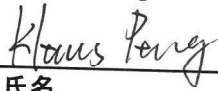


TEST REPORT	
Attached Table 9, Lithium ion secondary batteries of Ministerial Ordinance for Determining Technical Standards for Electrical Appliances	
試験報告書番号 Report Reference No. :	68.282.19.0285.01
日付 Date of issue :	2019-11-22
頁 Total number of pages :	24 pages
試験所 Testing Laboratory :	TÜV SÜD Certification and Testing(China) Co., Ltd. Shenzhen Branch No.11, Jukeng Rd., Juling Village, Jutang District, Guanlan, Longhua New District, Shenzhen, 518110 P.R. China
申請者: Applicant:	Shenzhen ACE Battery Co., LTD. BAK Industry Zone, Kuichong, Dapeng, 518119 Shenzhen, Guangdong Province, PEOPLE'S REPUBLIC OF CHINA
適用した試験基準: Test specification:	According to client's requirement (refer to Attached Table 9, Lithium ion secondary batteries of Ministerial Ordinance for Determining Technical Standards for Electrical Appliances)
試験者: Tested by:	照査者: Checked by:
Klaus Peng 	Charlie Zeng 
氏名 Name	署名 Signature
氏名 Name	署名 Signature
テスト項目説明 Test item description..... :	10S3P リチウムイオン電池 10S3P Rechargeable Li-ion Battery Pack
トレードマーク Trade Mark :	
製造者 Manufacturer..... :	Shenzhen BAK Power Battery Co., Ltd BAK Industry Zone, Kuichong, Dapeng, 518119 Shenzhen, Guangdong Province, PEOPLE'S REPUBLIC OF CHINA
モデル Model/Type reference :	909996
パラメーター Ratings :	37Vd.c., 8100mAh

Summary of testing:

Tests performed (name of test and test clause):

Tests are made with the number of samples specified in Attached Table 9, Lithium ion secondary batteries of Ministerial Ordinance for Determining Technical Standards for Electrical Appliances.

Clause 2.(1) Continuous low-rate charging
 Clause 2.(2) Vibration
 Clause 2.(3) Battery enclosure test at high ambient temperature
 Clause 2.(4) Temperature cycling
 Clause 3.(1) External short circuit
 Clause 3.(2) Free fall
 Clause 3.(3) Mechanical shock (crash hazard)
 Clause 3.(4) Thermal abuse
 Clause 3.(5) Crushing of cells
 Clause 3.(6) Low pressure
 Clause 3.(7) Overcharge
 Clause 3.(8) Forced discharge
 Clause 3.(9) Cell protection against a high charging rate
 Clause 3.(10) Forced internal short circuit of cells
 Clause 3.(11) Function of the overcharge protection of batteries

The samples comply with the requirements of above clauses.

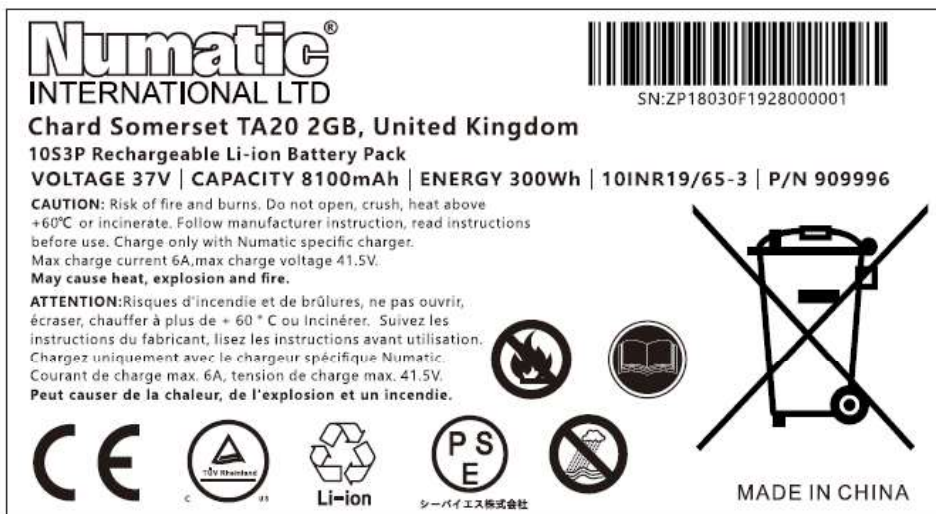
Testing location:

TÜV SÜD Certification and Testing(China) Co., Ltd. Shenzhen Branch

No.11, Jukeng Rd., Juling Village, Jutang District, Guanlan, Longhua New District, Shenzhen, 518110 P.R. 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.



Remark:

- 1) The polarity "+" "-" marked on plastic enclosure.
- 2) The code "ZP18030F1928000001" shown on the marking plate represents the information as below:
Where

"ZP18030" represents internal project number, ZP18030F is fixed value ;

"1928" represents the battery manufactured on the 28th week, 2019. Only for example;

"000001" represents the serial number.

Test item particulars	
Classification of installation and use	Build-in and use for portable applications
Supply Connection.....	Supply by connector
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)
Testing	
Date of receipt of test item	2019-08-13
Date (s) of performance of tests	2019-08-13 to 2019-11-21
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. 1) For electrotechnical sector, apply IEC Guide 115 as decision rule.	
Factory location:	
Shenzhen ACE Battery Co., LTD.	
BAK Industry Zone, Kuichong, Dapeng, 518119 Shenzhen, Guangdong Province, PEOPLE'S REPUBLIC OF CHINA	
Photo documentation: 9 pages	

General product information:

1. The battery model: 909996 is used for portable applications and consists of 3 cells connected in Parallel, then 10 of the parallel strings are connected in series, cell model: INR18650-29++. The cell is tested with battery.

2. Additionally, details information of the cell and battery, as following:

Product name	Lithium-Ion Rechargeable Battery Cell	10S3P Rechargeable Li-ion Battery Pack
Type/model	INR18650-29++	909996
Nominal voltage	3.7Vd.c.	37Vd.c.
Rated capacity	2700mAh	8100mAh
Charging voltage recommended by manufacturer	4.2V	41.5V
Upper limit charging voltage	4.25V	41.5V
Final voltage	2.5V	29V
Charging current declared by manufacturer	1350mA	3000mA
Maximum charge current	2000mA	6000mA
Charging temp. upper limit	45°C	45°C
Charging temp. lower limit	0°C	0°C
Recommended charge method by manufacturer at 20±5°C	Charge at constant current 1350mA until voltage reaches 4.2V, and then charge at constant voltage 4.2V till charge current is 54mA.	Charge at constant current 3000mA until voltage reaches 41.5V, and then charge at constant voltage 41.5V till charge current is 375mA.
Charge method at highest & lowest test temperature	Store at -5°C or 45°C for 1 to 4 hours, then charge at constant current 2000mA until voltage reaches 4.25V, then charge at constant voltage 4.25V till charge current reduced to 0.05 It A (135mA)	Store at -5°C or 45°C for 1 to 4 hours, then charge at constant current 6000mA until voltage reaches 41.5V, then charge at constant voltage 41.5V till charge current reduced to 0.05 It A (405mA)
Dimensions	DXH: Max. (18.4×65.0)mm	T×W×L: Max.(89.8×135.4×168.4)mm
Weight	Max. 45g	Approx. 1980g

The final evaluation of the battery must be conducted in the end product for which the battery will be used.

