: Shock		P
	Cells or batteries previously subjected to vibration test.		P
	Each cell or battery is subjected to three shocks in each direction of three mutually perpendicular mounting positions of the cell or battery for a total of 18 shocks. For each shock, the parameters are according to the specified table.	Test according to this requirement.	P
	Results: no leakage, no venting, no disassembly, no rupture and no fire during this test. 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.	See appended Table T.4 NL, NV, ND, NR, NF, NC.	P
38.3.4.5	Test T.5: External short circuit		P
	Cells or batteries previously subjected to shock test.		P
	Each cell or battery is stabilized at an external case temperature of 57 ± 4 °C. This period of time depends on the size and design of the cell or battery and is assessed and documented. If this assessment is not feasible, the exposure time shall be at least 6 hours for small cells and small batteries, and 12 hours for large cells and large batteries.	Test according to small batteries requirement.	P
	Then the cell or battery at 57 ± 4 °C is subjected to a short-circuit condition with a total external resistance of less than 0.1 ohm. Short-circuit condition is continued for at least 1 h after the cell or battery external case temperature has returned to 57 ± 4 °C.	Test according to this requirement.	P
	The temperature of large multi-cell batteries decreased by half of the maximum temperature increase.		N/A
	The short circuit and cooling down phases is conducted at least at ambient temperature.		P
	The test sample is observed for a further 6 h.		P
	Results: no excessive temperature rise, no disassembly, no rupture and no fire during this test and within the 6 h of observation.	See appended Table T.5 NT, ND, NR, NF.	P
38.3.4.6	Test T.6: Impact / Crush		N/A

Manual of Tests and Criteria, Eighth revised edition, Section 38.3			
Clause	Requirement + Test	Result - Remark	Verdict
	The test is conducted using test cells or component cells that have not been previously subjected to other transport tests.	Evaluated in separate test report of cell. See General product information - Engineering Considerations for details.	N/A
	Each test cell or component cell shall be subjected to one impact / crush only.		N/A
	Cylindrical cells not less than 18.0 mm in diameter is tested with impact test procedure. <i>NOTE: Diameter here refers to the design parameter (for example the diameter of 18 650 cells is 18.0 mm).</i>		N/A
	Test cell or component cell is placed on a flat smooth surface. A stainless steel bar with a diameter of 15.8 mm $\pm$ 0.1 mm and a length of at least 60 mm or of the longest dimension of the cell, whichever is greater, is placed across the centre of the test sample. A mass of 9.1 kg $\pm$ 0.1 kg is dropped from a height of 61 cm $\pm$ 2.5 cm at the intersection of the bar and the test sample using a vertical sliding track or channel. The vertical track is oriented 90 degrees from the horizontal supporting surface.		N/A
	The test sample is impacted with its longitudinal axis parallel to the flat surface and perpendicular to the longitudinal axis of the steel bar lying across the centre of the test sample.		N/A
	Prismatic, pouch, coin/button cells and cylindrical cells less than 18.0 mm in diameter is tested with crush test procedure. <i>NOTE: Diameter here refers to the design parameter (for example the diameter of 18 650 cells is 18.0 mm).</i>		N/A
	A cell or component cell is 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.		N/A
	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.		N/A

Manual of Tests and Criteria, Eighth revised edition, Section 38.3			
Clause	Requirement + Test	Result - Remark	Verdict
	The crushing is to be continued until one of the three conditions below is reached: - the applied force reaches 13 kN $\pm$ 0.78 kN; - the voltage of the cell drops by at least 100 mV; - the cell is deformed by 50 % or more of its original thickness. As soon as one of the above conditions has been obtained, the pressure shall be released.		N/A
	The test sample is observed for a further 6 h.		N/A
	Results: no excessive temperature rise, no disassembly and no fire during this test and within the 6 h of observation.		N/A
38.3.4.7	Test T.7: Overcharge		P
	The charge current of the rechargeable battery or the single cell rechargeable battery is twice the manufacturer's recommended maximum continuous charge current.	Test according to this requirement.	P
	The manufacturer's recommended charge voltage is not more than 18 V, the minimum voltage of the test is the lesser of two times the maximum charge voltage of the battery or 22 V.		N/A
	The manufacturer's recommended charge voltage is more than 18 V. The voltage of the test is not less than 1.2 times the maximum charge voltage.		P
	The test is conducted at ambient temperature. The charging condition is maintained for at least 24 h.		P
	The test sample is observed for a further 7 days.		P
	Results: no disassembly and no fire during this test and within the 7 days of observation.	See appended Table T.7. ND, NF.	P
38.3.4.8	Test T.8: Forced discharge		N/A
	Each cell is forced discharged at ambient temperature by connecting it in series with a 12 V direct current power supply at an initial current equal to the maximum continuous discharge current specified by the manufacturer. Time interval for discharging equals to rated capacity divided by the initial test current.	Evaluated in separate test report of cell. See General product information - Engineering Considerations for details.	N/A
	The test sample is observed for a further 7 days.		N/A
	Results: no disassembly and no fire during this test, nor within the 7 days of observation.		N/A

