

Battery Pack Test Report (UN38.3)

Customer: Lenovo

Pack Model: L18C3P71

Nominal voltage: 11.52V

Nominal capacity: 4255mAh 49Wh/

4385mAh 51Wh

Configuration: 3S1P

Customer P/N: SB10K97648

Celxpert P/N: 921300208

Cell Type: Coslight CA467973G-Q1

4255mAh/4385mAh

July 25 2018

Approved by

Reviewed by

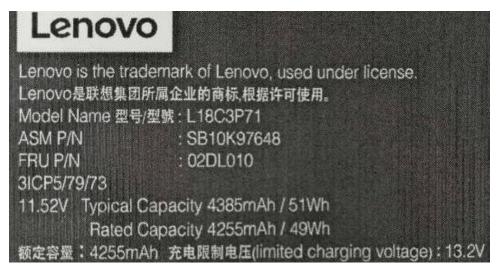
Prepared by



1. Figure photo of the pack.







PS:此報告僅針對送檢樣品有效

The test report is valid for the tested samples only.

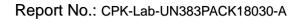


| 2. UN38.3 Test Report | | | | | | | | | | |
|-----------------------|--------------|-------------|------------|----------|-----------------------|--|--|--|--|--|
| Test Period | 2018/07/06~2 | 2018/07/24 | Test Spec. | ST/SG/AC | .10/11/Rev.6/Amend.1 | | | | | |
| Parts Name | Battery Pack | Application | NB | Quantity | Pack 16PCS/Cell 30pcs | | | | | |

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2.1 Test Summary

| Item | Test Item | Test Result | Details |
|------|-------------------------------------|-------------|---------|
| T1 | Altitude simulation test (UN38.3-1) | Pass | Page 5 |
| T2 | Thermal test (UN38.3-2) | Pass | Page 6 |
| Т3 | Vibration test (UN38.3-3) | Pass | Page 7 |
| T4 | Shock test (UN38.3-4) | Pass | Page 8 |
| T5 | Short Circuit test (UN38.3-5) | Pass | Page 9 |
| T6 | Crush Test (UN38.3-6) | Pass | Page 9 |
| T7 | Overcharge test (UN38.3-7) | Pass | Page 10 |
| T8 | Forced discharge test (UN38.3-8) | Pass | Page 11 |
| | | | |
| | | | |
| | | | |





