CMC TESTING 众检检验

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TEST REPORT

UL 1642

Lithium Batteries

Report Number. .....:	CMC250815002
Date of issue .....:	2025-09-15
Total number of pages.....:	38 pages
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Reviewed by (name, signature) ....:	Dylan Dou/Project Manager
Approved by (name, signature) ....:	Barry He/Technical Manager
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Applicant's name.....:	**TAIWAN ZHIFENGWEI TECHNOLOGY LIMITED**
Address .....:	ROOM 02.21/F.HIP KWAN COMMERCIAL BUILDING.38 PITT STREET,YAU MATEI.KOWLOON.H.K
Manufacturer's name.....:	**Zhifengwei (Chengdu) Technology Co., Ltd.**
Address .....:	No. 866, Tongwang Road, Industrial Centralized Development Zone, Qingbaijiang District, Chengdu City, Sichuan Province
Test specification:	
Standard .....:	UL 1642: 2020
Test procedure .....:	Type approved
Non-standard test method.....:	N/A
Test result .....:	Pass
Test item description .....:	Li-ion Cell
Trade Mark .....:	N/A
Model/Type reference .....:	See table 4 on page 5
Ratings .....:	See page 5

General disclaimer:

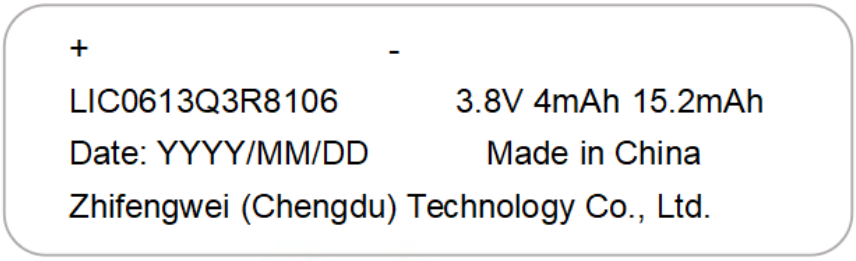
The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the CMC. The authenticity of this Test Report and its contents can be verified by contacting the CMC, responsible for this Test Report.

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

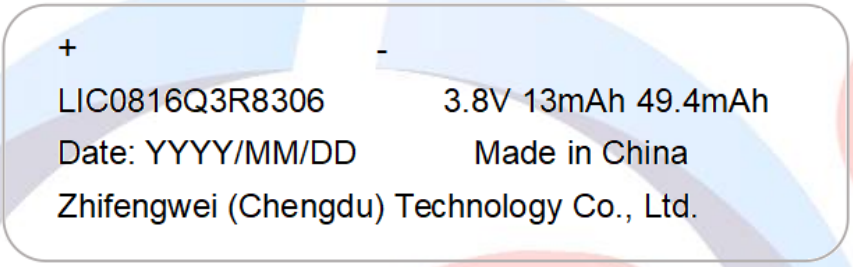
Attachment 1: Photo documentation (on pages 35 to 37).

Test item particulars:	
Information about the product needed to establish a correct test program, such as product mobility, type of power connections and similar.	(Test item particulars are selected by the TRF Originator base on the requirements in the standard)
Designation.....:	See table 4 on page 5
Nominal voltage.....:	3.8V
Rated capacity.....:	See table 4 on page 5
Maximum charge voltage .....:	4.20V
End discharge voltage.....:	2.5V
Manufacturer's charge method.....:	Charge the cell at 1.0C CC to 4.0V, then 4.0V CV until charging current reaches 0.01C at 20±5°C.
Utilization Type.....:	Technician replaceable cell
Sample Number.....:	SN250815002C001-SN250815002C115 SN250815005C001-SN250815005C115 SN250815006C001-SN250815006C115
Possible test case verdicts:	
Test case does not apply to the test object.....:	N/A
Test object does meet the requirement .....:	P(ass)
Test object does not meet the requirement.....:	F(ail)
Testing:	
Date of receipt of test item.....:	2025-08-15
Date(s) of performance of tests ....:	2025-08-20 to 2025-09-03
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. "(CXXX)" refers to sample number of cells, "X" is 0~9; "(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 ☐ comma / ☒ point is used as the decimal separator.**	

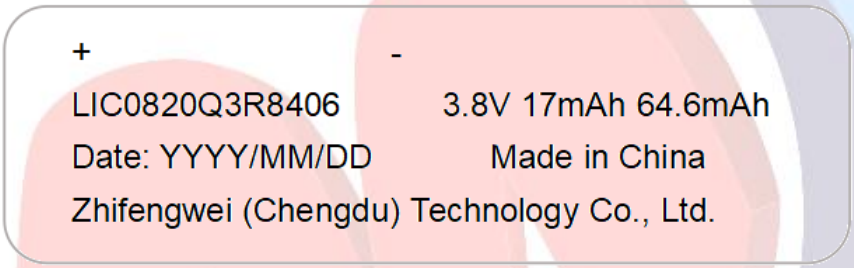
Copy of marking plate:



Label 1 for model LIC0613Q3R8106



Label 2 for model LIC0816Q3R8306



Label 3 for model LIC0820Q3R8406

Remark:
1. For the date code “YYYY/MM/DD”:
“YYYY” represents the year of manufacture
“MM” represents the month of manufacture
“DD” represents the day of manufacture
e.g.: 2025/09/05 represents Sept. 05th, 2025
2. Due to similarity of the marking plate, only label of three representative models listed.

Summary of testing:
The component cell is evaluated in this test report per the following test items according to UL 1642: 2020. Charging method declared by the manufacturer: charge the cell at 1.0C CC to 4.0V, then 4.0V CV until charging current reaches 0.01C at 20±5°C.

Test items:
cl.10 Short-Circuit Test
cl.11 Abnormal Charging Test
cl.13 CrushTest
cl.14 Impact Test
cl.15 Shock Test
cl.16 Vibration Test
cl.17 Heating Test
cl.18 Temperature Cycling Test
cl.19 Low Pressure (Altitude Simulation) Test
cl.20 Projectile Test

Description of the product:
This cell consists of the positive electrode plate, negative electrode plate, separator and electrolyte. The positive and negative electrode plates are housed in the case in the state being separated by the separator.
1) These tested cells have not been evaluated in combination with charger(s) or host product(s). Additional evaluation to determine compliance may be required on the combination(s) in the end product evaluation.
2) The tested cells were evaluated for a maximum charge current and maximum voltage limit outlined in the Table below. The end product evaluation shall ensure that current and voltage limits noted are maintained.
3) The charging temperature is 0~45°C and the discharging temperature is -20~60°C.
4) The ten models (model name: **LIC0820Q3R8406**, **LIC0816Q3R8306**, LIC1013Q3R8306, LIC0825Q3R8306, LIC0622Q3R8256, LIC1013Q3R8256, LIC0820Q3R8256, LIC0813Q3R8206, **LIC0613Q3R8106**, LIC0813Q3R8106) are identical (same shape, same chemical system, using same material), except the model name and the capacity. The tested models LIC0820Q3R8406, LIC0816Q3R8306 and LIC0813Q3R8106 are representatives of all models.
5) The charging method of cl.17: charge the cell (CC/CV) at 10C and 4.25V until charging current reaches 0.05C (10 pcs at 45°C and 10 pcs at-5°C).

- Table 1: Electrical parameter of model LIC0613Q3R8106:

Model	Nominal capacity	Nominal voltage	Nominal Charge current	Nominal discharge current	Max. Charge current	Max. Discharge current	Max. Charge voltage	End discharge voltage
LIC0613Q3R8106	4mAh	3.8V	4mA	4mA	40mA	40mA	4.20V	2.5V

- Table 2: Electrical parameter of model LIC0816Q3R8306:

Model	Nominal capacity	Nominal voltage	Nominal Charge current	Nominal discharge current	Max. Charge current	Max. Discharge current	Max. Charge voltage	End discharge voltage
LIC0816Q3R8306	13mAh	3.8V	13mA	13mA	130mA	130mA	4.20V	2.5V

- Table 3: Electrical parameter of model LIC0820Q3R8406:

Model	Nominal capacity	Nominal voltage	Nominal Charge current	Nominal discharge current	Max. Charge current	Max. Discharge current	Max. Charge voltage	End discharge voltage
LIC0820Q3R8406	17mAh	3.8V	17mA	17mA	170mA	170mA	4.20V	2.5V

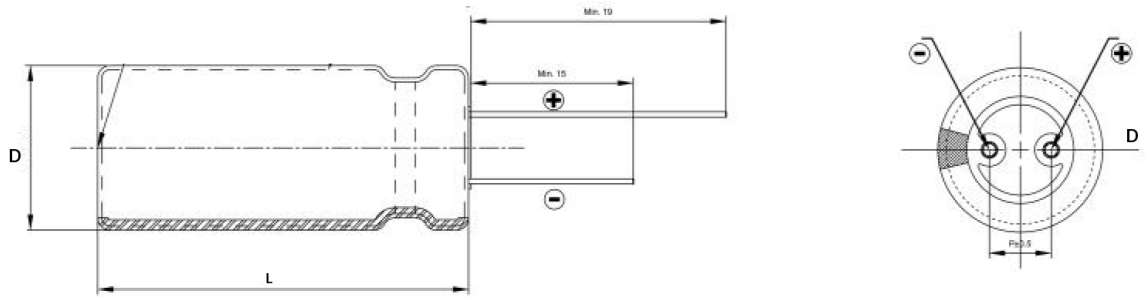
Remark: for other models feature, see Table 4 below.

- Table 4: All of the models:

Model	Energy density (Wh/L)	Rated capacity (mAh)	Max. Diameter (mm)	Max. Height (mm)	Nominal charge current (mA)	Nominal discharge current (mA)	Max. charge current (mA)	Max. discharge current (mA)
LIC0820Q 3R8406	**64.26**	**17**	**8**	**20**	**17**	**17**	**170**	**170**
LIC0816Q 3R8306	**61.42**	**13**	**8**	**16**	**13**	**13**	**130**	**130**
LIC1013Q 3R8306	48.38	13	10	13	13	13	130	130
LIC0825Q 3R8306	39.31	13	8	25	13	13	130	130
LIC0622Q 3R8256	55.41	10	6.3	22	10	10	100	100
LIC1013Q 3R8256	37.22	10	10	13	10	10	100	100
LIC0820Q 3R8256	37.80	10	8	20	10	10	100	100
LIC0813Q 3R8206	46.52	8	8	13	8	8	80	80
LIC0613Q 3R8106	**37.51**	**4**	**6.3**	**13**	**4**	**4**	**40**	**40**
LIC0813Q 3R8106	23.26	4	8	13	4	4	40	40

Remark: All the models have the same nominal voltage 3.8V and the same end discharge voltage 2.5V, and have the same Max. charge voltage 4.20V.

