

Report No.: 18270BC00056601-M2

# **APPLICATION FOR LOW VOLTAGE DIRECTIVE REPORT**

Client Name Hinston Electronics Co., Ltd.

Room 1609, Block A, Veristrong Industrial Centre, 34-36 Address

Au Pui Wan Street, Fotain, Shatin, HKSAR.

Product Name Rechargeable Polymer Li-ion Battery

Date Mar. 19, 2021

**Anbotek** Shenzhen Anbotek Compliance Laboratory Limited \* Approved





Report No.: 18270BC00056601-M2 Page 2 of 28

#### **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

Report

...... 18270BC00056601-M2 Reference No.....

Compiled by (+ signature)...... Lucy Zeng / Project Engineer Lucy Zeng

Approved by (+ signature)...... Davis Yang / Project Manager

Davis Yang

Date of issue.....: Mar. 19, 2021

**Testing laboratory** 

Name....... Shenzhen Anbotek Compliance Laboratory Limited

...... East of 4/F., Building A, Hourui No.3 Industrial Zone, Xixiang Address.....

Street, Bao'an District, Shenzhen, Guangdong, China

Testing location......: Shenzhen Anbotek Compliance Laboratory Limited

Client

.....: Hinston Electronics Co., Ltd. Name N

Room 1609, Block A, Veristrong Industrial Centre, 34-36 Au Pui

Wan Street, Fotain, Shatin, HKSAR.

Test specification

Standard..... EN 62133-2: 2017

Non-standard test method...... N.A.

Test item

Description.....: Rechargeable Polymer Li-ion Battery

Trademark.....: XK

Model and/or type reference.....: XK103450

Manufacturer...... Dongguan Lean Power New Energy Technology Co.,Ltd.

.....: 2nd-3nd Floor, Building G, No, 198, Jin Chuan Er, Rd, Xie gang

town, Dongguan city, Guangdong, P.R. China

: Same as Manufacturer Factory.....

Address..... Same as Manufacturer

Rating(s)...... DC 3.7V, 1800mAh, 6.66Wh





Report No.: 18270BC00056601-M2 Page 3 of 28

Particulars: test item vs. test requirements

Ambient temperature : 20°C ± 5°C.

Test case verdicts

Test item does meet the requirement ...... P (ass)

Test item does not meet the requirement ..... F (ail)

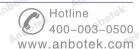
**Testing** 

Date of receipt of test item .....: Mar. 17, 2020

Date(s) of performance of test······: Mar. 17, 2020 to Apr. 07, 2020

Date of receipt of test item · · · · · : Mar. 16, 2020

Date of receipt of test item .....: Mar. 12, 2021





Report No.: 18270BC00056601-M2 Page 4 of 28

#### General remarks

This test report shall not be reproduced except in full without the written approval of the testing laboratory.

The test results presented in this report are only relevant to the test sample.

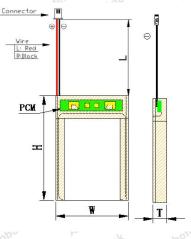
"(see remark #)" refers to a remark appended to the report.

"(see appended table)" refers to a table appended to the report.

Throughout this report a dot is used as the decimal separator.

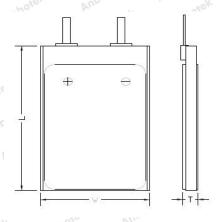
The test report 18270BC00056601-M2 supersedes the test report 18270BC00056601 18270BC00056601-M1 which withdrawn.

#### Construction



Item	Dimension
T hor	10 mm MAX
W	34.5 mm MAX
Pole T	52.5 mm MAX
Anboi L1	100±5 mm

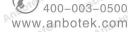




Item	Dimension
T <sup>anbo</sup>	10 mm MAX
W And	34.5 mm MAX
Upoter F V	50.5 mm MAX

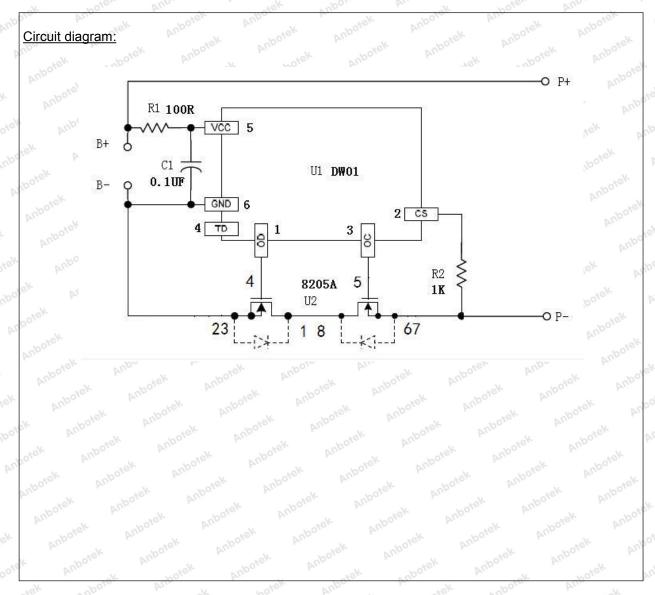
Code: AB-BAT-38-b

#### **Shenzhen Anbotek Compliance Laboratory Limited**





Report No.: 18270BC00056601-M2 Page 5 of 28





Report No.: 18270BC00056601-M2 Page 6 of 28

#### Copy of marking plate:

The artwork below may be only a draft.

Rechargeable Polymer Li-ion Battery

Model:XK103450

Rated: 3.7V 1800mAh 6.66Wh

Dongguan Lean Power New Energy

Technology Co.,Ltd

1ICP10/35/51

03/2020







Report No.: 18270BC00056601-M2 Page 7 of 28

#### General product information and other remarks:

This battery is constructed with single lithium-ion cell (1S1P), and has overcharge, over-discharge, over current and short-circuits proof circuit.