Attached Table 9, Lithium ion secondary batteries of Ministerial Ordinance for Determining Technical Standards for Electrical Appliances

Clause	Requirement + Test	Result - Remark	Verdict
1.	Basic Design		P
1.(1)	Insulation and Wiring		P
	a) The insulation resistance between the positive terminal and a metal surface (excluding electrical contact surfaces and electrical parts having the same potential as the electrode potential of the battery) exposed to outside the battery, and which, as mounted on the equipment, may be touched by a human, shall be 5 MΩ or more at 500 VDC.	>1000 MΩ	P
	b) Internal wiring and its insulation shall sufficiently withstand anticipated maximum current, maximum voltage, and maximum temperature.		P
	c) Equipment having connection terminals shall be wired to maintain an appropriate clearance and creepage distance between terminals.		P
1.(2)	Inner Pressure Reduction Mechanism		P
	a) Battery cases and cells shall be designed with a gas release mechanism, or shall be designed to reduce excessive internal pressure when the equipment reaches a value or rate set so as to protect against explosion or fire.		P
	b) If support material is used to fix cells within the battery case, the type of support material and method of fixing cells shall not inhibit pressure relief, and the battery shall not induce overheating during normal use of the battery.		P
1.(3)	Temperature and current management		P
	The battery shall be designed so that abnormal temperature-rise conditions are prevented.		P
	Provided that this does not apply if a current limiter is installed outside the battery to control abnormal temperature-rise during charging and discharging within a safety level.		P
1.(4)	Terminal contacts		P
	a) The battery shall be marked positive (+) or negative (-) for terminals on its external surface or be designed with no fear of misconnection.		P
	b) Batteries having a terminal contact plate shall be sized and shaped to ensure the flow of maximum current anticipated.		P

Attached Table 9, Lithium ion secondary batteries of Ministerial Ordinance for Determining Technical Standards for Electrical Appliances

Clause	Requirement + Test	Result - Remark	Verdict
	c) Batteries having a terminal contact plate shall be designed so that the surface of the terminal contact plate will be a conductive material with good mechanical strength and corrosion resistance.		P
	Moreover, the terminal contact plate shall be arranged to minimize the risk of short circuits.		P
1.(5)	Assembly of cells into batteries		P
	Batteries made of series connected cell blocks shall be designed so that cells are assembled to make the cell blocks the same capacity, and cell polarity reversal is prevented.		P
	Provided that this does not apply to the battery controlled by itself or the equipment as cell polarity reversal is prevented.		N/A
2.	Intended Use		P
2.(1)	Continuous Low Rate Charge		P
	Cells charged under the conditions specified in Annex Table 1-2 (hereafter called "the charged cells") shall not fire, explode, or leak after being charged at constant voltage for 28 days.	See table 2.(1)	P
2.(2)	Vibration		P
	Cells and batteries charged under the conditions specified in Annex Table 1-2 (hereafter called "the charged cells or batteries") shall not fire, explode, or leak when tested under the following test conditions:		P
	a) A simple harmonic motion with an amplitude of 0.76 mm and a total maximum excursion of 1.52 mm shall be applied to the charged cells.		P
	b) The frequency shall be increased at a rate of 1 Hz/minute from 10 Hz and reduced at a rate of 1 Hz/minute after it reaches 55 Hz, and then it shall be ensured that the frequency has reached 10 Hz.		P
	c) The entire range of frequency (10 Hz to 55 Hz) shall be tested for 90 ± 5 minutes in each of the three mutually perpendicular directions of vibration (X, Y, and Z axes).		P
	d) The vibration shall be applied in each of mutually perpendicular direction (X, Y, and Z axes) in the sequence specified below according to conditions a) to c) Provided that the order of steps 2 to 4 can be changed.		P

Attached Table 9, Lithium ion secondary batteries of Ministerial Ordinance for Determining Technical Standards for Electrical Appliances

Clause	Requirement + Test	Result - Remark	Verdict
	Step 1: Ensure that the measured voltages of charged cells or batteries are the voltages after charging. From steps 2 to 4: Apply vibration as specified in Table 1. Step 5: Leave the charged cells or batteries for one hour, and then conduct a visual inspection.		P
2.(3)	Battery enclosure test at high ambient temperature		P
	A battery charged under conditions specified in Annex Table 1-2 (hereafter called "the charged battery") shall be left in an air circulating oven at $70 \pm 2^{\circ}\text{C}$ for seven hours.		P
	Then the battery shall be removed from the air circulating oven and the temperature of the battery case shall be returned back to $20 \pm 5^{\circ}\text{C}$.		P
	At that time, said case shall not undergo deformation that exposes the internal contents.		P
2.(4)	Temperature cycling		P
	Charged cells or batteries shall not fire, explode, or leak when tested under the following test conditions:		P
	a) The charged cells or batteries shall be left in a thermostatic oven.		P
	b) The inner temperature of the thermostatic oven, the time it is to be left as is, and the test procedure shall be as follows: Step 1: Leave the charged cells or batteries at $75 \pm 2^{\circ}\text{C}$ for four hours. Step 2: Change the temperature to $20 \pm 5^{\circ}\text{C}$ within 30 minutes and left the equipment for at least two hours. Step 3: Change the temperature to – (minus) $20 \pm 2^{\circ}\text{C}$ within 30 minutes and the equipment shall be left for four hours. Step 4: Change the temperature to $20 \pm 5^{\circ}\text{C}$ within 30 minutes and left the equipment for at least two hours. Step 5: Steps 1 to 4 repeat another four times. Step 6: Store the charged cells at $20 \pm 5^{\circ}\text{C}$ for seven days, and then conduct a visual inspection.		P

Table 9, Lithium ion secondary batteries of Ministerial Ordinance for Determining Technical Standards for Electrical Appliances

Clause	Requirement + Test	Result - Remark	Verdict
3	Reasonably foreseeable misuse		P
3.(1)	External short circuit	See table 3.(1)	P
	a) The charged cell shall be left at an ambient temperature of $55 \pm 5^{\circ}\text{C}$.		P
	With the positive and negative terminals short-circuited via connection to a total external resistance of $80 \pm 20 \text{ m}\Omega$, the battery shall be left for 24 hours or until the difference between the surface temperature of the charged cell and the ambient temperature becomes not more than 20% of the maximum difference (whichever is the sooner), and the battery shall not fire or explode.		P
	b) The charged battery shall be left at an ambient temperature of $20 \pm 5^{\circ}\text{C}$.		P
	With the positive and negative terminals short-circuited via connection to a total external resistance of $80 \pm 20 \text{ m}\Omega$, the battery shall be left for 24 hours or until the difference between the temperature of the battery container and the ambient temperature becomes not more than 20% of the maximum difference (whichever is the sooner ; if the battery incorporates a protective device or protective circuit and the current has stopped, then for one hour after the current stopped), and the battery shall not fire or explode.		P
3.(2)	Free fall		P
	When the charged cell or battery is dropped three times from a level of 1.000 mm onto a concrete floor in a random direction, the battery shall not fire or explode.	Dropped three times from a height of 1.0m.	P
	Provided that this does not apply to charged batteries weighting more than 7 kg.		N/A
3.(3)	Mechanical shock (crash hazard)		P
	Charged cells and batteries shall not fire, explode, or leak when tested under the following test conditions:		P
	a) The charged cell or battery shall be secured to on an impact testing machine by means of a rigid mount. Then shock of the equal magnitude shall be applied to the battery in each of three mutually perpendicular directions (X, Y, and Z axes).		P