2.2 Test sample list

| No. | Pack S/N | Test item | No. | Cell Num. | Test item |
|-----|-----------------|-----------|-----|-------------------------------|-----------|
| 1 | Sample No:1/16 | 38.3.1~5 | 1 | Coslight CA467973G-Q1 4255mAh | 38.3.6 |
| 2 | Sample No:2/16 | 38.3.1~5 | 2 | Coslight CA467973G-Q1 4255mAh | 38.3.6 |
| 3 | Sample No:3/16 | 38.3.1~5 | 3 | Coslight CA467973G-Q1 4255mAh | 38.3.6 |
| 4 | Sample No:4/16 | 38.3.1~5 | 4 | Coslight CA467973G-Q1 4255mAh | 38.3.6 |
| 5 | Sample No:5/16 | 38.3.1~5 | 5 | Coslight CA467973G-Q1 4255mAh | 38.3.6 |
| 6 | Sample No:6/16 | 38.3.1~5 | 6 | Coslight CA467973G-Q1 4255mAh | 38.3.6 |
| 7 | Sample No:7/16 | 38.3.1~5 | 7 | Coslight CA467973G-Q1 4255mAh | 38.3.6 |
| 8 | Sample No:8/16 | 38.3.1~5 | 8 | Coslight CA467973G-Q1 4255mAh | 38.3.6 |
| 9 | Sample No:9/16 | 38.3.7 | 9 | Coslight CA467973G-Q1 4255mAh | 38.3.6 |
| 10 | Sample No:10/16 | 38.3.7 | 10 | Coslight CA467973G-Q1 4255mAh | 38.3.6 |
| 11 | Sample No:11/16 | 38.3.7 | 11 | Coslight CA467973G-Q1 4255mAh | 38.3.8 |
| 12 | Sample No:12/16 | 38.3.7 | 12 | Coslight CA467973G-Q1 4255mAh | 38.3.8 |
| 13 | Sample No:13/16 | 38.3.7 | 13 | Coslight CA467973G-Q1 4255mAh | 38.3.8 |
| 14 | Sample No:14/16 | 38.3.7 | 14 | Coslight CA467973G-Q1 4255mAh | 38.3.8 |
| 15 | Sample No:15/16 | 38.3.7 | 15 | Coslight CA467973G-Q1 4255mAh | 38.3.8 |
| 16 | Sample No:16/16 | 38.3.7 | 16 | Coslight CA467973G-Q1 4255mAh | 38.3.8 |
| | | | 17 | Coslight CA467973G-Q1 4255mAh | 38.3.8 |
| | | | 18 | Coslight CA467973G-Q1 4255mAh | 38.3.8 |
| | | | 19 | Coslight CA467973G-Q1 4255mAh | 38.3.8 |
| | | | 20 | Coslight CA467973G-Q1 4255mAh | 38.3.8 |
| | | | 21 | Coslight CA467973G-Q1 4255mAh | 38.3.8 |
| | | | 22 | Coslight CA467973G-Q1 4255mAh | 38.3.8 |
| | | | 23 | Coslight CA467973G-Q1 4255mAh | 38.3.8 |
| | | | 24 | Coslight CA467973G-Q1 4255mAh | 38.3.8 |
| | | | 25 | Coslight CA467973G-Q1 4255mAh | 38.3.8 |
| | | | 26 | Coslight CA467973G-Q1 4255mAh | 38.3.8 |
| | | | 27 | Coslight CA467973G-Q1 4255mAh | 38.3.8 |
| | | | 28 | Coslight CA467973G-Q1 4255mAh | 38.3.8 |
| | | | 29 | Coslight CA467973G-Q1 4255mAh | 38.3.8 |
| | | | 30 | Coslight CA467973G-Q1 4255mAh | 38.3.8 |



2.3 Test result

| Item | Test Item | | Т | est specificati | ion | Jud | ge criteria | Samp | le(s) | |
|------------|--------------------------------------|--|--|-------------------|--------------------------------------|-----------|-----------------------------------|------------|---|--|
| T 1 | Altitude Simulation (UN38.3-1) | ii v t 1-2.E c a 1-3.\ | in fully charged state. All batteries weight is measured. The charged batteries voltage are measured and recorded. I-2. Batteries shall be stored at a pressure of 11.6Kpa or less for at least six hours (<0.1%), no leakage, no venting, no disassembly, no rupture and no fire. Battery voltage drop < | | | | | | 4 packs are first cycle in fully charged (Pack#1~4) 4 packs are 25 times cycled ending in fully charged state (Pack #5~8) | |
| Test Per | ind | Star | t: 2018/0 | 07/06 | End: | 2018/07/0 | 6 | | | |
| | | | | | | | | | | |
| Test Equ | | 数位 | . 電表 Q15 | 3, 電十大十 | P Q090, 真3 | E 烘箱 QU4 | 43 | | | |
| Major Pr | | - | | | | | | | | |
| Warning | Point | - | | | | | | | | |
| Recomm | nendation | The | packs pa | ass the tes | st | | | | | |
| | | No | OCV (V) 13.152 | Weight (g) 204.27 | OCV Weight (V) (g) 13.150 204.26 | | voltage residue Volt (%) 99.98% | weight (%) | other event | |
| | | 2 | 13.149 | 204.27 | 13.148 | 204.26 | 99.98% | 0.00% | 0 | |
| | | 3 | 13.156 | 204.36 | 13.155 | 204.35 | 99.99% | 0.00% | 0 | |
| | | 4 | 13.143 | 204.16 | 13.140 | 204.15 | 99.98% | 0.00% | 0 | |
| | | 5 | 12.924 | 204.56 | 12.922 | 204.55 | 99.98% | 0.00% | 0 | |
| | | 6 | 12.935 | 204.76 | 12.932 | 204.75 | 99.98% | 0.00% | 0 | |
| Pov | w Data | 7 8 | 12.946 12.945 | 204.85 204.17 | 12.945 12.941 | 204.84 | 99.99% 99.9 7 % | 0.00% | 0 | |
| Nav | v Dala | | | | | | 99.9170 | 0.0076 | 0 | |
| | | | | | sembly; R-Rupture Disassembly, No | | <u> </u> | | | |
| | | | | | | | | | | |



