UN38.3 Test Summary

Product	Rechargeable Li-ion Battery Pack
Model	B6029LA , AB6029LA , AP602, AP606, AP607
Product Description	☒Lithium ion ☐ Lithium polymer ☐ Lithium metal ☐Large cell ☐ Small cell ☒Battery ☐ Large battery ☒ Small battery ☐ Single cell battery ☐ Multi-cell battery ☐ Battery assembly

Item:	Specification	Remark
Rated Voltage (Vdc):	54	
Rated capacity (Ah):	2	
End of discharge voltage **(**EODV) (Vdc):	41.5	
Standard charge voltage (Vdc):	61	
Maximum charge voltage (Vdc):	61	
Standard charge current (A):	1.5	
Maximum charge current (A):	2.5	
Standard discharge current (A):	2	
Maximum discharge current (A):	20	
Mass (kg):	Approx. 1015 g	
Watt-hour rating , or lithium content:	108 Wh	

Test Report number	**50284084 001**
Date of Test Report	2019-9-9
Testing Laboratory	

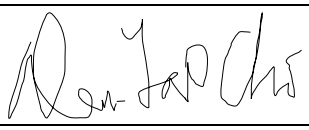
TÜV Rheinland Taiwan Ltd. Taichung Branch Office, No. 9, Ln. 36, Sec. 3, Minsheng Rd., Daya District , Taichung City 428, Taiwan R.O.C..
Tel: +886 2 2172-7000 Mail: Bruce.Tsai@tuv.com · Website: www.tuv.com

Test Specfication	UN Manual of Tests and Criteria(Sixth revised edition),Part III ,Sub-section 38.3

Tests Performced and Resuts

Test	Results		
	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

Manufactures's contact information	Mobiletron Electronics Co.,Ltd No.85, Sec.4, Chung-Ching Rd., Ta-Ya District,Taichung,428, Taiwan Website: www.durofix.com.tw / Email: Isaac@more.com.tw Tel: 886-4-25683366 Ext :1862
Name and Title of Signatory	Safety Senior Supervisor Wen-Yao Chi 

Prüfbericht-Nr.: *Test Report No.*:	**50284084 001**	**Auftrags-Nr.:** *Order No.*:	238108867	Seite 1 von 15 *Page 1 of* 15
Kunden-Referenz-Nr.: *Client Reference No.*:	N/A	**Auftragsdatum:** *Order date*:	2019-08-13	
Auftraggeber: *Client*:	Mobiletron Electronics Co. Ltd. No. 85, Sec. 4, Chung-Ching Rd., Ta-Ya District, Taichung 428 Taiwan			
Prüfgegenstand: *Test item*:	See following pages			
Bezeichnung / Typ-Nr.: *Identification / Type No.*:	See following pages			
Auftrags-Inhalt: *Order content*:	Service of test report			
Prüfgrundlage: *Test specification*:	United Nations Recommendations on the Transport of Dangerous Goods – Manual of Tests and Criteria, Sixth revised edition, Part III, Section 38.3			

Wareneingangsdatum: *Date of receipt*:	See following pages	See appendix to this report for photo documentation
Prüfmuster-Nr.: *Test sample No.*:	A000974140-001 to -024	
Prüfzeitraum: *Testing period*:	See following pages	
Ort der Prüfung: *Place of testing*:	See following pages	
Prüflaboratorium: *Testing laboratory*:	Taichung Testing Laboratories	
Prüfergebnis*: *Test result**:	Pass	

geprüft von / *tested by*:

9/9/2019

X

Project Engineer
Signed by: Bruce C.C. Tsai

Datum *Date*	**Name / Stellung** *Name / Position*	**Unterschrift** *Signature*

kontrolliert von / *reviewed by*:

9/9/2019

X

Reviewer
Signed by: Paul L.M Lin

Datum *Date*	**Name / Stellung** *Name / Position*	**Unterschrift** *Signature*

Sonstiges / *Other*:

Zustand des Prüfgegenstandes bei Anlieferung: *Condition of the test item at delivery*:	Prüfmuster vollständig und unbeschädigt *Test item complete and undamaged*

* Legende:	1 = sehr gut	2 = gut	3 = befriedigend	4 = ausreichend	5 = mangelhaft
	P(ass) = entspricht o.g. Prüfgrundlage(n)		F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
Legend:	*1 = very good*	*2 = good*	*3 = satisfactory*	*4 = sufficient*	*5 = poor*
	P(ass) = passed a.m. test specification(s)		*F(ail) = failed a.m. test specification(s)*	*N/A = not applicable*	*N/T = not tested*

Test item description .....:	Rechargeable Li-ion Battery Pack
Trade Mark .....:	1) Durofix, 2) ACDelco, 3) NAREX
Manufacturer.....:	Same as applicant.
Model/Type reference .....:	1) B6029LA, 2) AB6029LA, 3) AP602, AP606, AP607
Ratings .....:	DC 54V, 2Ah

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

- Photo Documentation

Total number of pages in each attachment is indicated in each individual attachment.

