

# UN38.3 Test Report

<b>Applicant's name</b>	Timechant (Hong Kong) Limited
<b>Applicant's Address</b>	Flat 18, 10/F., Corporation Square, 8 Lam Lok Street, Kowloon Bay, Kowloon Hong Kong
<b>Name of Sample</b>	Lithium Polymer Battery
<b>Model</b>	401020
<b>Testing Laboratory</b>	Shenzhen TCT Testing Technology Co., Ltd. 1B/F., Building 1, Yibaolai Industrial Park, Qiaotou, Fuyong, Baoan District, Shenzhen, Guangdong, China
<b>Report No.</b>	TCT200331B017
<b>Date of Issue</b>	2020. 04. 10
<b>Test Conclusion:</b>	<b>The test results are qualified.</b>

Tested by: May Hou

Approved by: Allen Din

Inspected by: Amy Zeng

Seal of TCT:



## I、Sample Description

<b>Name of Sample</b>	Lithium Polymer Battery	<b>Model</b>	401020		
<b>Manufacturer's name</b>	Timechant (Hong Kong) Limited				
<b>Manufacturer's Address</b>	Flat 18, 10/F., Corporation Square, 8 Lam Lok Street, Kowloon Bay, Kowloon Hong Kong				
<b>Manufacturer's Contact Telephone</b>	+86-852-3113 4120	<b>E-mail</b>	support@timechant.com	<b>Web</b>	----
<b>Trade Mark</b>	----	<b>Shape</b>	Prismatic	<b>Size (L×W×T)</b>	(20.4×11.3×4.3)mm
<b>Nominal Voltage</b>	3.7V	<b>Rated Capacity</b>	80mAh 0.3Wh	<b>Charge Voltage</b>	4.2V
<b>Nominal Charge Current</b>	16mA	<b>Maximum Charge Current</b>	80mA	<b>End of Charge Current</b>	0.8mA
<b>Discharge Cut-off Voltage</b>	3.0V	<b>Standard Discharge Current</b>	16mA	<b>Maximum Discharge Current</b>	80mA
<b>Cell Model</b>	401020	<b>Cell Nominal Voltage</b>	3.7V	<b>Cell Rated Capacity</b>	80mAh
<b>Cells Number</b>	1PCS	<b>Sample Receiving Date</b>	2020. 03. 27	<b>Testing Date</b>	2020. 03. 31 — 2020. 04. 10

## II、Standard

UNITED NATIONS "Recommendations on the TRANSPORT OF DANGEROUS GOODS Manual of Tests and Criteria" Sixth revised edition Amendment 1 (ST/SG/AC.10/11/Rev.6/Amend.1)

## III、Test Item

- |  |  |
|--|--|
| T.1. <input checked="" type="checkbox"/> Altitude simulation | T.5. <input checked="" type="checkbox"/> External short circuit                  |
| T.2. <input checked="" type="checkbox"/> Thermal test        | T.6. <input type="checkbox"/> Impact / <input checked="" type="checkbox"/> Crush |
| T.3. <input checked="" type="checkbox"/> Vibration           | T.7. <input checked="" type="checkbox"/> Overcharge                              |
| T.4. <input checked="" type="checkbox"/> Shock               | T.8. <input checked="" type="checkbox"/> Forced discharge                        |

## IV、 Test Method and Requirement

### T.1. Altitude simulation

#### Purpose

This test simulates air transport under low-pressure conditions.

#### Test procedure

Test cells and batteries shall be stored at a pressure of 11.6 kPa or less for at least six hours at ambient temperature ( $20 \pm 5$  °C).

#### Requirement

Cells and batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire and if 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. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.

### T.2. Thermal test

#### Purpose

This test assesses cell and battery seal integrity and internal electrical connections. The test is conducted using rapid and extreme temperature changes.

#### Test procedure

Test Cells and batteries are to be stored for at least six hours at a test temperature equal to  $72 \pm 2$  °C, followed by storage for at least six hours at a test temperature equal to  $-40 \pm 2$  °C. The maximum time interval between test temperature extremes is 30 minutes. This procedure is to be repeated until 10 total cycles are complete, after which all test cells and batteries are to be stored for 24 hours at ambient temperature ( $20 \pm 5$  °C). For large cells and batteries the duration of exposure to the test temperature extremes should be at least 12 hours.

#### Requirement

Cells and batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire and if 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. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.

### T.3. Vibration

#### Purpose

This test simulates vibration during transport.

#### Test procedure

Cells and batteries are firmly secured to the platform of the vibration machine without distorting the cells in such a manner as to faithfully transmit the vibration. The vibration shall be a sinusoidal waveform with a logarithmic sweep between 7 Hz and 200 Hz and back to 7 Hz traversed in 15 minutes. This cycle shall be repeated 12 times for a total of 3 hours for each of three mutually perpendicular mounting positions of the cell. One of the directions of vibration must be perpendicular to the terminal face.

The logarithmic frequency sweep shall differ for cells and batteries with a gross mass of not more than 12 kg (cells and small batteries), and for batteries with a gross mass of more than 12 kg (large batteries).

For cells and small batteries: from 7 Hz a peak acceleration of 1 gn is maintained until 18 Hz is reached. The amplitude is then maintained at 0.8 mm (1.6 mm total excursion) and the frequency increased until a peak acceleration of 8 gn occurs (approximately 50 Hz). A peak acceleration of 8 gn is then maintained until the frequency is increased to 200 Hz.

For large batteries: from 7 Hz to a peak acceleration of 1 gn is maintained until 18 Hz is reached. The amplitude is then maintained at 0.8 mm (1.6 mm total excursion) and the frequency increased until a peak acceleration of 2 gn occurs (approximately 25 Hz). A peak acceleration of 2 gn is then maintained until the frequency is increased to 200 Hz.