| Item | Test Item | | Т | est specificati | on | | , | Judge criteria | Samp | ole(s) | | |
|----------|----------------------------|------------|--|---|---|--|--------------------------------------|----------------------|-------------|--------|--|--|
| T2 | Thermal test (UN38.3-2) | 2-2.F | followed by some follow | ored for 6 houstorage for 6 houstorage for 6 hours in time intervale re extremes is or 10 times. The bient for 24 houseasured. The measured and | mass loss 1%), no leakage, enting, no ssembly, no ure and no fire. ery voltage drop < | 4 packs are f fully charged 4 packs are 2 cycled ending charged state #5~8) | (Pack#1~4) 25 times g in fully | | | | | |
| Test Per | iod | Star | eart: 2018/07/09 End: 2018/07/16 | | | | | | | | | |
| Test Equ | ipment | 數位 | | 3, 電子天平 | ² Q090, | 冷熱衝 | 擊棋 | € Q0446 | | | | |
| Major Pr | oblem | - | | | | | | | | | | |
| Warning | | - | | | | | | | | | | |
| | nendation | The | packs pa | ass the tes | it. | | | | | | | |
| | | No. | OCV (V) | efore Weight (g) | After OCV Weight (V) (g) | | voltage residue Volt (%) | mass loss Weight (%) | other event | | | |
| | | 1 | 13.150 | 204.26 | 13.081 | 204.2 | _ | 99.48% | 0.01% | 0 | | |
| | | 3 | 13.148 | 204.35 204.35 | 13.072 13.080 | 204.3 | | 99.42% 99.43% | 0.01% | 0 | | |
| | | 4 | 13.140 | 204.15 | 13.066 | 204.1 | | 99.44% | 0.01% | 0 | | |
| | | 5 | 12.922 | 204.55 | 12.851 | 204.5 | 3 | 99.45% | 0.01% | 0 | | |
| | | 6 | 12.932 | 204.75 | 12.857 | 204.7 | 3 | 99.42% | 0.01% | 0 | | |
| | | 7 | 12.945 12.941 | 204.84 204.16 | 12.877 | 204.8 | _ | 99.47% | 0.01% | 0 | | |
| Rav | v Data | 8 Note: | | /enting ; D-Disass | 12.866 | 204.1 | | 99.42% | 0.01% | 0 | | |
| Ita | V Data | | | , No Venting , No [| | | | Fire | | | | |
| | | | | | | | | | | | | |



| Item | Test Item | | | Test spe | cification | | | Judge crite | eria | Sample(s) | | |
|----------|------------------------------|--|--|--|------------------|---------------|---------------------------|------------------|------------------|--------------------------|---|--|
| Т3 | Vibration test (UN38.3-3) | v a v la | 3-1. Packs are firmly secured to the platform of the vibration machine without distorting the packs in such a manner as to faithfully transmit the vibration. The vibration shall be a sinusoidal waveform with a logarithmic sweep between 7 and 200 Hz and back to 7 Hz traversed in 15 minutes. This cycle shall be repeated 12 times for a total of 3 hours for each of 3 mutually perpendicular to the terminal face. 3-2. The logarithmic frequency sweep is as follows: 7-18 Hz → 1gn 18-50 Hz → 0.8mm amplitude 50-200 Hz → 8gn 3-3. All packs weight are measured. The charged packs voltage are measured and recorded. | | | | | | | | 4 packs are first cycle in fully charged (Pack#1~4) 4 packs are 25 times cycled ending in fully charged state (Pack #5~8) | |
| Test Per | iod | Sta | art: 2018/0 | 7/17 | End: | 2018/07/1 | 8 | | | | | |
| Test Equ | ipment | 數位 | | 3, 電子天 | 平 Q090, | 振動測試 | 機 Q | 300 | | | | |
| Major Pr | oblem | - | | | | | | | | | | |
| Warning | | - | | | | | | | | | | |
| | nendation | The | packs pa | ass the te | st. | | | | | | | |
| | | No. Before OCV Weight | | | | | ed Packs age residue Volt | | ss loss eight | other event | | |
| | | 1 | (V) 13.081 | (g) 204.24 | (V) 13.074 | (g) 204.22 | | (%) 99.95% | | <mark>(%)</mark> .01% | 0 | |
| | | 2 | 13.072 | 204.33 | 13.065 | 204.31 | | 99.95% | | .01% | 0 | |
| | | 3 | 13.080 | 204.33 | 13.072 | 204.32 | | 99.94% | 0 | .01% | 0 | |
| | | 4 | 13.066 | 204.14 | 13.058 | 204.12 | | 99.94% | | .01% | 0 | |
| | | 5 6 | 12.851 12.857 | 204.53 204.73 | 12.843 12.851 | 204.51 | | 99.94% 99.95% | | .01% | 0 | |
| | | 7 | 12.877 | 204.82 | 12.868 | 204.79 | | 99.93% | | .01% | 0 | |
| Rav | w Data | 8 | 12.866 | 204.14 | 12.859 | 204.12 | | 99.95% | 0 | .01% | 0 | |
| | | | | /enting ; D-Disas , No Venting , No | | | No Fire | | | | | |
| | | | Ţ. | | | | | | | | | |