The main features of the battery are shown as below (clause 7.1.1):

Model	Nominal capacity	Nominal voltage	Nominal Charge Current	Nominal Discharge Current	Maximum Charge Current	Maximum Discharge Current	Maximum Charge Voltage	Final Voltage
XK103450	1800mAh	3.7V	360mA	360mA	1800mA	1800mA	4.2V	2.75V

The main features of the cell in the battery are shown as below (clause 7.1.1):

Model	Nominal capacity	Nominal voltage	Nominal Charge Current	Nominal Discharge Current	Maximum Charge Current	Maximum Discharge Current	Maximum Charge Voltage	Final Voltage
XK103450	1800mAh	3.7V	360mA	360mA	1800mA	1800mA	4.2V	2.75V

The main features of the cell in the battery are shown as below (clause 7.1.2):

Model	Upper limit charge voltage	Taper-off current	Lower charge temperature	Upper charge temperature
XK103450	4.2V	90mA	0°C	45°C





Report No.: 18270BC00056601-M2 Page 8 of 28

potek	Anborek Anbo	EN 62133-2: 2017	Anbotek Anbotek	Anbo
Clause	Requirement + Test	Anbotek Anbot	Result - Remark	Verdict

4	PARAMETER MEASUREMENT TOLERANCES	A.P.ofer	
Aupor	Parameter measurement tolerances	Panbot	

5	GENERAL SAFETY CONSIDERATIONS		P
5.1	General Moore Androvek	Anbo Ak hotek An	oo'tek
Anbotek	Cells and batteries so designed and constructed that they are safe under conditions of both intended use and reasonably foreseeable misuse	Anbotek Anbotek	Anbotek
5.2 Anbe	Insulation and wiring	ek Anbotek	Rubo
tek botek	The insulation resistance between the positive terminal and externally exposed metal surfaces of the battery (excluding electrical contact surfaces) is not less than 5 $\mbox{M}\Omega$	No metal case exists.	otek N M
hotek	Insulation resistance (MΩ)	hotek Anbotes	
Anbote	Internal wiring and insulation are sufficient to withstand maximum anticipated current, voltage and temperature requirements	ek Anbotek Anbotek	Pupo,
3K b	Orientation of wiring maintains adequate clearance and creepage distances between conductors	Anbotek Anbotek Anbote	orek P Ar
ootek	Mechanical integrity of internal connections accommodates reasonably foreseeable misuse	Anbotek Anbotek	nboteP
5.3	Venting Anbore Anbore	Anboatek anbotek	PU/B
Anbo Anbo	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 pouch cell.	lek Vuj
otek nbotek	Encapsulation used to support cells within an outer casing does not cause the battery to overheat during normal operation nor inhibit pressure relief	Anbotek Anbotek And	botel P
5.4 botek	Temperature, voltage and current management	L nbotek Anbote	Pote
Anbo	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 7.	P
nbotek nbotek	Batteries are designed to be within temperature, voltage and current limits specified by the cell manufacturer	See above.	oo <sup>tek</sup> P





Report No.: 18270BC00056601-M2 Page 9 of 28

D' P	EN 62133-2: 2017	Bupo, Vi.	poier
Clause	Requirement + Test	Result - Remark	Verdic
, ek	mbore And And Ando	Tek Suport	Ville
Anbotek Anbotek	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 user manual.	APOT AN
5.5	Terminal contacts	Anbor Ak hotek An	o'ter P
botek	The size and shape of the terminal contacts ensure that they can carry the maximum anticipated current	DC connector used.	Anbo P
Anbotek	External terminal contact surfaces are formed from conductive materials with good mechanical strength and corrosion resistance	DC connector complied with the requirements.	k Aup
ek An	Terminal contacts are arranged to minimize the risk of short-circuit	Anbotek Anbotek Anbot	otek P
5.6	Assembly of cells into batteries	Anboten Anbo tek	abotP'
5.6.1	General	Anbotek Anbo.	Pre
Anbotek Anbotek	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.	Anb Anb
o <sub>jek</sub>	This protection may be provided external to the battery such as within the charger or the end devices	Anbotek Anbotek Anb	nbotek
	If protection is external to the battery, the manufacturer of the battery provide this safety relevant information to the external device manufacturer for implementation	Anbotek Anbotek Anbotek	Anh
stek And	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	Anbotek Anbotek Anbo	botek
Anbotek Anbotek	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.	Anbo
tek Anbo	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	Anbotek Anbotek Anbo	ek P
Anbotek	Protective circuit components added as appropriate and consideration given to the end-device application	Anbotek Anbotek	Aupo,





Report No.: 18270BC00056601-M2 Page 10 of 28

Dr. by	tek spotek	EN 62133-2	2. 2017	Anbore And	, ek	poter
Clause	Requirement + Test	Anbotek An	loc rek	Result - Remark	upore A	Verdic
Anbotek Anbotek	The manufacturer of the banalysis of the battery safe report including a fault and circuit under both charging conditions confirming the	ety circuitry with a alysis of the protec g and discharging	test	Safety analysis re by the manufactur		Anu Ani
5.6.2	Design recommendation	Aupo.	potek	Aupores Aug	botek An	o <sup>tek</sup> P
Anbotek Anbotek	For the battery consisting cellblock, it is recommend voltage of the cell does not the charging voltage spec	led that the charginate of the charginate in the charginate in the charge in the charg	ng er limit of	Charging voltage exceed the upper charging voltage 4 specified in Table	limit of the I.2V	Anbořek Anboře
ootek Anbotek	For the battery consisting single cells or series-connrecommended that the vosingle cells or single cellb upper limit of the charging Table 2, by monitoring the cell or the single cellblock	nected plural cellblo ltages of any one locks does not exc g voltage, specified e voltage of every s	ocks, it is of the ceed the d in	Anbotek Anbotek  Anbotek Anbotek  Anbotek An	Anbotek Anbotek	k N
Anborek Anbore Anborek Otek	For the battery consisting single cells or series-conrecommended that charging upper limit of the charging any one of the single cells measuring the voltage of single cellblocks	nected plural cellbloing is stopped whe g voltage is exceed or single cellblock	ocks, it is en the ded for ks by	otek Anbotek  Anbotek Anbotek  Anbotek Anbotek  Anbotek Anbotek	Anbotek Anbotek Anbotek Anbotek	N And And Arek
Anbotek	For batteries consisting of cell blocks, nominal charg as an overcharge protecti	je voltage not be c		Anbotek Anbotek	Anbotek	Anb Niet
k Aupor	For batteries consisting of cell blocks, cells have close be of the same design, be and be from the same ma	sely matched capa e of the same chen	acities,	upotek Anbotel	k Anbotek	N A!
nbotek	It is recommended that the discharged beyond the centre final voltage		specified	Final voltage of ba not exceed the fin specified by cell m	al voltage	P <sub>A</sub> nbotek
Anbotek	For batteries consisting of cell blocks, cell balancing the battery management s	circuitry incorpora		tek Anbotek	Anborek	N Ar
5.6.3	Mechanical protection for batteries	cells and compone	ents of	Anbotek Anbo	tek Anbo	Pootek
Anbotek Anbotek	Mechanical protection for control circuits within the I damage as a result of interforeseeable misuse	pattery provided to	prevent	Anbotek A	Anbotek	Anbor