**Requirement**

Cells and batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire during the test and after the test and if the open circuit voltage of each test cell or battery directly after testing in its third perpendicular mounting position is not less than 90% of its voltage immediately prior to this procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.

**T.4. Shock**

**Purpose**

This test assesses the robustness of cells and batteries against cumulative shocks.

**Test procedure**

Test cells and batteries shall be secured to the testing machine by means of a rigid mount which will support all mounting surfaces of each test battery.

Each cell shall be subjected to a half-sine shock of peak acceleration of 150 gn and pulse duration of 6 milliseconds. Alternatively, large cells may be subjected to a half-sine shock of peak acceleration of 50 gn and pulse duration of 11 milliseconds.

Each battery shall be subjected to a half-sine shock of peak acceleration depending on the mass of the battery. The pulse duration shall be 6 milliseconds for small batteries and 11 milliseconds for large batteries. The formulas below are provided to calculate the appropriate minimum peak accelerations.

Each cell or battery shall be subjected to three shocks in the positive direction and to three shocks in the negative direction in each of three mutually perpendicular mounting positions of the cell or battery for a total of 18 shocks.

The formulas below are provided to calculate the appropriate minimum peak accelerations.

Battery	Minimum peak acceleration	Pulse duration
Small batteries	150 gn or result of formula $\text{Acceleration}(g_n) = \sqrt{\left(\frac{100850}{\text{mass}^*}\right)}$ whichever is smaller	6 ms
Large batteries	50 gn or result of formula $\text{Acceleration}(g_n) = \sqrt{\left(\frac{30000}{\text{mass}^*}\right)}$ whichever is smaller	11 ms

\* Mass is expressed in kilograms.

**Requirement**

Cells and batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire and if 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. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.

**T.5. External short circuit**

**Purpose**

This test simulates an external short circuit.

**Test procedure**

The cell or battery to be tested shall be heated for a period of time necessary to reach a homogeneous stabilized temperature of 57 ± 4 °C, measured on the external case. This period of time depends on the size and design of the cell or battery and should be 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. Then the cell or battery at  $57 \pm 4$  °C shall be subjected to one short circuit condition with a total external resistance of less than 0.1 ohm.

This short circuit condition is continued for at least one hour after the cell or battery external case temperature has returned to  $57 \pm 4$  °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.

The short circuit and cooling down phases shall be conducted at least at ambient temperature.

### Requirement

Cells and batteries meet this requirement if their external temperature does not exceed 170 °C and there is no disassembly, no rupture and no fire during the test and within six hours after the test.

## T.6. Impact / Crush

### Purpose

These tests simulate mechanical abuse from an impact or crush that may result in an internal short circuit.

### Test procedure – Impact (applicable to cylindrical cells not less than 18.0 mm in diameter)

The test sample cell or component cell is to be placed on a flat smooth surface. A 15.8 mm  $\pm$  0.1mm diameter, at least 6 cm long, or the longest dimension of the cell, whichever is greater, Type 316 stainless steel bar is to be placed across the centre of the sample. A 9.1 kg  $\pm$  0.1 kg mass is to be dropped from a height of 61  $\pm$  2.5 cm at the intersection of the bar and sample in a controlled manner using a near frictionless, vertical sliding track or channel with minimal drag on the falling mass. The vertical track or Channel used to guide the falling mass shall be oriented 90 degrees from the horizontal supporting surface.

The test sample is to be impacted with its longitudinal axis parallel to the flat surface and perpendicular to the longitudinal axis of the 15.8 mm  $\pm$  0.1mm diameter curved surface lying across the centre of the test sample. Each sample is to be subjected to only a single impact.

### Test procedure – Crush (applicable to prismatic, pouch, coin/button cells and cylindrical cells less than 18.0 mm in diameter)

A cell or component cell is to be crushed between two flat surfaces. The crushing is to be gradual with a speed of approximately 1.5 cm/s at the first point of contact. The crushing is to be continued until the first of the three options below is reached.

- (a) The applied force reaches 13 kN  $\pm$  0.78 kN;
- (b) The voltage of the cell drops by at least 100 mV; or
- (c) The cell is deformed by 50% or more of its original thickness.

Once the maximum pressure has been obtained, the voltage drops by 100 mV or more, or the cell is deformed by at least 50% of its original thickness, the pressure shall be released.

A prismatic or pouch cell shall be crushed by applying the force to the widest side. A button/coin cell shall be crushed by applying the force on its flat surfaces. For cylindrical cells, the crush force shall be applied perpendicular to the longitudinal axis.

Each test cell or component cell is to be subjected to one crush only. The test sample shall be observed for a further 6 h. The test shall be conducted using test cells or component cells that have not previously been subjected to other tests.

### Requirement

Cells and component cells meet this requirement if their external temperature does not exceed 170 °C and there is no disassembly and no fire during the test and within six hours after this test.

## T.7. Overcharge

### Purpose

This test evaluates the ability of a rechargeable battery or a single cell rechargeable battery to withstand an overcharge condition.

### Test procedure

The charge current shall be twice the manufacturer's recommended maximum continuous charge current. The minimum voltage of the test shall be as follows:

- (a) When the manufacturer's recommended charge voltage is not more than 18 V, the minimum voltage

of the test shall be the lesser of two times the maximum charge voltage of the battery or 22 V.

(b) When the manufacturer's recommended charge voltage is more than 18 V, the minimum voltage of the test shall be 1.2 times the maximum charge voltage.

Tests are to be conducted at ambient temperature. The duration of the test shall be 24 hours.