| Energy | Corporation | report non or relations nervision n | | | | | | | | | |
|----------|--------------------------|-------------------------------------|--|------------------|--------------------------------------|----------|---------------------------------------|------------------|---------------|---|--|
| Item | Test Item | | | Test specific | | | J | udge criteria | Sam | ple(s) | |
| Т4 | Shock test (UN38.3-4) | 4-2. 4-2. 1 | 4-1. Packs shall be secured to the testing machine by means of a rigid mount, which will support all mounting surfaces. 4-2. Packs shall be subjected to a half-sine shock of peak acceleration 150gn and pulse duration of 6 milliseconds. Each pack shall be subjected to 3 shocks in the positive direction followed by three shocks in the negative direction of three mutually perpendicularly mounting positions of the pack for a total of 18 shocks. 4-3. All batteries weight are measured. The charged cell voltage are measured and recorded. | | | | | | | 4 packs are first cycle in fully charged (Pack#1~4) 4 packs are 25 times cycled ending in fully charged state (Pack #5~8) | |
| Test Per | iod | Star | t: 2018/07 | 7/19 | End | 2018 | /07/19 |) | | | |
| Test Equ | ipment | 數位 | _電表 Q15 | 3, 電子天- | 平 Q090, 衝 | 擊測討 | ····································· | 154 | | | |
| Major Pr | · | - | | | , | • | | | | | |
| Warning | | - | | | | | | | | | |
| | nendation | The | packs pa | ass the te | st. | | | | | | |
| | | No | Shock Test on Charged Packs Before After voltage residue | | | | | | mass loss | other event | |
| | | NO. | OCV (V) | Weight (g) | OCV (V) | Wei | _ | Volt (%) | Weight (%) | other event | |
| | | 1 | 13.074 | 204.22 | 13.068 | 204 | | 99.95% | 0.00% | 0 | |
| | | 2 | 13.065 | 204.31 | 13.060 | 204 | | 99.96% | 0.00% | 0 | |
| | | 3 4 | 13.072 | 204.32 204.12 | 13.067 13.052 | 204 | | 99.96% 99.95% | 0.00% | 0 | |
| | | 5 | 12.843 | 204.51 | 12.839 | 204 | | 99.97% | 0.00% | 0 | |
| | | 6 | 12.851 | 204.71 | 12.844 | 204 | | 99.95% | 0.00% | 0 | |
| | | 7 8 | 12.868 | 204.79 204.12 | 12.862 12.854 | 204 | | 99.95% 99.96% | 0.00% | 0 | |
| Rav | v Data | | L-Leakage ; V-V | enting; D-Disas: | sembly; R-Rupture Disassembly, No | ; F-Fire | | | | | |
| | | | | | | | | | | | |