Table 9, Lithium ion secondary batteries of Ministerial Ordinance for Determining Technical Standards for Electrical Appliances

Clause	Requirement + Test	Result - Remark	Verdict
	b) The shock applied to the charged cell or battery shall be accelerated so that the minimum average acceleration will be 735 m/s^2 during the first 3ms. The peak acceleration shall be between 1.228 m/s^2 and 1.716 m/s^2 .		P
3.(4)	Thermal abuse		P
	The charged cell at $20 \pm 5^\circ\text{C}$ shall be placed in a gravity or circulating air-convection oven.		P
	The oven temperature shall then be increased to $130 \pm 2^\circ\text{C}$ at a rate of $5 \pm 2^\circ\text{C/min.}$, left for 10 minutes, and then the battery shall not fire or explode.		P
3.(5)	Crushing of cells		P
	The charged cells shall not fire or explode when tested under the following test conditions:	See table 3.(5)	P
	a) A charged cell shall be placed between two flat surfaces and a force of $13 \pm 1 \text{ kN}$ shall be applied by a crushing apparatus.		P
	b) The force shall be released when any of the following occurs:		P
	(1) the maximum force is applied		P
	(2) an abrupt voltage drop of one-third of the original voltage has been obtained		N/A
	(3) there is 10% deformation of the battery height.		N/A
	c) Force shall be applied to charged cells so that the longitudinal axis of the cells becomes parallel with the flat surface of the crushing apparatus		P
	For charged cells that are prismatic (hereafter called "the prismatic cells"), a similar test shall be performed by rotating a cell 90° around its longitudinal axis and it shall be ensured that force is applied to both the wide and narrow sides of the prismatic cells. At that time, one sample shall receive force in a single direction.		N/A
3.(6)	Low pressure		P
	A charged cell shall be placed in a vacuum chamber, the chamber shall be closed, and then the chamber shall be gradually reduced to a pressure equal to or less than 11.6 kPa . After being kept in that pressure of the value in the vacuum chamber for six hours, the cell shall not fire, explode, or leak.		P
3.(7)	Overcharge		P

Table 9, Lithium ion secondary batteries of Ministerial Ordinance for Determining Technical Standards for Electrical Appliances

Clause	Requirement + Test	Result - Remark	Verdict
	The cell discharged under the conditions specified in Annex Table 1-2 (including cells equipped with a protective device for use in equipment or batteries; hereafter called "the discharged cells") shall be provided.		P
	Then by using a power supply of not less than 10V, the battery shall be energized until it reaches 250% of the rated capacity or the test voltage with the designed charging current, and the battery shall not fire or explode.	See table 3.(7)	P
3.(8)	Forced discharge		P
	When polarity reversely charged at 1 ItA for 90 minutes, the discharged cell shall not fire or explode.	See table 3.(8)	P
3.(9)	Cell protection against a high charging rate	See table 3.(9)	P
	The discharged cells shall not fire or explode when charged at a current three times the designed charging current,		P
	thereby fully charging it,		P
	or when a protective device used in the equipment or battery cuts off the charge current.		N/A
3.(10)	Forced internal short circuit of cells	See table 3.(10)	P
	The winding core of a charged cell (except for those whose electrolyte is not liquid) shall not fire when tested according to the test procedure specified below. Note that each test shall use a new sample.		P
	Inserted between the positive active material and negative active material		P
	Inserted between the uncoated current collector of positive electrode and the active material coated negative active electrode		N/A
	Test was stopped when voltage drop of over 50 mV was obtained, or		N/A
	Stopped when the pressure reached 800 N (for prismatic cells, 400N).	800N	P
	Ambient temperature when testing		P
	Number of test sample		P
3.(11)	Function of the overvoltage protection of batteries		P
	When tested at an ambient temperature of $20 \pm 5^{\circ}\text{C}$ by using any method specified below, the cell block in the battery shall not exceed the upper limited charging voltage specified in Annex Table 1-2.		P

Table 9, Lithium ion secondary batteries of Ministerial Ordinance for Determining Technical Standards for Electrical Appliances

Clause	Requirement + Test	Result - Remark	Verdict
	a) For batteries made of a one cell block, the voltage applied to the cell block during charging shall be measured.		N/A
	b) For batteries consisting of a series of two pieces or more of cell blocks, it shall be charged while measuring the voltage of each cell block and at the same time, one cell block shall forcibly be discharged and the voltages of the other cell blocks shall gradually be measured.		P
	c) For batteries consisting of a series of connection of two pieces or more of cell blocks, a voltage exceeding the upper limited charging voltage specified in Annex Table 1-2 shall be applied to the cell block while measuring the voltage of each cell block. When the charging stops, the voltage shall be measured.		N/A
3.(12)	Free fall of appliance		N/A
	The charged batteries shall not undergo short-circuiting when tested under the conditions specified below.	See table 3.(12)	N/A
	At an ambient temperature of $20 \pm 5^{\circ}\text{C}$, according to the appliance specified in the left field of Table 3, the charged battery shall be installed in appliance to be used, and shall be dropped once onto a concrete floor or iron plate in a direction considered to most likely affect the battery in a negative manner.		N/A
	Otherwise, an equivalent load shall be applied to said battery.		N/A
	However, this does not apply to portable appliance including battery weighing more than 7 kg or desktop appliance (excluding for appliance that may be carried around) weighing more than 5 kg including battery.	>7Kg	N/A
	Kind of equipment	Vacuum Cleaners	N/A
	Applicable standard	Portable appliance	N/A
	Height in drop testing		N/A

Table 9, Lithium ion secondary batteries of Ministerial Ordinance for Determining Technical Standards for Electrical Appliances

Clause	Requirement + Test	Result - Remark	Verdict
4	Labelling		P
	Labelling for batteries shall be provided as below on surface where it can easily be seen but not easily faded.		P
	Rated voltage	37Vd.c.	P
	Rated capacity	8100mAh	P

0	TABLE: Charging procedure		P
Charging conditions	Values etc.	Comments	
For cell			
Ambient temperature when charging	45°C and -5°C for clause 3.(1), 3.(4), 3.(5), 3.(10); 20 ± 5°C for Clause 2.(1), 2.(2), 2.(4), 3.(2), 3.(3), 3.(6)	P	
Charging voltage	4.2V	P	
Charging current	Charging current declared by manufacturer:1350mA Maximum charging current: 2000mA	P	
Upper limit charging voltage	4.25V	P	
For batteries			
Charger/charging circuits	CC/CV	P	
Ambient temperature when charging	45°C and -5°C for clause 3.(1); 20 ± 5°C for Clause 2.(2), 2.(3), 2.(4), 3.(2), 3.(3)	P	
Charging voltage	41.5V	P	
Charging current	Charging current declared by manufacturer: 3000mA Maximum charging current: 6000mA	P	
	-		
supplementary information:			