### Requirement

Rechargeable batteries meet this requirement if there is no disassembly and no fire during the test and within seven days after the test.

## T.8. Forced discharge

### Purpose

This test evaluates the ability of a primary or a rechargeable cell to withstand a forced discharge condition.

### Test procedure

Each cell shall be forced discharged at ambient temperature by connecting it in series with a 12 V D.C. power supply at an initial current equal to the maximum discharge current specified by the manufacturer.

The specified discharge current is to be obtained by connecting a resistive load of the appropriate size and rating in series with the test cell. Each cell shall be forced discharged for a time interval (in hours) equal to its rated capacity divided by the initial test current (in ampere).

### Requirement

Primary or rechargeable cells meet this requirement if there is no disassembly and no fire during the test and within seven days after the test.

## V、General terms and definitions

Table 38.3.1: Mass loss limit

Mass M of cell or battery	Mass loss limit
$M < 1 \text{ g}$	0.5%
$1 \text{ g} \leq M \leq 75 \text{ g}$	0.2%
$M > 75 \text{ g}$	0.1%

In order to quantify the mass loss, the following procedure is provided:

$$\text{Mass loss (\%)} = (M_1 - M_2)/M_1 \times 100$$

Where  $M_1$  is the mass before the test and  $M_2$  is the mass after the test. When mass loss does not exceed the values in Table 38.3.1, it shall be considered as "no mass loss".

Leakage means the visible escape of electrolyte or other material from a cell or battery or the loss of material (except battery casing, handling devices or labels) from a cell or battery such that the loss of mass exceeds the values in Table 38.3.1.

Venting means the release of excessive internal pressure from a cell or battery in a manner intended by design to preclude rupture or disassembly.

Disassembly means a vent or rupture where solid matter from any part of a cell or battery penetrates a wire mesh screen (annealed aluminium wire with a diameter of 0.25 mm and grid density of 6 to 7 wires per cm) placed 25 cm away from the cell or battery.

Rupture means the mechanical failure of a cell container or battery case induced by an internal or external cause, resulting in exposure or spillage but not ejection of solid materials.

Fire means that flames are emitted from the test cell or battery.

## VI、Main Test Apparatus

Serial No.	Name of Equipment	Model	Calibration Date /Due Date
TC-B01	Low Altitude Simulation Tester	GX-3020-Z	2019. 04. 16
			2020. 04. 15
TC-B04	Vertical Shock Test Instrument	SY10-2	2019. 09. 06
			2020. 09. 05
TC-B05	Vibration test instrument	ES-3-150	2019. 04. 16
			2020. 04. 15
TC-B07	Battery Test System	CTS 20V/10A	2019. 04. 17
			2020. 04. 16
TC-B11	Crush Test Instrument	BE-6045T	2019. 04. 16
			2020. 04. 15
TC-B13	Battery Short Circuit Tester	GX-6055-B	2019. 04. 17
			2020. 04. 16
TC-B14	Electronic Balance	PTT-A+300	2019. 04. 16
			2020. 04. 15
TC-B15	Data Collector	34970A	2019. 04. 16
			2020. 04. 15
TC-B18	DC POWER	PSW 80-27	2019. 04. 16
			2020. 04. 15
TC-B21	Battery Impact Tester	BE-5066	2019. 04. 16
			2020. 04. 15
TC-B25	Digital Multimeter	15B	2019. 09. 06
			2020. 09. 05
TC-B30	Programmable high & low temperature test chamber	GX-3000-150	2019. 09. 06
			2020. 09. 05

## VII、Test Data

### T.1. Altitude simulation

Test sample status	No.	Pre-test		After test		Mass loss (%)	Change ratio (%)	Status
		Mass (g)	Voltage (V)	Mass (g)	Voltage (V)			
first cycle, fully charged state	1#	1.436	4.18	1.436	4.18	0.00	100.0	Pass
	2#	1.420	4.19	1.420	4.18	0.00	99.8	Pass
	3#	1.436	4.18	1.435	4.18	0.07	100.0	Pass
	4#	1.415	4.17	1.415	4.17	0.00	100.0	Pass
	5#	1.418	4.18	1.418	4.18	0.00	100.0	Pass
25th cycle, fully charged state	6#	1.437	4.19	1.437	4.19	0.00	100.0	Pass
	7#	1.438	4.18	1.438	4.17	0.00	99.8	Pass
	8#	1.424	4.18	1.424	4.18	0.00	100.0	Pass
	9#	1.426	4.19	1.426	4.19	0.00	100.0	Pass
	10#	1.424	4.18	1.423	4.18	0.07	100.0	Pass

**Notes :** Ambient temperature: 23.2 °C.

After the test, there is no leakage, no venting, no disassembly, no rupture and no fire. And change ratio is not less than 90 %.

### T.2. Thermal test

Test sample status	No.	Pre-test		After test		Mass loss (%)	Change ratio (%)	Status
		Mass (g)	Voltage (V)	Mass (g)	Voltage (V)			
first cycle, fully charged state	1#	1.436	4.18	1.434	4.15	0.14	99.3	Pass
	2#	1.420	4.18	1.419	4.14	0.07	99.0	Pass
	3#	1.435	4.18	1.434	4.14	0.07	99.0	Pass
	4#	1.415	4.17	1.415	4.14	0.00	99.3	Pass
	5#	1.418	4.18	1.417	4.14	0.07	99.0	Pass
25th cycle, fully charged state	6#	1.437	4.19	1.436	4.15	0.07	99.0	Pass
	7#	1.438	4.17	1.437	4.14	0.07	99.3	Pass
	8#	1.424	4.18	1.423	4.14	0.07	99.0	Pass
	9#	1.426	4.19	1.425	4.15	0.07	99.0	Pass
	10#	1.423	4.18	1.422	4.14	0.07	99.0	Pass

**Notes :** Ambient temperature: 23.3 °C.

After the test, there is no leakage, no venting, no disassembly, no rupture and no fire. And change ratio is not less than 90 %.