Construction:



(Dimensions value refer to Table 4)

Cell

Factory location:

Zhifengwei (Chengdu) Technology Co., Ltd.

No. 866, Tongwang Road, Industrial Centralized Development Zone, Qingbaijiang District, Chengdu City, Sichuan Province

UL1642: 2020			
Clause	Requirement + Test	Result - Remark	Verdict
INTRODUCTION			
1	**Scope**		P
2	**General**		P
3	**Glossary**		P
CONSTRUCTION			
4	**General**		N/A
4.1	**Casing**		N/A
4.1.1	The casing of a lithium battery shall have the strength and rigidity necessary to resist the abuses to which it may be subjected, without resulting in a risk of fire. The casing of a user-replaceable lithium battery shall have the strength and rigidity necessary to resist the abuses to which it may be subjected without resulting in a risk of injury to persons.	Technician-replaceable cell without enclosure.	N/A
4.1.2	A cell of a user-replaceable battery shall be in a rigid casing of sufficient strength to prevent flexing. A tool providing the mechanical advantage of a pliers, screwdriver, or hacksaw shall be the minimum capable of opening the user-replaceable cell casing, if opening of the casing will expose metallic lithium.	See above.	N/A
4.2	**Electrolyte**		N/A
4.2.1	A user-replaceable battery shall not contain pressurized vapor or liquid that could spray materials into the eyes or leak more than 5 mL of liquid when the battery casing is punctured under normal laboratory conditions, 23 ±2°C (73 ±3.6°F).	Technician-replaceable cell.	N/A
4.3	**Use**		N/A
4.3.1	A lithium battery shall be protected from abnormal charging currents during use. A battery tested and found acceptable for the charging current, I_C (see Section 11), under fault conditions specified by the manufacturer, shall be protected from larger charging currents in the end product application by: a) Two blocking components, such as diodes, or b) One blocking component and one current limiting component, such as a resistor or a fuse. The current limiting component shall limit the charging current to one-third the value used in the Abnormal Charging Test, Section 11.	Cell only.	N/A
PERFORMANCE			
5	**General**		P
5.1	**Technician-replaceable Batteries**		P

UL1642: 2020			
Clause	Requirement + Test	Result - Remark	Verdict
5.1.1	Technician-replaceable lithium cells or batteries are to be tested as described in Sections 10 – 20. Section 12, Forced-Discharge Test, is applicable only to cells intended to be used in series-connected multicell applications such as battery packs. For multicell installations, also see 5.3.1.		P
5.1.2	When a fire or explosion occurs as a result of the Crush Test, Section 13, or the Impact Test, Section 14, or the cell or battery ruptures to the extent that the aluminum test cage is penetrated during the Projectile Test, Section 20; the use of the technician replaceable cell or battery shall be restricted to applications in which it is not exposed to, or is protected from, any conditions shown to cause a fire or explosion.	No fire or explosion occurs.	P
5.1.3	Cells and batteries subjected to the Shock Test, Section 15, Vibration Test, Section 16, Temperature Cycling Test, Section 18, and Low Pressure (Altitude Simulation) Test, Section 19, shall also not leak or vent. For these tests, unacceptable leakage is determined to have occurred when the resulting mass loss exceeds the values shown in Table 5.1, Venting and leakage mass loss criteria.	No leak or vent.	P
5.2	**User-replaceable Batteries**		N/A
5.2.1	User-replaceable lithium cells or batteries are to be tested as described in Sections 10 – 20. Section 12, Forced Discharge Test, is applicable only to cells intended to be used in multicell applications such as battery packs. In addition to complying with the requirements for a technician replaceable cell or battery as specified in 5.1.1, a user-replaceable cell or battery shall not explode or ignite when subjected to the Crush Test, Section 13, or the Impact Test, Section14. A user-replaceable battery shall comply with the requirements for Sections 10 – 20 and with the applicable construction requirements outlined in Section 4. Secondary lithium cells shall not be considered user-replaceable.	Technician-replaceable cell.	N/A
5.2.2	Sets of five specimens each are to be used for the Projectile Test, Section 20.3; see Table 6.1. When only one specimen from a set of five does not comply with the requirements, another set of five specimens is to be tested. All specimens from this second set shall comply with the requirements.	Technician-replaceable cell.	N/A
5.3	**Multi-cell Installation**		N/A

UL1642: 2020			
Clause	Requirement + Test	Result - Remark	Verdict
5.3.1	A technician-replaceable or user-replaceable cell intended for use in multicell installations or battery packs shall also be tested as described in 10.3 and Section 12. No fire or explosion shall occur as a result of these tests. In addition, batteries subjected to the test described in 10.3 shall meet the requirements as described in 5.1.1 and 5.2.1 for a cell or battery subjected to the Short-Circuit Test, Section10.	Single cell.	N/A
6	**Samples**		P
6.1	Fully charged primary cells or batteries and primary cells or batteries that have been conditioned by partial or complete discharge, or both, are to be used for the tests described in Sections 10 – 20. The number of samples to be used in each test for a primary cell or battery is shown in Table 6.1. When a group of cells or batteries of different sizes, but similar chemistries is involved, selected sizes representative of the range are to be tested.	The samples are secondary cells.	N/A
6.2	Fully charged secondary cells or batteries and secondary cells or batteries that have been conditioned by charge-discharge cycling are to be used for the tests described in Sections 10 – 20. The number of samples to be used in each test for a secondary cell or battery is shown in Table 6.2. When a group of cells or batteries of different sizes, and similar chemistries is involved, selected sizes representative of the range are to be tested.	The samples are secondary technician-replaceable cells. Prepared as required.	P
6.3	Prior to conducting the testing in Section 17, the lithium ion cell samples shall be pre-conditioned as outlined in 6.4 and 6.5.	Prepared as required.	P
6.4	For the heating test of Section 17, two sets of five lithium ion cell samples are to be fully discharged (i.e. to the manufacturer's specified end point voltage). The samples are then placed in a test chamber and conditioned for 1 to 4 h (5 samples at the upper temperature limit and 5 samples at the lower temperature limit of the operating region) as outlined in Table 6.3.	Prepared as required.	P
6.5	While still in the test chamber set at the temperature limits, the samples are charged (5 samples at the upper temperature limit and 5 samples at lower temperature limit) at the specified maximum charging current and upper limit charging voltage per Table 6.3, using a constant voltage charging method. Charging is continued until the charge current is reduced to the specified end of charge conditions (i.e. 0.05 times the charge current).	Prepared as required.	P
7	**Conditioning of Samples**		P
7.1	**Discharge**		N/A

UL1642: 2020			
Clause	Requirement + Test	Result - Remark	Verdict
7.1.1	Primary batteries are to be completely discharged by connecting their terminals through resistors that provide the desired level of discharge within 60 days. Batteries are to be discharged at room temperature. Cells with a liquid cathode such as thionyl chloride or sulfur dioxide, shall also be conditioned by one-half discharge	The samples are secondary cells.	N/A
7.1.2	For solid electrolyte and other types of primary lithium batteries that cannot be discharged within 60 days because of the small currents they inherently produce, longer discharge times plus discharge at higher temperatures may be used to obtain the desired level of discharge. The manufacturer's recommended discharge procedures are to be followed so as to obtain the required discharge level in the minimum time.	The samples are secondary cells.	N/A
7.2	**Charge-discharge cycling**		P
7.2.1	Secondary cells are to be conditioned at 25°C (77°F). Cells are continuously cycled as per the manufacturer's specifications. The specification shall be such that the full rated capacity of the cell is utilized and the number of cycles accumulated shall be at least equal to 25% of the advertised cycle life of the cell or cycled continuously for 90 days, whichever is shorter. Cycling is to be done either individually or in groups. Cells are to be recharged prior to testing as indicated in Table 6.2.	The samples are cycled at manufacturer's factory before they were sent for test.	P
8	**Important test considerations**		P
8.1	Some lithium batteries are capable of exploding when the tests described in Sections 10-20 are conducted. It is important that personnel be protected from the flying fragments, explosive force, sudden release of heat, and noise that results from such explosions. The test area is to be well ventilated to protect personnel from possible harmful fumes or gases.	Prepared the tests as required.	P
8.2	As an additional precaution, the temperatures on the surface of the battery casings shall be monitored during the tests described in Sections 10, 11, 12, 13, and 14. All personnel involved in the testing of lithium batteries are to be instructed never to approach a lithium battery while the surface temperature exceeds 90°C (194°F) and not to touch the lithium battery while the surface temperature exceeds 45°C (113°F).	Prepared the tests as required.	P
8.3	For protection, the Projectile Test, Section 20 is to be conducted in a room separate from the observer.	Prepared the tests as required.	P
9	**Temperature measurements**		P

UL1642: 2020			
Clause	Requirement + Test	Result - Remark	Verdict
9.1	Temperatures are to be measured by thermocouples consisting of wires not larger than 24 AWG (0.21 mm^2) and not smaller than 30 AWG (0.05 mm^2) and a potentiometer-type instrument.	Prepared the tests as required.	P
9.2	The temperature measurements on the batteries are to be made with the measuring junction of the thermocouple held tightly against the metal casing of the battery.	Prepared the tests as required.	P
TESTS FOR TECHNICIAN-REPLACEABLE AND USER-REPLACEABLE BATTERIES			
ELECTRICAL TESTS			
10	**Short-Circuit Test**		P
10.1	Each test sample battery, in turn, is to be short-circuited by connecting the positive and negative terminals of the battery with a circuit load having a resistance load of 80±20mΩ. The temperature of the battery case is to be recorded during the test. The battery is to discharge until a fire or explosion is obtained, or until it has reached a completely discharged state of less than 0.2 V and the battery case temperature has returned to ±10°C (±18°F) of ambient temperature. The voltage at the end of the test may not reach 0.2 V due to operation of protective devices in the circuit. The return to near ambient of the battery (cell) casing in an indication of ultimate results.	Tested as required. See table 10.	P
10.2	Tests are to be conducted at 20 ±5°C (68 ±9°F) and at 55 ±5°C (131 ±9°F). The batteries are to reach equilibrium at 20 ±5°C or 55 ±5°C, as applicable, before the terminals are connected.	Tested as required.	P
10.3	A battery is to be tested individually unless the manufacturer indicates that it is intended for use in series or parallel. For series or parallel use, additional tests on five sets of batteries are to be conducted using the maximum number of batteries to be covered for each configuration.	Tested as required.	P
10.4	When an overcurrent protective device activates during the test, the test shall be repeated with the battery supply connected to the maximum load that does not cause the protective device to open. Protective devices that are relied upon to meet the compliance criteria for the short circuit test shall comply with 2.3.1.	Only one single lithium-ion cell, no over-current or thermal protective device was integrated into the cell.	N/A
10.5	The samples shall not explode or catch fire.	The test results meet the requirements.	P
11	**Abnormal Charging Test**		P
11.1	Primary cells or batteries shall comply with 11.2—11.7.	Secondary cell.	N/A