Summary of testing:

Tests performed (name of test and test clause):

☒ 38.3.4.1 Test T.1: Altitude simulation
☒ 38.3.4.2 Test T.2: Thermal Test
☒ 38.3.4.3 Test T.3: Vibration
☒ 38.3.4.4 Test T.4: Shock
☒ 38.3.4.5 Test T.5: External short circuit
☐ 38.3.4.6 Test T-6: Impact / crush
☒ 38.3.4.7 Test T-7: Overcharge
☐ 38.3.4.8 Test T-8: Forced discharge

- The test samples were pre-production samples without serial number
- The test performed on model B6029LA is considered to be the representative of other models

Testing location:

All tests as described in Test Case and Measurement Sections were performed at the laboratory described as below:

TÜV Rheinland Taiwan Ltd., Taichung Testing Laboratories

No. 9, Lane 36, Minsheng Rd., Sec. 3, Daya District, Taichung City 428, Taiwan

Test item particulars .....:	☐ Lithium metal ☒ Lithium ion ☐ button ☐ cell ☒ battery ☐ component cell ☐ Large ☐ Small cell ☐ Large ☒ Small battery ☐ Single cell battery ☐ battery assembly
Weight of cell or battery .....:	
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 .....:	2019-08-14
Date (s) of performance of tests.....:	2019-08-16 to 2019-08-30

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.

Where statement of conformity is provided in this test report, if not otherwise indicated, “accuracy method” described in IEC GUIDE 115 has been taken to address uncertainty of measurement.

Abbreviations used in the report:

ND: No disassembly
NF: No fire
NL: No leakage
NE: No explosion
NR: No rupture

NT: No excessive temperature rise (The temperature of sample casing was not exceed 170ºC)
NV: No venting
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.

General product information:

- The equipment under test (EUT) is a rechargeable Li-ion battery pack which is constructed with 15 series, 1 parallel cells.
- The top enclosure and bottom enclosure are secured together by screws

Model and construction differences:

- The models AB6029LA, AP602, AP606, AP607 are identical to model B6029LA except for the trademark and model designation.

Features of the product

Item:	Specification	Remark
Number of series connected cells	15S	
End of discharge voltage (EODV) (Vdc):	41.5	
Standard charge voltage (Vdc):	61	
Maximum charge voltage (Vdc):	61.5	
Standard charge current (A):	1.5	
Maximum charge current (A):	2.5	
Standard discharge current (A):	2	
Maximum discharge current (A):	20	

Engineering Conditions of Acceptability:

- The component cell used within this product has also been tested and found in compliance with the standard of earlier version. The suitability of use has been evaluated in this report as below:
  - T-6 Impact test: no further testing is necessary
  - T-8 Forced discharge test: no further testing is necessary

Object/part no.	Manufacturer/ trademark	Type/model	Technical data	Standard	Remark
Rechargeable Li-ion cell	LG	ICR18650HD2	3.65V, 2000mAh	ST/SG/AC.10/11/Rev.5, Part III, sub-section 38.3	Test report no.: QAE-EF02-130128-CY018650HD2 issued by LG Chem Mobile Energy Division

UN Recommendations on the Transport of Dangerous Goods, Part III – 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		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).	Tested according to the requirements.	P
	Results: no mass loss, 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, NE, NF, NC.	P
38.3.4.2	Test T-2: Thermal cycling		P
	Cells or batteries previously subjected to altitude test.		P
	Cells or batteries are stored for at least 6 h at a test temperature of 72 ± 2C°, followed by storage for at least 6 h at a test temperature of - 40 ± 2C°. Maximum time for transfer is 30 minutes. This procedure is executed 10 times.	Tested according to the requirements.	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).	Tested according to the requirements.	P
	Results: no mass loss, 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, NE, NF, NC.	P
38.3.4.3	Test T-3: Vibration		P
	Cells or batteries previously subjected to thermal cycling test	Tested according to the requirements.	P
	Cells or batteries are subjected to sinusoidal vibration during transport.	Tested according to the requirements.	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.	Tested according to the requirements.	P

