Test Report

Report No.: MTi230106007-01B1

Date of issue: Jan. 30, 2023

Sample Name:	Portable Power Station
Model:	F2400
Applicant:	Shenzhenshi Julichuangxiang Maoyiyouxiangongsi
Address:	Shenzhenshi Longhuaqu minzhijiedao 1970kejiwenhuaxiaozhen8dong406

Shenzhen Microtest Co., Ltd.
http://www.mtitest.com

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Add: 101, No. 7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinhe Community, Fuhai Street, Bao 'an District, Shenzhen, Guangdong, China.

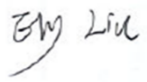
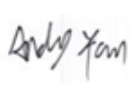
TEST REPORT

電気用品の技術上の基準を定める省令の解釈について（**20210802** 商局第 **4** 号）

別表第九 リチウムイオン蓄電池

Interpretation of the Ministerial Ordinance Specifying Technical Standards for Electrical Appliances and Materials (20130605 商局 No. 3)

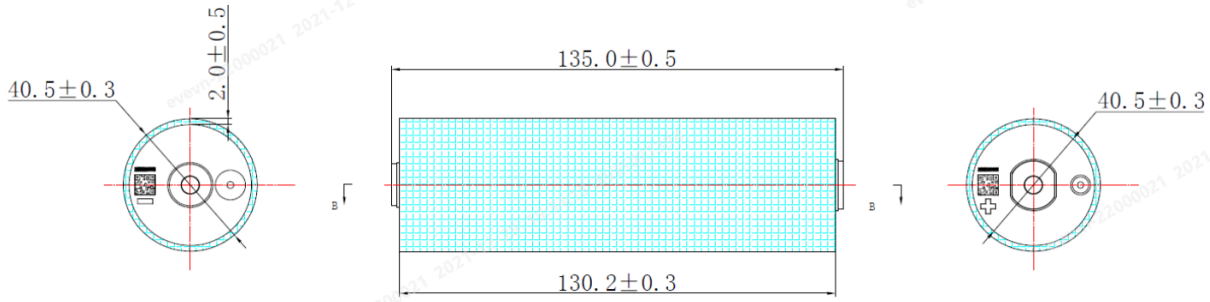
Appendix 9 Lithium ion secondary batteries

Tested by (printed name and signature) .....:	Ely Liu	
Reviewed by (printed name and signature).....:	Andy Yan	
Approved by (printed name and signature) .....:	Tom Xue	
Tested date.....:	2022-11-01~2022-11-30	
Testing laboratory.....:	**Shenzhen Microtest Co., Ltd.**	
Address .....:	101, No. 7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinhe Community, Fuhai Street, Bao 'an District, Shenzhen, Guangdong, China.	
Applicant .....:	**Shenzhen Qichang Intelligent Technology Co., Ltd.**	
Address .....:	Room 510, 5th Floor, Building 7, Yunli Intelligent Park, No. 7, Changfa Middle Road, Yangmei Community, Bantian Street, Longgang District, Shenzhen	
Test item description……....:	Portable Power Station	
Trade Mark..... :	aliroen	
Model/Type reference..... :	F2400	
Ratings..... :	51.2V, 40Ah, 2048Wh	
serial model No.:	AR2400， F2400 PRO， AR2400 PRO， F2400 PLUS， AR2400 PLUS，F2400 MAX，AR2400 MAX; Only the model name is different	
Manufacturer ..... :	**Shenzhen Qichang Intelligent Technology Co., Ltd.**	
Address .....:	Room 510, 5th Floor, Building 7, Yunli Intelligent Park, No. 7, Changfa Middle Road, Yangmei Community, Bantian Street, Longgang District, Shenzhen	
Test specification:		
Standard ..... :	電気用品の技術上の基準を定める省令の解釈について （**20210802** 商局第 **4** 号）別表第九 リチウムイオン蓄電池 **Interpretation of the Ministerial Ordinance Specifying Technical Standardsfor Electrical Appliances and Materials (20210802** 商局第**4** 号**) Appendix 9 Lithium ion secondary batteries**	

Summary of testing:	
Tests performed (name of test and test clause): **Tests are made with the nunber of batteries** Test items: Clause 2.1 Continuous low-rate charging Clause 2.2 Vibration 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 overvoltage protection of batteries Clause 3.12 Free fall of appliance	**Testing location:** **Shenzhen Microtest Co., Ltd.** 101, No. 7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinhe Community, Fuhai Street, Bao 'an District, Shenzhen, Guangdong, China.