Manual of Tests and Criteria, Eighth revised edition, Section 38.3			
Clause	Requirement + Test	Result - Remark	Verdict

T.1		TABLE: Altitude simulation						P
Sample No.	Precondition	Open circuit voltage before test (V)	Mass before test (kg)	Open circuit voltage after test (V)	Mass after test (kg)	Mass loss (%)	Mass loss limit (%)	Results
014	A	27.02	2.243	27.01	2.243	0	0.1	A
015	A	26.92	2.239	26.92	2.239	0	0.1	A
016	A	26.98	2.241	26.98	2.241	0	0.1	A
017	A	26.98	2.245	26.98	2.245	0	0.1	A
018	B	27.0	2.240	27.0	2.240	0	0.1	A
019	B	27.01	2.237	27.01	2.237	0	0.1	A
025	B	26.97	2.244	26.97	2.244	0	0.1	A
026	B	26.97	2.241	26.97	2.241	0	0.1	A
Supplementary information: 1. Precondition: A = test sample at first cycle, in fully charged states. B = test sample after 25 cycles, in fully charged states 2. Test result: A: No leakage, no venting, no disassembly, no rupture and no fire during this test. 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. B: Other (please explain)								

T.2		TABLE: Thermal test						P
Sample No.	Precondition	Open circuit voltage before test (V)	Mass before test (kg)	Open circuit voltage after test (V)	Mass after test (kg)	Mass loss (%)	Mass loss limit (%)	Results
014	A	27.01	2.243	27.01	2.243	0	0.1	A
015	A	26.92	2.239	26.92	2.239	0	0.1	A
016	A	26.98	2.241	26.98	2.241	0	0.1	A
017	A	26.98	2.245	26.98	2.245	0	0.1	A
018	B	27.0	2.240	27.0	2.240	0	0.1	A
019	B	27.01	2.237	27.01	2.237	0	0.1	A
025	B	26.97	2.244	26.97	2.244	0	0.1	A
026	B	26.97	2.241	26.97	2.241	0	0.1	A

Manual of Tests and Criteria, Eighth revised edition, Section 38.3			
Clause	Requirement + Test	Result - Remark	Verdict

Supplementary information:

1. Precondition:

A = test sample at first cycle, in fully charged states.

B = test sample after 25 cycles, in fully charged states

2. Test result:

A: No leakage, no venting, no disassembly, no rupture and no fire during this test. 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.

B: Other (please explain)

T.3		TABLE: Vibration						P
Sample No.	Precondition	Open circuit voltage before test (V)	Mass before test (kg)	Open circuit voltage after test (V)	Mass after test (kg)	Mass loss (%)	Mass loss limit (%)	Results
014	A	27.01	2.243	26.99	2.242	0.04	0.1	A
015	A	26.92	2.239	26.92	2.237	0.09	0.1	A
016	A	26.98	2.241	26.98	2.241	0.00	0.1	A
017	A	26.98	2.245	26.98	2.243	0.09	0.1	A
018	B	27.0	2.240	27.0	2.240	0.00	0.1	A
019	B	27.01	2.237	27.0	2.237	0.00	0.1	A
025	B	26.97	2.244	26.97	2.242	0.09	0.1	A
026	B	26.97	2.241	26.97	2.241	0.00	0.1	A

Supplementary information:

1. Precondition:

A = test sample at first cycle, in fully charged states.

B = test sample after 25 cycles, in fully charged states

Manual of Tests and Criteria, Eighth revised edition, Section 38.3

Clause	Requirement + Test	Result - Remark	Verdict
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2. Test condition:

Frequency range		Amplitudes (a: acceleration, s: displacement)	Duration of logarithmic sweep cycle (7 Hz – 200 Hz – 7 Hz)	Axis	Number of cycles
From	To				
$f_1 = 7 \text{ Hz}$	f_2	$a_1 = 1 \text{ gn}$	15 min	X	12
f_2	f_3	$s = 0.8 \text{ mm}$		Y	12
f_3	$f_4 = 200 \text{ Hz}$	a_2		Z	12
and back to $f_1 = 7 \text{ Hz}$				Total	36
Key:					
	Type:	f_2	f_3	a_2	
☒	Cell & small battery	18 Hz	50 Hz	8 gn	
☐	Large battery	18 Hz	25 Hz	1 gn	

3.. Test result:

A: No leakage, no venting, no disassembly, no rupture and no fire during this test. 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.

B: Other (please explain)

T.4	TABLE: Shock							P
Sample No.	Precondition	Open circuit voltage before test (V)	Mass before test (kg)	Open circuit voltage after test (V)	Mass after test (kg)	Mass loss (%)	Mass loss limit (%)	Results
014	A	26.99	2.242	26.99	2.242	0	0.1	A
015	A	26.92	2.237	26.92	2.236	0.04	0.1	A
016	A	26.98	2.241	26.98	2.240	0.04	0.1	A
017	A	26.98	2.243	26.97	2.243	0	0.1	A
018	B	27.0	2.240	27.0	2.240	0	0.1	A
019	B	27.0	2.237	27.01	2.237	0	0.1	A
025	B	26.97	2.242	26.97	2.242	0	0.1	A
026	B	26.97	2.241	26.97	2.241	0	0.1	A

Manual of Tests and Criteria, Eighth revised edition, Section 38.3

Clause	Requirement + Test	Result - Remark	Verdict
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Supplementary information:

1. Precondition:

A = test sample at first cycle, in fully charged states.