UL1642: 2020			
Clause	Requirement + Test	Result - Remark	Verdict
11.2	Cells or batteries conditioned in accordance with Tables 6.1, as applicable, are to be used for this test. The batteries are to be tested in an ambient temperature of 20 ±5°C (68 ±9°F).		N/A
11.3	Each test sample battery is to be subjected to a charging current of three times the current I_c, specified by the manufacturer by connecting it in opposition to a dc-power supply. The specified charging current is to be obtained by connecting a resistor of the specified size and rating in series with the battery. The test charging time is to be calculated using the formula: $t_c = \frac{2.5C}{3(I_c)}$, in which ***$t_c$** is the charging time in hour* ***C** is the capacity of the cell/batteiy in ampere-hours, and* ***I_c** is the maximum charging current, in amperes, specified by the manufacturer.* The minimum charging time is to be 7 hours.		N/A
11.4	When a non-resettable overcurrent or protective device operates during the test, the test is to be repeated at a charge current below the level that the protective device operates. When a resettable protective device operates during the test, the protector is allowed to reset to a total of 10 cycles; or until the appropriate charging time has been completed, but not less than 7 hours. Protective devices that are relied upon to meet the compliance criteria for the abnormal charging test shall comply with 2.3.1.		N/A
11.5	The samples shall not explode or catch fire.		N/A
11.6	Secondary cells or batteries shall comply with 11.7— 11.10.	See table 11, tested as required.	P
11.7	Cells or batteries conditioned in accordance with Tables 6.2, as applicable, are to be used for this test. The batteries are to be tested in an ambient temperature of 20 ±5°C (68 ±9°F).	Tested as required.	P
11.8	Each test sample battery is to be discharged at a constant current of 0.2 C/1 h, to a manufacturer specified discharge endpoint voltage. The cell or battery is then to be charged with a constant maximum specified output voltage and a current limit of three times the maximum charging current I_c, specified by the manufacturer. Charging duration is to be 7 hours or the time required to reach the manufacturer's specified end-of-charge condition, whichever is greater.	Tested as required.	P

UL1642: 2020			
Clause	Requirement + Test	Result - Remark	Verdict
11.9	When a non-resettable overcurrent or protective device operates during the test, the test shall be repeated at an overcharging current below the level that the protection device operates. When a resettable protective device operates during the test, the protector is to be allowed to reset to a total of 10 cycles; or until the appropriate charging time has been completed, but not less than 7 hours. Protective devices that are relied upon to meet the compliance criteria for the abnormal charging test shall comply with 2.3.1.	The samples are to be tested without any assistance of over-current or thermal protective devices.	N/A
11.10	The samples shall not explode or catch fire.	No explosion or catch fire during and after the test.	P
12	**Forced-Discharged Test**		N/A
12.1	This test is intended for cells that are to be used in series-connected, multicell applications, such as battery packs.	One single cell.	N/A
12.2	A fully discharged cell is to be force-discharged by connecting it in series with fully charged cells of the same kind. The number of fully charged cells to be connected in series with the discharged cell is to equal the maximum number less one of the cells to be covered for series use. Five cells are to be completely discharged, at room temperature.		N/A
12.3	Once the fully discharged cell is connected in series with the specified number of fully charged cells the resultant battery pack is to be short circuited.		N/A
12.4	The positive and negative terminals of the sample are to be connected with a copper wire with a resistance load of 80±20mΩ. The sample is to discharge until a fire or explosion is obtained, or until it has reached a completely discharged state of less than 0.2V and the battery case temperature has returned to ±10°C (18°F) of ambient temperature. The voltage at the end of the test may not reach 0.2V due to operation of protective devices in the circuit. The return to near ambient of the cell casing is an indication of ultimate results.		N/A
12.5	When an overcurrent or protective operates during the test, the test shall be repeated with the battery supply connected to the maximum load that does not cause the protective device to open. Protective devices that are relied upon to meet the compliance criteria for the forced discharge test shall comply with 2.3.1.		N/A
12.6	The samples shall not explode or catch fire.		N/A
MECHANICAL TESTS			
13	**Crush Test**		P

UL1642: 2020			
Clause	Requirement + Test	Result - Remark	Verdict
13.1	A battery is to be crushed between two flat surfaces. The force for the crushing is to be applied by a hydraulic ram or similar force mechanism. The flat surfaces are to be brought in contact with the cells and the crushing is to be continued until an applied force of 13 ±1 kN (3000 ±224 lbs) is reached. Once the maximum force has been obtained it is to be released.	Tested as required. See table 13.	P
13.2	A cylindrical, pouch or prismatic cell is to be crushed with its longitudinal axis parallel to the flat surfaces of the crushing apparatus. A prismatic cell is also to be rotated 90° around its longitudinal axis so that both the wide and narrow sides will be subjected to the crushing force. Each sample is to be subjected to a crushing force in only one direction. Separate samples are to be used for each test. Exception: For Lithium ion systems, a cylindrical, pouch or prismatic cell is to be crushed with its longitudinal axis parallel to the flat surface of the crushing apparatus. Each sample is to be subjected to a crushing force in only one direction. Test only the wide side of pouch and prismatic cells.	Tested as required. The samples are cylindrical lithium-ion cells.	P
13.3	A coin or button battery is to be crushed with the flat surface of the battery parallel with the flat surfaces of the crushing apparatus.	Not a coin or button battery.	N/A
13.4	The samples shall not explode or catch fire.	No explosion or catch fire during and after the test.	P
14	**Impact Test**		P
14.1	A test sample battery is to be placed on a flat surface. A 15.8 ±0.1-mm (5/8 ±0.004-in) diameter bar is to be placed across the center of the sample. A 9.1 ±0.46-kg (20 ±1-lb) weight is to be dropped from a height of 610 ±25 mm (24 ±1 in) onto the sample. See Figure 14.1.	Tested as required. See table 14.	P
14.2	A cylindrical, pouch or prismatic cell is to be impacted with its longitudinal axis parallel to the flat surface and perpendicular to the longitudinal axis of the 15.8-mm (5/8-in) diameter curved surface lying across the center of the test sample. A prismatic cell is also to be rotated 90° around its longitudinal axis so that both the wide and narrow sides are subjected to the impact. Each sample is to be subjected to only a single impact. Separate samples are to be used for each test.	Tested as required.	P

UL1642: 2020			
Clause	Requirement + Test	Result - Remark	Verdict
	Exception 1: For Lithium ion systems, a cylindrical, pouch or prismatic cell is to be impacted with its longitudinal axis parallel to the flat surface and perpendicular to the longitudinal axis of the 15.8-mm (5/8-in) diameter curved surface lying across the center of the test sample. Each sample is to be subjected to only a single impact. Test only the wide side of pouch and prismatic cells.	The samples are lithium-ion cells.	P
	Exception 2: Pouch cells not evaluated to this test, and with a capacity greater than 300mAh, shall comply with the Round Bar Crush Test in Section 14A.	Cylindrical cell.	N/A
14.3	A coin or button battery is to be impacted with the flat surface of the test sample parallel to the flat surface and the 15.8-mm (5/8-in) diameter curved surface lying across its center.		N/A
14.4	The samples shall not explode or catch fire.	No explosion or catch fire.	P
14A	**Round Bar Crush Test**		N/A
14A.1	With reference to Exception No. 2 in 14.2, pouch cells not evaluated with the Impact Test in Section 14 and with a capacity greater than 300 mAh shall be evaluated with this test.		N/A
14A.2	The sample shall be fully charged with the method recommended by the manufacturer.		N/A
14A.3	The sample shall be positioned on a flat surface with a 25 ±1 mm (1 ±0.039 in) diameter steel round bar placed on top of the sample. The edge of the bar is to be aligned with the top edge of the cell body, with the longitudinal axis of the bar perpendicular to the tab of the cell. The bar shall extend beyond the width of the test sample on each side by at least 5 mm (0.197 in) as shown in Figure 14A.1. A preload pressure of 0.4 – 0.6 N/cm^2 (0.58 – 0.87 psi) shall be applied before the sample thickness is measured in 14A.5 and the crush force in 14A.6 is applied. See 14A.4. NOTE: A sample may be taped, glued or clamped to the flat surface, avoiding obstructing the round bar placement and crush plate motion, to eliminate any unevenness between the sample and the flat test surface.		N/A
14A.4	For cells with the positive tab and negative tab on opposite sides, the bar placement in 14A.3 and the crush force application in 14A.6 are applied on each side of the cell near the tabs, using a different set of samples for each side.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
14A.5	After the bar placement per 14A.3 or 14A.4 and the preload pressure is applied per 14A.3, the thickness of the sample shall be measured allowing a tolerance of ±0.1 mm (±0.039 in), using the Measuring Method of Cell Thickness in the Annex for Dimensions of the Cell with a Laminate Film Case in the Standard for Secondary Cells and Batteries Containing Alkaline or Other Non-Acid Electrolytes – Secondary Lithium Cells and Batteries for Portable Applications – Part 3: Prismatic and Cylindrical Lithium Secondary Cells, and Batteries Made from Them, IEC 61960-3.		N/A
14A.6	A crush force shall be applied onto the round bar, with a crushing direction of 90 ±1° between the crushing direction and round bar and the crushing direction and test platform. The displacement in the vertical direction shall be measured. The moving speed of the crush plate is to be no greater than 0.1 mm/s (0.004 in/s). The displacement of the crush plate shall be stopped and held for 30 s once the cell deformation reaches 13 ±1% of the cell thickness (starting from the preload thickness measured in 14A.5) or the crush force reaches the force value in Table 14A.1, whichever comes first. See Figure 14A.1 and Figure 14A.2.		N/A
14A.7	The samples shall not explode or catch fire.		N/A
15	**Shock Test**		P
15.1	The cell is to be secured to the testing machine by means of a rigid mount which supports all mounting surfaces of the cell. Each cell shall be subjected to a total of three shocks of equal magnitude. The shocks are to be applied in each of three mutually perpendicular directions unless it has only two axes of symmetry in which case only two directions shall be tested. Each shock is to be applied in a direction normal to the face of the cell. For each shock the cell is to be accelerated in such a manner that during the initial 3 ms the minimum average acceleration is 75 g (where g is the local acceleration due to gravity). The peak acceleration shall be between 125 and 175 g. Cells shall be tested at a temperature of 20 ± 5°C (68 ± 9°F).	Prepared the test as required. See table 15.	P
15.2	The samples shall not explode or catch fire. In addition, the sample shall not vent or leak as described in 5.1.1.	No explosion or catch fire, the sample not vent or leak.	P
16	**Vibration Test**		P
16.1	A battery is to be subjected to simple harmonic motion with an amplitude of 0.8 mm (0.03 inch) [1.6 mm (0.06 inch) total maximum excursion].	Prepared the test as required. See table 16.	P