Code: AB-BAT-38-b

Anbo







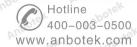
Report No.: 18270BC00056601-M2 Page 11 of 28

otek A	EN 62133-2: 2017	nbotek Anbore Ans	potek
Clause	Requirement + Test	Result - Remark	Verdict
YUZ	abotek Anbote	but apoter.	Aupo
Anbotek Anbotek	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	tek Anbotek Anbotek	APOPE.
	The battery case and compartments housing cells designed to accommodate cell dimensional tolerances during charging and discharging as recommended by the cell manufacturer	Anbotek Anbotek Anbotek Anbotek	hotek P Anbotek
Anbotek Anbotek	For batteries intended for building into a portable end product, testing with the battery installed within the end product considered when conducting mechanical tests	ek Anbotek Anbotek	Ar <b>N</b> ore Anbor
5.7 An	Quality plan	botek Anbotel And	nek P
Anbotek Anbotek	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	Anbotek Anbotek Anbotek Anbotek Anbotek	Anborek
5.8 Ambote	Battery safety components	otek Anbotek Anbo	P
ek ant	According annex F	otek unpotek Aupor	P

6	TYPE TEST AND SAMPLE SIZE		nbot P
Anboten	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	k Anbotek Anbotek	Anbore Anbore
ek Aup	Coin cells with resistance ≤ 3 Ω (measured according annex D) are tested according table 1	Not coin cells	NARIO
bojek b	Unless otherwise specified, tests are carried out in an ambient temperature of 20°C ± 5°C	Tests are carried out at 20°C ± 5°C.	Potek P
Anbotek Anbotek	The safety analysis of 5.6.1 identify those components of the protection circuit that are critical for short-circuit, overcharge and overdischarge protection	Anbotek Anbotek Anbotek	Aupote,
Potek V	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	obotek Anbotek Anbotek	PAnb.

7	SPECIFIC REQUIREMENTS AND TESTS				Aupole
7.1	Charging procedure for test purposes	Aupore	Lithium system.	abotek	ÞΡ̈́
7.1.1	First procedure	Anb	otek Aupo.	abotek	Panboi



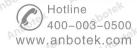




Report No.: 18270BC00056601-M2 Page 12 of 28

OLC VI	EN 62133-2: 2017	Auport Air	poier
Clause	Requirement + Test	Result - Remark	Verdict
", ekek	And sek abotek Anbo.	Ai.	AUD
Anbotek	This charging procedure applies to subclauses other than those specified in 7.1.2	tek Anbotek Anbotek	A.P.o.
tek Anbor	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	Anbotek Anbotek Anbot	P <sup>A</sup>
Anbotek	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	Anbotek Anbotek	Anbotek
7.1.2	Second procedure	ek Aupo, ok wotek	Pupo
ek Aupore	This charging procedure applies only to 7.3.1, 7.3.4, 7.3.5 and 7.3.9	ootek Anbottek Anbot	K P N
Anbotek Anbotek Anbotek	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 lt A, using a constant voltage charging method	Charge temperature 0-45°C declared.	P Inbotek Anbotek
7.2 nb	Intended use	otek Anbotek Anbo.	P
7.2.1	Continuous charging at constant voltage (cells)	Test complied.	Р
Anbotek Anbotek	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 for 7days with 36mA.	nbotek Anbotek
Aug	Results: No fire. No explosion. No leakage:	(See appended table 7.2.1)	₽ <sub>po</sub>
7.2.2 Anbar	Case stress at high ambient temperature (battery)	otek Wigo, W. potel	N An
Aupo	Oven temperature (°C):	70°C	_
otek Ar	Results: No physical distortion of the battery case resulting in exposure of internal protective components and cells	Anbotek Anbotek An	iboteN ibotek
7.3 hotek	Reasonably foreseeable misuse	Anborek Anbore	Poste
7.3.1	External short-circuit (cell)	Tested complied.	P w
Anbo	The cells were tested until one of the following occurred:	upotek Aupotek Aupotek	ek P
otek An	- 24 hours elapsed; or	Anborek Anbor All	o <sup>tek</sup> N
nbotek	- The case temperature declined by 20 % of the maximum temperature rise	Anbotek Anbotek An	Anbo <b>P</b> <sup>k</sup>
Vupo.	Results: No fire. No explosion:	(See appended table 7.3.1)	P.Pore
7.3.2	External short-circuit (battery)	Tested complied.	Panb
	External errort errout (battery)	rooted complica.	1.50







Report No.: 18270BC00056601-M2 Page 13 of 28

oter l	EN 62133-2: 2017	abotek Anbo	hotek
Clause	Requirement + Test	Result - Remark	Verdict
rek	anbores Anbors Anbors	by. Apoles	Aug
	The batteries were tested until one of the following occurred:	tek Anbotek Anbotek	A.P.ofe
200	- 24 hours elapsed; or	stek anbotek Anbote	N
ick b	- The case temperature declined by 20 % of the maximum temperature rise	Anbotek Anbotek Anbot	N
botek Anbotek	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	Anbotek Anbotek Anbotek Anbotek	Anbore <sup>l</sup>
Anbo arbo	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 two samples.	otek p
Anbotek Anbotek	A single fault applies to protective component parts such as MOSFET, fuse, thermostat or positive temperature coefficient (PTC) thermistor	Single fault applies on MOSFET (U2), see appended table 7.3.2.	Anbotek
Anborer	Results: No fire. No explosion:	(See appended table 7.3.2)	Panbo
7.3.3 phob	Free fall	Tested complied.	Р
k An	Results: No fire. No explosion	No fire. No explosion	P P
7.3.4	Thermal abuse (cells)	Tested complied.	P
rek	Oven temperature (°C)	130°C	_
'uppe	Results: No fire. No explosion	No fire. No explosion	PU/B
7.3.5	Crush (cells)	Tested complied.	₽\o
Vupo.	The crushing force was released upon:	otek Anbo, W. potek	P
rek Ant	- The maximum force of 13 kN $\pm$ 0,78 kN has been applied; or	Motek Anborek Anbr	leγ P
nbotek	- An abrupt voltage drop of one-third of the original voltage has been obtained	Anbotek Anbotek A	ibolo N
upotek	Results: No fire. No explosion	(See Table 7.3.5)	Post
3.6	Over-charging of battery	Tested complied.	P
P. 10	The supply voltage which is:	tek abotek Anbotes	A P
iek bi	- 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	5.88V applied.	P
Aupotek In	- 1,2 times the upper limit charging voltage resented in Table A.1 per cell for series connected multi-cell batteries, and	Anbotek Anbotek	Anbor
700	V 2010 APT	10 No.	L

