Test Report issued under the responsibility of:

TEST REPORT
EN 62133-2: 2017
Secondary cells and batteries containing alkaline or other non-acid electrolytes – Safety requirements for portable sealed secondary cells, and for batteries made from them, for use in portable applications – Part 2: Lithium systems

Report Number.....:	RSZBHST220916850
Date of issue.....:	2022-09-26
Total number of pages .....:	25 Pages
Name of Testing Laboratory preparing the Report .....:	Shenzhen Beihang Testing Co., Ltd. Room 202, 2/F, Building F, HaoWei Industrial Park, QingSong West Road, PingShan District, Shenzhen, Guangdong, China
Applicant's name .....:	Shenzhen Tugao Intelligent Co., Ltd.
Address.....:	NO.801,802,1001,1002,BldgA,Jingang Science&Technology Park, Fuhai Street, Qiaotou Coummunity, Baoan District, Shenzhen, China 518103
Manufacturer .....:	Shenzhenshi jiuliyuan electronic technology co., LTD
Address.....:	201, Jiuli Yuan Factory, Building A, No. 470, Pingshan Jinbi Road, Biling Community, Biling Street, Pingshan District, Shenzhen
Factory .....:	Shenzhenshi jiuliyuan electronic technology co., LTD
Address.....:	201, Jiuli Yuan Factory, Building A, No. 470, Pingshan Jinbi Road, Biling Community, Biling Street, Pingshan District, Shenzhen
Test item description.....:	Rechargeable Li-ion polymer Battery
Model/Type reference.....:	P2202T
Trade Mark.....:	N/A
Ratings.....:	3.85Vd.c, 15600mAh
Standard .....:	EN 62133-2: 2017
Test procedure.....:	Test Report
Non-standard test method .....:	N/A

General disclaimer:

The test results presented in this report relate only to the object tested.

Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):		
☒	**Testing Laboratory:**	Shenzhen Beihang Testing Co., Ltd.
Testing location/ address.....:		Room 202, 2/F, Building F, HaoWei Industrial Park, QingSong West Road, PingShan District, Shenzhen, Guangdong, China
Tested by (name, function, signature).....:		Romy. Luo
Approved by (name, function, signature)...:		Arvin. Shang

Summary of testing:
The sample(s) tested complies with the requirements of EN 62133-2:2017
When determining the test conclusion, the Measurement Uncertainty of test has been considered.

Tests performed (name of test and test clause):	**Testing location:**
☒5.2 Insulation resistance ☒7.2.1 Continuous charging at constant voltage (cells) ☒7.2.2 Case stress at high ambient temperature (battery) ☒7.3.1 External short circuit (cell) ☒7.3.2 External short circuit (battery) ☒7.3.3 Free fall ☒7.3.4 Thermal abuse (cells) ☒7.3.5 Crush (cells) ☒7.3.6 Over-charging of battery ☒7.3.7 Forced discharge (cells) ☒7.3.8 Mechanical tests (batteries) ☒7.3.9 Design evaluation – Forced internal short-circuit (cells)	Shenzhen Beihang Testing Co., Ltd. Room 202, 2/F, Building F, HaoWei Industrial Park, QingSong West Road, PingShan District, Shenzhen, Guangdong, China

Summary of compliance with National Differences (List of countries addressed):

Group differences for CENELEC countries are considered.

The product fulfils the requirements of IEC 62133-2: 2017(Edition1.0) and EN 62133-2:2017.

Phone : +86 755 8650 3482
Fax : +86 755 8650 3182
Website: http://www.hc-stc.net
Check: cs@hc-stc.net

Shenzhen Beihang Testing Co., Ltd.
Room 202, 2/F, Building F, HaoWei Industrial Park, QingSong West Road, PingShan District, Shenzhen, Guangdong, China .

Copy of marking plate:

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.

Rechargeable Li-ion polymer Battery
\+ Model：P2202T 1ICP5/63/91-3
3.85V 15600mAh
\- YYYYMMDD
Shenzhenshi jiuliyuan electronic technology co., LTD

Remark: “YYYYMMDD” represents the date of manufacture, “YYYY” represents year of manufacture, “MM” represents the month of manufacture, “DD” represents the date of manufacture.

Phone : +86 755 8650 3482
Fax : +86 755 8650 3182
Website: http://www.hc-stc.net
Check: cs@hc-stc.net

Shenzhen Beihang Testing Co., Ltd.
Room 202, 2/F, Building F, HaoWei Industrial Park, QingSong West Road, PingShan District, Shenzhen, Guangdong, China .

Test item particulars.....:	--
Classification of installation and use.....:	Battery for special end products
Recommend charging method declared by the manufacturer.....:	Charging the battery with1040mA constant current until 4.4V, then constant voltage until charge current reduces to 104mA at ambient 20°C±5°C
Discharge current (0,2 It A) .....:	1040mA
Specified final voltage.....:	3.0V
Upper limit charging voltage per cell.....:	4.4V
Maximum charging current.....:	10920mA
Charging temperature upper limit.....:	45°C
Charging temperature lower limit.....:	5°C
Possible test case verdicts:	
- test case does not apply to the test object.....:	N/A
- test object does meet the requirement.....:	P (Pass)
- test object does not meet the requirement.....:	F (Fail)
Date of receipt of test item .....:	2022-09-12
Date (s) of performance of tests.....:	2022-09-13 to 2022-09-25

General remarks:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.
"(See Enclosure #)" refers to additional information appended to the report.
"(See appended table)" refers to a table appended to the report.

Throughout this report a ☒ comma / ☐ point is used as the decimal separator.

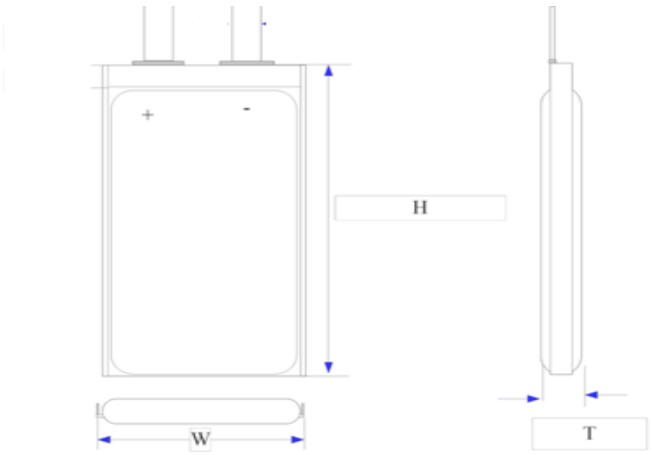
Phone : +86 755 8650 3482
Fax : +86 755 8650 3182
Website: http://www.hc-stc.net
Check: cs@hc-stc.net

Shenzhen Beihang Testing Co., Ltd.
Room 202, 2/F, Building F, HaoWei Industrial Park, QingSong West Road, PingShan District, Shenzhen, Guangdong, China .