## T.3. Vibration

Test sample status	No.	Pre-test		After test		Mass loss (%)	Change ratio (%)	Status
		Mass (g)	Voltage (V)	Mass (g)	Voltage (V)			
first cycle, fully charged state	1#	1.434	4.15	1.434	4.15	0.00	100.0	Pass
	2#	1.419	4.14	1.418	4.14	0.07	100.0	Pass
	3#	1.434	4.14	1.434	4.14	0.00	100.0	Pass
	4#	1.415	4.14	1.415	4.13	0.00	99.8	Pass
	5#	1.417	4.14	1.417	4.14	0.00	100.0	Pass
25th cycle, fully charged state	6#	1.436	4.15	1.436	4.15	0.00	100.0	Pass
	7#	1.437	4.14	1.437	4.14	0.00	100.0	Pass
	8#	1.423	4.14	1.422	4.14	0.07	100.0	Pass
	9#	1.425	4.15	1.425	4.14	0.00	99.8	Pass
	10#	1.422	4.14	1.422	4.14	0.00	100.0	Pass

**Notes :** Ambient temperature: 23.3 °C.

After the test, there is no leakage, no venting, no disassembly, no rupture and no fire. And change ratio is not less than 90 %.

## T.4. Shock

Test sample status	No.	Pre-test		After test		Mass loss (%)	Change ratio (%)	Status
		Mass (g)	Voltage (V)	Mass (g)	Voltage (V)			
first cycle, fully charged state	1#	1.434	4.15	1.433	4.14	0.07	99.8	Pass
	2#	1.418	4.14	1.418	4.14	0.00	100.0	Pass
	3#	1.434	4.14	1.434	4.14	0.00	100.0	Pass
	4#	1.415	4.13	1.415	4.13	0.00	100.0	Pass
	5#	1.417	4.14	1.417	4.14	0.00	100.0	Pass
25th cycle, fully charged state	6#	1.436	4.15	1.436	4.15	0.00	100.0	Pass
	7#	1.437	4.14	1.437	4.13	0.00	99.8	Pass
	8#	1.422	4.14	1.421	4.14	0.07	100.0	Pass
	9#	1.425	4.14	1.425	4.14	0.00	100.0	Pass
	10#	1.422	4.14	1.422	4.14	0.00	100.0	Pass

**Notes :** Ambient temperature: 23.4°C.

After the test, there is no leakage, no venting, no disassembly, no rupture and no fire. And change ratio is not less than 90 %.

## T.5. External short circuit

Test sample status	No.	Maximum external temperature (°C)	Status
first cycle, fully charged state	1#	57.3	Pass
	2#	57.1	Pass
	3#	57.2	Pass
	4#	57.3	Pass
	5#	57.4	Pass
25th cycle, fully charged state	6#	57.3	Pass
	7#	57.2	Pass
	8#	57.1	Pass
	9#	57.2	Pass
	10#	57.3	Pass

**Notes:** Ambient temperature: 23.4 °C.

Test sample external temperature does not exceed 170 °C and there is no disassembly, no rupture and no fire during the test and within six hours after the test.

## T.6. Crush

Test sample status	No.	Maximum external temperature (°C)	Status
first cycle, 50% charged state	11#	23.4	Pass
	12#	23.6	Pass
	13#	23.5	Pass
	14#	23.7	Pass
	15#	23.5	Pass
25th cycle, 50% charged state	16#	23.8	Pass
	17#	23.5	Pass
	18#	23.6	Pass
	19#	23.7	Pass
	20#	23.5	Pass

**Notes:** Ambient temperature: 23.5 °C.

Test sample external temperature does not exceed 170 °C and there is no disassembly, no rupture and no fire during the test and within six hours after the test.

## T.7. Overcharge

Test sample status	No.	Status

first cycle, fully charged state	21#	Pass
	22#	Pass
	23#	Pass
	24#	Pass
25th cycle, fully charged state	25#	Pass
	26#	Pass
	27#	Pass
	28#	Pass

**Notes:** Ambient temperature: 23.5 °C.

There is no disassembly and no fire during the test and within seven days after the test.

## T.8. Forced discharge

Test sample status	No.	Status
first cycle, fully discharged state	29#	Pass
	30#	Pass
	31#	Pass
	32#	Pass
	33#	Pass
	34#	Pass
	35#	Pass
	36#	Pass
	37#	Pass
	38#	Pass
25th cycle, fully discharged state	39#	Pass
	40#	Pass
	41#	Pass
	42#	Pass
	43#	Pass
	44#	Pass
	45#	Pass
	46#	Pass
	47#	Pass
	48#	Pass

**Notes:** Ambient temperature: 23.4 °C.

There is no disassembly and no fire during the test and within seven days after the test.