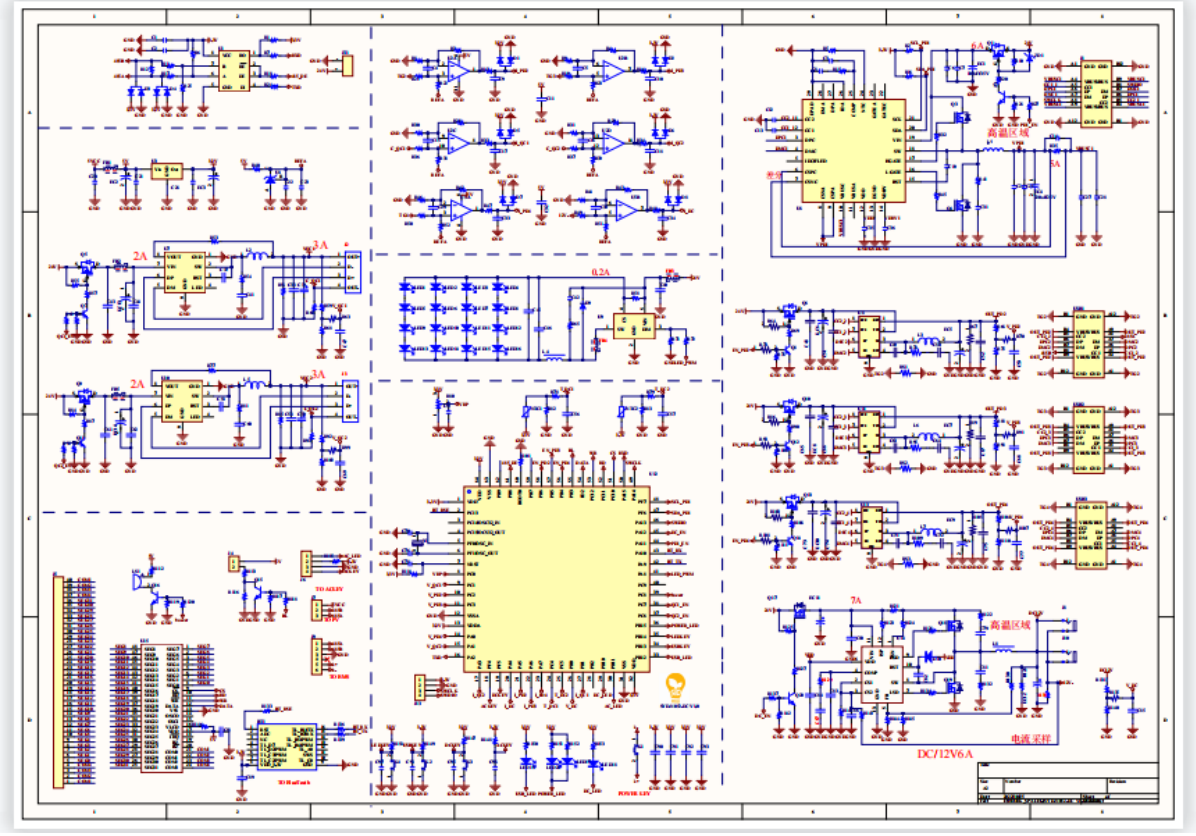
Copy of marking plate:

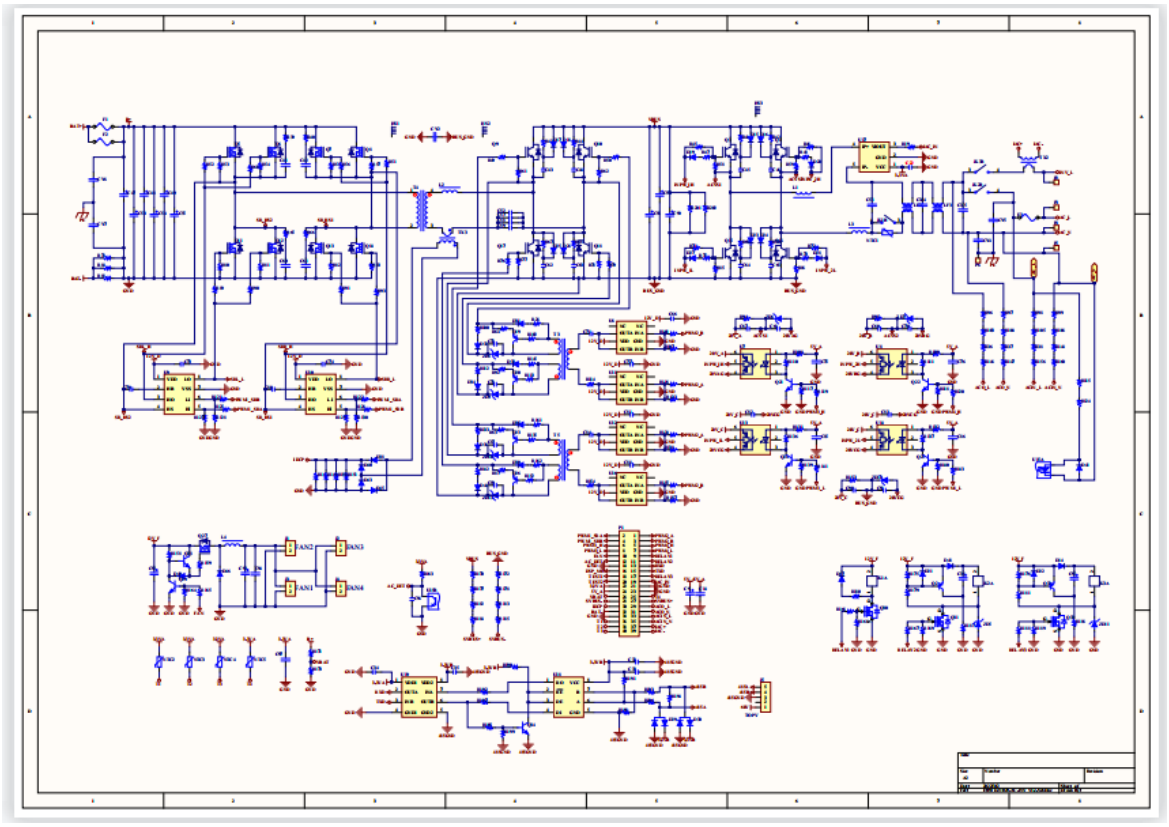
Construction:

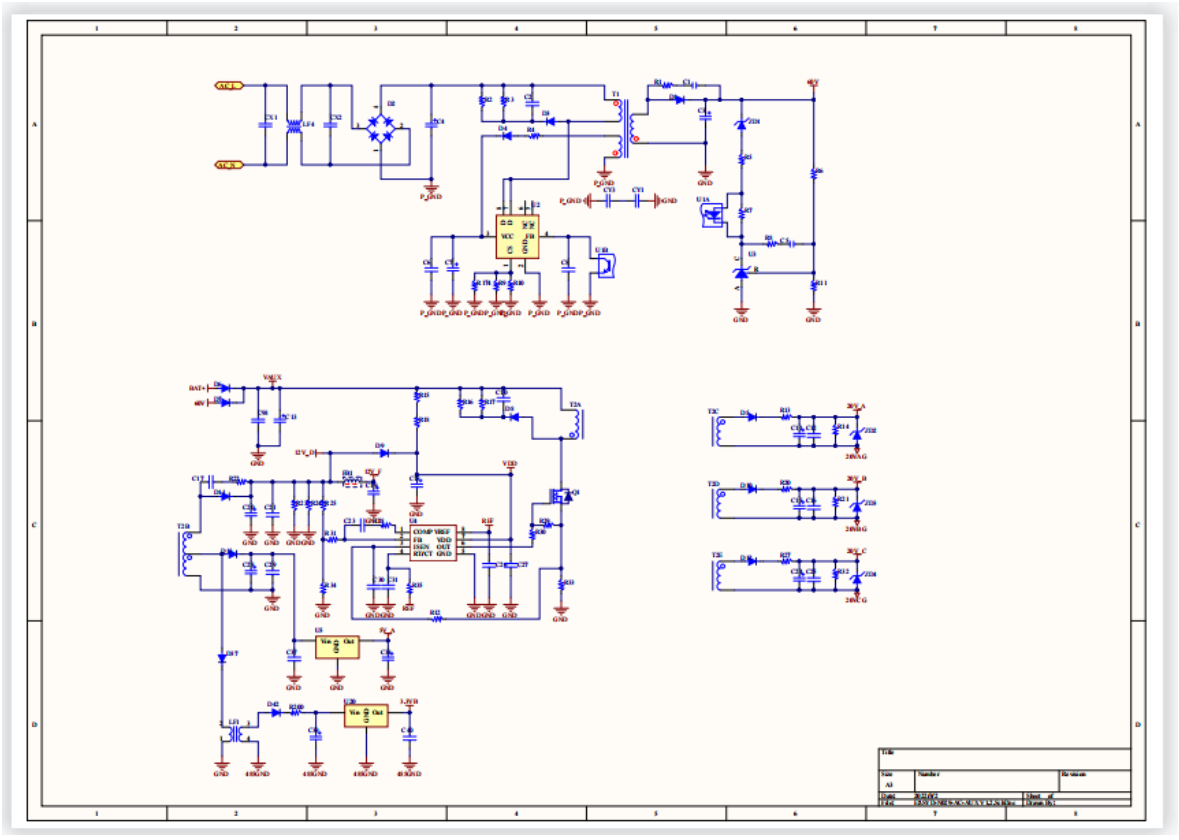


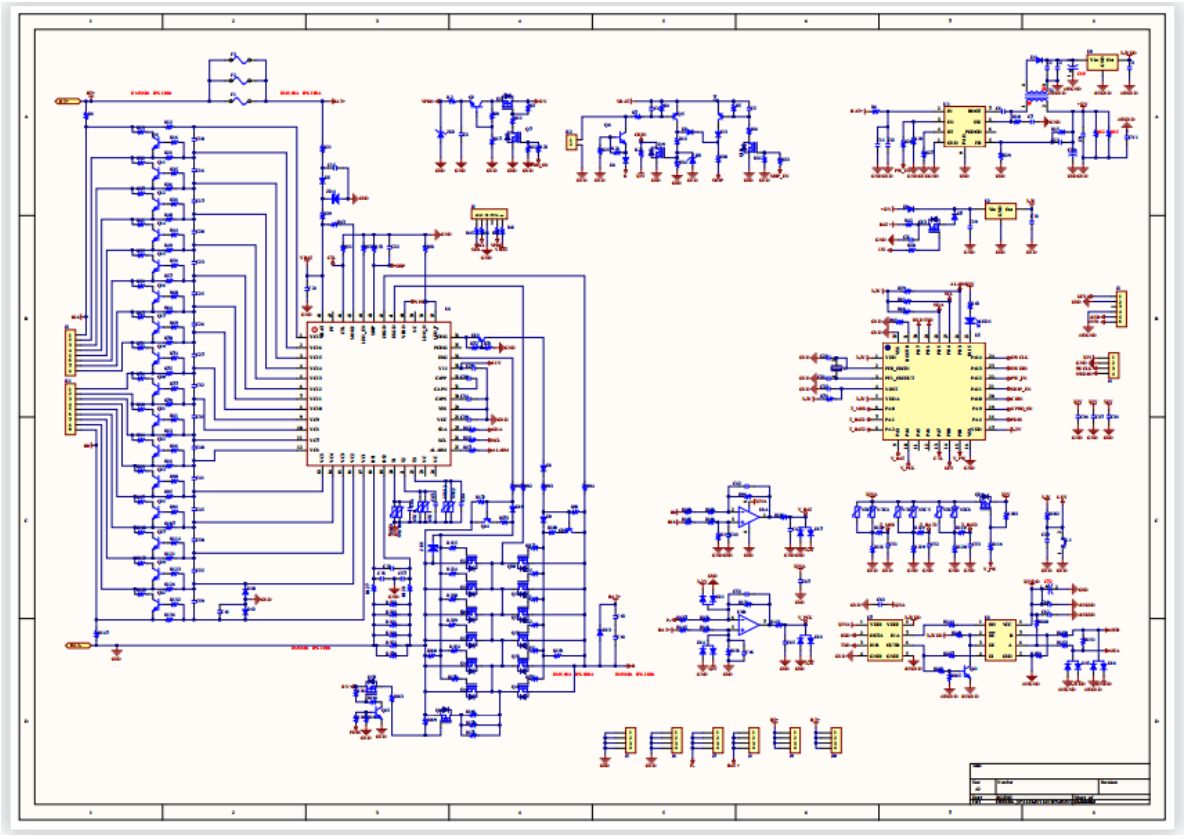
Cell
