Microtest

中国认可
国际互认
检测
TESTING
CNAS L5868

[redacted]

(UN38.3Test report)

[redacted] [redacted]

（Report No.）

[redacted] [redacted]

（Date of Issue）

[redacted] [redacted]

[redacted] [redacted]

[redacted]

[redacted] [redacted]

（Product Name） Powerbank

[redacted] [redacted]

（Test Type） (Commissioned Inspection)

[redacted]

[redacted]

[redacted]

UNITED NATIONS "Manual of Tests and Criteria"
(ST/SG/AC.10/11/Rev.8 Section 38.3)

Product Name.....:	Powerbank
Trade Mark.....:	NINE CARAT
Model.....:	M60
Testing Laboratory.....:	Shenzhen Microtest Co., Ltd.
Received Date.....:	
Tested Date.....:	

UNITED NATIONS "Manual of Tests and Criteria" (ST/SG/AC.10/11/Rev.8 Section 38.3)

Test result: **Pass**

Powerbank			
Model	M60		5000mAh/19.25Wh
Technical parameters	USB-C Input:5V3A,9V2A, 12V1.5A USB-C Output:5V3A,9V2.22A, 12V1.67A Wireless Output:5W/7.5W/10W/15W		
	1PCS	Nominal Voltage	3.85V
Model	526284PH		5000mAh/19.25Wh
Nominal Voltage	3.85V		Prismatic
Standard Charge Current	1000mA	Maximum Charge Current	5000mA
Standard Discharge Current	1000mA	Maximum Discharge Current	7500mA
Limited charge voltage	4.45V	Cut-off voltage	3.0V

Standard	Item	Sample number	Verdict
UNITED NATIONS "Manual of Tests and Criteria" (ST/SG/AC.10/11/Rev.8 Section 38.3)	Altitude simulation	B1-B5, B6-B10	PASS
	Thermal test		PASS
	Vibration		PASS
	Shock		PASS
	External short circuit		PASS
	~~Impact~~/Crush	C1-C5, C6-C10	PASS
	Overcharge	B11-B14, B15-B18	PASS
	Forced discharge	C11-C20, C21-C30	PASS

Possible test case Verdicts:

Test case does not apply to the test object.....:	N/A
Test item does meet the requirement.....:	P(ass)
Test item does not meet the requirement.....:	F(ail)

Remark:

-Update the product color, name, model, trademark and nameplate.

After evaluated, no additional testing is required.

1. Each battery type is subjected to tests T.1 to T.8. Tests T.1 to T.5 are conducted in sequence on the same battery. Tests 6 and 8 are conducted using not otherwise tested batteries. Test T.7 may be conducted using undamaged batteries previously used in Tests T.1 to T.5 for purposes of testing on cycled batteries.

2. In order to quantify the mass loss, the following procedure is provided: Mass loss(%)=(M1-M2)/M1×100

Where M1 is the mass before the test and M2 is the mass after the test. When mass loss does not exceed the values in Table below, it is considered as "no mass loss".

	Mass lost limite
M＜1g	0.5%
1g≤M≤75g	0.2%
M＞75g	0.1%

3. In test T.1 to T.4, 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 battery after testing is not less than 90% of its voltage immediately prior to this procedure.

(1)

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

(2) **Requirement**

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

No.					Mass loss	Voltage after test/ Voltage pre- test	Verdict
	Mass	Voltage	Mass	Voltage			
B1	105.990	5.17	105.988	5.17	0.002	100.00	
B2	105.975	5.18	105.975	5.18	0.000	100.00	
B3	105.934	5.16	105.934	5.15	0.000	99.81	
B4	105.651	5.13	105.650	5.13	0.001	100.00	
B5	104.690	5.14	104.690	5.14	0.000	100.00	
B6	105.741	5.16	105.741	5.16	0.000	100.00	
B7	104.853	5.14	104.853	5.13	0.000	99.81	
B8	105.875	5.15	105.875	5.15	0.000	100.00	
B9	105.934	5.16	105.934	5.16	0.000	100.00	
B10	104.684	5.16	104.684	5.16	0.000	100.00	

#：No leakage, No venting, No disassembly No rupture and no fire.

No.B1 to B5 five batteries at first cycle, in fully charged state;

No.B6 to B10 five batteries after 25 cycles, in fully charged state.

(1) **Test procedure**

Test cells and batteries are to be stored for at least six hours at a test temperature equal to(72 ± 2)°C, followed by storage for at least six hours at a test temperature equal to(-40±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±5)°C. For large cells and batteries the duration of exposure to the test temperature extremes should be at least 12 hours.