General product information and other remarks:

Product name	Lithium-ion Cell	Rechargeable Li-ion polymer Battery
Type/model	476391-5200mAh	P2202T
Nominal voltage	3.85V	3.85V
Rated capacity	5200mAh	15600mAh
Recommended charging voltage	4.4V	4.4V
Nominal Charge Current	1040mA	3120mA
Nominal Discharge Current	1040mA	3120mA
Maximum Charge Voltage	4.4V	4.4V
Maximum charging current	3640mA	10920mA
Maximum discharging current	3640mA	10920mA
Discharge cut-off voltage	3.0V	3.0V
Charge Temperature Range	5-45°C	5-45°C

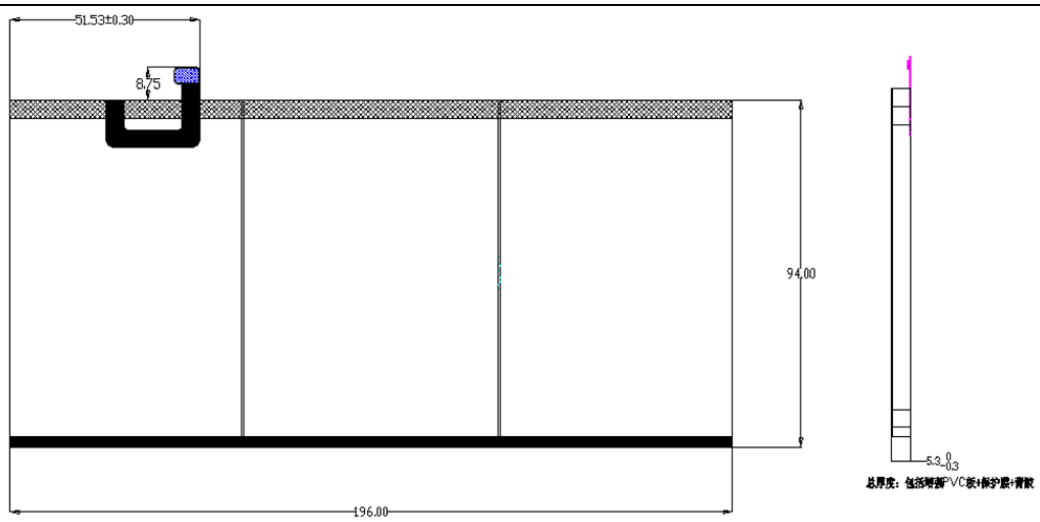
Construction:



Cell (Unit:mm): 5.3（T）*65.0（W）*92.5（H）

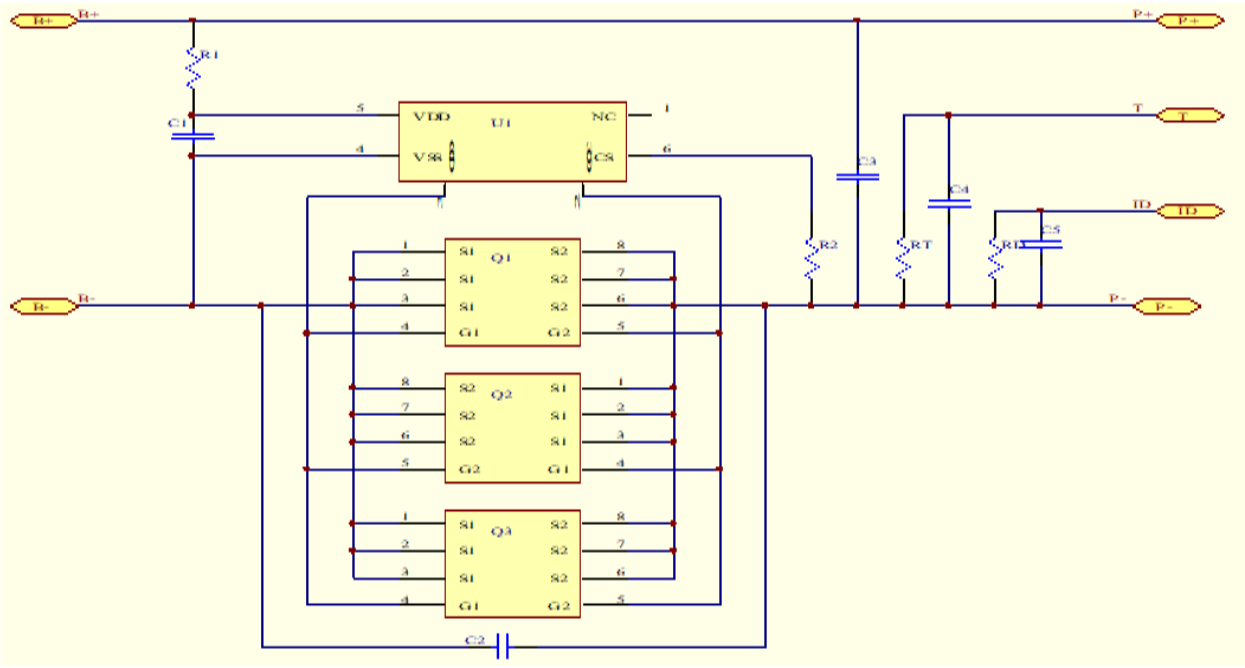
Phone : +86 755 8650 3482
Fax : +86 755 8650 3182
Website: http://www.hc-stc.net
Check: cs@hc-stc.net

Shenzhen Beihang Testing Co., Ltd.
Room 202, 2/F, Building F, HaoWei Industrial Park, QingSong West Road, PingShan District, Shenzhen, Guangdong, China .



Battery (Unit: mm): 5.3（T）*94.0（W）*196.0（H）

Circuit diagram



Phone : +86 755 8650 3482
Fax : +86 755 8650 3182
Website: http://www.hc-stc.net
Check: cs@hc-stc.net

Shenzhen Beihang Testing Co., Ltd.
Room 202, 2/F, Building F, HaoWei Industrial Park, QingSong West Road, PingShan District, Shenzhen, Guangdong, China .