H(Max.): D(Max.)= 135.5mm:40.8mm

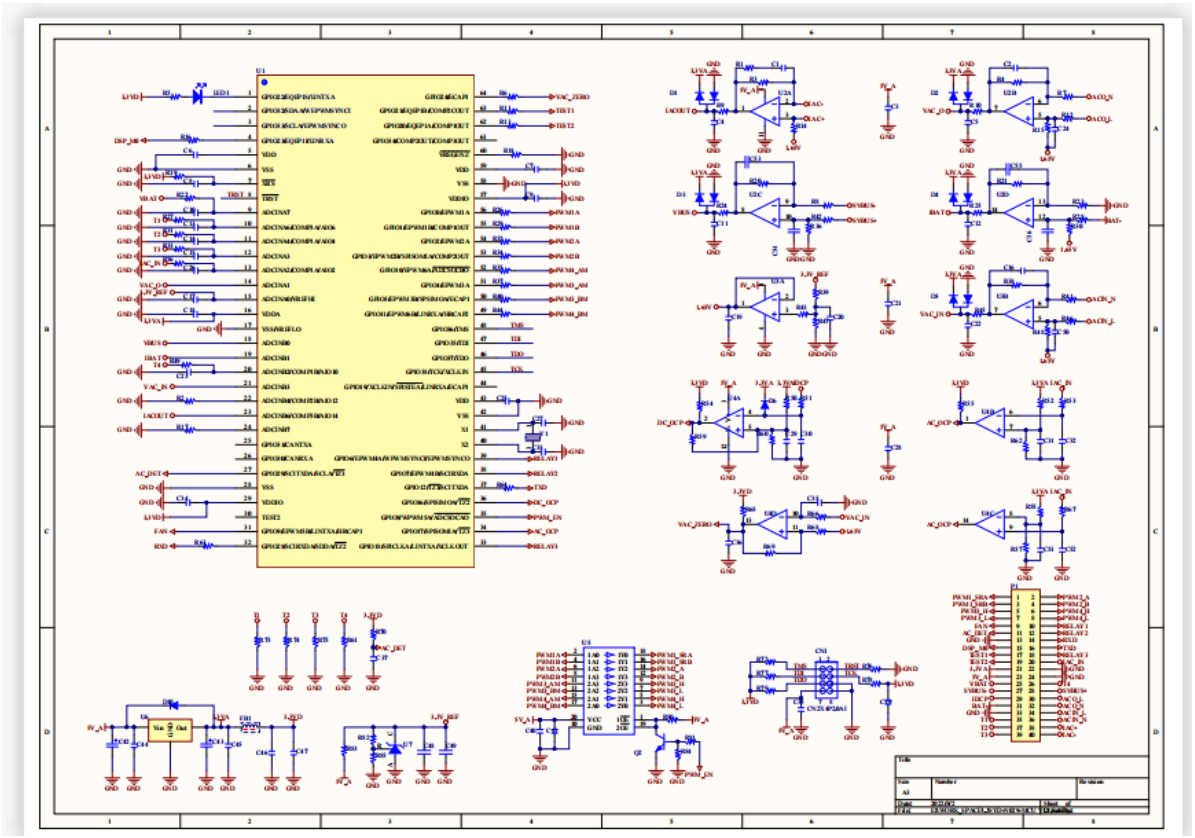
Circuit diagram:

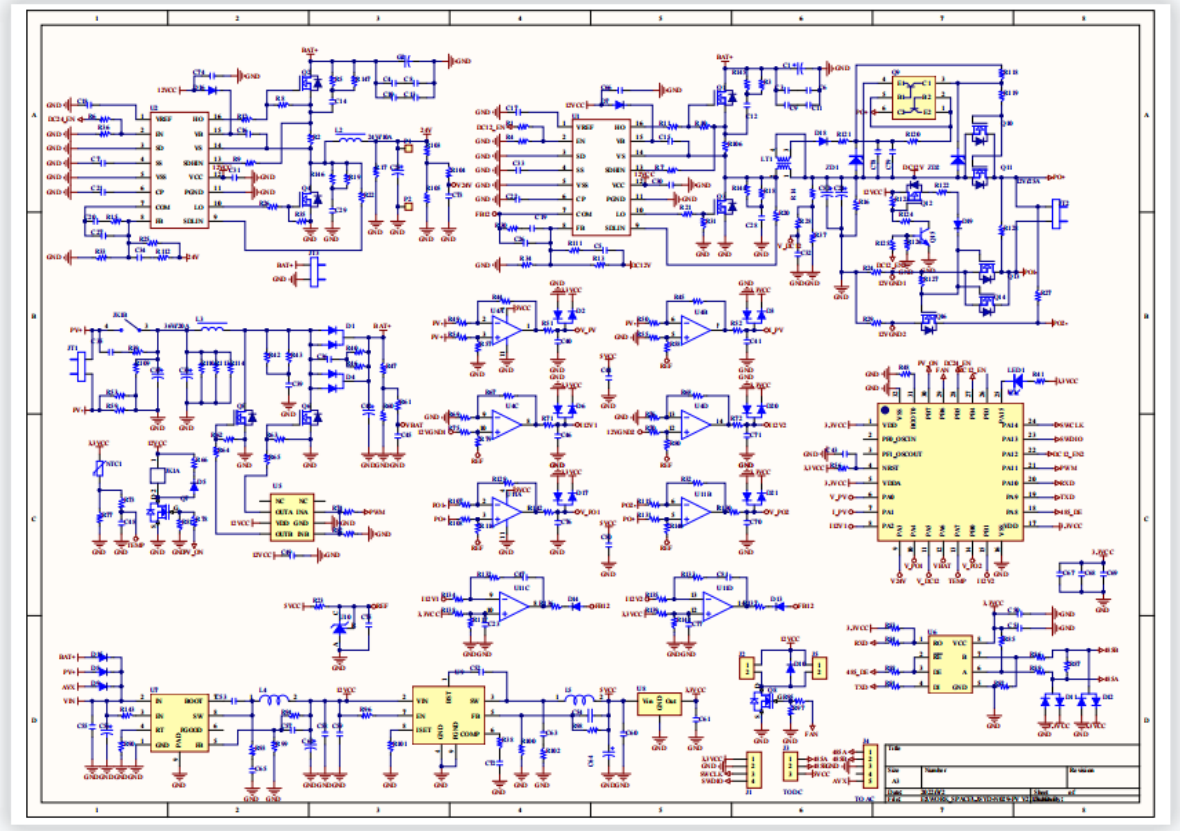












Test item particulars .....:	
Classification of installation and use .....:	N/A
Supply connection.....:	**DC&AC Lear Wire Connector**
Recommend charging method declaired by the manufacturer.....:	Charging the Portable Power Station with 20A constant current and 36Vdc constant voltage until the current reduces to 2000mA at ambient 20°C±5°C.
Discharge current (0. 2 I_t A) .....:	8000mA
Specified final voltage .....:	32V
Chemistry .....:	☐ nickel systems ☒ lithium systems ☐ N/A
Recommend of charging limit for lithium system	
Upper limit charging voltage per cell.....:	3.65V
Maximum charging current.....:	20000mA
Charging temperature upper limit.....:	55°C
Charging temperature lower limit.....:	0°C
Polymer cell electrolyte type.....:	☐ gel polymer ..... ☐ solid polymer ☒ N/A
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)

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 point is used as the decimal separator.

General product information:

The main features of the Power Bank is shown as below:

Model	Technical Parameters
F2400	

The main features of the cell are shown as below:

Model	Nominal capacity	Nominal voltage	Maximum Charge Voltage	Cut-off Voltage
C40	20000mAh	3.2V	3.65V	2.0V
	Nominal Charge Current	Nominal Discharge Current	Maximum Charge Current	Maximum Discharge Current
	10000mA	10000mA	20000mA	60000mA
	Upper limit charge voltage	Taper-off current	Lowest test temperature	Highest test temperature
	3.65V	1000mA	0°C	55°C