2.1-2.5		TABLE: List of critical Components				P
Object/part no.	Manufacturer/ trademark	Type/model	Technical data	Standard	Mark(s) of conformity	
1. Lithium-Ion Rechargeable Battery Cell	SAMSUNG SDI CO LTD	INR18650-29++	3.7Vd.c., 2700mAh	Attached Table 9, Lithium ion secondary batteries of Ministerial Ordinance for Determining Technical Standards for Electrical Appliances	Tested with battery	
-Electrolyte	-	-	Ethylene carbonate, ethyl methyl carbonated, dimethyl carbonate, fluorobenzene, LiPF ₆	-	-	
-Separator	-	-	PE	-	-	
-Negative electrode	-	-	Graphite	-	-	
-Positive electrode	-	-	Lithium Nickel Cobalt Aluminium Oxide	-	-	
-Can	-	-	0.2mm, Steel	-	-	
-CID	-	-	1.6-2.0MPa	-	-	
-Insulating film	-	-	PET, 0.1mm	-	-	
2.PCM	-	-	Overcharge detection voltage: 4.25V, Overdischarge detection voltage: 2.9±0.1V, Charge overcurrent protection current: 10±3A, Discharge overcurrent protection current: 75±10A	-	-	
3. IC (U1)	Texas Instruments Incorporated	BQ7693003D BTR	V _I : 0 to 50V, T _{OPR} : -40°C to 85°C	-	-	
IC (U2)	STMicroelectronics	STM8L151K6 T6	V _{DD} : -0.3V to 4.0V, T _{opr} : -40°C to 85°C	-	-	
IC (U3)	HOLTEK SEMICONDUCTOR INC.	HT7533	V _{OUT} : 3.3V, T _{opr} : 0°C to 70°C	-	-	
IC (U4, U5)	Texas Instruments Incorporated	BQ771806DP JR	V _{OV} : 4.35V, T _A : -40°C to 110°C	-	-	

4. MOSFET (T1 to T10)	ALPHA & OMEGA SEMICONDUCTOR, LTD.	AO3402	V_{DS} : 30V, V_{GS} : $\pm 12V$, I_D : 4A($T_A=25^\circ C$), T_J, T_{STG} : $-55^\circ C$ to $150^\circ C$	-	-
MOSFET (T11, T12, T14)	JIANGSU CHANGJIANG ELECTRONICS TECHNOLOGY CO., LTD	2N7002K	V_{DS} : 60V, V_{GS} : $\pm 20V$, I_D : 0.34A($T_A=25^\circ C$), T_{stg} : $-55^\circ C$ to $150^\circ C$, T_J : $150^\circ C$	-	-
MOSFET (T15, T16, T22)	Analog Power	AM2358NE	V_{DS} : 60V, V_{GS} : $\pm 20V$, I_D : 2.8A($T_A=25^\circ C$), T_J, T_{stg} : $-55^\circ C$ to $150^\circ C$	-	-
MOSFET (T13)	ZETEX SEMICONDUCTORS	ZXMP10A13F	V_{DSS} : -100V, V_{GS} : $\pm 20V$, I_D : -0.7A($T_A=25^\circ C$), T_J, T_{stg} : $-55^\circ C$ to $150^\circ C$	-	-
MOSFET (T19, T20)	JIANGSU CHANGJIANG ELECTRONICS TECHNOLOGY CO., LTD	BSS84	V_{DS} : -50V, V_{GS} : $\pm 20V$, I_D : -0.13A($T_A=25^\circ C$), T_{STG} : $-55^\circ C$ to $150^\circ C$, T_J : $150^\circ C$	-	-
MOSFET (T17, T18, T21)	Xi'an Huayi Microelectronics Co., Ltd.	HY4008B	V_{DSS} : 80V, V_{GSS} : $\pm 25V$, I_S : 200A($T_C=25^\circ C$), T_{STG} : $-55^\circ C$ to $175^\circ C$, T_J : $175^\circ C$	-	-
5. PCB material	SHEN ZHEN JIRUIDA CIRCUIT TECHNOLOGY CO LTD	JRD-S	V-0, $130^\circ C$	UL 796	UL E340032
-Alternative	Interchangeable	Interchangeable	V-0, $130^\circ C$	UL	UL Approved
6. Fuse (F1)	DEXERIALS CORP	SFK-4030A	Operating voltage: 62Vdc, Rated current: 30A, Interrupting Current: 80A	UL 248-1 UL 248-14	UL E167588
Fuse (F2)	LITTELFUSE INC	451*	Operating voltage: 125Vdc, Rated current: 10A, Interrupting Current: 50A	UL 248-1 UL 248-14	UL E10480
7. NTC	SEMITEC CORP	103AT-4	$B_{25^\circ C/85^\circ C}=3435K \pm 1\%$, $R_{25^\circ C}$: $10K\Omega \pm 1\%$, T_{moa} : $90^\circ C$	UL 1434	UL E92669
8. Black plastic enclosure	FORMOSA CHEMICALS & FIBRE CORP PLASTICS DIV	AC3100	Min. Thickness: 3.0mm, PC, ABS, V-0, 5VA, $90^\circ C$	UL 94	UL E162823
9. Connector (metal)	SHENZHEN XINLILAI INDUSTRIAL MATERIAL CO., LTD	C5191	Copper, $200^\circ C$, 80A, 250Vdc	-	-
-Connector (metal) (alternative)	Interchangeable	Interchangeable	Copper, $200^\circ C$, 80A, 250Vdc	-	-
Connector (plastic)	FORMOSA CHEMICALS & FIBRE CORP PLASTICS DIV	AC3100	Min. Thickness: 1.5mm, PC, ABS, V-0, $90^\circ C$	UL 94	UL E162823

10. Plastic Bracket	SABIC INNOVATIVE PLASTICS B V	CX7240 (GG)	Min. Thickness: 1.2mm, PC, ABS, V-0, 90°C	UL 94	UL E45329
Aluminium alloy shell	Foshan Jiawang Aluminum Co., Ltd	6063	Aluminium	-	-
-Aluminium alloy shell (alternative)	Interchangeable	Interchangeable	Aluminium	-	-
11. Insulating plate	JIANGSU YUXING FILM TECHNOLOGY CO LTD	CY28	PET, VTM-2, 105°C	UL 94	UL E212271
Supplementary information:					

2.(1)	TABLE: Continuous low-rate charging				P
Model	Recommended charging voltage V _c , (Vdc)	Recommended charging current I _{rec} , (A)	OCV at start of test, (Vdc)	Results	
INR18650-29++	4.2	1.35	4.187	A, B	
INR18650-29++	4.2	1.35	4.187	A, B	
INR18650-29++	4.2	1.35	4.187	A, B	
INR18650-29++	4.2	1.35	4.186	A, B	
INR18650-29++	4.2	1.35	4.187	A, B	
Supplementary information: A- No fire or explosion B- No leakage C- Leakage D- Fire E- Explosion F- Bulge G- Others (please explain)					

3.(1)	TABLE: External short circuit (cell)				P
Model	Ambient, (°C)	OCV at start of test, (Vdc)	Resistance of circuit, (Ω)	Maximum case temperature rise ΔT , (K)	Results
Samples charged at the highest test temperature					
INR18650-29++	56.5	4.191	0.088	68.5	A
INR18650-29++	56.5	4.190	0.078	60.6	A
INR18650-29++	56.5	4.190	0.089	63.7	A
INR18650-29++	56.5	4.191	0.091	66.5	A
INR18650-29++	56.5	4.189	0.088	64.6	A
Samples charged at the lowest test temperature					
INR18650-29++	55.1	4.117	0.089	76.0	A
INR18650-29++	55.1	4.118	0.087	50.3	A
INR18650-29++	55.1	4.114	0.092	78.0	A
INR18650-29++	55.1	4.115	0.078	71.5	A
INR18650-29++	55.1	4.115	0.079	76.9	A