EN 62133-2: 2017			
Clause	Requirement + Test	Result - Remark	Verdict
4	**PARAMETER MEASUREMENT TOLERANCES**		P
	Parameter measurement tolerances		P
5	**GENERAL SAFETY CONSIDERATIONS**		P
5.1	**General**		P
	Cells and batteries so designed and constructed that they are safe under conditions of both intended use and reasonably foreseeable misuse		P
5.2	**Insulation and wiring**		P
	The insulation resistance between the positive terminal and externally exposed metal surfaces of the battery (excluding electrical contact surfaces) is not less than 5 MΩ	No metal case exists.	P
	Insulation resistance (MΩ) ..... :		—
	Internal wiring and insulation are sufficient to withstand maximum anticipated current, voltage and temperature requirements		P
	Orientation of wiring maintains adequate clearance and creepage distances between conductors		P
	Mechanical integrity of internal connections accommodates reasonably foreseeable misuse		P
5.3	**Venting**		P
	Battery cases and cells incorporate a pressure relief mechanism or are constructed so that they relieve excessive internal pressure at a value and rate that will preclude rupture, explosion and self-ignition	Venting mechanism exists on the narrow side of the cell.	P
	Encapsulation used to support cells within an outer casing does not cause the battery to overheat during normal operation nor inhibit pressure relief		N/A
5.4	**Temperature, voltage and current management**		P
	Batteries are designed such that abnormal temperature rise conditions are prevented	Overcharge, over discharge, over current and short-circuit proof circuit used in this battery. See tests of clause 8.	P
	Batteries are designed to be within temperature, voltage and current limits specified by the cell manufacturer	See above.	P
	Batteries are provided with specifications and charging instructions for equipment manufacturers so that specified chargers are designed to maintain charging within the temperature, voltage and current limits specified	The charging limits specified in the manufacturer's specifications.	P

Phone : +86 755 8650 3482
Fax : +86 755 8650 3182
Website: http://www.hc-stc.net
Check: cs@hc-stc.net

Shenzhen Beihang Testing Co., Ltd.
Room 202, 2/F, Building F, HaoWei Industrial Park, QingSong West Road, PingShan District, Shenzhen, Guangdong, China .

EN 62133-2: 2017			
Clause	Requirement + Test	Result - Remark	Verdict
5.5	**Terminal contacts**		P
	The size and shape of the terminal contacts ensure that they can carry the maximum anticipated current	Complied, DC connector used.	P
	External terminal contact surfaces are formed from conductive materials with good mechanical strength and corrosion resistance	Complied.	P
	Terminal contacts are arranged to minimize the risk of short-circuit		P
5.6	**Assembly of cells into batteries**		P
5.6.1	General		P
	Each battery have an independent control and protection for current, voltage, temperature and any other parameter required for safety and to maintain the cells within their operating region	Protective circuit equipped on battery.	P
	This protection may be provided external to the battery such as within the charger or the end devices		N/A
	If protection is external to the battery, the manufacturer of the battery provide this safety relevant information to the external device manufacturer for implementation		N/A
	If there is more than one battery housed in a single battery case, each battery have protective circuitry that can maintain the cells within their operating regions		N/A
	Manufacturers of cells specify current, voltage and temperature limits so that the battery manufacturer/designer may ensure proper design and assembly	Current, voltage and temperature limits specified by cell manufacturer.	P
	Batteries that are designed for the selective discharge of a portion of their series connected cells incorporate circuitry to prevent operation of cells outside the limits specified by the cell manufacturer		P
	Protective circuit components added as appropriate and consideration given to the end-device application		P
	The manufacturer of the battery provide a safety analysis of the battery safety circuitry with a test report including a fault analysis of the protection circuit under both charging and discharging conditions confirming the compliance	Safety analysis report provided by manufacturer.	P
5.6.2	Design recommendation		P

Phone : +86 755 8650 3482
Fax : +86 755 8650 3182
Website: http://www.hc-stc.net
Check: cs@hc-stc.net

Shenzhen Beihang Testing Co., Ltd.
Room 202, 2/F, Building F, HaoWei Industrial Park, QingSong West Road, PingShan District, Shenzhen, Guangdong, China .

EN 62133-2: 2017			
Clause	Requirement + Test	Result - Remark	Verdict
	For the battery consisting of a single cell or a single cellblock, it is recommended that the charging voltage of the cell does not exceed the upper limit of the charging voltage specified in Table 2	1S3P, Max. Charging voltage of cell: 4.4V, not exceed 4.4V specified in Clause 7.1.2, Table 2.	P
	For the battery consisting of series-connected plural single cells or series-connected plural cellblocks, it is recommended that the voltages of any one of the single cells or single cellblocks does not exceed the upper limit of the charging voltage, specified in Table 2, by monitoring the voltage of every single cell or the single cellblocks		N/A
	For the battery consisting of series-connected plural single cells or series-connected plural cellblocks, it is recommended that charging is stopped when the upper limit of the charging voltage is exceeded for any one of the single cells or single cellblocks by measuring the voltage of every single cell or the single cellblocks		N/A
	For batteries consisting of series-connected cells or cell blocks, nominal charge voltage not be counted as an overcharge protection		N/A
	For batteries consisting of series-connected cells or cell blocks, cells have closely matched capacities, be of the same design, be of the same chemistry and be from the same manufacturer		N/A
	It is recommended that the cells and cell blocks not discharged beyond the cell manufacturer's specified final voltage	Final voltage of cell: 3.0V, not exceed the final voltage specified by cell manufacturer.	P
	For batteries consisting of series-connected cells or cell blocks, cell balancing circuitry incorporated into the battery management system		N/A
5.6.3	Mechanical protection for cells and components of batteries		P
	Mechanical protection for cells, cell connections and control circuits within the battery provided to prevent damage as a result of intended use and reasonably foreseeable misuse	Mechanical protection for cell connections and control circuits provided.	P
	The mechanical protection can be provided by the battery case or it can be provided by the end product enclosure for those batteries intended for building into an end product	Build-in batteries, mechanical protection for cells should be provided by end product.	N/A
	The battery case and compartments housing cells designed to accommodate cell dimensional tolerances during charging and discharging as recommended by the cell manufacturer	To be evaluated in final system.	N/A

Phone : +86 755 8650 3482
Fax : +86 755 8650 3182
Website: http://www.hc-stc.net
Check: cs@hc-stc.net

Shenzhen Beihang Testing Co., Ltd.
Room 202, 2/F, Building F, HaoWei Industrial Park, QingSong West Road, PingShan District, Shenzhen, Guangdong, China .