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Clause	Requirement + Test	Result - Remark	Verdict
16.2	The frequency is to be varied at the rate of 1 Hz/min between 10 and 55 Hz, and return in not less than 90 nor more than 100 min. The battery is to be tested in three mutually perpendicular directions. For a battery that has only two axes of symmetry, the battery is to be tested perpendicular to each axis.	Tested as required.	P
16.3	The samples shall not explode or catch fire. In addition the sample shall not vent or leak as described in 5.1.1.	The test results meet the requirements.	P
ENVIRONMENTAL TESTS			
17	**Heating Test**		P
17.1	A battery is to be heated in a gravity convection or circulating air oven with an initial temperature of 20 ±5°C (68±9°F). The temperature of the oven is to be raised at a rate of 5 ±2°C (9±3.6°F) per minute to a temperature of 130 ±2°C (266±3.6°F) and remain for 10 min. The sample shall return to room temperature (20±5°C) and then be examined. For batteries specified for temperatures above 100°C (212°F), the conditioning temperature shall be increased from 130 ±2°C (266±3.6°F), to 30±2°C (86±3.6°F) above the manufacturers maximum specified temperature. For a battery of lithium metal chemistry, the conditioning temperature shall be increased to a maximum of 170 ±2°C (338±3.6°F).	Tested as required. Oven temperature: 130°C.	P
17.2	The samples shall not explode or catch fire.	The test results meet the requirements.	P
18	**Temperature Cycling Test**		P
18.1	The batteries are to be placed in a test chamber and subjected to the following cycles: a) Raising the chamber-temperature to 70 ±3°C (158 ±5°F) within 30 minutes and maintaining this temperature for 4 hours. b) Reducing the chamber temperature to 20 ±3°C (68 ±5°F) within 30 minutes and maintaining this temperature for 2 hours. c) Reducing the chamber temperature to minus 40 ±3°C (minus 40 ±5°F) within 30 minutes and maintaining this temperature for 4 hours. d) Raising the chamber temperature to 20 ±3°C (68 ±5°F) within 30 minutes. e) Repeating the sequence for a further 9 cycles. f) After the 10th cycle, storing the batteries for a minimum of 24 hours, at a temperature of 20 ±5°C (68 ±9°F) prior to examination.	Tested as required. See table 18.	P
18.2	The samples shall not explode or catch fire. In addition, the samples shall not vent or leak as described in 5.1.1.	The test results meet the requirements.	P

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Clause	Requirement + Test	Result - Remark	Verdict
19	**Low Pressure (Altitude Simulation) Test**		P
19.1	Sample batteries are to be stored for 6 hours at an absolute pressure of 11.6 kPa (1.68 psi) and a temperature of 20 ± 3°C (68 ± 5°F).	Tested as required. See table 19.	P
19.2	The samples shall not explode or catch fire as a result of the Low Pressure (Altitude Simulation) Test. In addition, the samples shall not vent or leak as described in 5.1.1.	The test results meet the requirements.	P
FIRE EXPOSURE TEST			
TESTS FOR USER-REPLACEABLE LITHIUM BATTERIES			
20	**Projectile Test**		P
20.1	When subjected to the test described in 20.2 - 20.5 no part of an exploding cell or battery shall penetrate the wire screen such that some or all of the cell or battery protrudes through the screen.	The test results meet the requirements.	P
20.2	Each test sample cell or battery is to be placed on a screen that covers a 102 mm (4 inch) diameter hole in the center of a platform table. The screen is to be constructed of steel wire mesh having 20 openings per inch (25.4 mm) and a wire diameter of 0.017 inch (0.43 mm).	Prepared the test as required.	P
20.3	The screen is to be mounted 38 mm (1-1/2 inch) above a burner. The fuel and air flow rates are to be set to provide a bright blue flame that causes the supporting screen to glow a bright red.	Prepared the test as required.	P
20.4	An eight-sided covered wire cage, 610 mm (2 feet) across and 305 mm (1 foot) high, made from metal screening is to be placed over the test sample. See Figure 20.1. The metal screening is to be constructed from 0.25 mm (0.010 inch) diameter aluminum wire with 16 — 18 wires per inch (25.4 mm) in each direction.	Tested as required.	P
20.5	The sample is to be heated and shall remain on the screen until it explodes or the cell or battery has ignited and burned out. It is not required to secure the sample in place unless it is at risk of falling off the screen before the test is completed. When required, the sample shall be secured to the screen with a single wire tied around the sample.	Tested as required.	P
MARKING			
21	**General**		P

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Clause	Requirement + Test	Result - Remark	Verdict
21.1	A battery shall be legibly and permanently marked with: The manufacturer's name, trade name, or trademark or other descriptive marking by which the organization responsible for the product may be identified; A distinctive ("catalog" or "model") number or the equivalent; The date or other dating period of manufacture not exceeding any three consecutive months.	See the copy of marking plate on page 3.	P
21.2	If a manufacturer produces a battery at more than one factory, each battery package shall have a distinctive marking to identify it as the product of a particular factory.	One single factory.	N/A
22	**Primary Batteries**		N/A
22.1	A primary battery shall be marked with the word "WARNING" and the following or an equivalent statement: "Risk of fire and burns. Do not recharge, open, crush, heat above (the manufacturer's specified temperature rating), or incinerate." If space does not permit marking on the battery, the marking may be on the smallest unit package.	Secondary cell.	N/A
22.2	The packaging for a user-replaceable battery shall be marked with the word "CAUTION" and the following or equivalent statements: "Risk of fire and burns. Do not recharge, disassemble, heat above (the manufacturer's specified temperature rating), or incinerate. Keep battery out of reach of children and in original package until ready to use. Dispose of used batteries promptly."		N/A
22.3	For user replaceable lithium primary coin cells (3.0 V) the packaging shall also include the following or equivalent: "WARNING – Never put batteries in mouth. Swallowing may lead to serious injury or death. If ingested, immediately seek medical attention and have the doctor phone the National Capital Poison Control Center." This marking may be combined with the marking of 22.2, if the signal word "WARNING" is used instead of "CAUTION."		N/A

Critical Components					
Material: e.g. external enclosure, PCB, closed-end connector, sleeves, cord anchorage etc Components with winding: e.g. motor, transformer, magnetic coil etc. Other components: e.g. switch, thermostat, heater, plug, internal wire, capacitor, relay, varistor etc.					
Object/ Part No.	Manufacturer / Trademark	Type/Model	Technical data	Standard	Mark(s) of conformity
Cell	Zhifengwei (Chengdu) Technology Co., Ltd.	1) LIC0820Q3R8406 2) LIC0816Q3R8306 3) LIC1013Q3R8306 4) LIC0825Q3R8306 5) LIC0622Q3R8256 6) LIC1013Q3R8256 7) LIC0820Q3R8256 8) LIC0813Q3R8206 9) LIC0613Q3R8106 10) LIC0813Q3R8106	1) 3.8V, 17mAh 2) 3.8V, 13mAh 3) 3.8V, 13mAh 4) 3.8V, 13mAh 5) 3.8V, 10mAh 6) 3.8V, 10mAh 7) 3.8V, 10mAh 8) 3.8V, 8mAh 9) 3.8V, 4mAh 10) 3.8V, 4mAh	UL 1642:2020	Tested with appliance
Positive electrode	Ningbo Rongbay New Energy Technology Co., Ltd.	S76L	$LiNi_{0.6}Co_{0.2}Mn_{0.2}O_2$/AC/$LiNiO_2$, PVDF, NMP, Conductive additive	--	--
Negative electrode	Shandong OBO New Material Co., Ltd	PSCAM280	Soft/Hard carbon, SBR, CMC, Distilled water, Conductive additive	--	--
Electrolyte	Shenzhen Huachi New Energy Technology Co., LTD	CF4111H	Concentration: 1.2g/cm^3 Conductivity: 14ms/cm $LiPF_6$+EMC+EC	--	--
Separator	Nippon Kodoshi Corporation	TF 4030	Thickness: ≥30μm Density: 0.400±0.05, PE, shutdown temperature: 130°C~135°C	--	--

10	TABLE: Short-Circuit Test (for model LIC0613Q3R8106)				P
Fully Charged Cell					
Ambient temperature: 23.5°C					
Sample No.	SN250815002C001	SN250815002C002	SN250815002C003	SN250815002C004	SN250815002C005
Tmax(°C)	106.9	112.0	109.2	115.2	101.9
Failure Mode	No	No	No	No	No
Ambient temperature: 55.2°C					
Sample No.	SN250815002C006	SN250815002C007	SN250815002C008	SN250815002C009	SN250815002C010
Tmax(°C)	108.5	103.6	110.8	107.5	103.5
Failure Mode	No	No	No	No	No
Cycled Cell					
Ambient temperature: 23.1°C					
Sample No.	SN250815002C011	SN250815002C012	SN250815002C013	SN250815002C014	SN250815002C015
Tmax(°C)	107.8	114.7	108.6	106.2	101.3
Failure Mode	No	No	No	No	No
Ambient temperature 56.1°C					
Sample No.	SN250815002C016	SN250815002C017	SN250815002C018	SN250815002C019	SN250815002C020
Tmax(°C)	111.4	107.7	111.6	109.6	104.3
Failure Mode	No	No	No	No	No
Supplementary information: Tmax was recorded on the centre of the cell sureface. No explode or catch fire.					