UN Recommendations on the Transport of Dangerous Goods, Part III – Section 38.3			
Clause	Requirement + Test	Result - Remark	Verdict
	Results: no mass loss, 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, NE, NF, NC.	P
38.3.4.4	Test T-4: Shock		P
	Cells or batteries previously subjected to vibration test.	Tested according to the requirements.	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.	Tested according to the requirements.	P
	Results: no mass loss, 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, NE, NF, NC.	P
38.3.4.5	Test T-5: External short-circuit		P
	Cells or batteries previously subjected to shock test.	Tested according to the requirements.	P
	Each cell or battery is heated and 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.	Tested according to the requirements.	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, or in the case of the large batteries, has decreased by half of the maximum temperature increase observed during the test and remains below that value.	Tested according to the requirements.	P
	The short circuit and cooling down phases is conducted at least at ambient temperature.		N/A
	The test sample is observed for a further 6 h.	Tested according to the requirements.	P
	Results: The external temperature dose not exceed 170 °C, no rupture, no disassembly 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

UN Recommendations on the Transport of Dangerous Goods, Part III – 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 cell test report. See General product information - Engineering Conditions of Acceptability 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. *NOTE: Diameter here refers to the design parameter (for example the diameter of 18 650 cells is 18.0 mm).*		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 ± 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 ± 0.1 kg is dropped from a height of 61 cm ± 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. *NOTE: Diameter here refers to the design parameter (for example the diameter of 18 650 cells is 18.0 mm).*		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

UN Recommendations on the Transport of Dangerous Goods, Part III – 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 ± 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: The external temperature dose not exceed 170 °C, 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 battery or a single cell rechargeable battery is twice the manufacturer's recommended maximum continuous charge current.	Tested according to the requirements.	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 cell test report. See General product information - Engineering Conditions of Acceptability 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

UN Recommendations on the Transport of Dangerous Goods, Part III – Section 38.3			
Clause	Requirement + Test	Result - Remark	Verdict

T.1	**TABLE: Altitude**							P
Sample No.	Precondition	Open circuit voltage before test (V)	Mass before test (g)	Open circuit voltage after test (V)	Mass after test (g)	Mass loss (%)	Mass loss limit (%)	Results
1	A	61.3	978.0	61.3	978.0	0	0.1	P
2	A	61.3	972.6	61.3	972.6	0	0.1	P
3	A	61.3	977.6	61.3	977.6	0	0.1	P
4	A	61.3	973.8	61.3	973.8	0	0.1	P
5	B	61.3	972.9	61.3	972.9	0	0.1	P
6	B	61.3	975.9	61.3	975.9	0	0.1	P
7	B	61.3	973.4	61.3	973.4	0	0.1	P
8	B	61.3	972.8	61.3	972.8	0	0.1	P

Supplementary information:

1. Precondition:
   A = test sample at first cycle, in fully charged states.
   B = test sample after 50 cycles, in fully charged states
   C = test sample after 25 cycles, in fully charged states

T.2	**TABLE: Thermal cycling**							P
Sample No.	Precondition	Open circuit voltage before test (V)	Mass before test (g)	Open circuit voltage after test (V)	Mass after test (g)	Mass loss (%)	Mass loss limit (%)	Results
1	A	61.3	978.0	60.3	977.6	0.04	0.1	P
2	A	61.3	972.6	60.4	972.5	0.01	0.1	P
3	A	61.3	977.6	60.4	977.4	0.02	0.1	P
4	A	61.3	973.8	60.4	973.6	0.02	0.1	P
5	B	61.3	972.9	60.4	972.7	0.02	0.1	P
6	B	61.3	975.9	60.4	975.6	0.03	0.1	P
7	B	61.3	973.4	60.4	973.3	0.01	0.1	P
8	B	61.3	972.8	60.4	972.7	0.01	0.1	P

UN Recommendations on the Transport of Dangerous Goods, Part III – 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 50 cycles, in fully charged states
   C = test sample after 25 cycles, in fully charged states

T.3	**TABLE: Vibration**							P
Sample No.	Precondition	Open circuit voltage before test (V)	Mass before test (g)	Open circuit voltage after test (V)	Mass after test (g)	Mass loss (%)	Mass loss limit (%)	Results
1	A	60.3	977.6	60.3	977.6	0	0.1	P
2	A	60.4	972.5	60.3	972.5	0	0.1	P
3	A	60.4	977.4	60.3	977.4	0	0.1	P
4	A	60.4	973.6	60.3	973.6	0	0.1	P
5	B	60.4	972.7	60.3	972.7	0	0.1	P
6	B	60.4	975.6	60.3	975.6	0	0.1	P
7	B	60.4	973.3	60.3	973.3	0	0.1	P
8	B	60.4	972.7	60.3	972.7	0	0.1	P