EN 62133-2: 2017			
Clause	Requirement + Test	Result - Remark	Verdict
	For batteries intended for building into a portable end product, testing with the battery installed within the end product considered when conducting mechanical tests		P
5.7	**Quality plan**		P
	The manufacturer prepares and implements a quality plan that defines procedures for the inspection of materials, components, cells and batteries and which covers the whole process of producing each type of cell or battery	Complied. ISO 9001:2015 certificate provided.	P
5.8	**Battery safety components**		N/A
	According annex F	See TABLE: Critical components information.	N/A
6	**TYPE TEST AND SAMPLE SIZE**		P
	Tests are made with the number of cells or batteries specified in Table 1 using cells or batteries that are not more than six months old		P
	Coin cells with resistance ≤ 3 Ω (measured according annex D) are tested according table 1	Not coin cells	N/A
	Unless otherwise specified, tests are carried out in an ambient temperature of 20 °C ± 5 °C		P
	The safety analysis of 5.6.1 identify those components of the protection circuit that are critical for short-circuit, overcharge and over discharge protection		N/A
	When conducting the short-circuit test, consideration given to the simulation of any single fault condition that is likely to occur in the protecting circuit that would affect the short-circuit test	See clause 7.3.2	P
7	**SPECIFIC REQUIREMENTS AND TESTS**		P
7.1	**Charging procedure for test purposes**		P
7.1.1	First procedure		P
	This charging procedure applies to subclauses other than those specified in 7.1.2		P
	Unless otherwise stated in this document, the charging procedure for test purposes is carried out in an ambient temperature of 20 °C ± 5 °C, using the method declared by the manufacturer	See page 4	P
	Prior to charging, the battery have been discharged at 20 °C ± 5 °C at a constant current of 0,2 It A down to a specified final voltage	See page 4	P

Phone : +86 755 8650 3482
Fax : +86 755 8650 3182
Website: http://www.hc-stc.net
Check: cs@hc-stc.net

Shenzhen Beihang Testing Co., Ltd.
Room 202, 2/F, Building F, HaoWei Industrial Park, QingSong West Road, PingShan District, Shenzhen, Guangdong, China .

EN 62133-2: 2017			
Clause	Requirement + Test	Result - Remark	Verdict
7.1.2	Second procedure		P
	This charging procedure applies only to 7.3.1, 7.3.4, 7.3.5, and 7.3.9		P
	After stabilization for 1 h and 4 h, respectively, at ambient temperature of highest test temperature and lowest test temperature, as specified in Table 2, cells are charged by using the upper limit charging voltage and maximum charging current, until the charging current is reduced to 0,05 It A, using a constant voltage charging method	Charge temperature range: 5~45°C declared. -5°C used for lower limit tests. 45°C used for upper limit tests.	P
7.2	**Intended use**		P
7.2.1	Continuous charging at constant voltage (cells)		P
	Fully charged cells are subjected for 7 days to a charge using the charging method for current and standard voltage specified by the cell manufacturer	Charging current: 1040mA, Charging voltage: 4.4V	P
	Results: No fire. No explosion. No leakage.....:	(See appended table 7.2.1)	P
7.2.2	Case stress at high ambient temperature (battery)	Tested as client's requirement.	P
	Oven temperature (°C).....:	70°C	—
	Results :No physical distortion of the battery case resulting in exposure of internal protective components and cells	No physical distortion of the battery casing.	P
7.3	**Reasonably foreseeable misuse**		P
7.3.1	External short-circuit (cell)	Tested complied.	P
	The cells were tested until one of the following occurred:		P
	- 24 hours elapsed; or		N/A
	- The case temperature declined by 20% of the maximum temperature rise		P
	Results: No fire. No explosion.....:	(See appended table7.3.1)	P
7.3.2	External short-circuit (battery)	Tested complied.	P
	The batteries were tested until one of the following occurred:		P
	- 24 hours elapsed; or		N/A
	- The case temperature declined by 20 % of the maximum temperature rise		P
	In case of rapid decline in short circuit current, the battery pack remained on test for an additional one hour after the current reached a low end steady state condition		P

Phone : +86 755 8650 3482
Fax : +86 755 8650 3182
Website: http://www.hc-stc.net
Check: cs@hc-stc.net

Shenzhen Beihang Testing Co., Ltd.
Room 202, 2/F, Building F, HaoWei Industrial Park, QingSong West Road, PingShan District, Shenzhen, Guangdong, China .

EN 62133-2: 2017			
Clause	Requirement + Test	Result - Remark	Verdict
	A single fault in the discharge protection circuit conducted on one to four (depending upon the protection circuit) of the five samples before conducting the short-circuit test	Single fault conducted on four samples.	P
	A single fault applies to protective component parts such as MOSFET, fuse, thermostat or positive temperature coefficient (PTC) thermistor	Single fault applies on MOSFET of four samples.	P
	Results: No fire. No explosion..... :	(See appended table7.3.2)	P
7.3.3	Free fall	Tested complied.	P
	Results: No fire. No explosion	No fire. No explosion	P
7.3.4	Thermal abuse (cells)		P
	Oven temperature (°C)..... :	130°C, 30min	—
	Results: No fire. No explosion	No fire. No explosion	P
7.3.5	Crush (cells)	Tested complied.	P
	The crushing force was released upon:		P
	- The maximum force of 13 kN±0,78kN has been applied; or		P
	- An abrupt voltage drop of one-third of the original voltage has been obtained		N/A
	Results: No fire. No explosion..... :	(See appended table 7.3.5)	P
7.3.6	Over-charging of battery	Tested complied.	P
	The supply voltage which is:		--
	- 1,4 times the upper limit charging voltage presented in Table A.1 (but not to exceed 6,0 V) for single cell/cell block batteries or	6.0V applied.	P
	- 1,2 times the upper limit charging voltage resented in Table A.1 per cell for series connected multi-cell batteries, and		N/A
	- Sufficient to maintain a current of 2,0 It A throughout the duration of the test or until the supply voltage is reached	31200mA	P
	Test was continued until the temperature of the outer casing:		P
	- Reached steady state conditions (less than 10°C change in 30-minute period); or		P
	- Returned to ambient		P
	Results: No fire. No explosion..... :	(See appended table 7.3.6)	P
7.3.7	Forced discharge (cells)	Tested complied.	P

Phone : +86 755 8650 3482
Fax : +86 755 8650 3182
Website: http://www.hc-stc.net
Check: cs@hc-stc.net

Shenzhen Beihang Testing Co., Ltd.
Room 202, 2/F, Building F, HaoWei Industrial Park, QingSong West Road, PingShan District, Shenzhen, Guangdong, China .