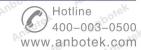






Report No.: 18270BC00056601-M2 Page 14 of 28

01	EN 62133-2: 2017	Dan H Brand hotel Ar	V/s a d's t
Clause	Requirement + Test	Result - Remark	Verdict
Anbotek	- Sufficient to maintain a current of 2,0 It A throughout the duration of the test or until the supply voltage is reached	tek Anbotek Anbotek	APOPE Anb
tek Aup	Test was continued until the temperature of the outer casing:	hotek Anbotek Anbot	ek P p
hotek	- Reached steady state conditions (less than 10°C change in 30-minute period); or	Anbotek Anbotek An	N.
Anboren	- Returned to ambient	Anbotek Anbo	, Botel
Anbotek	Results: No fire. No explosion:	(See appended table 7.3.6)	P
7.3.7	Forced discharge (cells)	Tested complied.	Р
botek Ar	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	Anbotek Anbotek Anbotek Anbotek Anbotek	otek N
Anbotek Anbot	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	otek Anbotek Anbotek	P Anbo
Yu.	Results: No fire. No explosion:	(See appended table 7.3.7)	P P
7.3.8	Mechanical tests (batteries)	Anbores And Arek	nbotek P
7.3.8.1	Vibration	Tested complied.	anb Biek
Anborek	Results: No fire, no explosion, no rupture, no leakage or venting:	(See appended table 7.3.8.1)	Phot
7.3.8.2	Mechanical shock	Tested complied.	P An
otek Aur	Results: No leakage, no venting, no rupture, no explosion and no fire:	(See appended table 7.3.8.2)	rek P
7.3.9	Design evaluation – Forced internal short-circuit (cells)	because of "Lithium polymer" used.	No Nek
Anbore	The cells complied with national requirement for:	Anbore Anthorek	_
Aupore	The pressing was stopped upon:	otek Anbore And Notek	N <sub>M</sub>
Anb	- A voltage drop of 50 mV has been detected; or	abotek Anbote Anu	ek N
siek b	- The pressing force of 800 N (cylindrical cells) or 400 N (prismatic cells) has been reached	Anbotek Anbotek Anb	pote/N
pote	Results: No fire:	Vupose Mus	~ post





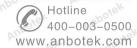
Report No.: 18270BC00056601-M2 Page 15 of 28

otek	Anbore And hotek	EN 62133-2: 2017	nbotek Anbote	Anshotek
Clause	Requirement + Test	upotek Anbo.	Result - Remark	Verdict

8	INFORMATION FOR SAFETY		P.P.	
8.1 Anbor	General Anbore Anb	lek Aupon An Potek	P	<sup>U</sup> po'
otek Anbr	Manufacturers of secondary cells ensure that information is provided about current, voltage and temperature limits of their products	Anbotek Anbotek Anbot	ek P	Ar
nbotek Anbotek	Manufacturers of batteries ensure that equipment manufacturers and, in the case of direct sales, endusers are provided with information to minimize and mitigate hazards	Anbotek Anbotek Anbotek	Anbo <sup>*</sup>	ek of
Anbo	Systems analyses performed by device manufacturers to ensure that a particular battery design prevents hazards from occurring during use of a product	ootek Anbotek Anbotek	otek N	
Anbotek	As appropriate, any information relating to hazard avoidance resulting from a system analysis provided to the end user	Anbotek Anbotek	Anboth Anboth	ek
Anbore	Do not allow children to replace batteries without adult supervision	ek Anbotek Anbotek	N	oote
8.2	Small cell and battery safety information	Not small cell and battery.	N	AUD
lootek An	The following warning language is to be provided with the information packaged with the small cells and batteries or equipment using them:	Anbotek Anbotek Anb	hbotek	P
Anborek	- Keep small cells and batteries which are considered swallowable out of the reach of children	k Aupotek Aupotek	An's N'e	otel
ek Antoti	- Swallowing may lead to burns, perforation of soft tissue, and death. Severe burns can occur within 2 h of ingestion	otek Anbotek Anbotel	N	Yup.
ootek	- In case of ingestion of a cell or battery, seek medical assistance promptly	Aupotek Aupotek Aup	Notel	17

9	MARKING		P rek
9.1	otek Cell marking And otek Inbotek And	rek sposek Aupose.	N
k Du.	Cells marked as specified in IEC 61960, except coin cells	upotek Ambotek Ambotek	NAMES ok Ar
<sup>7upo,e</sup> k	Coin cells whose external surface area is too small to accommodate the markings on the cells show the designation and polarity	Anbotek Anbotek An	pote <sup>V</sup> N
Anbotel Anbr	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	tek Anbotek Anbotek	Notek Anbot







Report No.: 18270BC00056601-M2 Page 16 of 28

	Anbore An hotek	EN 62133-2: 2017	abotek Anbore	An
Clause	Requirement + Test	abotek Anbo.	Result - Remark	Verdict