UN Recommendations on the Transport of Dangerous Goods, Part III – 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 50 cycles, in fully charged states
   C = test sample after 25 cycles, in fully charged states
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 Hz	*f*2	a_1 = 1 *g*n	15 min	X	12
*f*2	*f*3	s = 0.8 mm		Y	12
*f*3	*f*4 = 200 Hz	a_2		Z	12
and back to *f*1 = 7 Hz				Total	36

Key:

	Type:	*f*2	*f*3	a_2	
☒	Cell & small battery	18 Hz	50 Hz	8 *g*n	
☐	Large battery	18 Hz	25 Hz	1 *g*n	

T.4	**TABLE: Shock**							P
Sample No.	Precondition	Open circuit voltage before test (V)	Mass before test (g)	Open circuit voltage after test (V)	Mass after test (g)	Mass loss (%)	Mass loss limit (%)	Results
1	A	60.3	977.6	60.3	977.6	0	0.1	P
2	A	60.3	972.5	60.3	972.5	0	0.1	P
3	A	60.3	977.4	60.3	977.4	0	0.1	P
4	A	60.3	973.6	60.3	973.6	0	0.1	P
5	B	60.3	972.7	60.3	972.7	0	0.1	P
6	B	60.3	975.6	60.3	975.6	0	0.1	P
7	B	60.3	973.3	60.3	973.3	0	0.1	P
8	B	60.3	972.7	60.3	972.7	0	0.1	P

UN Recommendations on the Transport of Dangerous Goods, Part III – 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 50 cycles, in fully charged states
   C = 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: $Acceleration(g_n) = \sqrt{\left(\frac{30000}{mass*}\right)}$	

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
1	A	60.3	0	58.3	81.0	P
2	A	60.3	0	59.4	76.0	P
3	A	60.3	0	58.5	81.8	P
4	A	60.3	0	59.0	72.1	P
5	B	60.3	0	59.5	81.0	P
6	B	60.3	0	59.0	76.0	P
7	B	60.3	0	59.1	81.8	P
8	B	60.3	0	59.4	72.1	P

UN Recommendations on the Transport of Dangerous Goods, Part III – 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 50 cycles, in fully charged states
   C = 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 58.5 °C, and this condition is continued for additional 4 hours.
3. The short circuit and cooling down phases were conducted at ambient temperature 58.5 °C.

T.6a	**TABLE: Impact**		N/A
Sample No.	Open circuit voltage before test (V)	Maximum case temperature (°C)	Results
1			
2			
3			
4			
5			

Supplementary information:

1. Precondition: test sample at first cycle, at 50% charged states.

T.6b	**TABLE: Crush**						N/A
Sample No.	Open circuit voltage before test (V)	Voltage drop of the cell (mV)	Applied force (kN)	Thickness before test (mm)	Thickness after test (mm)	Maximum case temperature (°C)	Results
1							
2							
3							
4							
5							

Supplementary information:

1. Precondition: test sample at first cycle, at 50% charged states.

T.7	**TABLE: Overcharge**	P

UN Recommendations on the Transport of Dangerous Goods, Part III – Section 38.3			
Clause	Requirement + Test	Result - Remark	Verdict

Sample No.	Precondition	Open circuit voltage before test (V)	Maximum charging current (A)	Maximum charging voltage (V)	Total charging time (h)	Results
9	A	61.5	5	73.8	24	P
10	A	61.5	5	73.8	24	P
11	A	61.5	5	73.8	24	P
12	A	61.5	5	73.8	24	P
13	B	61.5	5	73.8	24	P
14	B	61.5	5	73.8	24	P
15	B	61.5	5	73.8	24	P
16	B	61.5	5	73.8	24	P

Supplementary information:

1. Precondition:
   A = test sample at first cycle, in fully charged states.
   B = test sample after 50 cycles, in fully charged states
   C = test sample after 25 cycles, in fully charged states

T.8	**TABLE: Forced discharge**				N/A
Sample No.	Precondition	Open circuit voltage before test (V)	Measured reverse charging current (mA)	Total time for reversed charging application (min)	Results
1	A				
2	A				
3	A				
4	A				
5	A				
6	A				
7	A				
8	A				
9	A				
10	A				
1	B				
2	B				
3	B				
4	B				
5	B				

UN Recommendations on the Transport of Dangerous Goods, Part III – Section 38.3			
Clause	Requirement + Test	Result - Remark	Verdict

6	B				
7	B				
8	B				
9	B				
10	B				

Supplementary information:

1. Precondition:

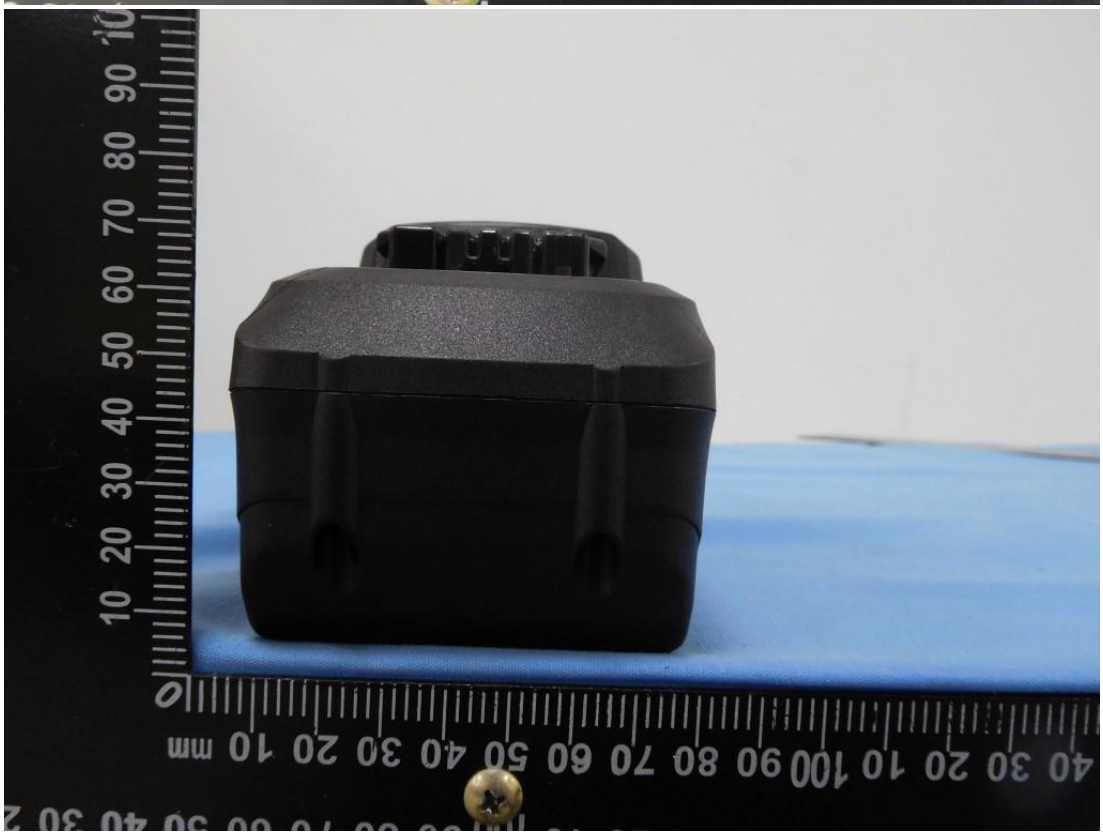
   A = test sample at first cycle, in fully discharged states.
   B = test sample after 50 cycles, in fully discharged states

2. Test condition:

   - Test voltage: 12V,
   - Initial supply current = maximum continuous discharge current = _____ mA
   - Time interval (h) = rated capacity divided by the initial test current = _____ h