Clause	Requirement – Test	Result - Remark	Verdict
1.	**Basic Design**		P
1.(1)	**Insulation and wiring**		P
	a) Insulation Resistance between an accessible metal case (excluding electrical contacts) and positive terminals ≥5MΩ.		N/A
	b) Internal wiring and insulation are sufficient to withstand maximum anticipated current, voltage and temperature requirements		P
	c) Orientation of wiring maintains adequate creepage and clearance distances between conductors. Mechanical integrity of internal connections are sufficient to accommodate conditions of reasonably foreseeable misuse.		P
	Mechanical integrity of internal connections accommodates reasonably foreseeable misuse		P
1.(2)	**Inner Pressure Reduction Mechanism**		P
	a) 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 selfignition.	Explosion-proof safety valve for venting exists.	P
	b) Encapsulant used to support cells within an outer casing does not cause the battery to overheat during normal operation no inhibit pressure relief.		N/A
1.(3)	**Temperature and current management**		P
	The 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.	P
	Means is provided to limit current to safe levels during charge and discharge.	Overcharge, over-discharge, over current and short-circuit, proof circuit used in this battery.	P
1.(4)	**Terminal contacts**		P
	a) Terminals have a clear polarity marking on the external surface of the battery or be designed with no fear of misconnection.	Complied.	P
	b) The size and shape of the terminal contacts ensure that they can carry the maximum anticipated current.	Complied.	P
	c) 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 circuits		P
1.(5)	**Assembly of cells into batteries**		P
	Cells used in the battery assembly have closely matched capacities, are of the same design, and are of the same chemistry and same manufacturer.		P

Clause	Requirement – Test	Result - Remark	Verdict
	The battery incorporates separate circuitry to prevent cell reversal from uneven charges as the pack is designed for the selective discharge of a portion of its series connected cells.		P
2.	**Intended Use**		P
2.(1)	**Continuous Low Rate Charge**		P
	Fully charged cells are subjected for 28 days to a charge as specified by the manufacturer.		P
	Ambient temperature when testing	60°C	P
	Results: no fire, no explosion, no leakage	No fire, no explosion, no leakage.	P
2.(2)	**Vibration**		P
	The measured open circuit voltage of the fully charged cells or batteries is within anticipated parameters		P
	The cells or batteries are subjected to a vibration sequence with amplitude of 0.76 mm and a total maximum excursion of 1.52 mm. The frequency was varied at the rate of 1 Hz/min between the limits of 10 Hz and 55 Ha. The entire range of frequencies (10 Hz to 55 Hz) and return (55 Hz to 10 Hz) was traversed in 90 min ± 5 min for each mounting position.		P
	The vibration was applied in each of three mutually perpendicular directions.		P
	Results: no fire, no explosion, no leakage	No fire, no explosion, no leakage.	P
2.(3)	**Battery enclosure test at high ambient temperature**		P
	Fully charged batteries were placed in an aircirculating oven at a temperature of 70°C±2°C for 7 hours. Afterwards, they are removed and allowed to return to room temperature.	70°C	P
	Results: no physical distortion of the battery casing resulting in exposure if internal components.		P
2.(4)	**Temperature cycling**		P
	Fully charged cells or batteries were subjected to temperature cycling (+75°C, +20°C, -20°C, +20°C) in forced draught chambers according to the procedure	Step 1: 75°C for 4 hours. Step 2: 20°C for 2 hours. Step 3: -20°C for 4 hours. Step 4: 20°C for 2 hours. Step 1 to Step 4 repeat another four times.	P
	After the fifth cycle, the cells or batteries were store at 20 ± 5°C for 7 days prior to examination.		P
	Results: No fire, no explosion, no leakage	No fire, no explosion, no leakage	P
3	**Reasonably foreseeable misuse**		P
3.(1)	**External short circuit**		P

Clause	Requirement – Test	Result - Remark	Verdict
	a) Fully charged cells were subjected to a short circuit test at 55°C ± 5°C.	Arrange the test as required. Each 5pcs cells charged at ambient temperature 60°C and ----5°C respectively prepared for the test.	P
	The external resistance did not exceed 80 ± 20 mΩ.	Total external resistance: 80±20 mΩ.	P
	The cells were tested for 24 h or until the case temperature declined by 20% of the maximum temperature rise.	The cells were tested until the case temperature declined by 20% of the maximum temperature rise.	P
	b) Fully charged batteries were subjected to a short circuit test at 20°C ± 5°C.	.	P
	The external resistance did not exceed 80 ± 20 mΩ.		P
	The batteries were tested for 24 h or until the case temperature declined by 20% of the maximum temperature rise.	Tested until the case temperature declined by 20% of the maximum temperature rise.	P
	If battery incorporates protective device or protective circuit and the current has stopped, then for one hour after the current stopped.		P
	Results: no fire, no explosion.	No fire, no explosion.	P
3.(2)	**Free fall**		P
	Fully charged cells and batteries were dropped 3 times from a height of 1.0 m onto a concrete floor.		P
	Results: no fire, no explosion	No fire, no explosion.	P
3.(3)	**Mechanical shock (crash hazard)**		P
	Fully charged cells and batteries shall not fire, explode, or leak when tested under the following test conditions:		
	a) The charged cell and 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
	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 was between 1226 m/s^2 and 1716 m/s^2.		P
	Results: no fire, no explosion, no leakage	No explosion, no leakage.	P
3.(4)	**Thermal abuse**		P
	Fully charged cellsl at 20 ± 5°C shall be placed in a gravity or circulating air-convention oven.	Arrange the test as required on all sources of cells.	P
	The oven temperature shall then be increased to 130 ± 2°C at a rate of 5 ± 2°C/min., left for 10 minutes, and then the battery shall not fire or explode.	Each 5pcs cells charged at ambient temperature 60°C and -5°C respectively prepared for the test.	P