(2) **Requirement**

Cells and batteries meet this requirement if there is no leakage, no venting, no disassembly, 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.

No.					Mass loss	Voltage after test/ Voltage pre- test	Verdict
	Mass	Voltage	Mass	Voltage			
B1	105.988	5.17	105.984	5.15	0.004	99.61	
B2	105.975	5.18	105.970	5.15	0.005	99.42	
B3	105.934	5.15	105.930	5.13	0.004	99.61	
B4	105.650	5.13	105.647	5.10	0.003	99.42	
B5	104.690	5.14	104.686	5.12	0.004	99.61	
B6	105.741	5.16	105.738	5.12	0.003	99.22	
B7	104.853	5.13	104.850	5.10	0.003	99.42	
B8	105.875	5.15	105.872	5.13	0.003	99.61	
B9	105.934	5.16	105.932	5.13	0.002	99.42	
B10	104.684	5.16	104.681	5.14	0.003	99.61	

#：No leakage, No venting, No disassembly No rupture and no fire.

No.B1 to B5 five batteries at first cycle, in fully charged state;

No.B6 to B10 five batteries after 25 cycles, in fully charged state.

(1) **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

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

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

(2) **Requirement**

Cells and batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture

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.

No.					Mass loss	Voltage after test/ Voltage pre- test	Verdict
	Mass	Voltage	Mass	Voltage			
B1	105.984	5.15	105.984	5.15	0.000	100.00	
B2	105.970	5.15	105.970	5.14	0.000	99.81	
B3	105.930	5.13	105.930	5.13	0.000	100.00	
B4	105.647	5.10	105.647	5.10	0.000	100.00	
B5	104.686	5.12	104.685	5.12	0.001	100.00	
B6	105.738	5.12	105.738	5.11	0.000	99.80	
B7	104.850	5.10	104.850	5.10	0.000	100.00	
B8	105.872	5.13	105.870	5.13	0.002	100.00	
B9	105.932	5.13	105.932	5.13	0.000	100.00	
B10	104.681	5.14	104.680	5.14	0.001	100.00	

#：No leakage, No venting, No disassembly No rupture and no fire.

No.B1 to B5 five batteries at first cycle, in fully charged state;

No.B6 to B10 five batteries after 25 cycles, in fully charged state.

(1) **Test procedure**

Test cells and batteries shall be secured to the testing machine by means of a rigid mount which will

subjected to three shocks in the positive direction followed by three shocks in the negative direction of

large cells and large batteries shall be subjected to a half-sine shock of peak acceleration of 50gn and

followed by three shocks in the negative direction of each of three mutually perpendicular mounting

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

* Mass is expressed in kilograms.

(2) **Requirement**

Cells and batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture

voltage immediately prior to this procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.

No.					Mass loss	Voltage after test/ Voltage pre- test	Verdict
	Mass	Voltage	Mass	Voltage			
B1	105.984	5.15	105.984	5.15	0.000	100.00	
B2	105.970	5.14	105.970	5.13	0.000	99.81	
B3	105.930	5.13	105.930	5.13	0.000	100.00	
B4	105.647	5.10	105.645	5.10	0.002	100.00	
B5	104.685	5.12	104.685	5.12	0.000	100.00	
B6	105.738	5.11	105.738	5.11	0.000	100.00	
B7	104.850	5.10	104.850	5.10	0.000	100.00	
B8	105.870	5.13	105.869	5.13	0.001	100.00	
B9	105.932	5.13	105.932	5.13	0.000	100.00	
B10	104.680	5.14	104.680	5.13	0.000	99.81	

#: No leakage, No venting, No disassembly No rupture and no fire.

No.B1 to B5 five batteries at first cycle, in fully charged state;

No.B6 to B10 five batteries after 25 cycles, in fully charged state.

(1) **Test procedure**

external resistance of less than 0.1 ohm at (57±4)°C. This short circuit condition is continued for at least

(2) **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.

No.	Peak temperature(°C)	Verdict
B1	56.2	
B2	56.7	
B3	57.5	
B4	56.8	
B5	58.0	

B6	58.2		
B7	57.7		
B8	58.3		
B9	56.8		
B10	57.5		

#: No leakage, No venting, No disassembly No rupture and no fire.

No.B1 to B5 five batteries at first cycle, in fully charged state;

No.B6 to B10 five batteries after 25 cycles, in fully charged state.