Product: Rechargeable Li-ion Battery Pack

Type Designation: 1) B6034LA, 2) AB6034LA, 3) AP602, AP606, AP607



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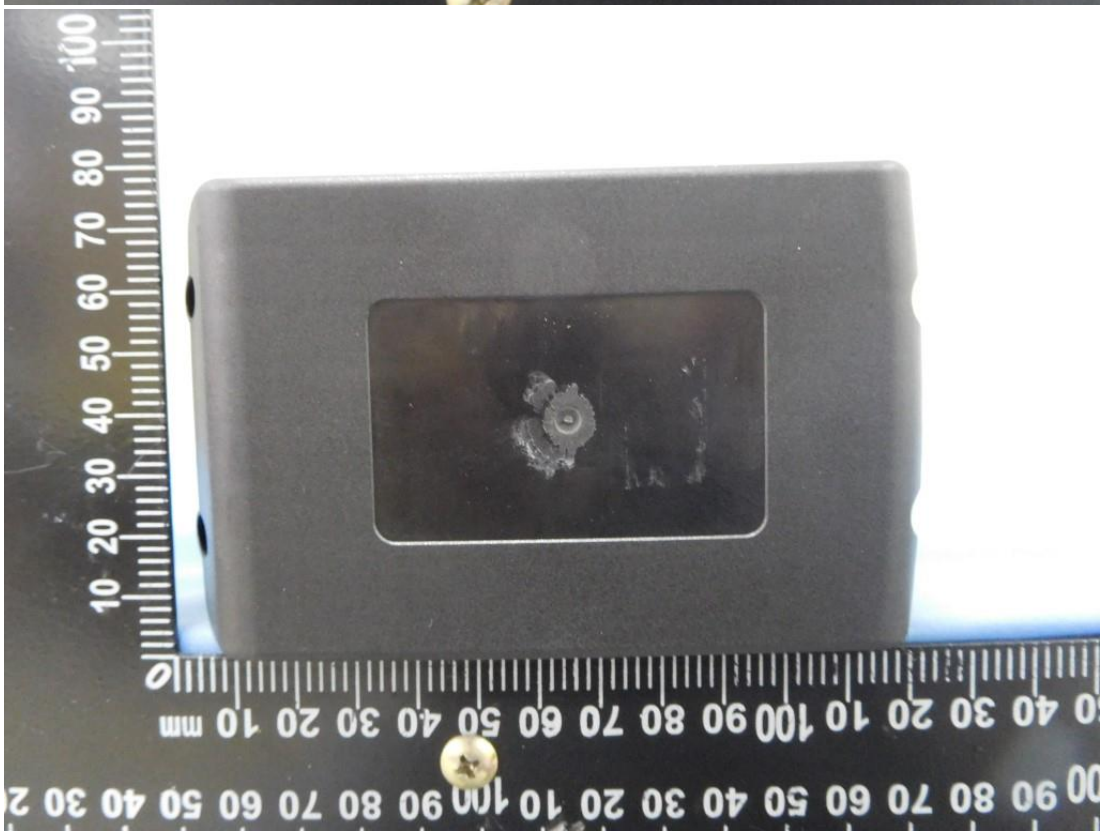

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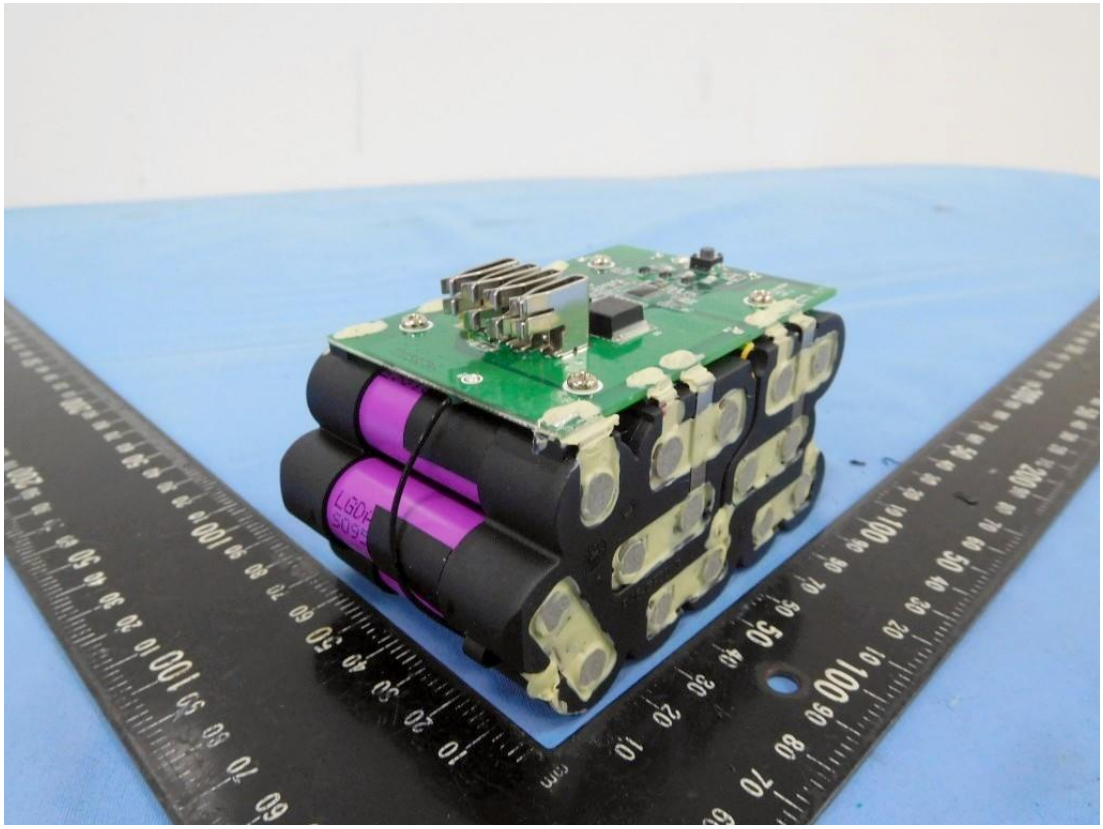