9.2	Battery marking	Aupo rek abotek	A.P.
k Aupor	Batteries marked as specified in IEC 61960, except for coin batteries	See marking plate on page 6.	PAnbo
otek An	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	Anbotek Anbotek Anbotek Anbotek Anbotek An	N Arbotek
Anborek	Terminals have clear polarity marking on the external surface of the battery	ek Anbotek Anbotek	Anbot Anbot
hpotek Ant	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	Anbotek Anbotek Anbotek Anbotek Anto	k P Ani
9.3	Caution for ingestion of small cells and batteries	Not small cell and battery.	N'N'tek
Anbore Anbore	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	botek Anbotek Anbotek	N.bote Ant
Aupotek b	When small cells and batteries are intended for direct sale in consumer-replaceable applications, caution for ingestion given on the immediate package	Anbotek Anbotek Anb	N nbotek Anbotek
9.4	Other information	k Anbore K Ans	Phote
ek Anbore	Storage and disposal instructions	Information for storage and disposal instructions mentioned in manufacturer's specifications.	ek Anb
Anbotek Anbotek	Recommended charging instructions	Information for recommended charging instructions mentioned in manufacturer's specifications.	Anbotek Anbotek

10	PACKAGING AND TRANSPORT	100	P
potek	Packaging for coin cells not small enough to fit within the limits of the ingestion gauge of Figure 3	Not coin cells.	N A
Anbotek Anbotek	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	Arr. tek abotek	Anbotek Anbotek



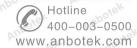


Report No.: 18270BC00056601-M2 Page 17 of 28

ootek	Anbore K Ans Motek	EN 62133-2: 2017	abotek Anbote	Aur
Clause	Requirement + Test	Anbotek Anbo	Result - Remark	Verdict

ANNEX A	CHARGING AND DISCHARGING RANGE OF SEC FOR SAFE USE	ONDARY LITHIUM ION CELLS	P.P.
A.1 000	General Dollar Amborett Amborett Amborett	tek abotek Anbor	P
A.2	Safety of lithium ion secondary battery	Complied.	Р
A.3	Consideration on charging voltage	Complied.	P
A.3.1	General Anboret Anboret	Charging voltage is 4.2V	Anbore
A.3.2	Upper limit charging voltage	4.2V	W.Bo,
A.3.2.1	General Andrew Andrew	ek Anbotek Anb	P
A.3.2.2	Explanation of safety viewpoint	notek Anbotes Anb	× N
A.3.2.3	Safety requirements, when different upper limit charging voltage is applied	4.2V applied.	otek N
A.4	Consideration of temperature and charging current	Anborek Anborek	unbot P
A.4.1	General	ok botek Anbotes	AUD P
A.4.2	Recommended temperature range	See A.4.2.2.	P
A.4.2.1	General Andrew Andrew	ore And Anbore	Р
A.4.2.2	Safety consideration when a different recommended temperature range is applied	Charging temperature declared by client is: 0-45°C	otek P
A.4.3 k	High temperature range	Not higher than the temperature range specific in this standard.	Anbore
A.4.3.1	General	rek abotek Anbote	N
A.4.3.2	Explanation of safety viewpoint	o. Anbotek Anbote	, N
A.4.3.3	Safety considerations when specifying charging conditions in the high temperature range	Inpotek Aupotek Aupo	N N
A.4.3.4	Safety considerations when specifying a new upper limit in the high temperature range	Anbotek Anbotek	Anbolis
A.4.4	Low temperature range	Lower than the temperature range specific in this standard.	Pb <sub>p</sub>
A.4.4.1	General And Andrew Andrew	stek shotek Anbor	y p
4.4.4.2	Explanation of safety viewpoint	up tek aupotek Aupo	р
A.4.4.3	Safety considerations, when specifying charging conditions in the low temperature range	Anbotek Anbotek An	pore p
A.4.4.4	Safety considerations when specifying a new lower limit in the low temperature range	-5°C applied.	P. Do
A.4.5	Scope of the application of charging current	And And Morek	P







Report No.: 18270BC00056601-M2 Page 18 of 28

ote, M	EN 62133-2: 2017	anbores And	potek
Clause	Requirement + Test	Result - Remark	Verdict
1 1/20tek	Consideration of displaces	A uposek Pupose	Ann
A.4.6	Consideration of discharge	ak hotek Anbotet	<sup>V</sup> B <sub>o</sub> ,
A.4.6.1	General	ole, Aug alokek	PAnt
A.4.6.2	Final discharge voltage and explanation of safety viewpoint	Cell specified final voltage 2.75V	e⊁ P
A.4.6.3	Discharge current and temperature range	Anbo Lek abotek An	P.
A.4.6.4	Scope of application of the discharging current	Anbor Ar. Aborek	Aupote
A.5	Sample preparation	Anbore An.	An Note
A.5.1	General	rek Anbore And	Nab
A.5.2	Insertion procedure for nickel particle to generate internal short	potek Anbotek Anbot	k N
A.5.3	Disassembly of charged cell	Anbore K Ant Sotek Ant	O. O. N
A.5.4	Shape of nickel particle	Aupoter Aug	N'odn
A.5.5	Insertion of nickel particle in cylindrical cell	Anbotek Anbo	Nich
A.5.5.1	Insertion of nickel particle in winding core	Ek Aupotek Aupo.	N
A.5.5.2	Marking the position of the nickel particle on both ends of the winding core of the separator	potek Anbotek Anbote	N
A.5.6	Insertion of nickel particle in prismatic cell	Anbotek Anb	otek N
A.6	Experimental procedure of the forced internal short-circuit test	Anbotek Anbotek	nbot¶ nbot¶
A.6.1	Material and tools for preparation of nickel particle	And otek Anbotek	Nau
A.6.2	Example of a nickel particle preparation procedure	Anbotek Anbotek	N <sub>po</sub>
4.6.3	Positioning (or placement) of a nickel particle	otek Auporal	N Pr
A.6.4	Damaged separator precaution	Auposek Aupo sek upo	Kelk N
A.6.5	Caution for rewinding separator and electrode	Anborek Anbor An	Note
A.6.6	Insulation film for preventing short-circuit	upotek Anbore A	Nok
A.6.7	Caution when disassembling a cell	k abotek Anbotes	N
A.6.8	Protective equipment for safety	rek abotek Anboten	N
A.6.9	Caution in the case of fire during disassembling	ok hotek Anbotek	NAV
A.6.10	Caution for the disassembling process and pressing the electrode core	hootek Anbotek Anbo	otek N
A.6.11	Recommended specifications for the pressing device	Anbotek Anbotek Ar	N/k