10	TABLE: Short-Circuit Test (for model LIC0816Q3R8306)				P
Fully Charged Cell					
Ambient temperature: 22.4°C					
Sample No.	SN250815005C001	SN250815005C002	SN250815005C003	SN250815005C004	SN250815005C005
Tmax(°C)	119.7	117.7	115.1	116.6	114.7
Failure Mode	No	No	No	No	No
Ambient temperature: 56.5°C					
Sample No.	SN250815005C006	SN250815005C007	SN250815005C008	SN250815005C009	SN250815005C010
Tmax(°C)	114.9	118.2	120.3	117.9	115.5
Failure Mode	No	No	No	No	No
Cycled Cell					
Ambient temperature: 22.3°C					
Sample No.	SN250815005C011	SN250815005C012	SN250815005C013	SN250815005C014	SN250815005C015
Tmax(°C)	114.7	115.6	118.8	118.6	119.6
Failure Mode	No	No	No	No	No
Ambient temperature: 56.3°C					
Sample No.	SN250815005C016	SN250815005C017	SN250815005C018	SN250815005C019	SN250815005C020
Tmax(°C)	116.8	115.7	114.1	119.9	121.9
Failure Mode	No	No	No	No	No
Supplementary information: Tmax was recorded on the centre of the cell sureface. No explode or catch fire.					

10	TABLE: Short-Circuit Test (for model LIC0820Q3R8406)				P
Fully Charged Cell					
Ambient temperature: 23.1°C					
Sample No.	SN250815006C001	SN250815006C002	SN250815006C003	SN250815006C004	SN250815006C005
Tmax(°C)	118.6	116.8	115.9	119.9	117.3
Failure Mode	No	No	No	No	No
Ambient temperature: 56.5°C					
Sample No.	SN250815006C006	SN250815006C007	SN250815006C008	SN250815006C009	SN250815006C010
Tmax(°C)	109.4	108.2	105.4	108.8	106.7
Failure Mode	No	No	No	No	No
Cycled Cell					
Ambient temperature: 23.1°C					
Sample No.	SN250815006C011	SN250815006C012	SN250815006C013	SN250815006C014	SN250815006C015
Tmax(°C)	112.5	113.4	114.6	115.4	109.0
Failure Mode	No	No	No	No	No
Ambient temperature: 56.7°C					
Sample No.	SN250815006C016	SN250815006C017	SN250815006C018	SN250815006C019	SN250815006C020
Tmax(°C)	102.4	103.4	102.9	106.3	105.8
Failure Mode	No	No	No	No	No
Supplementary information: Tmax was recorded on the centre of the cell sureface. No explode or catch fire.					

11	TABLE: Abnormal Charging Test (for model LIC0613Q3R8106)				P
Ambient temperature: 23.9°C					
Id		0.8mA	Ue		2.5V
Ic		40mA	Uc		4.2V
Fully Charged Cell					
Sample No.	SN250815002 C021	SN250815002 C022	SN250815002 C023	SN250815002 C024	SN25081500 2C025
Tmax(°C)	25.1	25.2	25.2	25.3	25.4
Failure Mode	No	No	No	No	No
Cycled cell					
Sample No.	SN250815002 C026	SN250815002 C027	SN250815002 C028	SN250815002 C029	SN25081500 2C030
Tmax(°C)	25.2	25.3	25.4	25.1	25.2
Failure Mode	No	No	No	No	No
Supplementary information: Tmax was recorded on the centre of the cell surface; Test current is 120mA; No explode or catch fire.					

11	TABLE: Abnormal Charging Test (for model LIC0816Q3R8306)				P
Ambient temperature: 23.4 °C					
Id		2.6mA	Ue		2.5V
Ic		130mA	Uc		4.2V
Fully Charged Cell					
Sample No.	SN250815005 C021	SN250815005 C022	SN250815005 C023	SN250815005 C024	SN25081500 5C025
Tmax(°C)	26.8	26.7	26.4	27.0	26.9
Failure Mode	No	No	No	No	No
Cycled cell					
Sample No.	SN250815005 C026	SN250815005 C027	SN250815005 C028	SN250815005 C029	SN25081500 5C030
Tmax(°C)	26.6	26.5	26.8	26.7	26.6
Failure Mode	No	No	No	No	No
Supplementary information: Tmax was recorded on the centre of the cell surface; Test current is 390mA; No explode or catch fire.					

11	TABLE: Abnormal Charging Test (for model LIC0820Q3R8406)		P
Ambient temperature: 23.4°C			
Id	3.4mA	Ue	2.5V
Ic	170mA	Uc	4.2V

Fully Charged Cell

Sample No.	SN250815006C021	SN250815006C022	SN250815006C023	SN250815006C024	SN250815006C025
Tmax(°C)	26.0	26.1	26.1	26.0	26.2
Failure Mode	No	No	No	No	No

Cycled cell

Sample No.	SN250815006C026	SN250815006C027	SN250815006C028	SN250815006C029	SN250815006C030
Tmax(°C)	25.3	25.7	25.9	26.1	26.1
Failure Mode	No	No	No	No	No

Supplementary information:
Tmax was recorded on the centre of the cell surface;
Test current is 510mA;
No explode or catch fire.

13	TABLE: Crush Test (for model LIC0613Q3R8106)				P
Ambient temperature: 22.9°C					

Fully Charged Cell

Sample No.	SN250815002C031	SN250815002C032	SN250815002C033	SN250815002C034	SN250815002C035
Catch fire	No	No	No	No	No
Explode	No	No	No	No	No
Crush direction	Longitudinal axis parallel to the flat surface	Longitudinal axis parallel to the flat surface	Longitudinal axis parallel to the flat surface	Longitudinal axis parallel to the flat surface	Longitudinal axis parallel to the flat surface
Failure mode	No	No	No	No	No

Cycled cell

Sample No.	SN250815002C036	SN250815002C037	SN250815002C038	SN250815002C039	SN250815002C040
Catch fire	No	No	No	No	No
Explode	No	No	No	No	No
Crush direction	Longitudinal axis parallel to the flat surface	Longitudinal axis parallel to the flat surface	Longitudinal axis parallel to the flat surface	Longitudinal axis parallel to the flat surface	Longitudinal axis parallel to the flat surface
Failure mode	No	No	No	No	No

Supplementary information: no explosion or catch fire.

13	TABLE: Crush Test (for model LIC0816Q3R8306)				P
Ambient temperature: 22.6°C					
Fully Charged Cell					
Sample No.	SN250815005C031	SN250815005C032	SN250815005C033	SN250815005C034	SN250815005C035
Catch fire	No	No	No	No	No
Explode	No	No	No	No	No
Crush direction	Longitudinal axis parallel to the flat surface	Longitudinal axis parallel to the flat surface	Longitudinal axis parallel to the flat surface	Longitudinal axis parallel to the flat surface	Longitudinal axis parallel to the flat surface
Failure mode	No	No	No	No	No
Cycled cell					
Sample No.	SN250815005C036	SN250815005C037	SN250815005C038	SN250815005C039	SN250815005C040
Catch fire	No	No	No	No	No
Explode	No	No	No	No	No
Crush direction	Longitudinal axis parallel to the flat surface	Longitudinal axis parallel to the flat surface	Longitudinal axis parallel to the flat surface	Longitudinal axis parallel to the flat surface	Longitudinal axis parallel to the flat surface
Failure mode	No	No	No	No	No
Supplementary information: no explosion or catch fire.					

13	TABLE: Crush Test (for model LIC0820Q3R8406)				P
Ambient temperature: 22.6°C					
Fully Charged Cell					
Sample No.	SN250815006C031	SN250815006C032	SN250815006C033	SN250815006C034	SN250815006C035
Catch fire	No	No	No	No	No
Explode	No	No	No	No	No
Crush direction	Longitudinal axis parallel to the flat surface	Longitudinal axis parallel to the flat surface	Longitudinal axis parallel to the flat surface	Longitudinal axis parallel to the flat surface	Longitudinal axis parallel to the flat surface
Failure mode	No	No	No	No	No
Cycled cell					
Sample No.	SN250815006C036	SN250815006C037	SN250815006C038	SN250815006C039	SN250815006C040
Catch fire	No	No	No	No	No
Explode	No	No	No	No	No
Crush direction	Longitudinal axis parallel to the flat surface	Longitudinal axis parallel to the flat surface	Longitudinal axis parallel to the flat surface	Longitudinal axis parallel to the flat surface	Longitudinal axis parallel to the flat surface
Failure mode	No	No	No	No	No

Supplementary information: no explosion or catch fire.

14	TABLE: Impact Test (for model LIC0613Q3R8106)				P
Ambient temperature: 22.8°C					
Fully Charged Cell					
Sample No.	SN250815002C041	SN250815002C042	SN250815002C043	SN250815002C044	SN250815002C045
Catch fire	No	No	No	No	No
Explode	No	No	No	No	No
Impact direction	Longitudinal axis parallel to the flat surface	Longitudinal axis parallel to the flat surface	Longitudinal axis parallel to the flat surface	Longitudinal axis parallel to the flat surface	Longitudinal axis parallel to the flat surface
Failure mode	No	No	No	No	No
Cycled cell					
Sample No.	SN250815002C046	SN250815002C047	SN250815002C048	SN250815002C049	SN250815002C050
Catch fire	No	No	No	No	No
Explode	No	No	No	No	No
Impact direction	Longitudinal axis parallel to the flat surface	Longitudinal axis parallel to the flat surface	Longitudinal axis parallel to the flat surface	Longitudinal axis parallel to the flat surface	Longitudinal axis parallel to the flat surface
Failure mode	No	No	No	No	No
Supplementary information: no explosion or catch fire.					