Supplementary information:

A- No fire or explosion
 B- No leakage
 C- Leakage
 D- Fire
 E- Explosion
 F- Bulge
 G- Others (please explain)

3.(1)	TABLE: External short circuit (battery)					P
Model	Ambient, (°C)	OCV at start of test, (Vdc)	Resistance of circuit, (Ω)	Maximum case temperature rise ΔT , (K)	Results	
Samples charged at the highest test temperature						
909996	22.4	41.33	0.089	2.0	A	
909996	22.4	41.32	0.079	2.2	A	
909996	22.4	41.35	0.088	2.3	A	
909996	22.4	41.34	0.091	1.9	A	
909996	22.4	41.33	0.086	2.2	A	
Samples charged at the lowest test temperature						
909996	21.7	40.77	0.078	2.4	A	
909996	21.7	40.90	0.082	2.2	A	
909996	21.7	40.82	0.086	2.2	A	
909996	21.7	40.75	0.091	1.8	A	
909996	21.7	40.74	0.089	2.4	A	
Supplementary information: A- No fire or explosion B- No leakage C- Leakage D- Fire E- Explosion F- Bulge G- Others (please explain) Remark: above tests were carried out on batteries incorporated MOSFET model: AO4480						

3.(5)	TABLE: Crush (longitudinal axis)					P
Model	OCV at start of test, (Vdc)	OCV at removal of crushing force, (Vdc)	Width/ diameter of cell before crush, (mm)	Required deformation for crush, (mm)	Results	
Samples charged and tested at the highest test temperature						
INR18650-29++	4.204	4.203	-	-	A	
INR18650-29++	4.203	4.202	-	-	A	
INR18650-29++	4.203	4.202	-	-	A	
INR18650-29++	4.203	4.202	-	-	A	
INR18650-29++	4.204	4.203	-	-	A	
Samples charged and tested at the highest test temperature						
INR18650-29++	4.114	4.113	-	-	A	
INR18650-29++	4.109	4.109	-	-	A	
INR18650-29++	4.115	4.114	-	-	A	
INR18650-29++	4.109	4.109	-	-	A	
INR18650-29++	4.110	4.109	-	-	A	
Supplementary information:						
A- No fire or explosion						
B- No leakage						
C- Leakage						
D- Fire						
E- Explosion						
F- Bulge						
G- Others (please explain)						

3.(7)	TABLE: Overcharge					P
Model	OCV at start of test, (Vdc)	Maximum Charging Current, (A)	Maximum Charging Voltage, (Vdc)	Total Time of Charging, (h)	Results	
Samples tested at the highest test temperature						
INR18650-29++	3.096	2.7	10	2.5	A	
INR18650-29++	3.117	2.7	10	2.5	A	
INR18650-29++	3.099	2.7	10	2.5	A	
INR18650-29++	3.106	2.7	10	2.5	A	
INR18650-29++	3.108	2.7	10	2.5	A	
Samples tested at the lowest test temperature						
INR18650-29++	3.103	2.7	10	2.5	A	
INR18650-29++	3.097	2.7	10	2.5	A	
INR18650-29++	3.083	2.7	10	2.5	A	
INR18650-29++	3.112	2.7	10	2.5	A	
INR18650-29++	3.095	2.7	10	2.5	A	
Supplementary information:						
A- No fire or explosion B- No leakage C- Leakage D- Fire E- Explosion F- Bulge G- Others (please explain)						

3.(8)	TABLE: Forced discharge				P
Model	OCV before application of reverse charge, (Vdc)	Measured Reverse charge I _t , (A)	Time for reversed charge, (minutes)	Results	
Samples tested at the highest test temperature					
INR18650-29++	3.150	2.7	90	A	
INR18650-29++	3.131	2.7	90	A	
INR18650-29++	3.150	2.7	90	A	
INR18650-29++	3.132	2.7	90	A	
INR18650-29++	3.131	2.7	90	A	
Samples tested at the lowest test temperature					
INR18650-29++	3.143	2.7	90	A	
INR18650-29++	3.135	2.7	90	A	
INR18650-29++	3.133	2.7	90	A	
INR18650-29++	3.142	2.7	90	A	
INR18650-29++	3.137	2.7	90	A	
Supplementary information:					
A- No fire or explosion B- No leakage C- Leakage D- Fire E- Explosion F- Bulge G- Others (please explain)					

3.(9)	Cell Protection Against a High Charging Rate				P
Model	OCV at start of test, (Vdc)	Maximum Charging Current, (A)	Maximum Charging Voltage, (Vdc)	Results	
Samples tested at the highest test temperature					
INR18650-29++	3.232	6	4.25	A	
INR18650-29++	3.215	6	4.25	A	
INR18650-29++	3.227	6	4.25	A	
INR18650-29++	3.224	6	4.25	A	
INR18650-29++	3.225	6	4.25	A	
Samples tested at the lowest test temperature					
INR18650-29++	3.219	6	4.25	A	
INR18650-29++	3.215	6	4.25	A	
INR18650-29++	3.229	6	4.25	A	
INR18650-29++	3.224	6	4.25	A	
INR18650-29++	3.234	6	4.25	A	
Supplementary information:					
A- No fire or explosion					
B- No leakage					
C- Leakage					
D- Fire					
E- Explosion					
F- Bulge					
G- Others (please explain)					

3.(10)		Table: Forced internal short circuit of cells					P
		Position which insert a small piece of metallic nickel:			Between the positive active material and negative material		
Model	Charge temperature (°C)	Test temperature (°C)	Open circuit voltage at the beginning of test (V)	Maximum applied pressure (N)	Voltage drop (mV)	Result	
INR18650-29++	45	45	4.204	800	3	A	
INR18650-29++	45	45	4.203	800	7	A	
INR18650-29++	45	45	4.203	800	4	A	
INR18650-29++	45	45	4.203	800	1	A	
INR18650-29++	45	45	4.203	800	1	A	
INR18650-29++	-5	-5	4.115	800	7	A	
INR18650-29++	-5	-5	4.110	800	4	A	
INR18650-29++	-5	-5	4.113	800	3	A	
INR18650-29++	-5	-5	4.110	800	7	A	
INR18650-29++	-5	-5	4.108	800	1	A	
		Position which insert a small piece of metallic nickel:			Between the uncoated current collector of positive electrode and the active material coated negative electrode		
Model	Charge temperature (°C)	Test temperature (°C)	Open circuit voltage at the beginning of test (V)	Maximum applied pressure (N)	Voltage drop (mV)	Result	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	

Supplementary information:

- A- No fire or explosion
- B- No leakage
- C- Leakage
- D- Fire
- E- Explosion
- F- Bulge
- G- Others (please explain)

3.(12)	Table: Free fall of appliance		N/A
	Construction for appliance to be used	Portable appliance	-
	Appliance weighting including battery (kg)	approx. 7745g	-
	Heights in free fall testing	☐ 1000 mm / for portable appliance within JIS C 6950 ☐ 750 mm / for desktop appliance within JIS C 6950 ☐ 1000 mm / for portable appliance within JIS C 6065 ☐ 1000 mm / for portable appliance other than mentioned above ☐ 750 mm / for desktop appliance other than mentioned above	
Model		Result	

---End of report---

Attachment No. 1 Photo Documentation

Details of:	Picture 1: View 1 of the battery, model: 909996
	

Details of:	Picture 2: View 2 of the battery
	

Attachment No. 1 Photo Documentation

Details of:	Picture 3: The final marking label will be pasted or printed on the battery and replace the label in picture 1
	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. The final marking which will be pasted or printed on the battery:   Remark: 1) The polarity “+” “-” marked on plastic enclosure. 2) The code “ZP18030F1928000001” shown on the marking plate represents the information as below: Where “ZP18030” represents internal project number, ZP18030F is fixed value; “1928” represents the battery manufactured on the 28th week, 2019. Only for example; “000001” represents the serial number.