B = test sample after 25 cycles, in fully charged states

2. Test condition:

Type	Minimum peak acceleration	Pulse duration
☐ All cells	☐ 150 gn	6 ms
☐ Large cells	☐ 50 gn	11 ms
☒ Small batteries	☒ 150 gn	6 ms
	☐ ____ gn , result of formula as below: $Acceleration(g_n) = \sqrt{\left(\frac{100850}{mass^*}\right)}$	
☐ Large batteries	☐ 50 gn	11 ms
	☐ ____ gn , result of formula as below: $Acceleration(g_n) = \sqrt{\left(\frac{30000}{mass^*}\right)}$	

3. Test result:

A: No leakage, no venting, no disassembly, no rupture and no fire during this test. 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.

B: Other (please explain)

T.5	TABLE: External short circuit					P
Sample No.	Precondition	Open circuit voltage before test (V)	Open circuit voltage after test (V)	Maximum case temperature (°C)	Total external resistance (mΩ)	Results
014	A	26.99	0	57.9	79.8	A, B
015	A	26.92	0	58.1	80.1	A, B
016	A	26.98	0	57.8	82.3	A, B
017	A	26.98	0	57.9	81.8	A, B
018	B	27.0	0.01	57.9	81.0	A, B
019	B	27.01	0.02	58.0	79.9	A, B
025	B	26.97	0	57.7	77.7	A, B
026	B	26.97	0.01	57.8	81.0	A, B

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Clause	Requirement + Test	Result - Remark	Verdict

Supplementary information:

1. Precondition:

A = test sample at first cycle, in fully charged states.

B = test sample after 25 cycles, in fully charged states

2. Prior to short circuit condition, the case temperature of cell is reached to a steady state temperature of 57.7 °C, and this condition is continued for additional 6 hours.

3. The short circuit and cooling down phases were conducted at ambient temperature: 57.7 °C

4. Test result:

A: No excessive temperature rise, no disassembly, no rupture and no fire during this test and within the 6 h of observation.

B: Other (please explain): Protection circuit activates and stops discharge immediately.

T.6a	TABLE: Impact			N/A
Sample No.	Precondition	Open circuit voltage before test (V)	Maximum case temperature (°C)	Results

Supplementary information:

1. Shape of cell: Cylindrical (diameter is not less than 18.0 mm)

2. Precondition:

A = test sample at first cycle, at 50% charged states.

B = test sample after 25 cycles, at 50% charged states.

3. Test result:

A: No excessive temperature rise, no disassembly and no fire during this test and within the 6 h of observation.

B: Other (please explain)

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Clause	Requirement + Test	Result - Remark	Verdict
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[illegible]

Supplementary information:

1. Shape of cell: ☐ Cylindrical (diameter less than 18.0 mm), ☐ Prismatic, ☐ Pouch
2. Precondition:
A = test sample at first cycle, at 50% charged states.
B = test sample after 25 cycles, at 50% charged states.
3. Test result:
A: No excessive temperature rise, no disassembly and no fire during this test and within the 6 h of observation.
B: Other (please explain)

T.7		TABLE: Overcharge				P
Sample No.	Precondition	Open circuit voltage before test (V)	Maximum charging current (A)	Maximum charging voltage (V)	Total charging time (h)	Results
027	A	27.04	12	35.28	24	A, B
028	A	27.02	12	35.28	24	A, B
029	A	26.98	12	35.28	24	A, B
030	A	26.98	12	35.28	24	A, B
031	B	27.13	12	35.28	24	A, B
032	B	27.01	12	35.28	24	A, B
033	B	26.93	12	35.28	24	A, B
034	B	26.92	12	35.28	24	A, B

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Clause	Requirement + Test	Result - Remark	Verdict

1. Precondition:

A = test sample at first cycle, in fully charged states.

A = test sample at first cycle, in fully charged states.

B = test sample after 25 cycles, in fully charged states

A: No disassembly and no fire during this test and within the 7 days of observation.

A: No disassembly and no fire during this test and within the 7 days of observation.

B: Other (please explain): The sample alarmed and overcharge stopped.

[illegible]

Manual of Tests and Criteria, Eighth revised edition, Section 38.3			
Clause	Requirement + Test	Result - Remark	Verdict

Supplementary information:

1. Precondition:

A = test sample at first cycle, in fully discharged states.

B = test sample after 25 cycles, in fully discharged states

2. Test condition:

- Test voltage: V dc,

- Initial supply current = maximum continuous discharge current = A

- Time interval (h) = rated capacity divided by the initial test current = h.

3. Test result:

A: No disassembly and no fire during this test, nor within the 7 days of observation.

B: Other (please explain):