Test T.6: Impact (applicable to cylindrical cells not less than 18.0mm in diameter) / Crush (applicable to prismatic, pouch, coin/button cells and cylindrical cells less than 18.0mm in

(1) **Test procedure**

be placed across the centre of the sample. A (9.1±0.1)kg mass is to be dropped from a height of (61±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±0.1)mm diameter curved surface lying across the centre of the test sample. Each sample is to be subjected to only a single impact.

(2) **Test procedure**

the three options below is reached.

(a) The applied force reaches (13±0.78)kN;

deformed by at least 50% of its original thickness, the pressure shall be released.

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.

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.

(3) **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.

No.	Peak temperature(°C)	Verdict
C1	23.5	
C2	22.6	
C3	23.8	
C4	22.8	
C5	24.2	
C6	23.6	
C7	23.7	
C8	23.7	
C9	23.2	
C10	22.9	

No.C1 to C5 five cells at first cycle at 50% of the design rated capacity;

No.C6 to C10 five cells after 25 cycles at 50% of the design rated capacity.

(1) **Test procedure**

current. The minimum voltage of the test shall be as follows:

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

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.

(2) **Requirement**

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

No.	Verdict
B11	
B12	
B13	
B14	
B15	
B16	
B17	
B18	

No.B11 to B14 four batteries at first cycle, in fully charged state;

No.B15 to B18 four batteries after 25 cycles, in fully charged state.

(1) **Test procedure**

The specified discharge current is to be obtained by connecting a resistive load of the appropriate size and its rated capacity divided by the initial test current (in ampere).

(2) **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.

	Verdict
C11	
C12	
C13	
C14	
C15	
C16	
C17	
C18	
C19	
C20	
C21	
C22	
C23	
C24	
C25	
C26	
C27	
C28	
C29	
C30	

No.C11 to C20 ten cells at first cycle, in fully discharged state states;

No.C21 to C30 ten cells after 25cycle, in fully discharged state states.