14	TABLE: Impact Test (for model LIC0816Q3R8306)				P
Ambient temperature: 22.8°C					
Fully Charged Cell					
Sample No.	SN250815005C041	SN250815005C042	SN250815005C043	SN250815005C044	SN250815005C045
Catch fire	No	No	No	No	No
Explode	No	No	No	No	No
Impact direction	Longitudinal axis parallel to the flat surface	Longitudinal axis parallel to the flat surface	Longitudinal axis parallel to the flat surface	Longitudinal axis parallel to the flat surface	Longitudinal axis parallel to the flat surface
Failure mode	No	No	No	No	No
Cycled cell					
Sample No.	SN250815005C046	SN250815005C047	SN250815005C048	SN250815005C049	SN250815005C050
Catch fire	No	No	No	No	No
Explode	No	No	No	No	No
Impact direction	Longitudinal axis parallel to the flat surface	Longitudinal axis parallel to the flat surface	Longitudinal axis parallel to the flat surface	Longitudinal axis parallel to the flat surface	Longitudinal axis parallel to the flat surface
Failure mode	No	No	No	No	No
Supplementary information: no explosion or catch fire.					

14	TABLE: Impact Test (for model LIC0820Q3R8406)				P
Ambient temperature: 22.9°C					
Fully Charged Cell					
Sample No.	SN250815006C041	SN250815006C042	SN250815006C043	SN250815006C044	SN250815006C045
Catch fire	No	No	No	No	No
Explode	No	No	No	No	No
Impact direction	Longitudinal axis parallel to the flat surface	Longitudinal axis parallel to the flat surface	Longitudinal axis parallel to the flat surface	Longitudinal axis parallel to the flat surface	Longitudinal axis parallel to the flat surface
Failure mode	No	No	No	No	No
Cycled cell					
Sample No.	SN250815006C046	SN250815006C047	SN250815006C048	SN250815006C049	SN250815006C050
Catch fire	No	No	No	No	No
Explode	No	No	No	No	No
Impact direction	Longitudinal axis parallel to the flat surface	Longitudinal axis parallel to the flat surface	Longitudinal axis parallel to the flat surface	Longitudinal axis parallel to the flat surface	Longitudinal axis parallel to the flat surface
Failure mode	No	No	No	No	No
Supplementary information: no explosion or catch fire.					

14A	TABLE: Round Bar Crush Test				N/A
Ambient temperature: °C					
Fully Charged Samples					
Sample No.					
Fire or explosion?					
Cell thickness (mm)					
Sample No.					
Fire or explosion?					
Cell thickness (mm)					
Supplementary information:					

15	TABLE: Shock Test (for model LIC0613Q3R8106)				P
Ambient temperature: 23.2°C					
Fully Charged Cell					
Sample No.	SN250815002 C051	SN250815002 C052	SN250815002 C053	SN250815002 C054	SN25081500 2C055
Mass before test (g)	0.851	0.853	0.856	0.854	0.851
Mass after test (g)	0.850	0.852	0.854	0.853	0.850
Mass loss ratio (%)	0.118	0.117	0.234	0.117	0.118
Cycled cell					
Sample No.	SN250815002 C056	SN250815002 C057	SN250815002 C058	SN250815002 C059	SN25081500 2C060
Mass before test (g)	0.855	0.857	0.853	0.852	0.856
Mass after test (g)	0.853	0.856	0.852	0.851	0.855
Mass loss ratio (%)	0.234	0.117	0.117	0.117	0.117
Supplementary information: no explosion or catch fire, in addition the sample did not vent or leak. Max loss less than 0.5%.					

15	TABLE: Shock Test (for model LIC0816Q3R8306)				P
Ambient temperature: 23.2°C					
Fully Charged Cell					
Sample No.	SN250815005 C051	SN250815005 C052	SN250815005 C053	SN250815005 C054	SN25081500 5C055
Mass before test (g)	1.551	1.557	1.557	1.555	1.559
Mass after test (g)	1.551	1.555	1.555	1.554	1.558
Mass loss ratio (%)	0.000	0.128	0.128	0.064	0.064
Cycled cell					
Sample No.	SN250815005 C056	SN250815005 C057	SN250815005 C058	SN250815005 C059	SN25081500 5C060
Mass before test (g)	1.553	1.559	1.556	1.557	1.553
Mass after test (g)	1.553	1.558	1.554	1.556	1.552
Mass loss ratio (%)	0.000	0.064	0.129	0.064	0.064
Supplementary information: no explosion or catch fire, in addition the sample did not vent or leak. Max loss less than 0.2%.					

15	TABLE: Shock Test (for model LIC0820Q3R8406)				P
Ambient temperature: 22.0°C					
Fully Charged Cell					
Sample No.	SN250815006 C051	SN250815006 C052	SN250815006 C053	SN250815006 C054	SN25081500 6C055
Mass before test (g)	1.964	1.966	1.963	1.968	1.968
Mass after test (g)	1.963	1.965	1.962	1.967	1.967
Mass loss ratio (%)	0.051	0.051	0.051	0.051	0.051
Cycled cell					
Sample No.	SN250815006 C056	SN250815006 C057	SN250815006 C058	SN250815006 C059	SN25081500 6C060
Mass before test (g)	1.967	1.962	1.964	1.965	1.963
Mass after test (g)	1.966	1.960	1.963	1.963	1.962
Mass loss ratio (%)	0.051	0.051	0.051	0.051	0.051
Supplementary information: no explosion or catch fire, in addition the sample did not vent or leak. Max loss less than 0.2%.					

16	TABLE: Vibration Test (for model LIC0613Q3R8106)				P
Ambient temperature: 23.2°C					
Fully Charged Cell					
Sample No.	SN250815002 C061	SN250815002 C062	SN250815002 C063	SN250815002 C064	SN25081500 2C065
Mass before test (g)	0.856	0.855	0.859	0.853	0.854
Mass after test (g)	0.855	0.853	0.858	0.851	0.852
Mass loss ratio (%)	0.117	0.234	0.116	0.234	0.234
Cycled cell					
Sample No.	SN250815002 C066	SN250815002 C067	SN250815002 C068	SN250815002 C069	SN25081500 2C070
Mass before test (g)	0.852	0.857	0.853	0.855	0.854
Mass after test (g)	0.850	0.856	0.852	0.854	0.853
Mass loss ratio (%)	0.235	0.117	0.117	0.117	0.117
Supplementary information: no explosion or catch fire, in addition the sample did not vent or leak. Max loss less than 0.5%.					

16	TABLE: Vibration Test (for model LIC0816Q3R8306)				P
Ambient temperature: 23.2°C					
Fully Charged Cell					
Sample No.	SN250815005 C061	SN250815005 C062	SN250815005 C063	SN250815005 C064	SN25081500 5C065
Mass before test (g)	1.551	1.551	1.557	1.559	1.559
Mass after test (g)	1.551	1.550	1.557	1.558	1.558
Mass loss ratio (%)	0.000	0.064	0.000	0.064	0.064
Cycled cell					
Sample No.	SN250815005 C066	SN250815005 C067	SN250815005 C068	SN250815005 C069	SN25081500 5C070
Mass before test (g)	1.559	1.559	1.551	1.557	1.553
Mass after test (g)	1.559	1.558	1.550	1.556	1.553
Mass loss ratio (%)	0.000	0.064	0.064	0.064	0.000
Supplementary information: no explosion or catch fire, in addition the sample did not vent or leak. Max loss less than 0.2%.					

16	TABLE: Vibration Test (for model LIC0820Q3R8406)				P
Ambient temperature: 22.2°C					
Fully Charged Cell					
Sample No.	SN250815006 C061	SN250815006 C062	SN250815006 C063	SN250815006 C064	SN25081500 6C065
Mass before test (g)	1.964	1.966	1.963	1.966	1.968
Mass after test (g)	1.963	1.965	1.962	1.964	1.967
Mass loss ratio (%)	0.051	0.051	0.051	0.102	0.051
Cycled cell					
Sample No.	SN250815006 C066	SN250815006 C067	SN250815006 C068	SN250815006 C069	SN25081500 6C070
Mass before test (g)	1.967	1.962	1.964	1.962	1.963
Mass after test (g)	1.966	1.962	1.963	1.962	1.963
Mass loss ratio (%)	0.051	0.000	0.051	0.000	0.000
Supplementary information: no explosion or catch fire, in addition the sample did not vent or leak. Max loss less than 0.2%.					

18	TABLE: Temperature Cycling Test (for model LIC0613Q3R8106)				P
Ambient temperature: 22.4°C					
Fully Charged Cell					
Sample No.	SN250815002 C091	SN250815002 C092	SN250815002 C093	SN250815002 C094	SN25081500 2C095
Mass before test (g)	0.854	0.855	0.858	0.856	0.851
Mass after test (g)	0.853	0.854	0.857	0.855	0.850
Mass loss ratio (%)	0.117	0.117	0.117	0.117	0.118
Cycled cell					
Sample No.	SN250815002 C096	SN250815002 C097	SN250815002 C098	SN250815002 C099	SN25081500 2C100
Mass before test (g)	0.853	0.857	0.856	0.859	0.852
Mass after test (g)	0.851	0.856	0.855	0.858	0.850
Mass loss ratio (%)	0.234	0.117	0.117	0.116	0.235
Supplementary information: no explosion or catch fire, in addition the sample did not vent or leak. Max loss less than 0.5%.					

18	TABLE: Temperature Cycling Test (for model LIC0816Q3R8306)				P
Ambient temperature: 23.1°C					
Fully Charged Cell					
Sample No.	SN250815005 C091	SN250815005 C092	SN250815005 C093	SN250815005 C094	SN25081500 5C095
Mass before test (g)	1.554	1.557	1.557	1.556	1.559
Mass after test (g)	1.551	1.555	1.555	1.553	1.556
Mass loss ratio (%)	0.193	0.128	0.128	0.193	0.192
Cycled cell					
Sample No.	SN250815005 C096	SN250815005 C097	SN250815005 C098	SN250815005 C099	SN25081500 5C100
Mass before test (g)	1.554	1.559	1.556	1.557	1.553
Mass after test (g)	1.552	1.556	1.554	1.555	1.550
Mass loss ratio (%)	0.129	0.192	0.129	0.128	0.193
Supplementary information: no explosion or catch fire, in addition the sample did not vent or leak. Max loss less than 0.2%.					