| Item | Test Item | Test specification Judge criteria Sample(s) | | | | | | | | |
|---------------------------------|-----------------------------|---|---|--|--|--|--|--|--|--|
| Item | 1031 110111 | 5-1.Pag | • | a (57±4) °C oven, | | Ÿ | 4 packs are first cycle in | | | |
| | | | erior packs tempera | | | | fully charged | | | |
| | | | | ach (57±4)°C, they a | ocion no firo no | (Pack#1~4) | | | | |
| | Short Circuit | sho | orted by connecting | terminals with a cop | per smo | ke Packs | , | | | |
| T5 | Test | | e of resistance less | | | iloi peak | 4 packs are 25 times | | | |
| | (UN38.3-5) | | | ed for more than 1ho | our tem | | cycled ending in fully | | | |
| | | | or the cell temperature return to 57°C. The packs are observed for a further 6 hours. charged state (Pack #5~8) | | | | | | | |
| | | рас | cks are observed for | a further 6 nours. | | | #5~8) | | | |
| Test Per | in d | | | | | | | | | |
| | | | 2018/07/23 | End: 20 | | | | | | |
| Test Equ | | | | 收集器 Q075, 烘 | 箱 Q1/ | 1 | | | | |
| Recomm | endation | The p | acks pass the t | test. | | | | | | |
| | | | nort Circuit Test on C | | | | | | | |
| | | No. | Max. Temp.(°C) | Other event | | | | | | |
| | | 1 | 55.36 | 0 | | | | | | |
| | | 3 | 56.26 55.49 | 0 | | | | | | |
| | | 4 | 56.17 | 0 | | | | | | |
| Rav | w Data | 5 | 54.59 | 0 | | | | | | |
| | | 6 | 55.38 | 0 | | | | | | |
| | | 7 | 55.18 | 0 | | | | | | |
| | | 8 | 56.24 | 0 | | | | | | |
| | | Note: D-I | Disassembly ; R-Rupture | ; F-Fire | | | | | | |
| | | | No Disassembly , No R | | | | | | | |
| Item | Test Item | | Test sp | ecification | | Judge criteri | a Sample(s) | | | |
| | | | | | | | | | | |
| | | | | • | | · · | | | | |
| | | (A 9.1 k | Kg mass is to be dro | pped from a height | | cell does not exce | ed cycle in charged | | | |
| | | (A 9.1 k | | pped from a height | | cell does not exce 170°C and there i | cycle in charged | | | |
| | Cruch toot | (A 9.1 k (61±2.5 | Kg mass is to be dro i)cm onto the sampl | opped from a height e.) | of | cell does not exce | cycle in charged states to 50%. | | | |
| Т6 | Crush test | (A 9.1 k (61±2.5 6-2.Cel | (g mass is to be dro i)cm onto the sampl I's diameter < 18mn | pped from a height | of est | cell does not exce 170℃ and there i disassembly and i | cycle in charged states to 50%. | | | |
| Т6 | Crush test (UN38.3-6) | (A 9.1 k (61±2.5 6-2.Cel (The ce | (g mass is to be dro i)cm onto the sampl I's diameter < 18mn ells are crushed with | opped from a height e.) n, Execution crush to | of est ush | cell does not exce 170°C and there i disassembly and i within 6 hours of t | cycle in charged states to 50%. (Pack#1~5) | | | |
| Т6 | | (A 9.1 k (61±2.5 6-2.Cel (The ce | (g mass is to be dro i)cm onto the sampl I's diameter < 18mn ells are crushed with | opped from a height e.) n, Execution crush to a 13 KN with the cr | of est ush | cell does not exce 170°C and there i disassembly and i within 6 hours of t | cycle in charged states to 50%. (Pack#1~5) 5 cells are after | | | |
| Т6 | | (A 9.1 k (61±2.5 6-2.Cel (The ce | (g mass is to be dro i)cm onto the sampl I's diameter < 18mn ells are crushed with | opped from a height e.) n, Execution crush to a 13 KN with the cr | of est ush | cell does not exce 170°C and there i disassembly and i within 6 hours of t | cycle in charged states to 50%. (Pack#1~5) 5 cells are after 25 cycles ending in charged states to 50%. | | | |
| | (UN38.3-6) | (A 9.1 k (61±2.5 6-2.Cel (The ce | (g mass is to be dro i)cm onto the sampl I's diameter < 18mn ells are crushed with | opped from a height e.) n, Execution crush to a 13 KN with the cr | of est ush | cell does not exce 170°C and there i disassembly and i within 6 hours of t | cycle in charged states to 50%. (Pack#1~5) 5 cells are after 25 cycles ending in charged states | | | |
| T6 | (UN38.3-6) | (A 9.1 k (61±2.5 6-2.Cel (The ce tester. | (g mass is to be dro i)cm onto the sampl I's diameter < 18mn ells are crushed with Once the force is o | e.) n, Execution crush to a 13 KN with the crubtained it is to be re | est ush leased.) | cell does not exce 170°C and there i disassembly and i within 6 hours of t test. | cycle in charged states to 50%. (Pack#1~5) 5 cells are after 25 cycles ending in charged states to 50%. (Pack #6~10) | | | |
| | (UN38.3-6) | (A 9.1 k (61±2.5 6-2.Cel (The ce tester. | (g mass is to be dro i)cm onto the sampl I's diameter < 18mn ells are crushed with Once the force is o | opped from a height e.) n, Execution crush to a 13 KN with the cr btained it is to be re | est ush leased.) | cell does not exce 170°C and there i disassembly and i within 6 hours of t test. | cycle in charged states to 50%. (Pack#1~5) 5 cells are after 25 cycles ending in charged states to 50%. (Pack #6~10) | | | |
| Test Per Test Equ | (UN38.3-6) | (A 9.1 k (61±2.5 6-2.Cel (The ce tester. Start: 數位電 | (g mass is to be dro i)cm onto the sampl I's diameter < 18mn ells are crushed with Once the force is o | ppped from a height e.) n, Execution crush to a 13 KN with the cr btained it is to be re End: 20 收集器 Q152,擠 | est ush leased.) | cell does not exce 170°C and there i disassembly and i within 6 hours of t test. | cycle in charged states to 50%. (Pack#1~5) 5 cells are after 25 cycles ending in charged states to 50%. (Pack #6~10) | | | |