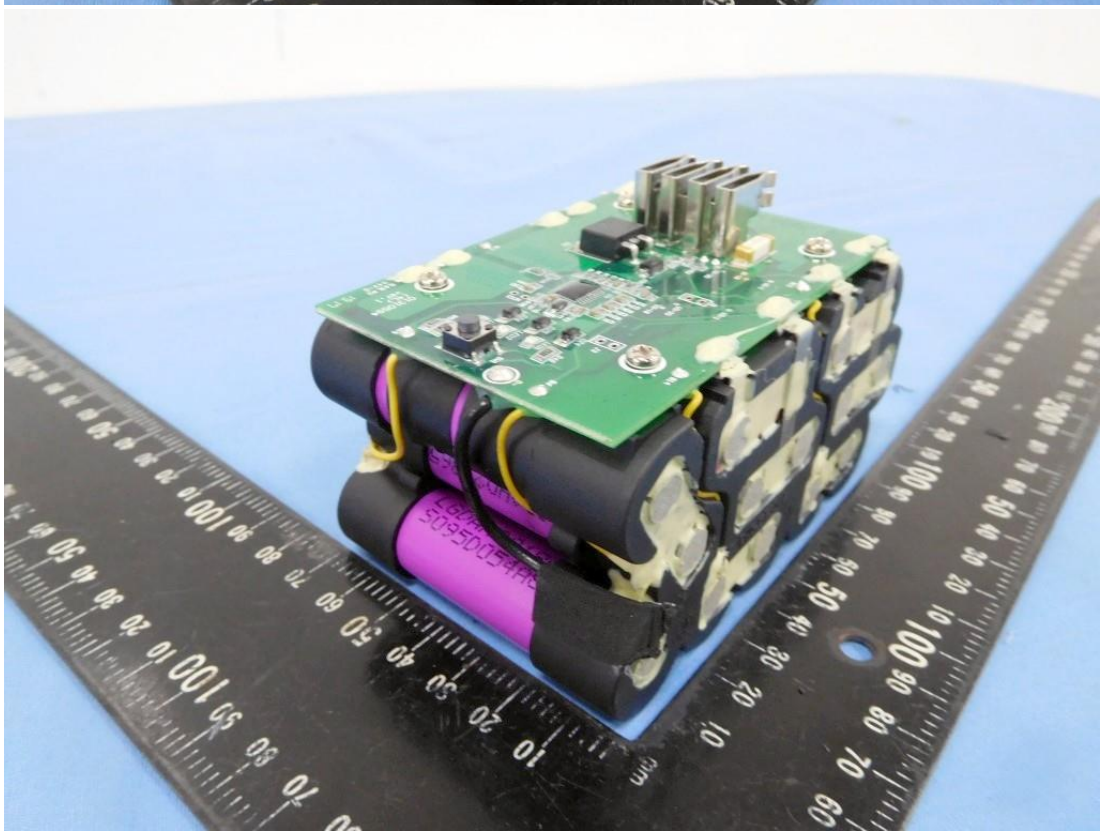

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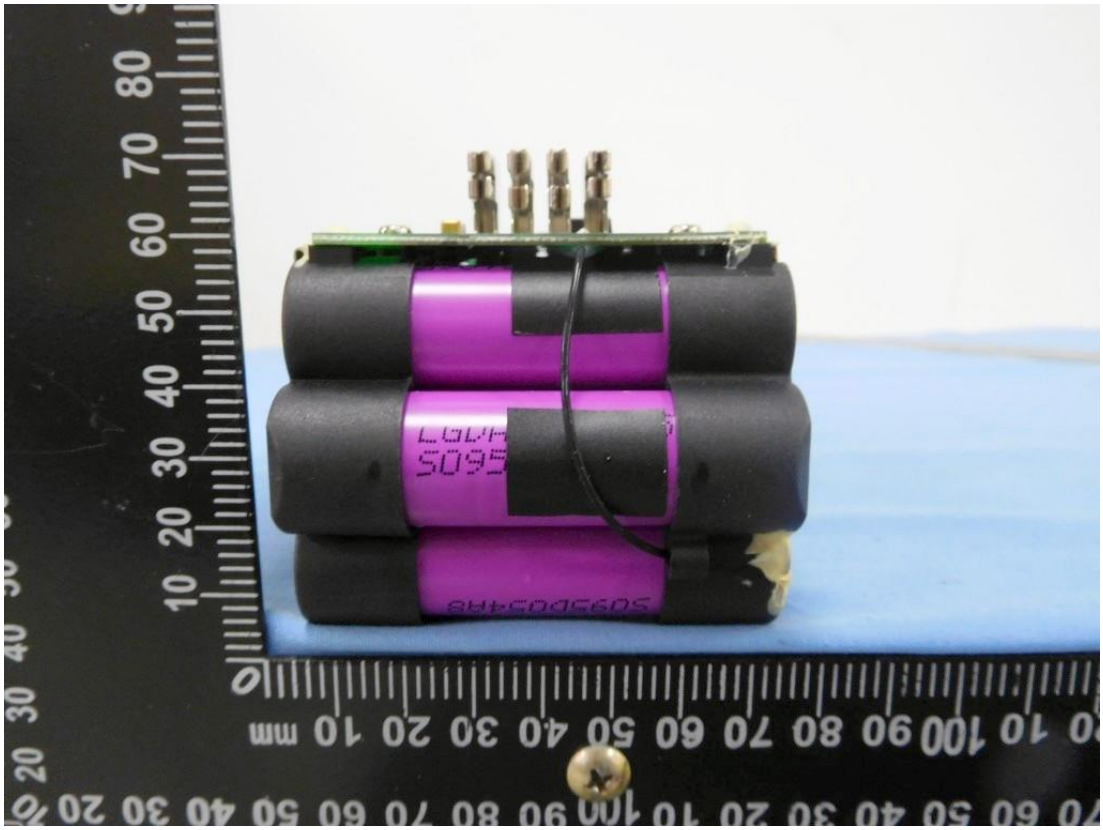