ANNEX B	RECOMMENDATIONS TO EQUIPMENT MANUFACTURERS AND BATTERY	N
	ASSEMBLERS	Anbe







Report No.: 18270BC00056601-M2 Page 19 of 28

otek	Anbore Am hotek	EN 62133-2: 2017	Anborek Anbore	An
Clause	Requirement + Test	Anborek Anbo.	Result - Remark	Verdict

ANNEX C	RECOMMENDATIONS TO THE END-USERS	A.Notes	
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ANNEX D	MEASUREMENT OF THE INTERNAL AC RESISTANCE FOR COIN CELLS				
D.1	General Anbore	Joseph Wypo,	N		
D.2	Method Anbore	Anbor An	N N		
upotek vipotek	A sample size of three coin cells is required for this measurement	(See appended table D.2)	Anbo'N		
Anborek	Coin cells with an internal resistance of less than or equal to 3 $\Omega$ are subjected to the testing according to Clause 6 and Table 1	ek Anbotek Anbotek	Anboi Anboi		
stek Ani	Coin cells with an internal resistance greater than 3 $\Omega$ require no further testing	Anbotek Anbotek Anbo	otek N		

ANN	IEX E	PACKAGING	AND T	RANSPO	ORT					N <sub>tek</sub>
Zi.	No.	poter	AUR		rek	"Upo,	Zi.	×	Poter	And

ANNEX F	COMPONENT STANDARDS REFERENCES	Nypote	1
			1





Report No.: 18270BC00056601-M2 Page 20 of 28

	TABLE: List of critical com		AnbP		
Object/ part No.	Manufacturer/ trademark	Type/mode	Technical data	Standard (Edition / year)	Mark(s) of conformity¹)
Cell	Dongguan Lean Power New Energ Technology Co.ltd	XK103450	3.7V, 1800mAh	EN 62133-2: 2017	Test with appliance
PCB	SHEN ZHEN MEI YA DI E LECTRONICS CO.,LTD	24*3.6*0.6 mm(xk01)	130°C	Anbor	Anborek
Anbotek Anbotek Anbotek Anbotek	Shenzhen DEVELOPER MICROELECTRONICS CO., Ltd	DW01	Overcharge detection voltage: 4.28±0.08V, Over discharge detection voltage: 2.40±0.10V, TOP: 0°C to	tek Anbotek  hootek Anbotek  Anbotek  Anbotek	Tested with appliance
MOSFET (U2)	Shenzhen DEVELOPER MICROELECTRONICS CO., Ltd	8205A	70°C VDS: 20V, VGS: ±12V, ID: 5A, Tstg: 0°C to 70°C	Potek Vupotek	Tested with appliance
- Positive electrode	Soundon New Energy Technology Co. Ltd	SN2G	NMC,, 155mAh/g 3.5g/cm3	Arthorek An	Pupotek W
- Negative electrode	Jiangxi Zichen Technology Co.,Ltd	otET-1 Anbot	Graphite, D50: 15.4µm	Anbotek	Aupore
- Separator	Shenzhen XuRan electronic Co.,LTD	16µm	PP, Shutdown temperature: 140°C	otek Anbor	- Aupotek
- Electrolyte	Guangdong jinguang Technology Co., Ltd	TF-107A	LiPF6+DEC+E C	rupotek Aut	Joseph Aupon
Wire	Dongguan City Jin Zao Li Electronic Technology Co Ltd	1571 Anbore	22AWG, 80°C, 30Vac	UL 758,	UL E332522
Connector	Dongguan Yuechen Wire & Cable Co., Ltd.	PH2.0	2Pin, 2A	- Anbotek	- Aupoten

<sup>1)</sup> An asterisk indicates a mark which assures the agreed level of surveillance.

7.2.1	TABLE: Continuous charging at constant voltage (cells)				
Sample No.	Recommended charging voltage V <sub>c</sub> , (Vdc)	Recommended charging current I <sub>rec</sub> , (mA)	OCV at start of test, (Vdc)	Results	
nbotek C1 Anb	4.20	360	4.18	Potek	
C2	4.20	360 And 184	4.18	P hotek	
C3	4.20	360 Marie 360	4.18	P P	
C4	4.20	360 And	4.18	ote. P Vue	







Report No.: 18270BC00056601-M2 Page 21 of 28

10,	C5	hotek	4.20	Vue Viek	360	Anbore 4	I.18	Anbore
t	1-070	Die	184	200	- V	1-01	Die	184

#### Supplementary information:

- No fire or explosion
- No leakage

7.2.2	TABLE: Moulded case stress at high ambient temperature (battery)				
Sample No.	Ambient, (°C)	OCV at start of test, (Vdc)	Results		
hotek - Anb	Prek Aupo rek upotek	inboth Annotek Anbotek	Aup **		
Up- Ofe <del>le</del>	hotek Anbor Anborek	Anbotek Anbotek	Aupo.		
Andrew	anbotek Anborn Ak hotek	Anboret And stek anbore	Aupore		

## Supplementary information:

- No fire or explosion
- No leakageOthers (please explain)

7.3.1	TABLE: External short circuit (cell)					
Sample No.	Ambient T, (°C)	OCV at start of test, (Vdc)  Resistance circuit, (mg		Maximum case temperature, (°C)	Results	
Charging temp	erature: -5°C	Jupo Po	tek Anbore	Yu. Viek	potek p	
C6	55.4	4.11	82.5	117.2	nboteP	
ofer C7 And	55.4	4.11	78.7 Moore	119.4	nbBek	
C8 M	55.4	4.12	74.9	121.5	Potek	
C9	55.4	4.110016	83.5	123.4	P	
C10	55.4	4.12 Anboren	81.2	118.7	P	
Charging temp	perature: 45°C	me Anbot	ek Anbo	abotek Ar	Pose V	
C11	53.1	4.18	92.1	116.1	Anbore P	
C12	53.1	4.18	88.4	116.9	AnbPer	
C13	53.1	4.17	88.2	113.9	Rotek	
C14	53.1	4.18	85.4	109.5	ek Panbot	
C15	53.1	4.18	86.3	112.4	P	