| Test Per Test Equ | (UN38.3-6) fiod sipment | (A 9.1 k (61±2.5 6-2.Cel (The ce tester. Start: 數位電 | Kg mass is to be dro i)cm onto the sampl I's diameter < 18mn ells are crushed with Once the force is o 2018/07/06 意表 Q153,資料。 Cells pass the to | ppped from a height e.) n, Execution crush to a 13 KN with the cr btained it is to be re End: 20 收集器 Q152,擠 | of est ush leased.) 018/07/0 壓試驗 | cell does not exce 170℃ and there i disassembly and i within 6 hours of t test. | cycle in charged states to 50%. (Pack#1~5) 5 cells are after 25 cycles ending in charged states to 50%. (Pack #6~10) | | | |
| Test Per Test Equ | (UN38.3-6) fiod sipment | (A 9.1 k (61±2.5 6-2.Cel (The ce tester. Start: 數位電 | Kg mass is to be dro i)cm onto the sampl I's diameter < 18mn ells are crushed with Once the force is o 2018/07/06 意表 Q153,資料。 Cells pass the to | pped from a height e.) n, Execution crush to a 13 KN with the crush tained it is to be reserved. End: 20 文集器 Q152, 擠est. Crush Test on 5 | est ush leased.) 018/07/0 壓試驗/ | cell does not exce 170℃ and there i disassembly and i within 6 hours of t test. 06 & Q437/撞擊測 | cycle in charged states to 50%. (Pack#1~5) 5 cells are after 25 cycles ending in charged states to 50%. (Pack #6~10) | | | |
| Test Per Test Equ | (UN38.3-6) fiod sipment | (A 9.1 r (61±2.5 6-2.Cel (The ce tester. Start: 數位電 The C | (g mass is to be dro i)cm onto the sample I's diameter < 18mn ells are crushed with Once the force is o 2018/07/06 意表 Q153,資料。 | pped from a height e.) n, Execution crush to a 13 KN with the crush tained it is to be reserved. End: 20 文集器 Q152, 擠est. Crush Test on 5 | est ush leased.) 018/07/0 壓試驗/ | cell does not exce 170℃ and there i disassembly and i within 6 hours of t test. 06 & Q437/撞擊測 | cycle in charged states to 50%. (Pack#1~5) 5 cells are after 25 cycles ending in charged states to 50%. (Pack #6~10) | | | |
| Test Per Test Equ | (UN38.3-6) fiod sipment | (A 9.1 r (61±2.5 6-2.Cel (The ce tester. Start: 數位電 The C | (g mass is to be dro i)cm onto the sampl I's diameter < 18mn ells are crushed with Once the force is o 2018/07/06 記表 Q153, 資料□ Cells pass the to | End: 20 上 第 Q152, Crush Test on 5 | est ush leased.) 0% Chi t No. | cell does not exce 170℃ and there i disassembly and i within 6 hours of t test. 06 & Q437/撞擊測 arged Cells Max. Temp.(%) | cycle in charged states to 50%. (Pack#1~5) 5 cells are after 25 cycles ending in charged states to 50%. (Pack #6~10) 武機 Q231 | | | |
| Test Peri Test Equ Recomm | (UN38.3-6) fiod sipment | (A 9.1 k (61±2.5 6-2.Cel (The ce tester. Start: 數位電 The C | (g mass is to be dro i)cm onto the sample I's diameter < 18mn ells are crushed with Once the force is o 2018/07/06 表 Q153, 資料。 Cells pass the te | End: 20 文集器 Q152,擠 Crush Test on 5 Other event | of est ush leased.) 018/07/0 壓試驗 t No. 6 | cell does not excell 170℃ and there is disassembly and within 6 hours of the test. 170℃ and there is disassembly and within 6 hours of the test. 106 108 108 109 109 109 109 109 109 | cycle in charged states to 50%. (Pack#1~5) 5 cells are after 25 cycles ending in charged states to 50%. (Pack #6~10) 試機 Q231 | | | |
| Test Peri Test Equ Recomm | iod nipment nendation | (A 9.1 k (61±2.5 6-2.Cel (The ce tester. Start: 數位電 The C | (g mass is to be dros) cm onto the sample of the sample o | ppped from a height e.) n, Execution crush to a 13 KN with the crubtained it is to be reserved. End: 20 文集器 Q152, 擠 est. Crush Test on 5 Other event | est ush leased.) 018/07/0 壓試驗和 t No. 6 | cell does not excell for and there is disassembly and is within 6 hours of the test. 26 26 27 28 28 28 20 20 20 20 20 20 20 | cycle in charged states to 50%. (Pack#1~5) 5 cells are after 25 cycles ending in charged states to 50%. (Pack #6~10) 武機 Q231 | | | |
| Test Peri Test Equ Recomm | iod nipment nendation | (A 9.1 F (61±2.5 6-2.Cel (The ce tester. Start: 數位電 The C | Kg mass is to be dro i)cm onto the sample I's diameter < 18mn ells are crushed with Once the force is on 2018/07/06 表 Q153,資料□ Cells pass the to 21.36 20.56 21.35 | End: 20 文字 Crush Test on 5 O C | of est ush leased.) 018/07/0 壓試驗 t No. 6 7 8 | cell does not excell does not excell 170℃ and there is disassembly and is within 6 hours of the test. Control of the test o | cycle in charged states to 50%. (Pack#1~5) 5 cells are after 25 cycles ending in charged states to 50%. (Pack #6~10) | | | |
| Test Peri Test Equ Recomm | iod nipment nendation | (A 9.1 F (61±2.5 6-2.Cel (The centester. start: 數位電 The Contester | Xg mass is to be dro S)cm onto the sample I's diameter < 18mn Bls are crushed with Once the force is of 2018/07/06 表 Q153,資料。 Cells pass the tell Max. Temp.(℃) 21.36 20.56 21.35 20.48 20.59 | End: 20 文集器 Q152, 擠 Crush Test on 5 O O | of est ush leased.) 018/07/0 壓試驗 t No. 6 7 8 9 10 | cell does not excell does not excell 170℃ and there is disassembly and is within 6 hours of the test. 20.66 20.48 21.59 20.66 20.14 21.79 | cycle in charged states to 50%. (Pack#1~5) 5 cells are after 25 cycles ending in charged states to 50%. (Pack #6~10) 武機 Q231 | | | |