Photo 1



Photo 2



Photo 3

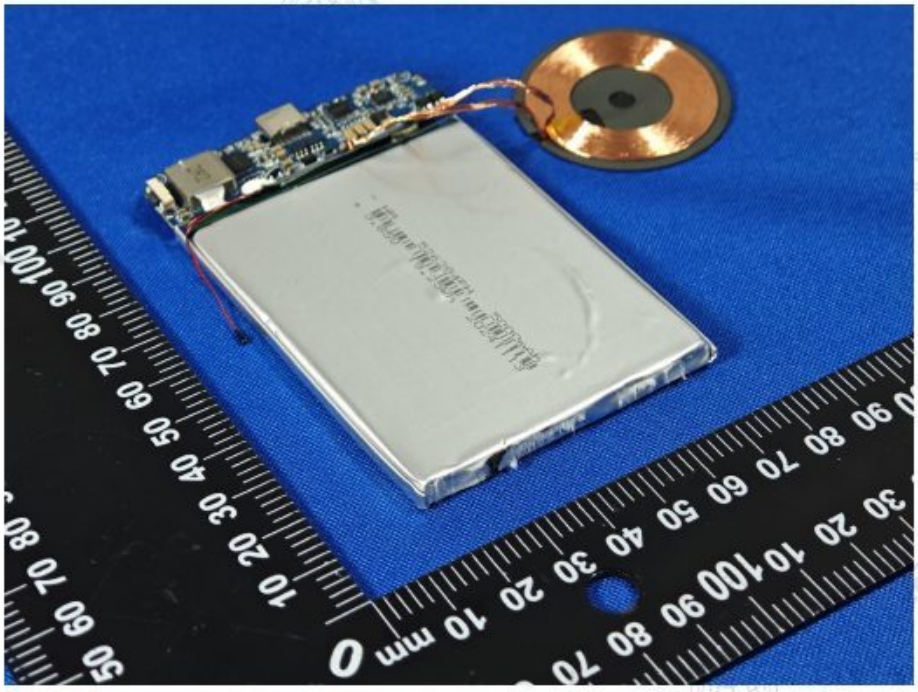


Photo 4

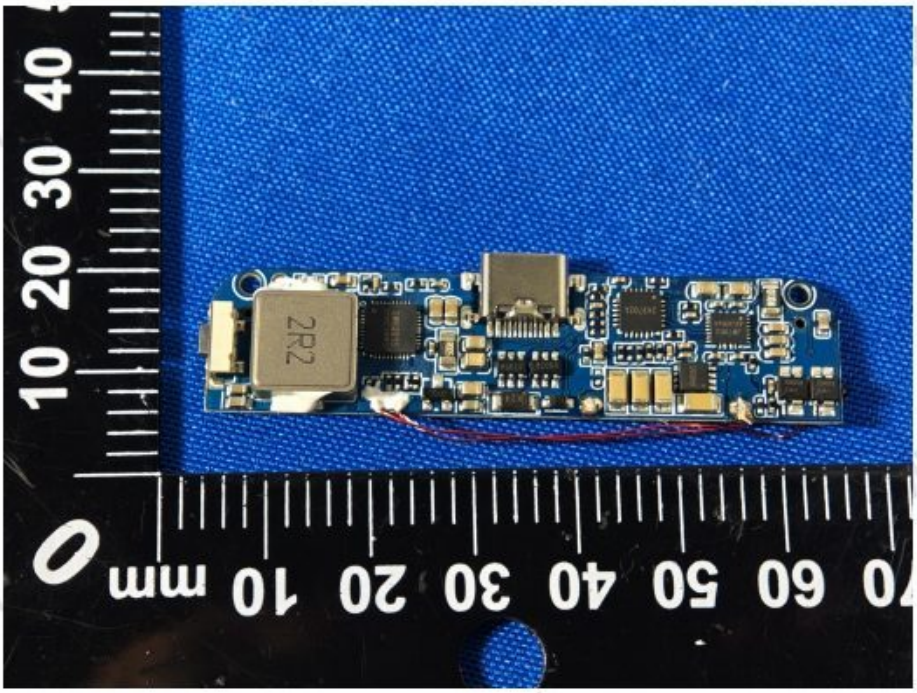


Photo 5

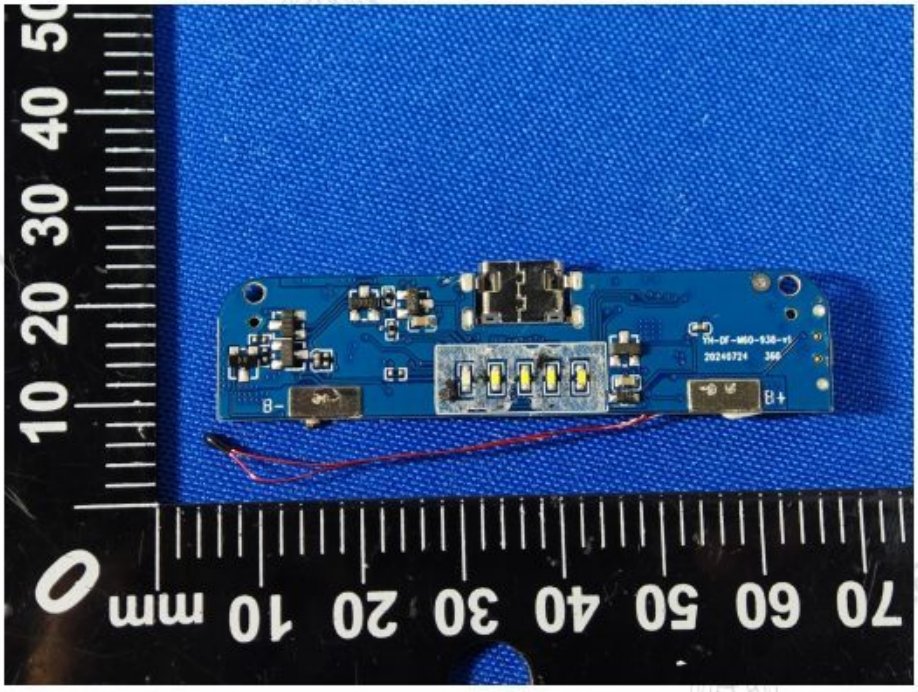


Photo 6

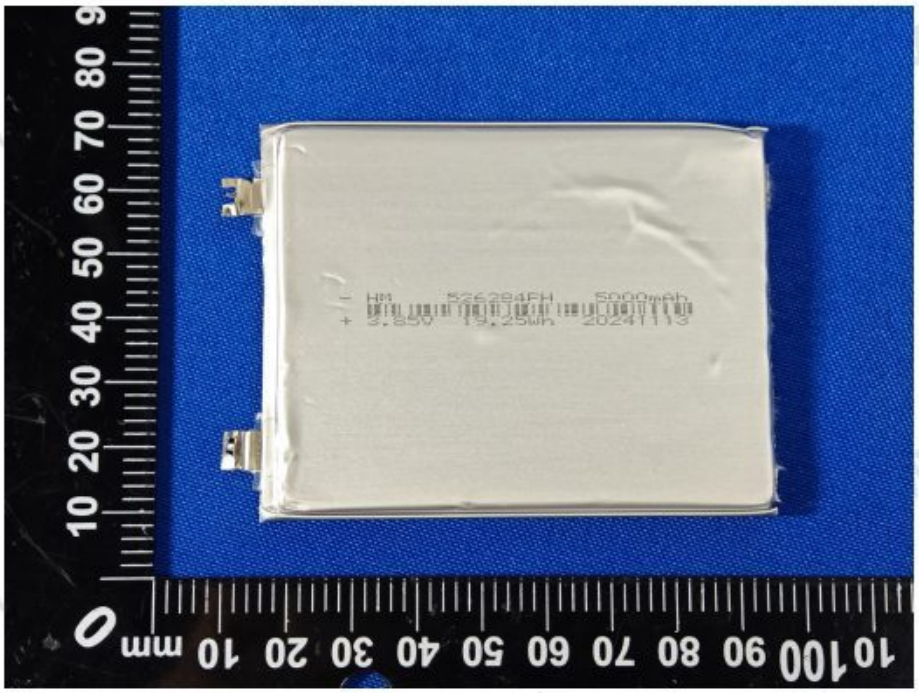


Photo 7

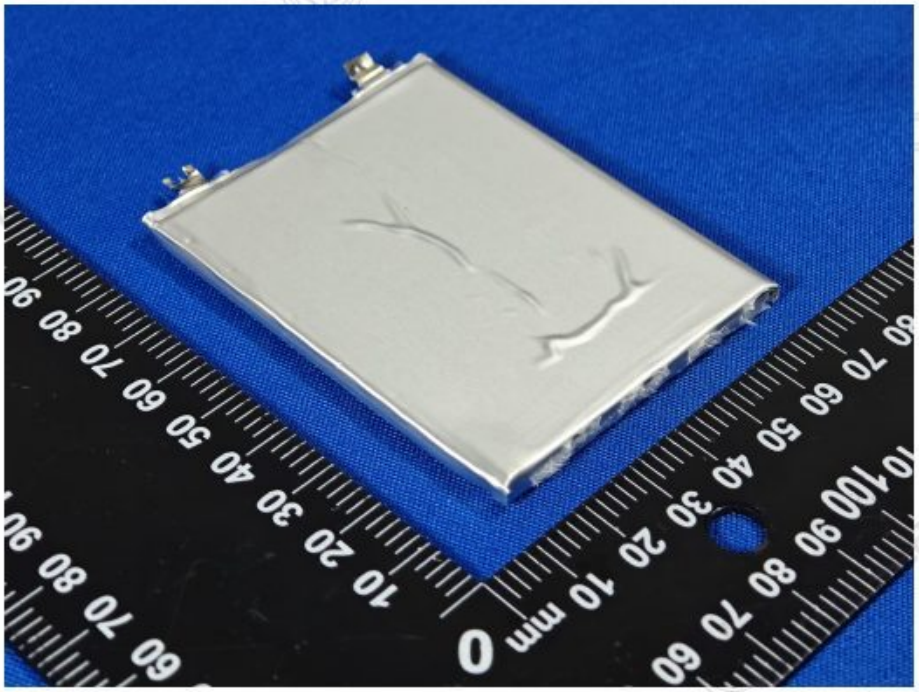


Photo 8

1	MTi-B001	Low Pressure Chamber
2	MTi-B003	High-Low Temperature Chamber
3	MTi-B072	Shock testing machine
4	MTi-B007	Vibration testing machine
5	MTi-B065	Temperature Control Battery Short Circuit Tester
6	MTi-B020	Electronic Balance
7	MTi-B074	Electronic Balance
8	MTi-B024	10V/10A Battery Charger System
9	MTi-B026	25V/10A Battery Charger System
10	MTi-B071	60V/25ABattery charging and discharging cabinet
11	MTi-B061	DC Source
12	MTi-B032	DC Source
13	MTi-B033	DC Electronic load
14	MTi-B044	Temperature Recorder
15	MTi-B075	Multimeter
16	MTi-B050	Battery Test System
17	MTi-B051	
18	MTi-B005	Battery extrusion testing machine
19	MTi-B004	Battery Impact Tester
Remark:The above equipment are within the calibration cycle.		

Statement

1. [redacted]

   (This report is invalid without the seal and signature of the laboratory.)

2. [redacted]

3. [redacted]

   (The report shall not be partially reproduced without the written consent of the Laboratory.)

4. [redacted]

   (This report is invalid if transferred, altered or tampered with in any form without authorization.)

5. [redacted]

   The observations or tests with special mark fall outside the scope of accreditation, and are only used for purpose of commission, research, training, internal quality control etc.

6. [redacted]

   (Any objection to this report shall be submitted to the laboratory within 15 days from the date of receipt of the report.)

[redacted]