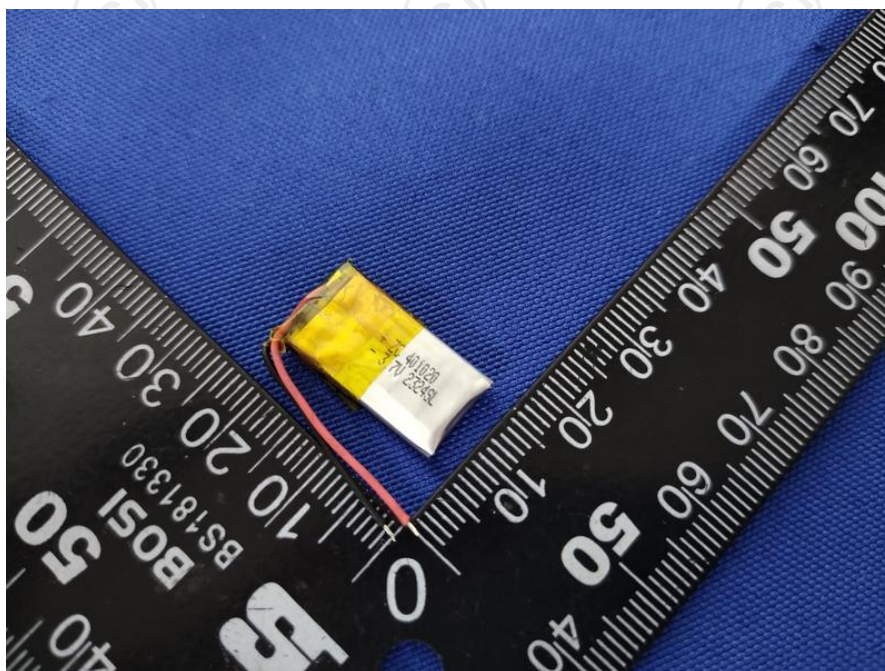
## VIII、Conclusion

No.	Name of test items	Cause number of standard	Test Result	Conclusion	Remark
1	Altitude simulation	38.3 Test T.1	See Appendix T.1. Altitude simulation	Pass	/
2	Thermal test	38.3 Test T.2	See Appendix T.2. Thermal test	Pass	/
3	Vibration	38.3 Test T.3	See Appendix T.3. Vibration	Pass	/
4	Shock	38.3 Test T.4	See Appendix T.4. Shock	Pass	/
5	External short circuit	38.3 Test T.5	See Appendix T.5. External short circuit	Pass	/
6	Crush	38.3 Test T.6	See Appendix T.6. Crush	Pass	/
7	Overcharge	38.3 Test T.7	See Appendix T.7. Overcharge	Pass	/
8	Forced discharge	38.3 Test T.8	See Appendix T.8. Forced discharge	Pass	/

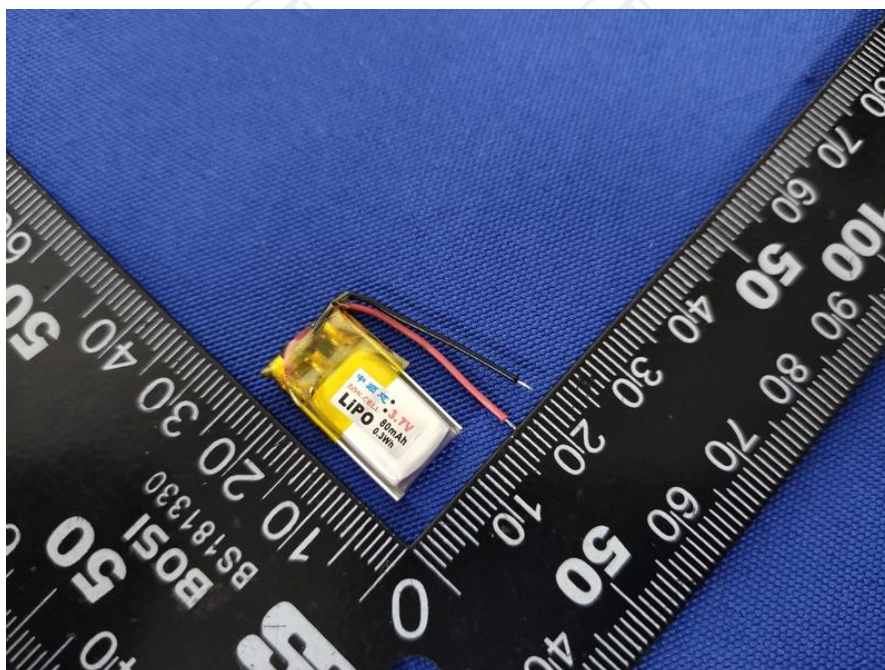
**According to the standard:**

UNITED NATIONS "Recommendations on the TRANSPORT OF DANGEROUS GOODS Manual of Tests and Criteria" Sixth revised edition Amendment 1 (ST/SG/AC.10/11/Rev.6/Amend.1).