| chergy | corporation | | | | | | | | | | | | |
|-----------|----------------------------------|--|--|---------------------|--|--|------------------|--|--|--|--|--|--|
| Item | Test Item | | Test | specification | | Judge crit | teria Sample(s) | | | | | | |
| Т7 | Overcharge test (UN38.3-7) | reco 7-2.The (a) Whe more the batt (b) Whe than time 7-3. Tes | ommended maximum minimum voltage of the her spec's recordent the spec's recordent the spec's recordent the spec's recordent 18V, the minimum test her maximum childrent maximu | ted at ambient temp | ge current. s follows: voltage is not e test shall be ge voltage of the voltage is more shall be 1.2 | No disasser no fire within seven days the test. | n cvcle in fully | | | | | | |
| Test Per | iod | | art: 2018/07/09 End: 2018/07/11 | | | | | | | | | | |
| Test Equi | pment | 數位電 | 表 Q153, 資料 | ·收集器 Q078, 等 | 電源供應器 Q | 148/Q150/ | 'Q0236 | | | | | | |
| Major Pr | oblem | - | | | | | | | | | | | |
| Warning | | - | | | | | | | | | | | |
| | nendation | The pa | acks pass the | test. | | | | | | | | | |
| | | No. | Charge Voltage(V) | Charge Current(A) | Max. Tem | p.(°C) | Other event | | | | | | |
| | | 9 | | | 20.36 | | 0 | | | | | | |
| | | 10 | | | 20.1 | | 0 | | | | | | |
| | | 11 | | | 21.49 | | 0 | | | | | | |
| | | 12 | 22.0 V | 8.5 | 21.58 | | 0 | | | | | | |
| | | 13 14 | | | 20.38 20.48 | | 0 | | | | | | |
| | | 15 | | | 20.40 | | 0 | | | | | | |
| Rav | w Data | 16 | | | 21.76 | | 0 | | | | | | |
| Raw Data | | Note: | D-Disassemb | ly;F-Fire / O | | | Fire | | | | | | |