- No fire or explosion





Report No.: 18270BC00056601-M2 Page 22 of 28

7.3.2 TABLE: External short-circuit (battery)					Р	
Sample No.	Ambient T, (°C)	OCV before test, (Vdc)	Resistance of circuit, (mΩ)	Maximum case temperature, (°C)	Component single fault condition	Results
B23	22.3	4.18	85.6	25.2	orek - onbo	tek P Anbo
B24	22.3	4.18	84.9	24.4	Aupo.	botek P A
B25 Andrew	22.3	4.18	87.2	24.8	Vupe,	- abotP
nbotek B26 Anb	22.3	4.18	80.8	113.5	SC MOS (U2)	Prek
B27	22.3	4.17	100 <sup>te</sup> 82.4	110.2	SC MOS (U2)	Photek

## Supplementary information:

- No fire or explosionOthers (SC=Short circuit)

7.3.3	TABLE: Free fall	Р	
Sample No.	OCV at start of test, (Vdc)	OCV at removal of thermal free fall, (Vdc)	Results
C16	Anbore 4.17 Anbore	And 4.17 of And	P por
C17	Anbore 4.18 otek Anbore	And tek 4.17 photek Anbe	P
C18	Anbore 4.17 otek and	4.17 Anborek A	Pose Pu
B28	4.18 Andrew	Ando 4.18	Anbore P
B29	orek Anbore 4.17 Anborek	Anbotek Anba.17 Anbotek	AnbPre
Anbor B30	and 4.18	4.18	Photek

## Supplementary information:

- No fire or explosion

7.3.4	3.4 TABLE: Thermal abuse (cells)				
Sample No.	OCV at start of test, (Vdc)	Ambient T, (°C)	Temperature raised at a rate, (°C)	Results	
Charging temp	perature: -5°C	Anbotek Anbote	And Motek Anbotek	Aupo.	
C19	4.11 Andrews	130±2	5°C/min	Phupo,	
C20	4.12	130±2	5°C/min	otek P Anl	
C21	4.11	130±2	5°C/min	nbotekP	
C22	4.11	130±2	5°C/min	, aboP <sup>k</sup>	
C23 MA	4.12	130±2	5°C/min	Potek	
Charging temp	perature: 45°C	Anbotek Anbe	anbotek Anbote	k Pu	
C24	Anbore 4.17	130±2	5°C/min	P P	
C25	4.18 And 4.18	130±2	5°C/min	ofer P Ann	







Report No.: 18270BC00056601-M2 Page 23 of 28

C26	4.18	130±2	5°C/min	Anbor
C27	4.18	130±2	5°C/min	A.Roter
C28	4.18	130±2	5°C/min	K Panbote

## **Supplementary information:**

- No fire or explosion

7.3.5	TABLE: Crush (cells)			P
Sample No.	OCV before test, (Vdc)	OCV at removal of crushing force, (Vdc)	annlied to the cell	
Charging temp	perature: -5°C	Anbo. A. botel	Anbote. And	otek onb
C29	4.11	4.10	13.4	Jek P
C30, 100 100	4.12	4.11	13.2	mbo P
C31	4.11	4,10 tel	13.1 hotek	Anbo P. ek
C32	4.11	notek 4.11 nootek	And tek 13.3 Anbotek	AUD.
C33	4.12	Anbotek 4.11 Anbotek	13.2	. Bipois
Charging temp	perature: 45°C	And cotek Anbotek	Anbo. Lek All	yek Aup
C34	4.18	4.17	13.1	notek P
C35	4.17	4.16	13.1	P
otek C36 Anbo	4.18	4.17	botek 13.10bote	Ant Pek
C37	4.18	4.18	botek 13.1 Anbote	Anb P otek
C38	4.18	4.17 Anbor	13.0	P

Jie. And	all above	by.	V	-Ote. AUG		ye.V
7.3.6	7.3.6 TABLE: Over-charging of battery					Р
Constant cha	rging current (A)	:	nboiek	3.6	upotek	_
Supply voltag	e (Vdc)	:	Anbotek	5.88	nbotek	_
Sample No.	OCV before charging, (Vdc)	Total charç		Maximum ou		Results

S	Sample No. OCV before charging, (Vdc)		Total charging time, (minute)	Maximum outer case temperature, (°C)	Results
18/4	B31	3.32	And 180	43.2	P. P.
.xe	B32	3.33	180	42.5	Anbore P. A
100	B33	3.33	180	45.5	Anbore K
VUP	B34	3.33	180 notek	42.4	A.Pores
P	B35	3.32	And tek 180 anbotek	44.5	k Panborek

Code: AB-BAT-38-b



## **Shenzhen Anbotek Compliance Laboratory Limited**



Report No.: 18270BC00056601-M2 Page 24 of 28

## Supplementary information:

- No fire or explosion

7.3.7	TABLE: Forced discharge (cells)				
Sample No.	OCV before application of reverse charge, (Vdc)	Measured reverse charge I <sub>t</sub> , (mA)	Lower limit discharge voltage, (Vdc)	Results	
C39	3.33	1800	2.75	Aupop	
C40	3.31	1800	2.75	Ar Potek	
C41	3.29	1800	2.75	k Panbotek	
C42	And 3.28 Model	1800	2.75	stek P nobo	
C43	3.33	1800	2.75	P	

## Supplementary information:

- No fire or explosion

7.3.8.1	TABLE: Vibration	k Aupoten	Anto stek and	otek Anbors	Photek
Sample No.	OCV before test, (Vdc)	OCV after test, (Vdc)	Mass before test, (g)	Mass after test, (g)	Results
B36	4.18	4.18	34.729	34.727	botek P Ant
B37	4.18	4.18	34.717	34.716	hoteP .
botek B38 Mupo	4.18	4.18	34.723	34.722	Prek

#### Supplementary information:

- No fire or explosion
- No rupture
- No leakage
- No venting

7.3.8.2 TABLE: Mechanical shock				ek abotek	Anbore P	
Sample No.	OCV before test, (Vdc)	OCV after test, (Vdc)	Mass before test, (g)	Mass after test, (g)	Results	
B39	4.18	4.18	34.715	34.713	P notek	
B40	4.18	4.18	34.709	34.706	PART	
B41	4.18	4.18	34.722	34.721	PAND	