EN 62133-2: 2017			
Clause	Requirement + Test	Result - Remark	Verdict
	If the discharge voltage reaches the negative value of upper limit charging voltage within the testing duration, the voltage is maintained at the negative value of the upper limit charging voltage by reducing the current for the remainder of the testing duration		N/A
	If the discharge voltage does not reach the negative value of upper limit charging voltage within the testing duration, the test is terminated at the end of the testing duration		P
	Results: No fire. No explosion..... :	(See appended table7.3.7)	P
7.3.8	Mechanical tests (batteries)	Tested complied.	P
7.3.8.1	Vibration		P
	Results: No fire, no explosion, no rupture, no leakage or venting. ..... :	(See appended table 7.3.8.1)	P
7.3.8.2	Mechanical shock	Tested complied.	P
	Results: No leakage, no venting, no rupture, no explosion and no fire ..... :	(See appended table 7.3.8.2)	P
7.3.9	Design evaluation – Forced internal short-circuit (cells)	Tested complied.	P
	The cells complied with national requirement for .....:	France, Japan, Republic of Korea, Switzerland.	—
	The pressing was stopped upon:		P
	- A voltage drop of 50 mV has been detected; or		N/A
	- The pressing force of 800 N (cylindrical cells) or 400 N (prismatic cells) has been reached	400 N for prismatic cells cells	P
	Results: No fire ..... :	(See appended table 7.3.9)	P
8	**INFORMATION FOR SAFETY**		P
8.1	**General**		P
	Manufacturers of secondary cells ensure that information is provided about current, voltage and temperature limits of their products	Information for safety mentioned in manufacturer's specifications.	P
	Manufacturers of batteries ensure that equipment manufacturers and, in the case of direct sales, end-users are provided with information to minimize and mitigate hazards	Information for safety mentioned in manufacturer's specifications.	P
	Systems analyses performed by device manufacturers to ensure that a particular battery design prevents hazards from occurring during use of a product		N/A

Phone : +86 755 8650 3482
Fax : +86 755 8650 3182
Website: http://www.hc-stc.net
Check: cs@hc-stc.net

Shenzhen Beihang Testing Co., Ltd.
Room 202, 2/F, Building F, HaoWei Industrial Park, QingSong West Road, PingShan District, Shenzhen, Guangdong, China .

EN 62133-2: 2017			
Clause	Requirement + Test	Result - Remark	Verdict
	As appropriate, any information relating to hazard avoidance resulting from a system analysis provided to the end user		N/A
	Do not allow children to replace batteries without adult supervision		N/A
8.2	**Small cell and battery safety information**	Not small cell and battery	N/A
	The following warning language is to be provided with the information packaged with the small cells and batteries or equipment using them:		N/A
	- Keep small cells and batteries which are considered swallowable out of the reach of children		N/A
	- Swallowing may lead to burns, perforation of soft tissue, and death. Severe burns can occur within 2 h of ingestion		N/A
	- In case of ingestion of a cell or battery, seek medical assistance promptly		N/A
9	**MARKING**		P
9.1	**Cell marking**		N/A
	Cells marked as specified in IEC 61960, except coin cells	The final product is battery.	N/A
	Coin cells whose external surface area is too small to accommodate the markings on the cells show the designation and polarity		N/A
	By agreement between the cell manufacturer and the battery and/or end product manufacturer, component cells used in the manufacture of a battery need not be marked		N/A
9.2	**Battery marking**		P
	Batteries marked as specified in IEC 61960, except for coin batteries	The battery is marked in accordance with IEC 61960, also see copy of marking plate.	P
	Coin batteries whose external surface area is too small to accommodate the markings on the batteries show the designation and polarity. Batteries also marked with an appropriate caution statement	Not coin battery.	N/A
	Terminals have clear polarity marking on the external surface of the battery		P
	Batteries with keyed external connectors designed for connection to specific end products need not be marked with polarity markings if the design of the external connector prevents reverse polarity connections		N/A

Phone : +86 755 8650 3482
Fax : +86 755 8650 3182
Website: http://www.hc-stc.net
Check: cs@hc-stc.net

Shenzhen Beihang Testing Co., Ltd.
Room 202, 2/F, Building F, HaoWei Industrial Park, QingSong West Road, PingShan District, Shenzhen, Guangdong, China .

EN 62133-2: 2017			
Clause	Requirement + Test	Result - Remark	Verdict
9.3	**Caution for ingestion of small cells and batteries**	Not small cell and battery	N/A
	Coin cells and batteries identified as small batteries according to 8.2 include a caution statement regarding the hazards of ingestion in accordance with 8.2		N/A
	When small cells and batteries are intended for direct sale in consumer-replaceable applications, caution for ingestion given on the immediate package		N/A
9.4	**Other information**		P
	Storage and disposal instructions	Information for disposal instructions mentioned in manufacturer's specifications.	P
	Recommended charging instructions	Information for disposal instructions mentioned in manufacturer's specifications.	P
10	**PACKAGING AND TRANSPORT**		P
	Packaging for coin cells not small enough to fit within the limits of the ingestion gauge of Figure 3		N/A
	The materials and packaging design are chosen so as to prevent the development of unintentional electrical conduction, corrosion of the terminals and ingress of environmental contaminants		P
ANNEX A	**CHARGING AND DISCHARGING RANGE OF SECONDARY LITHIUM ION CELLS FOR SAFE USE**		P
A.1	**General**		P
A.2	**Safety of lithium ion secondary battery**	Complied.	P
A.3	**Consideration on charging voltage**	Complied.	P
A.3.1	General		P
A.3.2	Upper limit charging voltage	4.4V applied.	P
A.3.2.1	General		P
A.3.2.2	Explanation of safety viewpoint		N/A
A.3.2.3	Safety requirements, when different upper limit charging voltage is applied	4.4V applied.	N/A
A.4	**Consideration of temperature and charging current**		P
A.4.1	General		P
A.4.2	Recommended temperature range	See A.4.2.2.	P
A.4.2.1	General		P

Phone : +86 755 8650 3482
Fax : +86 755 8650 3182
Website: http://www.hc-stc.net
Check: cs@hc-stc.net

Shenzhen Beihang Testing Co., Ltd.
Room 202, 2/F, Building F, HaoWei Industrial Park, QingSong West Road, PingShan District, Shenzhen, Guangdong, China .