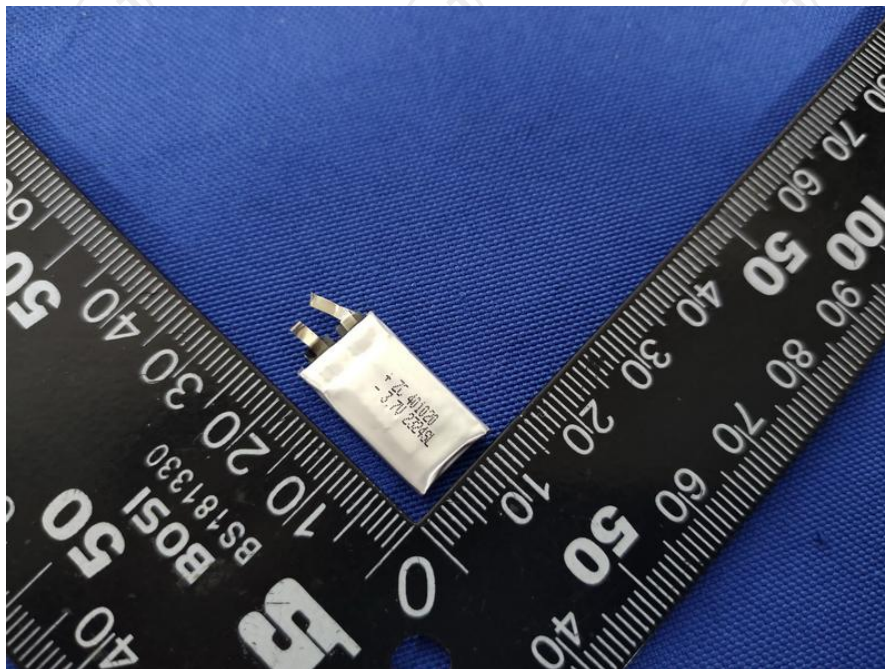
## IX、Picture of the sample



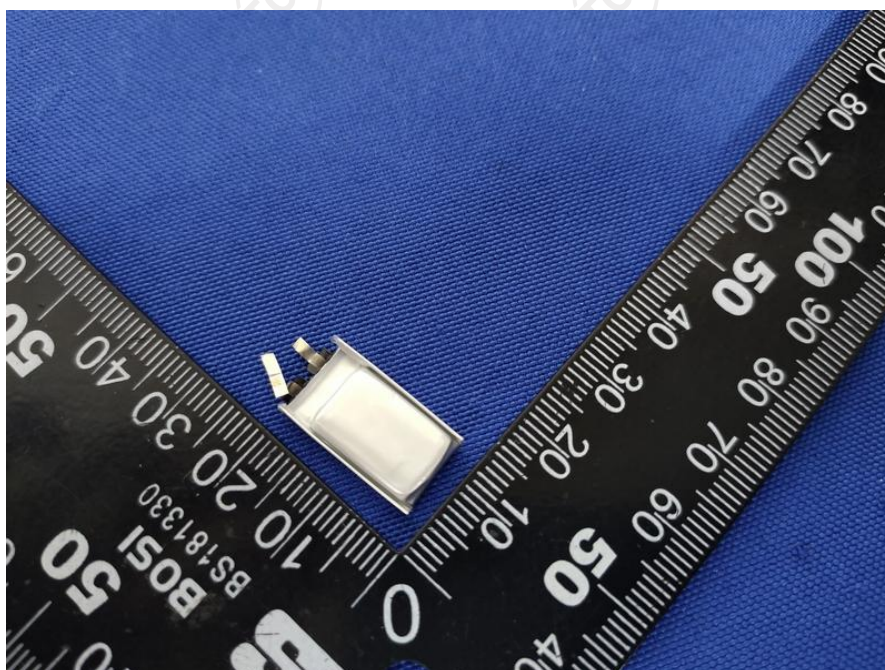
Picture 1. Battery view



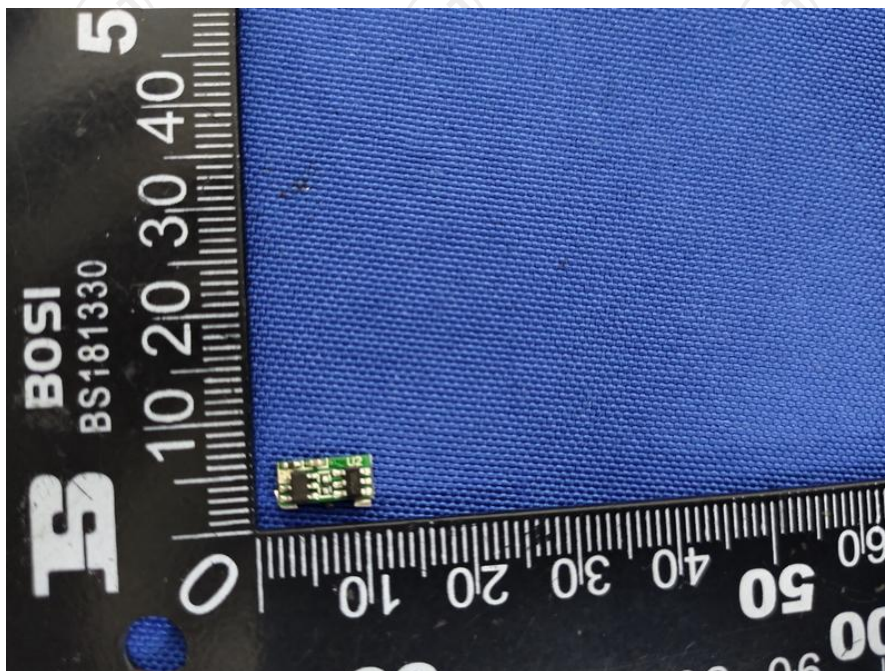
Picture 2. Battery view



Picture 3. Cell view



Picture 4. Cell view



Picture 5. Protection board view



Picture 6. Protection board view

\*\*\*\*\*End of Report \*\*\*\*\*

## Important Notice

1. The test report is invalid without the official stamp of TCT.
2. Nobody is allowed to photocopy or partly photocopy this test report without written permission of TCT.
3. The test report is invalid without the signatures of Ratifier, Reviewer and Testing engineer.
4. The report is invalid when anything of following happens – illegal transfer, reproduce, embezzlement, imposture, modification or tampering in any media form.
5. Objections to the test report must be submitted to TCT within 15 days.
6. The test report is valid for the tested samples only.
7. The Chinese contents in this report are only for reference.