18	TABLE: Temperature Cycling Test (for model LIC0820Q3R8406)				P
Ambient temperature: 22.6°C					
Fully Charged Cell					
Sample No.	SN250815006 C091	SN250815006 C092	SN250815006 C093	SN250815006 C094	SN25081500 6C095
Mass before test (g)	1.961	1.966	1.963	1.968	1.968
Mass after test (g)	1.958	1.964	1.960	1.965	1.966
Mass loss ratio (%)	0.153	0.102	0.153	0.152	0.102
Cycled cell					
Sample No.	SN250815006 C096	SN250815006 C097	SN250815006 C098	SN250815006 C099	SN25081500 6C100
Mass before test (g)	1.967	1.962	1.964	1.965	1.963
Mass after test (g)	1.964	1.960	1.961	1.963	1.960
Mass loss ratio (%)	0.153	0.102	0.153	0.102	0.153
Supplementary information: no explosion or catch fire, in addition the sample did not vent or leak. Max loss less than 0.2%.					

19	TABLE: Low Pressure (Altitude Simulation) Test (for model LIC0613Q3R8106)				P
Ambient temperature: 21.2°C					
Fully Charged Cell					
Sample No.	SN250815002 C101	SN250815002 C102	SN250815002 C103	SN250815002 C104	SN25081500 2C105
Mass before test (g)	0.850	0.854	0.855	0.852	0.853
Mass after test (g)	0.848	0.851	0.852	0.851	0.851
Mass loss ratio (%)	0.235	0.351	0.351	0.117	0.234
Cycled cell					
Sample No.	SN250815002 C106	SN250815002 C107	SN250815002 C108	SN250815002 C109	SN25081500 2C110
Mass before test (g)	0.856	0.855	0.858	0.857	0.855
Mass after test (g)	0.855	0.854	0.857	0.856	0.854
Mass loss ratio (%)	0.117	0.117	0.117	0.117	0.117
Supplementary information: no explosion or catch fire, in addition the sample did not vent or leak. Max loss less than 0.5%.					

19	TABLE: Low Pressure (Altitude Simulation) Test (for model LIC0816Q3R8306)				P
Ambient temperature: 21.4°C					
Fully Charged Cell					
Sample No.	SN250815005 C101	SN250815005 C102	SN250815005 C103	SN250815005 C104	SN25081500 5C105
Mass before test (g)	1.556	1.551	1.553	1.559	1.556
Mass after test (g)	1.555	1.551	1.552	1.558	1.555
Mass loss ratio (%)	0.064	0.000	0.064	0.064	0.064
Cycled cell					
Sample No.	SN250815005 C106	SN250815005 C107	SN250815005 C108	SN250815005 C109	SN25081500 5C110
Mass before test (g)	1.555	1.559	1.556	1.553	1.553
Mass after test (g)	1.554	1.558	1.555	1.552	1.553
Mass loss ratio (%)	0.064	0.064	0.064	0.064	0.000
Supplementary information: no explosion or catch fire, in addition the sample did not vent or leak. Max loss less than 0.2%.					

19	TABLE: Low Pressure (Altitude Simulation) Test (for model LIC0820Q3R8406)				P
Ambient temperature: 21.4°C					
Fully Charged Cell					
Sample No.	SN250815006 C101	SN250815006 C102	SN250815006 C103	SN250815006 C104	SN25081500 6C105
Mass before test (g)	1.964	1.966	1.963	1.968	1.968
Mass after test (g)	1.964	1.965	1.961	1.967	1.967
Mass loss ratio (%)	0.000	0.051	0.102	0.051	0.051
Cycled cell					
Sample No.	SN250815006 C106	SN250815006 C107	SN250815006 C108	SN250815006 C109	SN25081500 6C110
Mass before test (g)	1.967	1.962	1.964	1.965	1.963
Mass after test (g)	1.966	1.962	1.962	1.964	1.961
Mass loss ratio (%)	0.051	0.000	0.102	0.051	0.102
Supplementary information: no explosion or catch fire, in addition the sample did not vent or leak. Max loss less than 0.2%.					

Attachment 1: Photo documentation

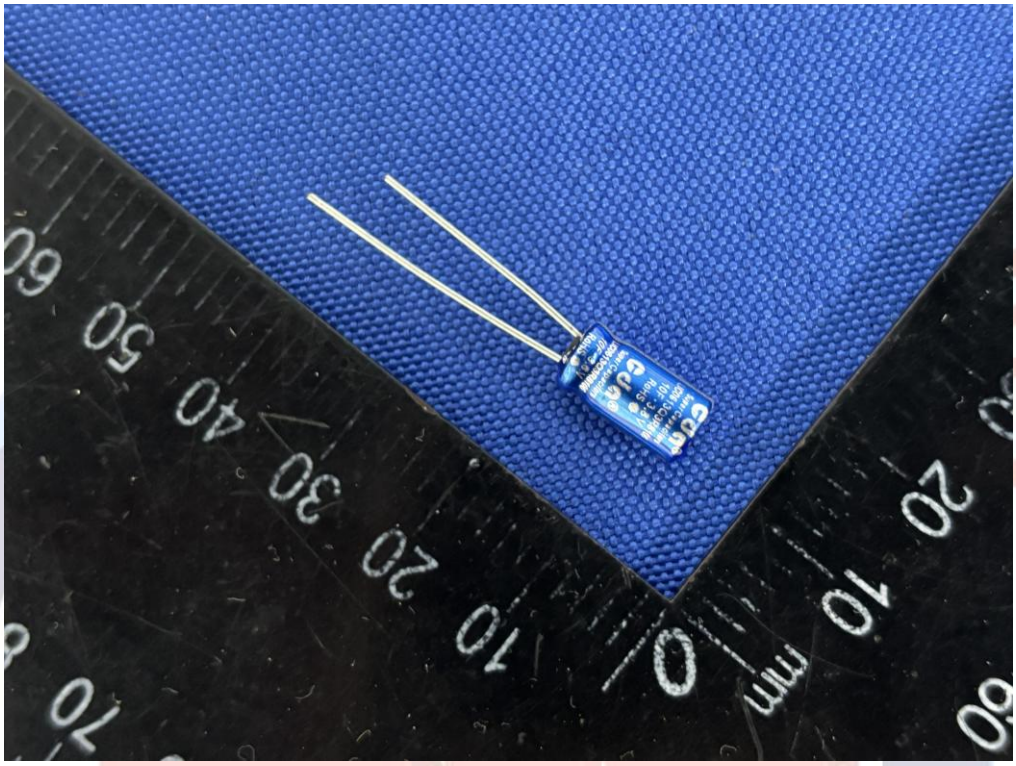

Figure 1 Side view-1 of cell (for model LIC0613Q3R8106)

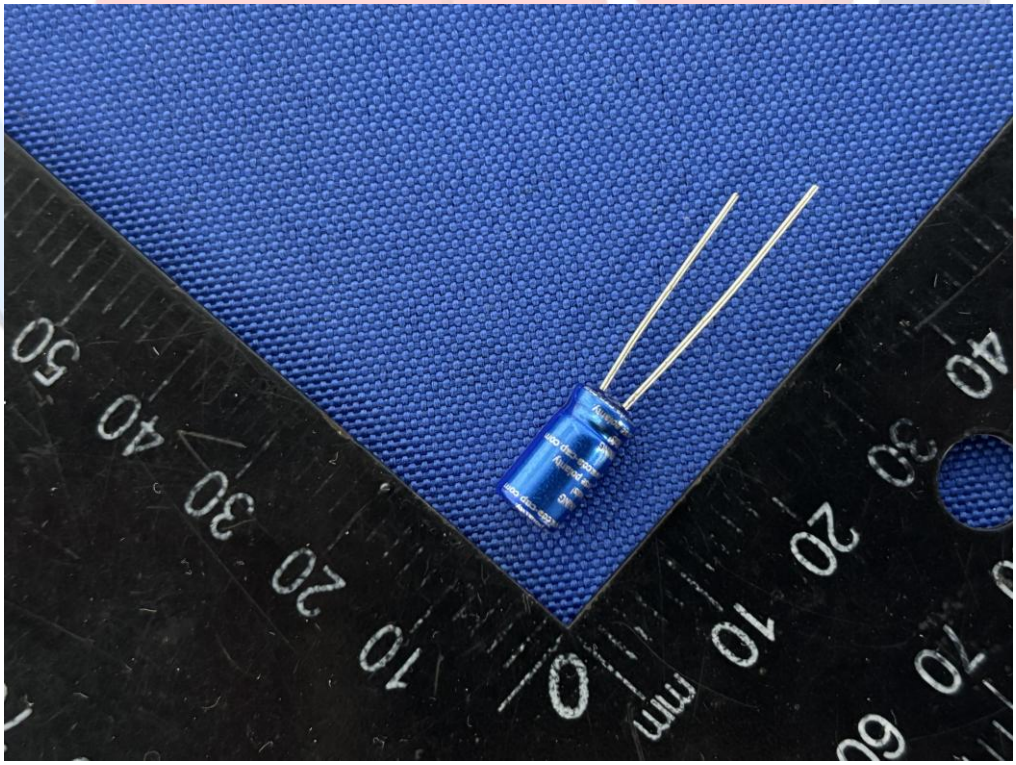

Figure 2 Side view-2 of cell (for model LIC0613Q3R8106)