EN 62133-2: 2017			
Clause	Requirement + Test	Result - Remark	Verdict
A.4.2.2	Safety consideration when a different recommended temperature range is applied	Charging temperature range declared by client is: 5-45°C	P
A.4.3	High temperature range	Not higher than the temperature range specific in this standard.	N/A
A.4.3.1	General		N/A
A.4.3.2	Explanation of safety viewpoint		N/A
A.4.3.3	Safety considerations when specifying charging conditions in the high temperature range		N/A
A.4.3.4	Safety considerations when specifying a new upper limit in the high temperature range	45°C applied.	N/A
A.4.4	Low temperature range		P
A.4.4.1	General		P
A.4.4.2	Explanation of safety viewpoint		P
A.4.4.3	Safety considerations, when specifying charging conditions in the low temperature range		P
A.4.4.4	Safety considerations when specifying a new lower limit in the low temperature range	-5°C applied.	P
A.4.5	Scope of the application of charging current		P
A.4.6	Consideration of discharge		P
A.4.6.1	General		P
A.4.6.2	Final discharge voltage and explanation of safety viewpoint	Cell specified final voltage 3.0V, not exceed 3.0V specified by cell manufacturer.	P
A.4.6.3	Discharge current and temperature range		P
A.4.6.4	Scope of application of the discharging current		P
A.5	**Sample preparation**		P
A.5.1	General		P
A.5.2	Insertion procedure for nickel particle to generate internal short		P
A.5.3	Disassembly of charged cell		P
A.5.4	Shape of nickel particle		P
A.5.5	Insertion of nickel particle in cylindrical cell		N/A
A.5.5.1	Insertion of nickel particle in winding core		N/A
A.5.5.2	Marking the position of the nickel particle on both ends of the winding core of the separator		N/A
A.5.6	Insertion of nickel particle in prismatic cell		P

Phone : +86 755 8650 3482
Fax : +86 755 8650 3182
Website: http://www.hc-stc.net
Check: cs@hc-stc.net

Shenzhen Beihang Testing Co., Ltd.
Room 202, 2/F, Building F, HaoWei Industrial Park, QingSong West Road, PingShan District, Shenzhen, Guangdong, China .

EN 62133-2: 2017			
Clause	Requirement + Test	Result - Remark	Verdict
A.6	**Experimental procedure of the forced internal short-circuit test**		P
A.6.1	Material and tools for preparation of nickel particle		P
A.6.2	Example of a nickel particle preparation procedure		P
A.6.3	Positioning (or placement) of a nickel particle		P
A.6.4	Damaged separator precaution		P
A.6.5	Caution for rewinding separator and electrode		P
A.6.6	Insulation film for preventing short-circuit		P
A.6.7	Caution when disassembling a cell		P
A.6.8	Protective equipment for safety		P
A.6.9	Caution in the case of fire during disassembling		P
A.6.10	Caution for the disassembling process and pressing the electrode core		P
A.6.11	Recommended specifications for the pressing device		P
ANNEX B	**RECOMMENDATIONS TO EQUIPMENT MANUFACTURERS AND BATTERY ASSEMBLERS**		N/A
ANNEX C	**RECOMMENDATIONS TO THE END-USERS**		P
ANNEX D	**MEASUREMENT OF THE INTERNAL AC RESISTANCE FOR COIN CELLS**		N/A
D.1	**General**	Not coin cells	N/A
D.2	**Method**		N/A
	A sample size of three coin cells is required for this measurement..... :	(See appended tableD.2)	N/A
	Coin cells with an internal resistance of less than or equal to 3 Ω are subjected to the testing according to Clause 6 and Table 1		N/A
	Coin cells with an internal resistance greater than 3 Ω require no further testing		N/A
ANNEX E	**PACKAGING AND TRANSPORT**		P
ANNEX F	**COMPONENT STANDARDS REFERENCES**		N/A

Phone : +86 755 8650 3482
Fax : +86 755 8650 3182
Website: http://www.hc-stc.net
Check: cs@hc-stc.net

Shenzhen Beihang Testing Co., Ltd.
Room 202, 2/F, Building F, HaoWei Industrial Park, QingSong West Road, PingShan District, Shenzhen, Guangdong, China .

TABLE: Critical components information

Object/part no.	Manufacturer/ trademark	Type/model	Technical data	Standard	Mark(s) of conformity[1)]
Cell	Shenzhenshi jiuliyuan electronic technology co., LTD	476391-5200mAh	3.85V, 5200mAh	-	Tested with appliance
-Electrolyte	Anhui Xingli New Energy Co., Ltd.	ZN-29	Composition:LiPF6+EC+DEC	N/A	N/A
-Separator	ShenZhen Xuran Electronic Co.,Ltd.	16um	Material:PE +AL2O3 Thickness 16um*Width 25.5mm Shutdowntemperature：135-140℃	N/A	N/A
-Positive Electrode	Hunan Kingfuli new energy co.,Ltd.	KP-05C	Material: LiNi(5)Co(2)Mn(3)O2	N/A	N/A
-Negative Electrode	Dongguan microcrystal limited company	WJ-350B	Material:C	N/A	N/A
PCB	SHENZHEN XING BAO SHUN ELECTRONICS SCIENTIFIC CO. ,LTD.	RR-JLY-P2202-476391-4.4V-PCB	FR-4, V-0, 130°C 188.0±0.2*5.0±0.1*1.0±0.1mm	UL 94	E361977
FPC	SHENZHEN XING BAO SHUN ELECTRONICS SCIENTIFIC CO. ,LTD.	RR-JLY-P2202-476391-4.4V-FPC	27.26±0.15*21.51±0.1*0.23±0.03mm	--	--
Protection IC (U1)	HONGKANG	HY2113-0B1B	Overcharge detection voltage: 4.4V±0.025V, Overdischarge detection voltage: 2.80V±0.05V, TOP: -40°C to +85°C	--	--
MOSFET (Q1,Q2)	CHANDIAN	CJS8810	Drain-Source Voltage: 20V ID: 7A IDM: 30A TSSOP-6	--	--
Connector	SMK	CPBA306-0102E	V-0， 85℃	--	--

Supplementary information:

[1)] Provided evidence ensures the agreed level of compliance.