# Supplementary information:

- No fire or explosion
- No rupture
- No leakage
- No venting





Report No.: 18270BC00056601-M2 Page 25 of 28

7.3.9	TABLE: Forced in	ternal short circui	t (cells)		N
Sample No.	Chamber ambient T, (°C)	OCV before test, (Vdc)	Particle location	Maximum applied pressure, (N)	Results
Charging temp	erature:	por Am	k Anbotek	Aupo rek	otek Anbo
· Pupor	bu.	Anborer Anbo	otek -nbotek	Aupor	-botek A
itek - Anbore	- Potek	Anbotel Anb	otek - nbotek	Aupo.	zu-
obotek - Anb	Ar Motek	Anbotek (	"upo	ek Fopose	Pur Potek
abotek P	Upoles Aug	ak Andorek	Anbo.	ootek Anbore	Aug Polsk
Ar. Potek	Anboren - Ano	otek -nbotek	Anbo Al	shotek Anbote	And
Charging temp	erature:	or rek mbotel	Anbore	An. Potek Aup	oten Anbo
k Ans sorek	Anborek	Pupo.	Hek Hupole	Aug Polek	upotek Ar
- And	rek nobotek	Aupo,	botek - Anbote.	And rick	nbotek
poter - Anbe	tek - nbotek	Anbore A	hotek Anbot	Anbo stek	, abotek
Anborek A	ipo - pote	k Vapose	And And	otekAnbo	- botek
nbetek	Aupo, A	otek -Anbotes	And	Vupotek Vupot	- 200°

## Supplementary information:

- 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)

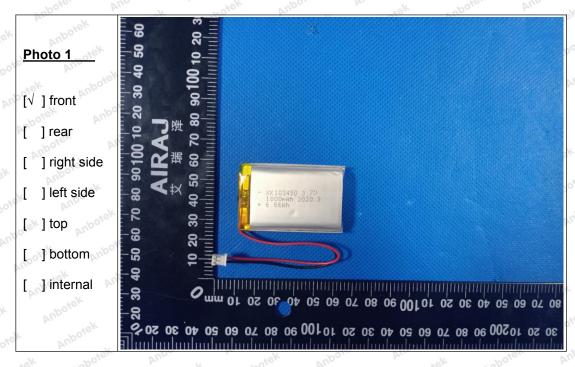
D.2	TABLE: Internal AC res	N		
Sample No.	Ambient T, (°C)	Store time, (h)	Resistance Rac, (m $\Omega$ )	Results 1)
- Alle	ek Anbotek Anbo	ek abotek Ar	oor Air	anborer-
Oley - Vupo	otek novotek An	DOLD WILL	Anboree _Anbo	nbotek
Aupoten - Au	tek - nbotek	Anbore An botek	Anboter - Anbo	4 upotek
Supplementar	y information:	Aupore Am	Anborek Anbo	ek abote

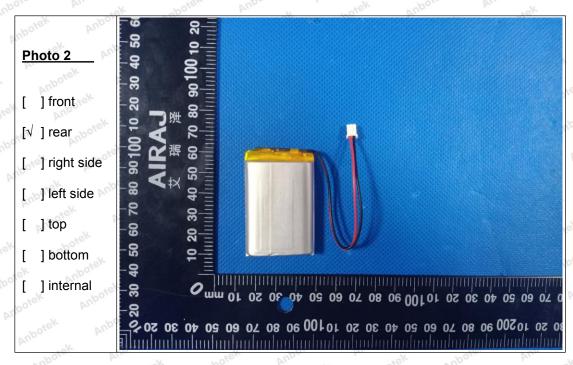


<sup>1)</sup> Identify one of the following:

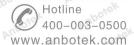


Report No.: 18270BC00056601-M2 Page 26 of 28



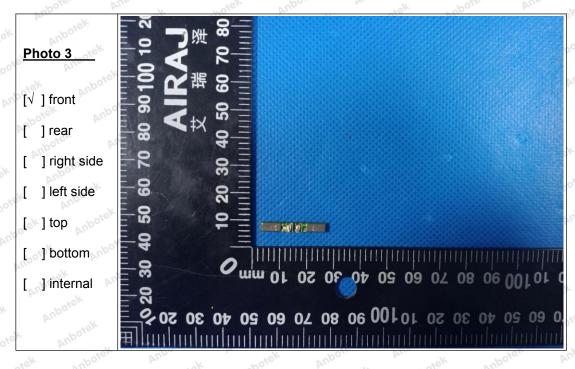


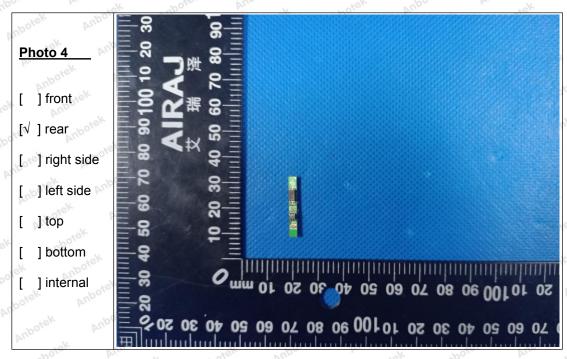






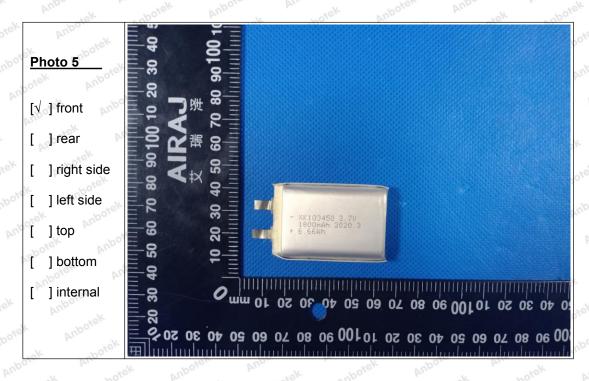
Page 27 of 28 Report No.: 18270BC00056601-M2

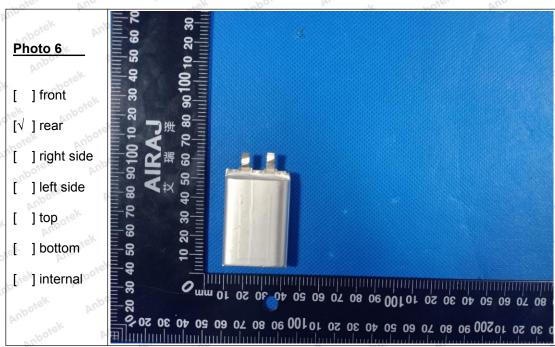






Report No.: 18270BC00056601-M2 Page 28 of 28





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