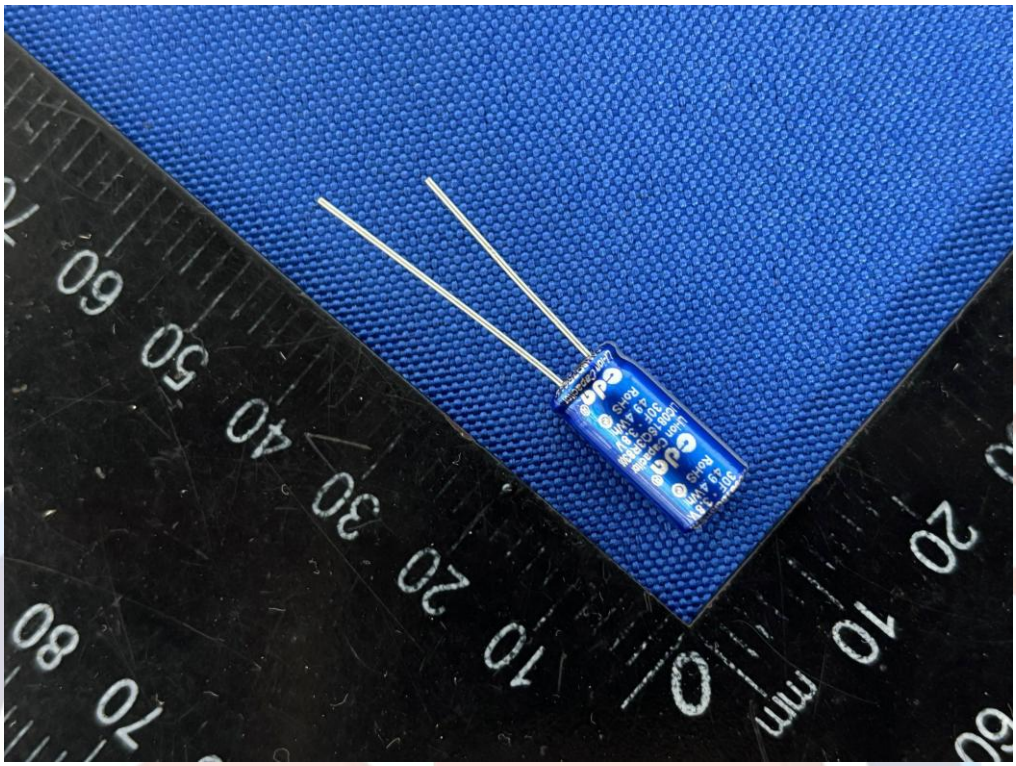

Figure 3 Side view-1 of cell (for model LIC0816Q3R8306)

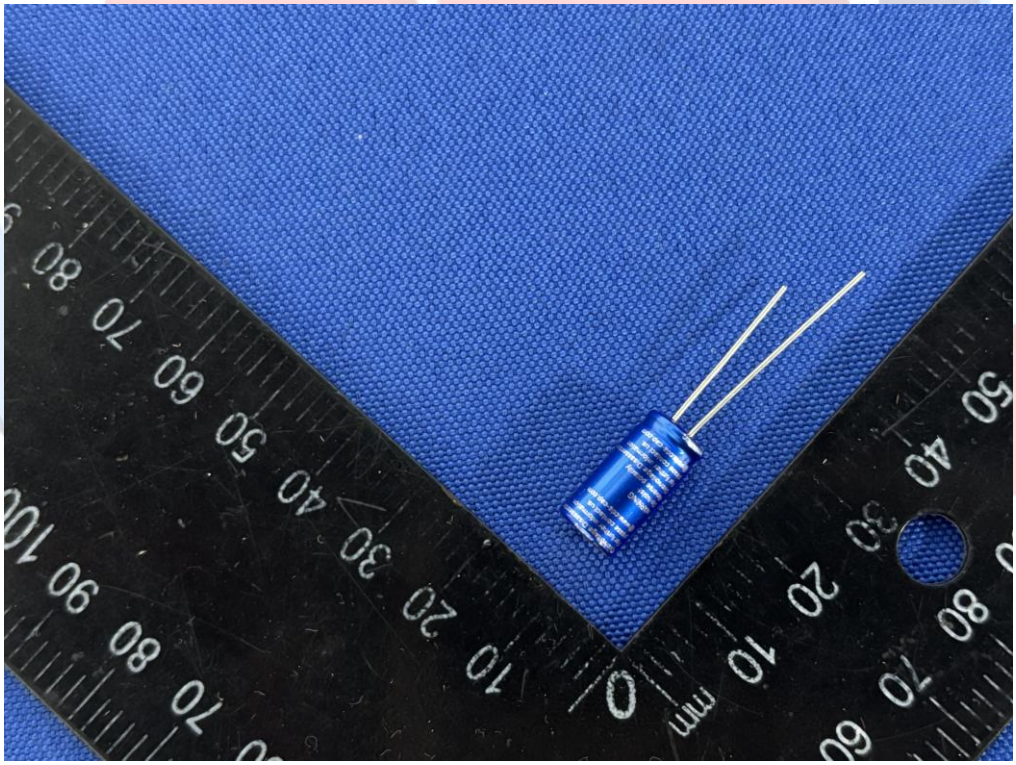

Figure 4 Side view-2 of cell (for model LIC0816Q3R8306)

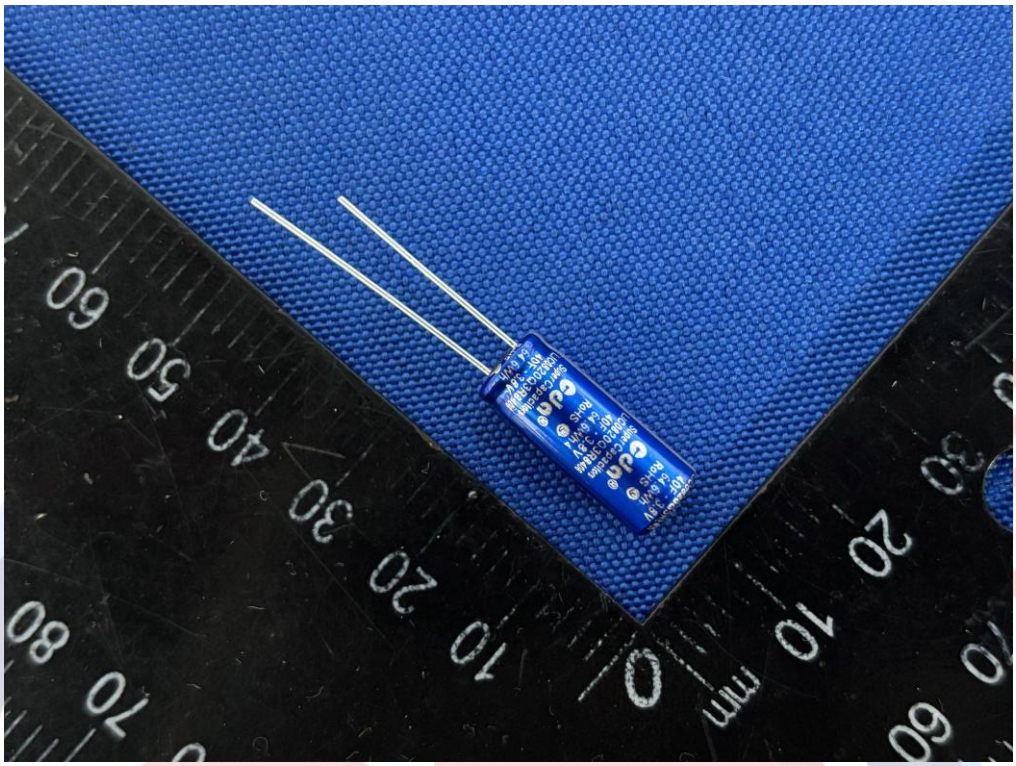

Figure 5 Side view-1 of cell (for model LIC0820Q3R8406)

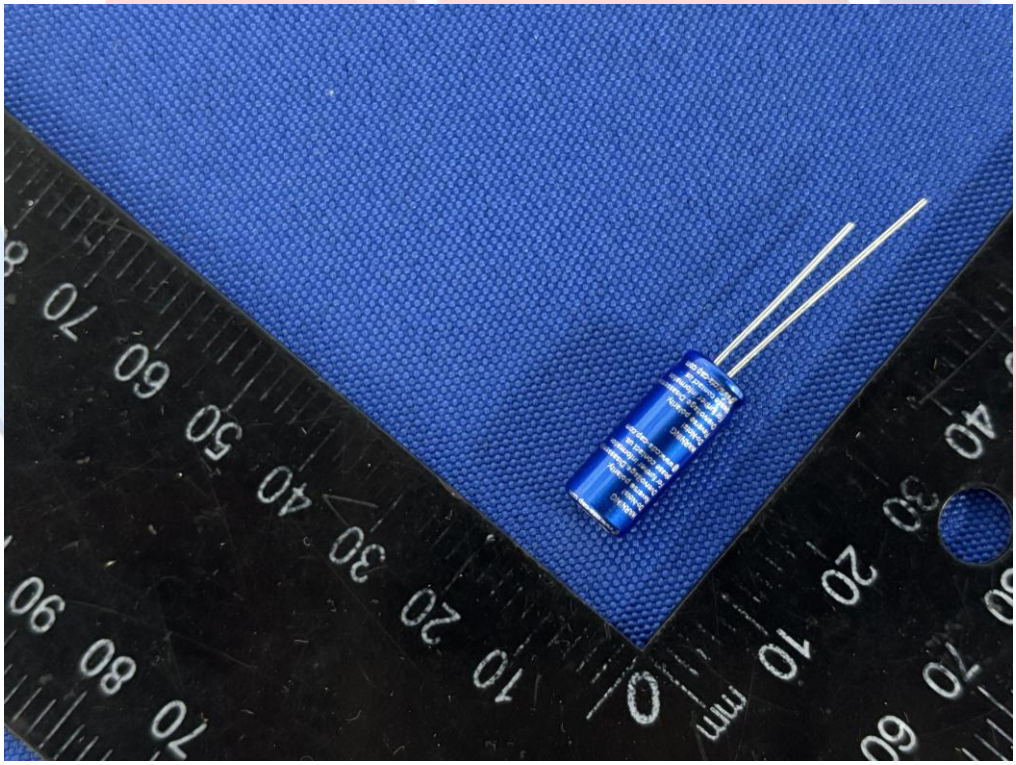

Figure 6 Side view-2 of cell (for model LIC0820Q3R8406)

Important

1. The test report is invalid if it is not affixed the official seal of the laboratory to it.
2. Copies of the test report without the official seal of the laboratory are invalid.
3. It is forbidden to copy the test report partially without the written approval of the laboratory.
4. The test report is invalid without the signatures of Approver, Reviewer and Testing engineer.
5. The test report is invalid if it is blotted out.
6. Objections to the test report must be submitted to CMC within 15 days.
7. The test report is valid for the tested samples only.
8. As for the Verdict, “-” means “no need for judgement”, “P” means “pass”, “F” means “fail” and “N/A” means “not applicable”.
9. This report is only responsible for the test results of the tested samples, and the test results and related judgment conclusions only reflect the evaluation of the tested samples. For the report and the content can not be used for commercial advertising, the use of direct or indirect losses and all legal consequences, the company does not assume any economic and legal responsibility.

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-- End of Report --