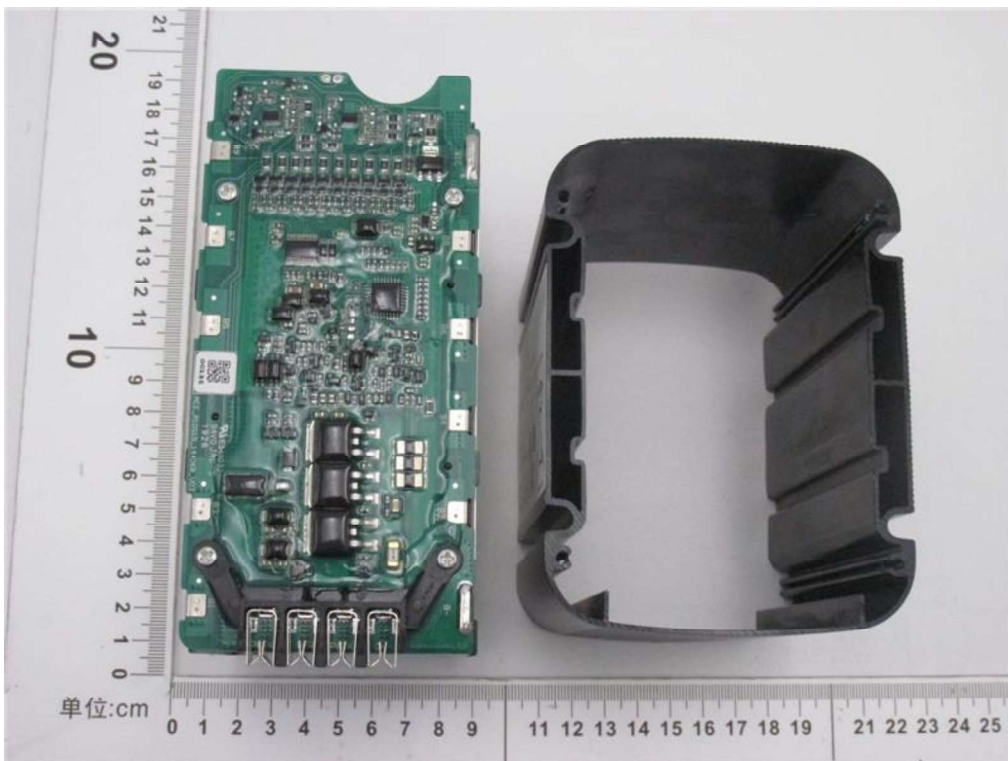
Attachment No. 1 Photo Documentation

Details of:	Picture 4: View 3 of the battery
	

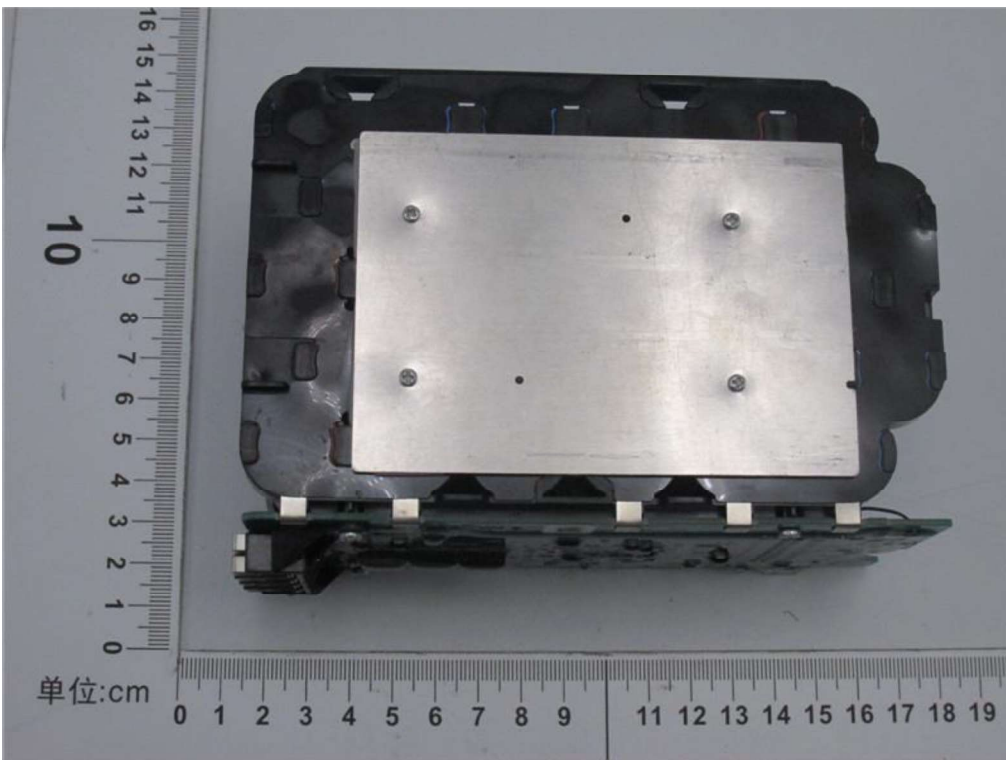
Details of:	Picture 5: View 4 of the battery
	