| Item | Test Item | | | Test specification | | Judge | criteria | Sample(s) |
|----------|--|------------------|--|---|----------|---|------------|--------------------------|
| Т8 | Forced discharge test (UN38.3-8) | conne initial | hall be forced di ecting it in series current equal to fied by the manu | 10 cells are first cycle in fully discharged states (Pack#11~20) 10 cells are after 25 cycles ending in fully discharged states (Pack #21~30) | | | | |
| Test Per | iod | Start | : 2018/07/16 | End: 20 | 018/0 | 7/17 | | , |
| Test Equ | uipment | | 電表 Q153, | | | | 00475/0 | 00476 |
| Major Pr | • | - | 3,44 3,75 3, | Х ГГРСЖ ВВ Д ГОСУ | -3 ///1 | 7 1/1/3 BB -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 | | |
| Warning | | - | | | | | | |
| | nendation | The | packs pass | the test. | | | | |
| | | Ford | | rst cycle in fully discharged | Force | d discharge are after 25 | cycles end | ling in fully discharged |
| | | No. | Max. Temp.(°C) | Other event | No. | Max. Temp.(°C) | | Other event |
| | | 11 | 51.23 | 0 | 21 | 48.26 | | 0 |
| | | 12 13 | 52.48 49.63 | 0 | 22 | 43.56 51.48 | | 0 |
| | | 14 | 47.25 | 0 | 24 | 52.48 | | 0 |
| | | 15 | 45.23 | 0 | 25 | 55.49 | | 0 |
| | | 16 | 52.25 | 0 | 26 | 53.76 | | 0 |
| | | 17 18 | 51.59 52.36 | 0 | 27 28 | 51.85 49.26 | | 0 |
| | | 19 | 55.14 | 0 | 29 | 48.35 | | 0 |
| | | 20 | 49.36 | 0 | 30 | 43.58 | | 0 |
| Ra | w Data | | | O re / O-No Disassembly , No Fi | | 43.58 | | 0 |