Phone : +86 755 8650 3482
Fax : +86 755 8650 3182
Website: http://www.hc-stc.net
Check: cs@hc-stc.net

Shenzhen Beihang Testing Co., Ltd.
Room 202, 2/F, Building F, HaoWei Industrial Park, QingSong West Road, PingShan District, Shenzhen, Guangdong, China .

7.2.1	TABLE: Continuous charging at constant voltage (cells)			P
Sample no.	**Recommended charging voltage Vc (Vdc)**	**Recommended charging current I_{rec} (A)**	**OCV before test (Vdc)**	**Results**
#C1	4.4	1.04	4.351	P
#C2	4.4	1.04	4.354	P
#C3	4.4	1.04	4.353	P
#C4	4.4	1.04	4.353	P
#C5	4.4	1.04	4.352	P

Supplementary information:

- No fire or explosion
- No leakage
- Others (please explain)

7.3.1	TABLE: External short-circuit (cell)				P
Sample no.	**Ambient T (°C)**	**OCV before test (Vdc)**	**Resistance of circuit (mΩ)**	**Maximum case temperature (℃)**	**Results**
Samples charged at charging temperature upper limit (45°C)					
#C6	55.5	4.393	88	125.6	P
#C7	55.5	4.392	81	122.7	P
#C8	55.5	4.391	84	123.5	P
#C9	55.5	4.393	87	123.1	P
#C10	55.5	4.391	82	124.7	P
Samples charged at charging temperature lower limit (-5°C)					
#C11	55.5	4.218	87	123.3	P
#C12	55.5	4.213	84	121.5	P
#C13	55.5	4.215	82	122.8	P
#C14	55.5	4.217	86	123.4	P
#C15	55.5	4.212	84	122.4	P

Supplementary information:

- No fire or explosion
- Others (please explain)

Phone : +86 755 8650 3482
Fax : +86 755 8650 3182
Website: http://www.hc-stc.net
Check: cs@hc-stc.net

Shenzhen Beihang Testing Co., Ltd.
Room 202, 2/F, Building F, HaoWei Industrial Park, QingSong West Road, PingShan District, Shenzhen, Guangdong, China .

7.3.2	TABLE: External short-circuit (battery)					P
Sample no.	**Ambient T (°C)**	**OCV before test (Vdc)**	**Resistance of circuit (mΩ)**	**Maximum case temperature rise (℃)**	**Component single fault condition**	**Results**
#B1	24.0	4.383	85	124.8	Short circuit MOSFET	P
#B2	24.0	4.381	82	126.4	Short circuit MOSFET	P
#B3	24.0	4.382	85	123.3	Short circuit MOSFET	P
#B4	24.0	4.381	84	127.1	Short circuit MOSFET	P
#B5	24.0	4.382	86	24.5	Normal	P
Supplementary information: - No fire or explosion - Others (please explain)						

7.3.5	TABLE: Crush (cells)			P
Sample no.	**OCV before test (Vdc)**	**OCV at removal of crushing force (Vdc)**	**Maximum force applied to the cell during crush (kN)**	**Results**
Samples charged at charging temperature upper limit (45°C)				
#C16	4.394	4.394	13.0	P
#C17	4.391	4.391	13.0	P
#C18	4.392	4.392	13.0	P
#C19	4.393	4.393	13.0	P
#C20	4.393	4.393	13.0	P
Samples charged at charging temperature lower limit (-5°C)				
#C21	4.215	4.215	13.0	P
#C22	4.215	4.215	13.0	P
#C23	4.216	4.216	13.0	P
#C24	4.216	4.216	13.0	P
#C25	4.215	4.215	13.0	P
Supplementary information: A 13kN force applied at the longitudinal axis of the cylindrical cells. No voltage abrupt occurred. - No fire or explosion - Others (please explain)				

7.3.6	TABLE: Over-charging of battery	P
Constant charging current (A) ..... :	**31.2A**	—

Phone : +86 755 8650 3482
Fax : +86 755 8650 3182
Website: http://www.hc-stc.net
Check: cs@hc-stc.net

Shenzhen Beihang Testing Co., Ltd.
Room 202, 2/F, Building F, HaoWei Industrial Park, QingSong West Road, PingShan District, Shenzhen, Guangdong, China .

Supply voltage (Vdc) ..... :	6.0V	—

Sample no.	OCV before charging (Vdc)	Total charging time (minute)	Maximum outer case temperature (°C)	Results
#B6	3.34	90	30.4	P
#B7	3.34	90	33.1	P
#B8	3.33	90	29.7	P
#B9	3.33	90	31.5	P
#B10	3.34	90	28.8	P

Supplementary information:

- No fire or explosion
- Others (please explain)

7.3.7	TABLE: Forced discharge (cells)	P

Sample no.	OCV before application of reverse charge (Vdc)	Measured reverse charge I_t (A)	Lower limit discharge voltage (Vdc)	Results
#C26	3.33	5.2	3.0	P
#C27	3.34	5.2	3.0	P
#C28	3.34	5.2	3.0	P
#C29	3.32	5.2	3.0	P
#C30	3.34	5.2	3.0	P

Supplementary information:

- No fire or explosion
- Others (please explain)

7.3.8.1	TABLE: Vibration	P

Sample no.	OCV before test (Vdc)	OCV after test (Vdc)	Mass before test (g)	Mass after test(g)	Results
#B11	4.384	4.381	202.122	202.115	P
#B12	4.381	4.376	202.634	202.619	P
#B13	4.388	4.383	202.353	202.342	P

Supplementary information:

- No fire or explosion
- No rupture
- No leakage
- No venting
- Others (please explain)

7.3.8.2	TABLE: Mechanical shock	P

Sample no.	OCV before test (Vdc)	OCV after test (Vdc)	Mass before test (g)	Mass after test(g)	Results

Phone : +86 755 8650 3482
Fax : +86 755 8650 3182
Website: http://www.hc-stc.net
Check: cs@hc-stc.net

Shenzhen Beihang Testing Co., Ltd.
Room 202, 2/F, Building F, HaoWei Industrial Park, QingSong West Road, PingShan District, Shenzhen, Guangdong, China .