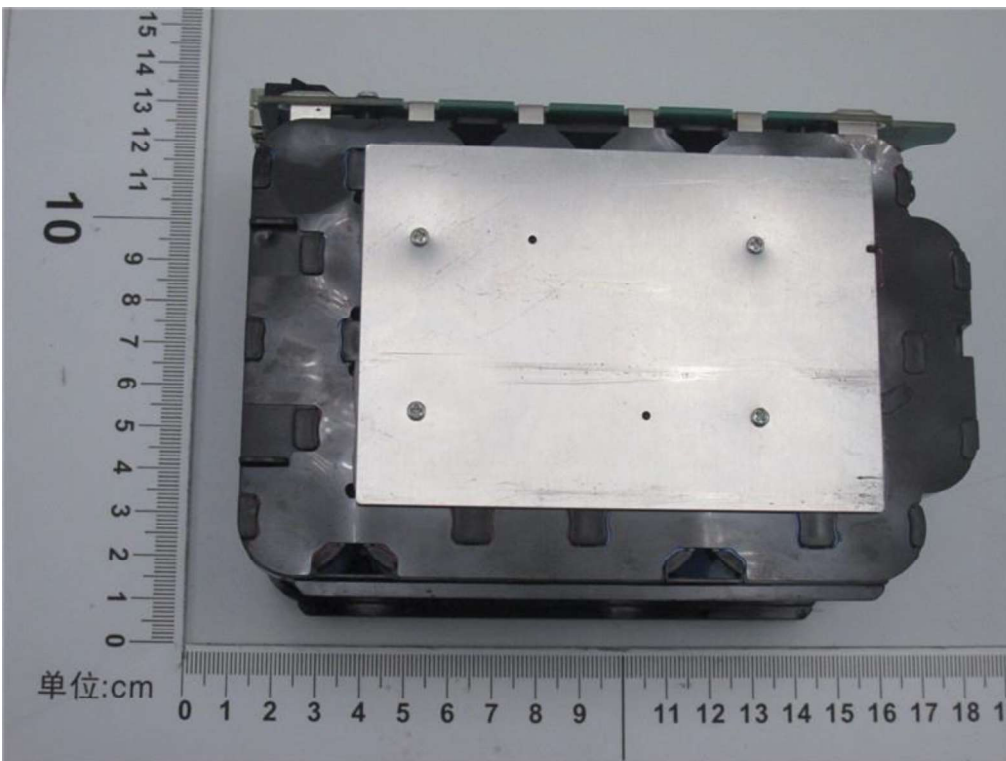
Attachment No. 1 Photo Documentation

Details of:	Picture 6: View 1 Unpack the internal battery
	

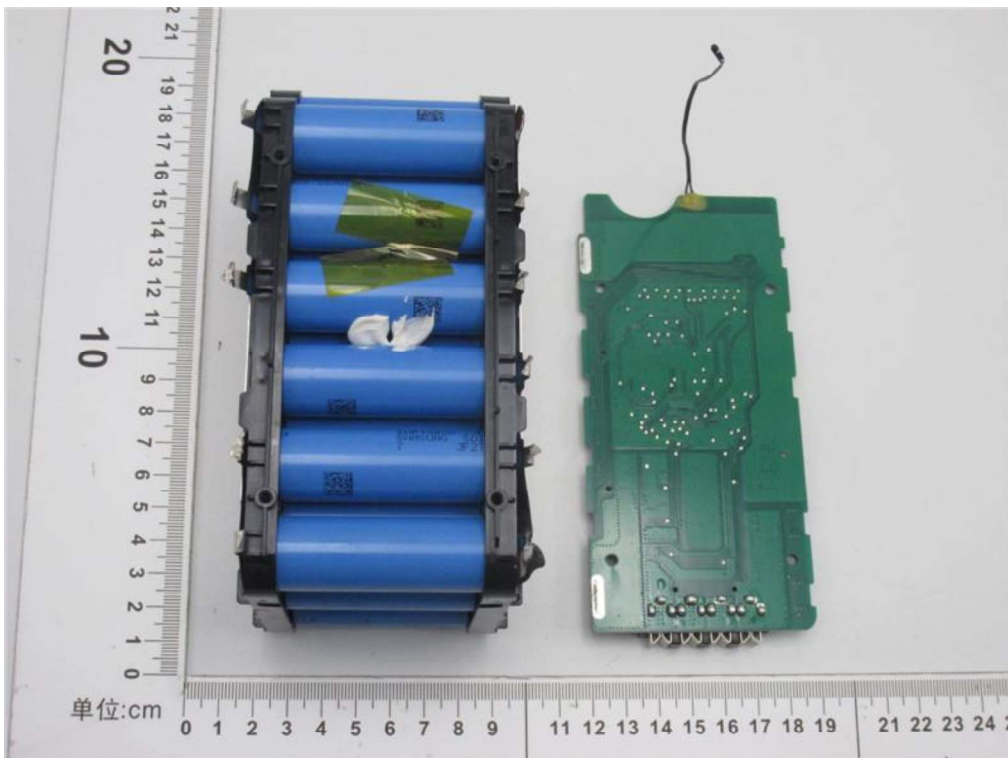
Details of:	Picture 7: View 2 Unpack the internal battery
	

Attachment No. 1 Photo Documentation

Details of:	Picture 8: View 3 Unpack the internal battery
	 A photograph showing the internal battery assembly from a top-down perspective. A large, rectangular metal plate is mounted on a black plastic frame. The plate has four screws. To the left of the assembly is a vertical ruler with markings from 0 to 16 cm. Below the assembly is a horizontal ruler with markings from 0 to 19 cm. The text '单位:cm' (Unit: cm) is visible near the bottom left of the rulers.