# MSDS Report

<b>Applicant's name</b>	Timechant (Hong Kong) Limited
<b>Applicant's Address</b>	Flat 18, 10/F., Corporation Square, 8 Lam Lok Street, Kowloon Bay, Kowloon Hong Kong
<b>Name of Sample</b>	Lithium Polymer Battery
<b>Model</b>	401020
<b>Nominal Voltage</b>	3.7V
<b>Rated Capacity</b>	80mAh, 0.3Wh
<b>Weight</b>	1.4g
<b>Size (LxWxT)</b>	(20.4x11.3x4.3)mm
<b>Prepared By</b>	Shenzhen TCT Testing Technology Co., Ltd. 1B/F., Building 1, Yibaolai Industrial Park, Qiaotou, Fuyong, Baoan District, Shenzhen, Guangdong, China.
<b>Report No.</b>	TCT200331M012

Written by: May HouApproved by: Allen DinInspected by: Amy ZengDate: 2020.04.10

**Material Safety Data Sheet****Section 1- Chemical Product & Company Identification**

<i>Name of Sample</i>	Lithium Polymer Battery
<i>Manufacturer's name</i>	Timechant (Hong Kong) Limited
<i>Manufacturer's Address</i>	Flat 18, 10/F., Corporation Square, 8 Lam Lok Street, Kowloon Bay, Kowloon Hong Kong
<i>Contact Person</i>	Christy Chan
<i>Tel</i>	+852-31134120
<i>Fax</i>	+852-31134173
<i>Emergency Tel</i>	+852-31134120
<i>E-mail</i>	support@timechant.com

**Section 2- Hazards Identification**

<i>Classification of Danger</i>	See section 14.
<i>Primary Route(s) of Exposure</i>	Eye, skin contact, ingestion.
<i>Health Hazard</i>	The batteries are not hazardous when used according to the instructions of manufacturer under normal conditions. In case of abuse, there's Hazard of rupture, fire, heat, leakage of internal components, which could cause casualty loss. Abuses including but not limited to the following cases: charged for long time, short circuited, put into fire, whacked with hard object, punctured with acute object, crushed, and broken.

### Section 3- Composition/Information on Ingredients

<i>Chemical Name</i>	<i>Concentration or concentration ranges (%)</i>	<i>CAS Number</i>
Lithium Cobalt Oxide (CoLiO <sub>2</sub> )	30-60	12190-79-3
Graphite	10-30	7782-42-5
Phosphate(1-), hexafluoro-, lithium	10-30	21324-40-3
Copper	5-10	7440-50-8
Aluminum foil	1-5	7429-90-5
Nickel	1-5	7440-02-0

Labeling according to EC directives.

No symbol and Hazard phrase are required.

Note: CAS number is Chemical Abstract Service Registry Number.

N/A=Not apply.

### Section 4- First Aid Measures

<i>Eye</i>	Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.
<i>Skin</i>	Remove contaminated clothes and rinse skin with plenty of water or shower for 15 minutes. Get medical aid.
<i>Inhalation</i>	Remove from exposure and move to fresh air immediately. Use oxygen if available.
<i>Ingestion</i>	Give at least 2 glasses of milk or water. Induce vomiting unless patient is unconscious. Call a physician.

### Section 5- Fire Fighting Measures

<i>Characteristics of Hazard</i>	Dusts at sufficient concentrations can form explosive mixtures with air. Combustion generates toxic fumes.
<i>Hazardous Combustion Products</i>	Carbon dioxide.
<i>Fire-extinguishing Methods and Extinguishing Media</i>	For small fires, use water spray, dry chemical, carbon dioxide or chemical foam.

<b>Attention in Fire-extinguishing</b>	Wear self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.
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**Section 6- Accidental Release Measures**

<i>Personal Precautions, protective equipment, and emergency procedures</i>	In case of rupture. Attention! Corrosive material. Avoid contact with skin, eyes and clothing. Ensure adequate ventilation. Use personal protective equipment as required. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Refer to protective measures listed in Sections 7 and 8.
<i>Environmental Precautions</i>	Prevent product from contaminating soil and from entering sewers or waterways.
<i>Methods and materials for Containment</i>	Stop the leak if safe to do so. Contain the spilled liquid with dry sand or earth. Clean up spills immediately.
<i>Methods and materials for cleaning up</i>	Absorb spilled material with an inert absorbent (dry sand or earth). Scoop contaminated absorbent into an acceptable waste container. Collect all contaminated absorbent and dispose of according to directions in Section 13. Scrub the area with detergent and water; collect all contaminated wash water for proper disposal.

**Section 7- Handling and Storage**

<i>Handling</i>	The battery may explode or cause burns, if disassembled, crushed or exposed to fire or high temperatures. Do not short or install with incorrect polarity.
<i>Storage</i>	Store in a cool, dry, well-ventilated area away from incompatible substances. Store locked up. Keep out of the reach of children.
<i>Other Precautions</i>	In case of rupture. Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes or clothing. Use personal protection equipment.

**Section 8 - Exposure Controls/Personal Protection**

<i>Engineering Controls</i>	Use adequate ventilation to keep airborne concentrations low. If used under conditions that generate particulates, the ACGIH TLV-TWA of 3mg/m <sup>3</sup> respirable fraction (10mg/m <sup>3</sup> total) should be observed.
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<i>Personal Protective Equipment</i>	<p>Eye and Face Protection: None required for consumer use. If there is a Hazard of contact: Tight sealing safety goggles. Face protection shield.</p> <p>Skin and Body Protection: None required for consumer use. If there is a Hazard of contact: Wear protective gloves and protective clothing.</p> <p>Respiratory Protection: No protective equipment is needed under normal use conditions. If exposure limits are exceeded or irritation is experienced, ventilation and evacuation may be required.</p>
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**Section 9- Physical and Chemical Properties**

<i>Physical State</i>	Appearance: Prismatic
	Color: Silver
	Odour: If leaking, smells of medical ether.
<i>Change in condition</i>	
pH	Not applicable as supplied.
Flash Point	Not applicable unless individual components exposed.
Flammability	Not applicable unless individual components exposed.
Relative density:	Not applicable unless individual components exposed.
Solubility (water)	Not applicable unless individual components exposed.
Solubility (other)	Not applicable unless individual components exposed.