#B14	4.381	4.381	202.115	202.115	P
#B15	4.376	4.376	202.619	202.619	P
#B16	4.383	4.383	202.342	202.342	P

Supplementary information:

- No fire or explosion
- No rupture
- No leakage
- No venting
- Others (please explain)

7.3.9	TABLE: Forced internal short circuit (cells)				P
Sample no.	**Chamber ambient T (°C)**	**OCV before test (Vdc)**	**Particle location[1)]**	**Maximum applied pressure (N)**	**Results**
Samples charged at charging temperature upper limit (45°C)					
Cell #C44	45	4.393	1	400	P
Cell #C45	45	4.395	1	400	P
Cell #C46	45	4.394	1	400	P
Cell #C47	45	4.392	1	400	P
Cell #C48	45	4.393	1	400	P
Samples charged at charging temperature lower limit (-5°C)					
Cell #C49	-5	4.216	1	400	P
Cell #C50	-5	4.215	1	400	P
Cell #C51	-5	4.216	1	400	P
Cell #C52	-5	4.215	1	400	P
Cell #C53	-5	4.216	1	400	P

Supplementary information:

[1)]Identify one of the following:

1: Nickel particle inserted between positive and negative (active material) coated area.

2: Nickel particle inserted between positive aluminium foil and negative active material coated area.

- No fire or explosion
- Others (please explain)

D.2	TABLE: Internal AC resistance for coin cells			N/A
Sample no.	**Ambient T (°C)**	**Store time (h)**	**Resistance Rac (Ω)**	**Results[1)]**

Supplementary information:

[1)] Coin cells with internal resistance less than or equal to 3 Ω, see test result on corresponding tables

Phone : +86 755 8650 3482
Fax : +86 755 8650 3182
Website: http://www.hc-stc.net
Check: cs@hc-stc.net

Shenzhen Beihang Testing Co., Ltd.
Room 202, 2/F, Building F, HaoWei Industrial Park, QingSong West Road, PingShan District, Shenzhen, Guangdong, China .

Photo Document

Fig.1 –Front view of battery

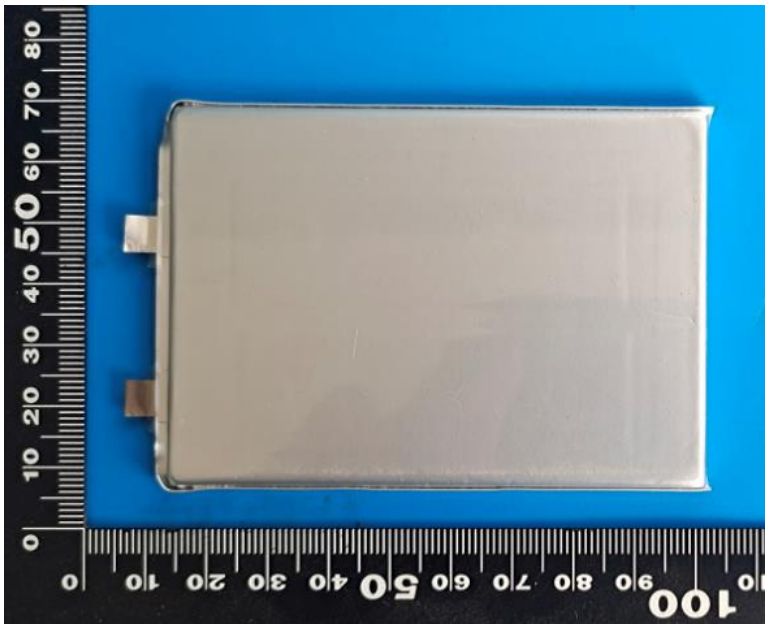
Fig. 2 –Back view of battery

Phone : +86 755 8650 3482
Fax : +86 755 8650 3182
Website: http://www.hc-stc.net
Check: cs@hc-stc.net

Shenzhen Beihang Testing Co., Ltd.
Room 202, 2/F, Building F, HaoWei Industrial Park, QingSong West Road, PingShan District, Shenzhen, Guangdong, China .

Fig. 3–Front view of Cell

Fig. 4–Back view of Cell

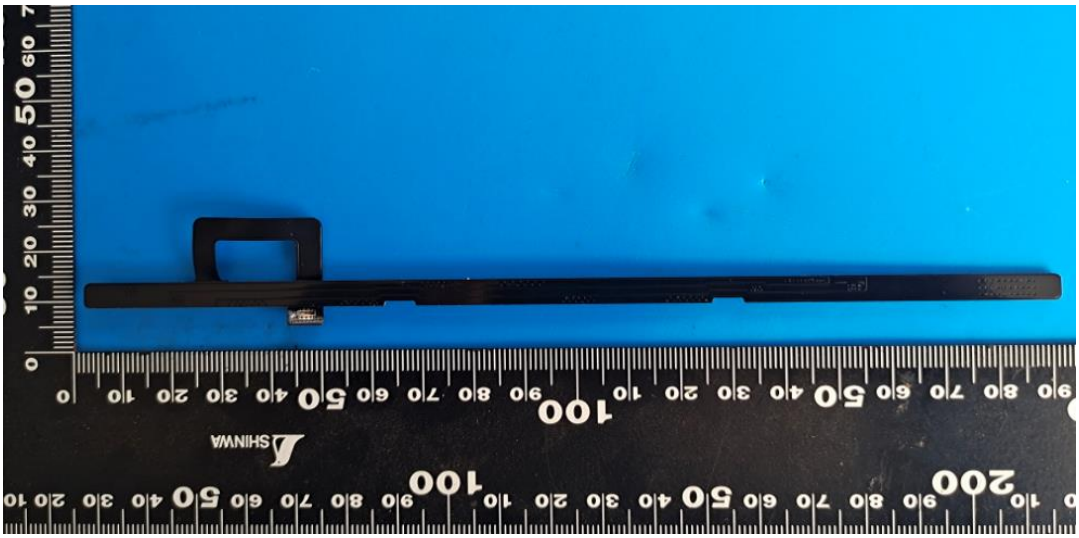


Phone : +86 755 8650 3482
Fax : +86 755 8650 3182
Website: http://www.hc-stc.net
Check: cs@hc-stc.net

Shenzhen Beihang Testing Co., Ltd.
Room 202, 2/F, Building F, HaoWei Industrial Park, QingSong West Road, PingShan District, Shenzhen, Guangdong, China .

Fig. 5–Front view of PCM

Fig. 6–Back view of PCM



---End report---

Phone : +86 755 8650 3482
Fax : +86 755 8650 3182
Website: http://www.hc-stc.net
Check: cs@hc-stc.net

Shenzhen Beihang Testing Co., Ltd.
Room 202, 2/F, Building F, HaoWei Industrial Park, QingSong West Road, PingShan District, Shenzhen, Guangdong, China .