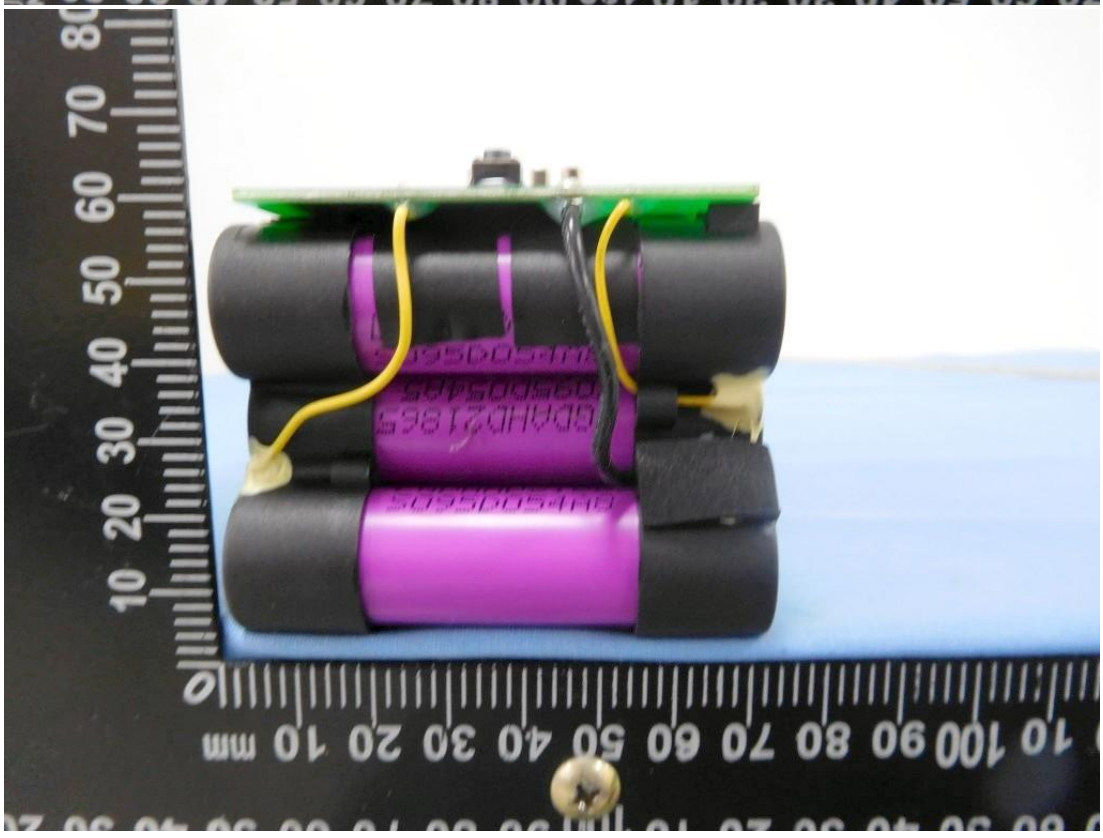

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