**Section 10 – Stability and Reactivity**

<i>Chemical Stability</i>	Stable under recommended storage conditions.
<i>Possibility of Hazardous Reactions</i>	None under normal processing.
<i>Conditions to Avoid</i>	Exposure to air or moisture over prolonged periods.
<i>Incompatible materials</i>	Acids, Oxidizing agents, Bases.
<i>Hazardous Decomposition Products</i>	Carbon oxides.

### Section 11 – Toxicological Information

<i>Irritation</i>	In the event of exposure to internal contents, vapour fumes may be very irritating to the eyes and skin.
<i>Sensitization</i>	Not Available.
<i>Reproductive Toxicity</i>	Not Available.
<i>Toxicologically Synergistic Materials</i>	Not Available.

### Section 12-Ecological Information

<i>General note:</i>	Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
<i>Anticipated behavior of a chemical product in environment/possible environmental impact/ ecotoxicity</i>	Not Available.

### Section 13 – Disposal Considerations

<i>Waste Treatment</i>	Recycle or dispose of in accordance with government, state & local regulations.
<i>Attention for Waste Treatment</i>	Deserted batteries shouldn't be treated as ordinary trash. Shouldn't be thrown into fire or placed in high temperature. Shouldn't be dissected, pierced, crushed or treated similarly. Best disposal method is recycling.

### Section 14 – Transport Information

<i>UN number</i>	3480 & 3481
<i>Proper shipping name</i>	Lithium ion batteries (limited to a maximum of 30% SoC) or; Lithium ion batteries packed with equipment (including lithium ion polymer batteries) or; Lithium ion batteries contained in equipments (including lithium ion polymer batteries).
<i>Label(s) / Placard Required</i>	Miscellaneous Lithium batt

*Special precautions which a user needs to be aware of, or needs to comply with, in connection with transport or conveyance either within or outside their premises*

ICAO / IATA:	Can be shipped by air in accordance with International Civil Aviation Organization (ICAO), TI or International Air Transport Association (IATA), DGR Packing Instructions (PI) 965 Section II/Section IB, PI 966 Section II and PI 967 Section II appropriate of IATA DGR 61 <sup>st</sup> (2020 Edition) for transportation.
IMDG CODE:	The batteries are not restricted to IMDG Code 2018 Edition (Amdt 39-18) according to special provision 188.
DOT:	Other requirements for the US Department of Transportation (DOT) Subchapter C, Hazardous Materials Regulations if shipped in compliance with 49 CFR 173.185.
ADR/ ADN:	The batteries are not subject to the provisions of United Nations Economic Commission for Europe (UNECE) ADR/ADN if they meet the requirements of special provision 188 of Chapter 3.3. Applicable as from 1 January 2019.
In addition, to be permitted in transport each lithium cell and battery types must have passed the applicable tests set out in Subsection 38.3 of the UN Manual of Tests and Criteria.	

## Section 15 – Regulatory Information

Dangerous Goods Regulations

Recommendations on the Transport of Dangerous Goods-Model Regulations (20th revised edition)

Recommendations on the Transport of Dangerous Goods-Manual of Tests and Criteria

International Air Transport Association (IATA)

International Maritime Dangerous Goods (IMDG Code 2018 Edition Amdt 39-18)

Technical Instructions for the Safe Transport of Dangerous Goods

Classification and code of dangerous goods (GB 6944-2012)

2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Toxic Substance Control Act (TSCA)

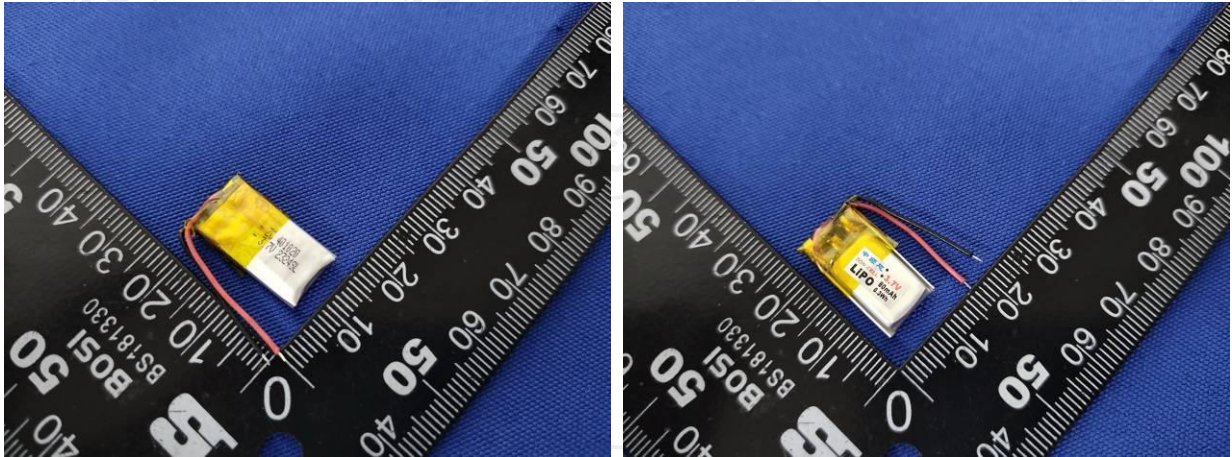
Code of Federal Regulations

In accordance with all Federal, State and local laws

Section 16 – Additional Information

MSDS creation date: 2020 Version: 1.0

Sample photo:



To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

The data/information contained herein has been reviewed and approved for general release on the basis that this document contains no export controlled information.

\*\*\*\*\*End of report\*\*\*\*\*