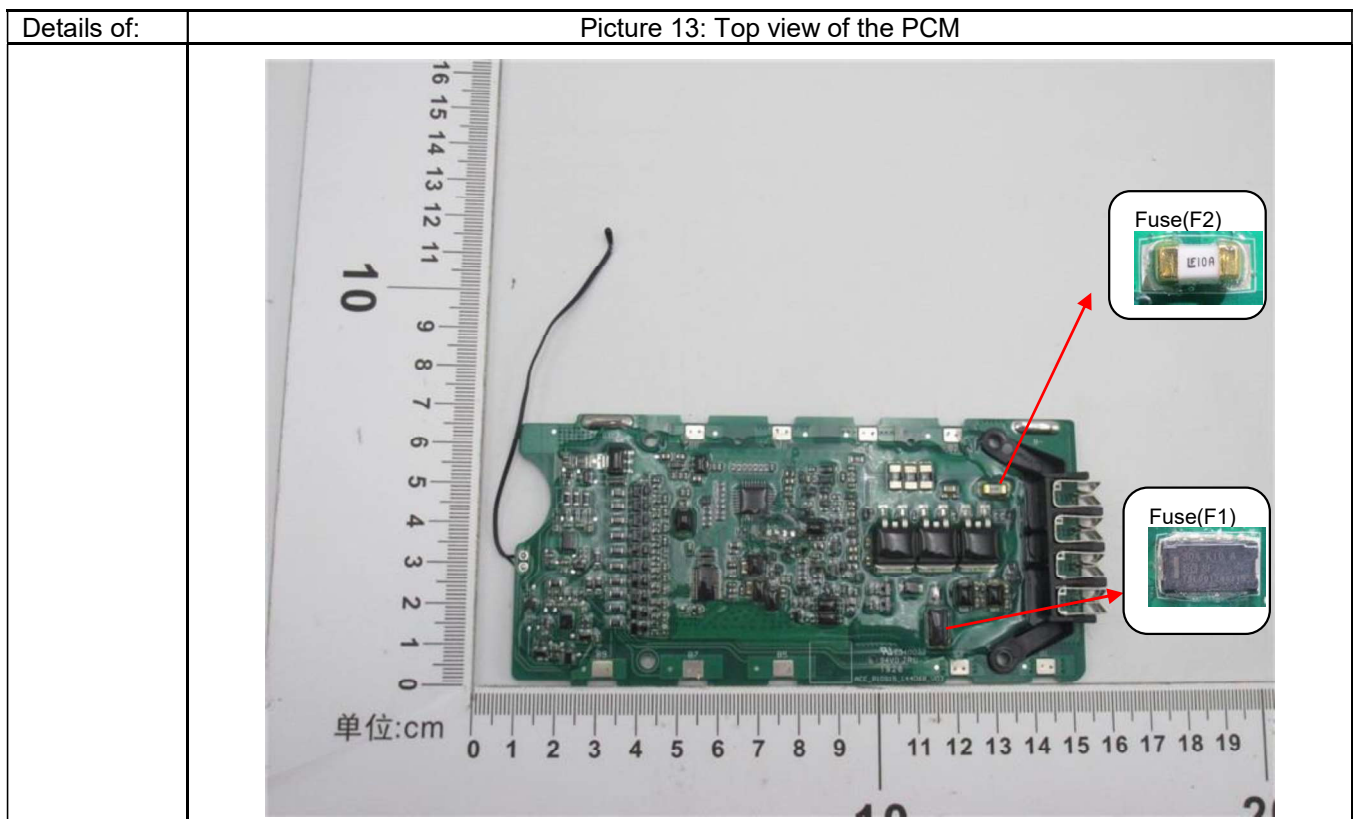
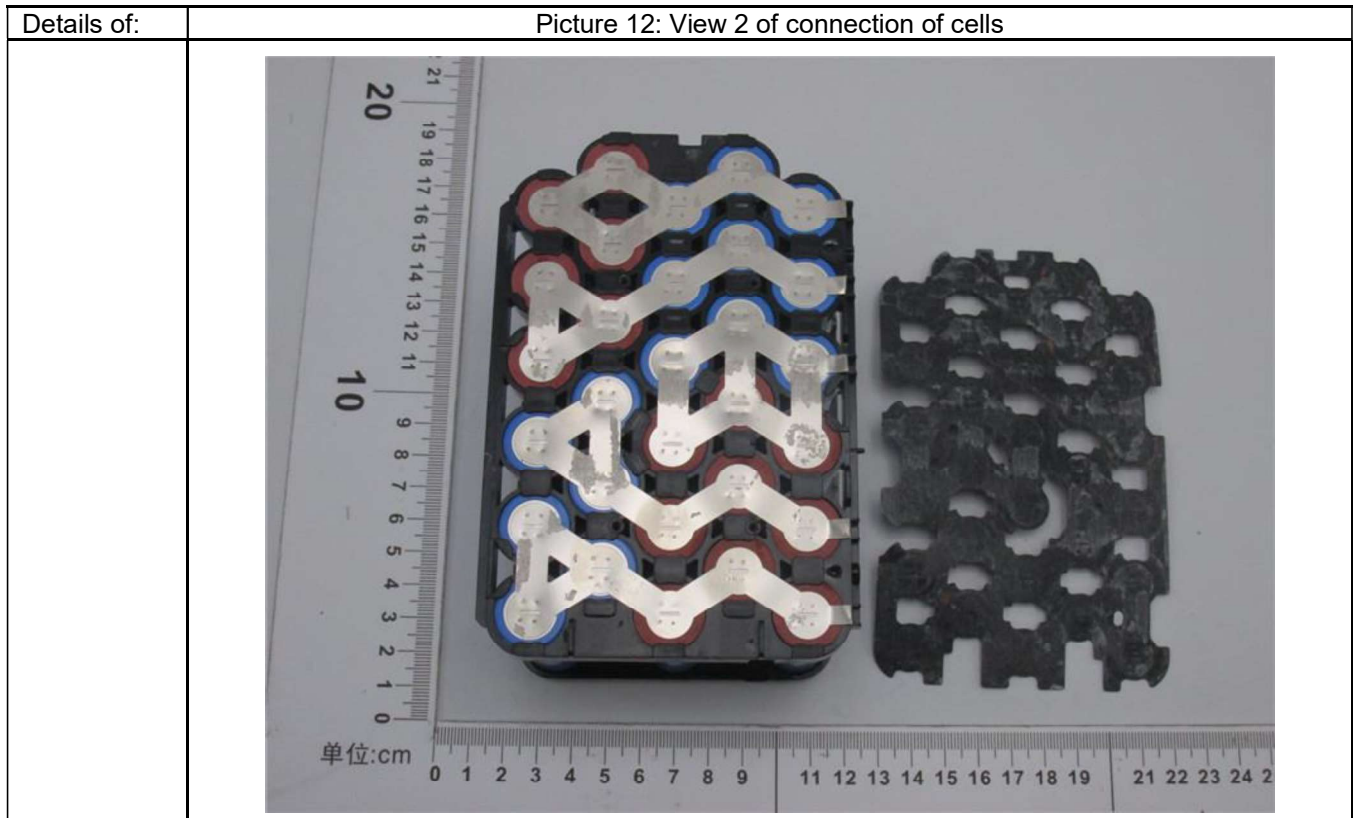
Details of:	Picture 9: View 4 Unpack the internal battery
	 A photograph showing the internal battery assembly from a different angle, likely the bottom. A large, rectangular metal plate is mounted on a black plastic frame. The plate has four screws. To the left of the assembly is a vertical ruler with markings from 0 to 15 cm. Below the assembly is a horizontal ruler with markings from 0 to 19 cm. The text '单位:cm' (Unit: cm) is visible near the bottom left of the rulers.

Attachment No. 1 Photo Documentation

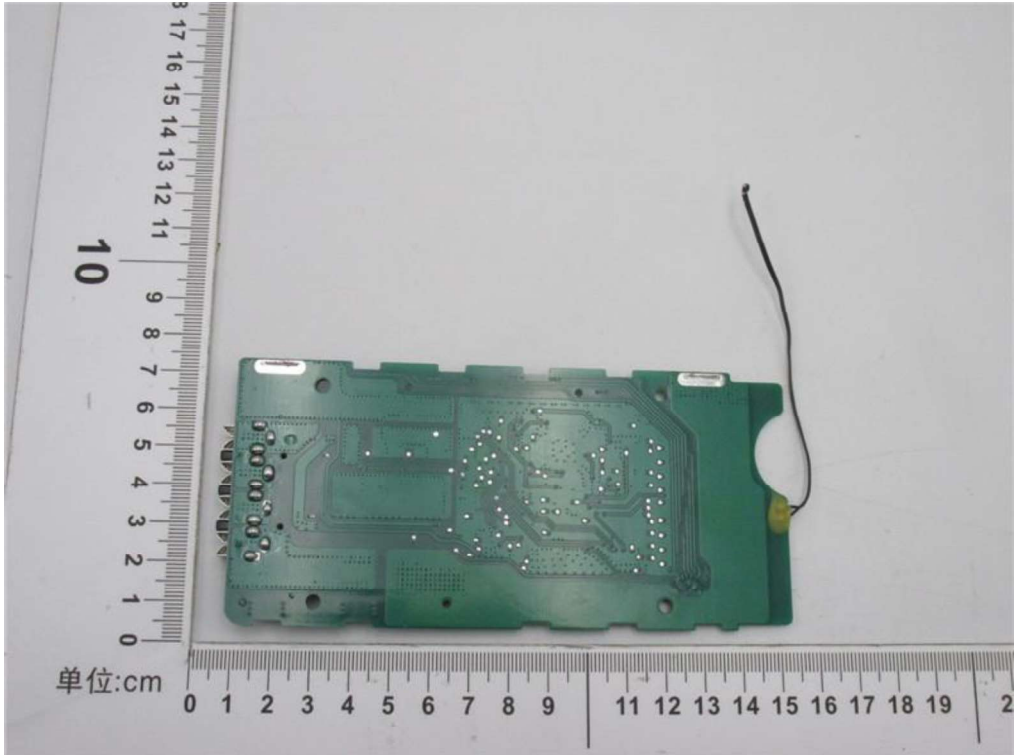
Details of:	Picture 10: View 5 Unpack the internal battery
	

Details of:	Picture 11: View 1 of connection of cells
	

Attachment No. 1 Photo Documentation



Attachment No. 1 Photo Documentation

Details of:	Picture 14: Bottom view of the PCM
	

Details of:	Picture 15: Front view of the cell, model: INR18650-29++
	

Attachment No. 1 Photo Documentation

Details of:	Picture 16: Top view of the cell
	

Details of:	Picture 17: Bottom view of the cell
	

--The End--