Clause	Requirement – Test	Result - Remark	Verdict
	Results: no fire, no explosion	No fire, no explosion.	P
3.(5)	**Crushing of cells**		P
	Fully charged cells shall not fire or explode when tested under the following test conditions:	See table 3.(5)	P
	a) Fully charged cells shall be placed between two flat surfaces and a force of 13 ± 1 kN shall be applied by a crushing apparatus.		P
	b) The force was released when any of the following occurs:		P
	(1) the maximum forces applied		P
	(2) an abrupt voltage drop of one-third of the original voltage has been obtained		N/A
	(3) There was 10% deformation of 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
	Ambient temperature when testing	Ambient temperature 60°C and -5°C respectively.	P
	Results: no fire, no explosion.	No fire, no explosion.	P
3.(6)	**Low pressure**		P
	Fully charged cells are 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.		P
	Results: no fire, no explosion, no leakage	No fire, no explosion, no leakage.	P
3.(7)	**Overcharge**		P
	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)	
	Ambient temperature when testing	Ambient temperature 60°C and -5°C respectively.	P
	Results: no fire, no explosion.	No fire, no explosion.	P
3.(8)	**Forced discharge**		P
	When polarity reversely charged at1I_tA for 90 minutes, the discharged cell shall not fire or explode.	See table 3.(8)	P
	Ambient temperature when testing	Ambient temperature 60°C and -5°C respectively.	P

Clause	Requirement – Test	Result - Remark	Verdict
	Results: no fire, no explosion	No fire, no explosion.	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
	Ambient temperature when testing	Ambient temperature 60°C and -5°C respectively.	P
	Results: no fire, no explosion	No fire, no explosion.	P
3.(10)	**Forced internal short circuit of cells**		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		P
	Test was stopped when voltage drop of over 50mV was obtained, or		N/A
	Stopped when the pressure reached 800 N (for prismatic cells, 400N).	800N	P
	Ambient temperature when testing		P
	Results: no fire, no explosion	See table 3.(10)	P
3.(11)	**Function of the overvoltage protection of batteries**		P
	When tested at an ambient temperature of 20 ± 5°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
	a) For batteries made of a one cell block, the voltage applied to the cell block during charging shall be measured		P
	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		N/A
	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

Clause	Requirement – Test	Result - Remark	Verdict
	The charged batteries shall be installed to be used, and shall be dropped once a concrete floor or iron plate in a direction considered to most likely affect the battery in a negative manner.		N/A
	An equivalent load shall be applied to the battery		N/A
	Kind of equipment		N/A
	Weight of appliance		N/A
	Applicable standard		N/A
	Height in drop testing		N/A
	Results: no short-circuiting		N/A
4	**Labeling**		P
	Labeling for batteries shall be provided as below on surface where it can easily be seen but not easily faded.	The label of battery meets the requirements.	P
	Rated voltage		P
	Rated capacity		P

List of Critical Components:

Item No.	Object/part no.	Manufacturer/ Trademark	Type/Model	Technical Data	Standard	Mark(s) of Conformity
System component						
1	Plastic enclosure	Formosa Chemicals & Fibre Copr Plastics Div	AC310(+)	PC/ABS, min. 1.5 mm thick, rated V-0, 90°C (RTI)	UL94 UL746C	UL E162823
	Power cord set	DONGGUAN E-JUN WIRE CO LTD (CHINA)	EJ-302	Plug: 5-15P, 125V, 15A, Cord: 14AWG, 300V, FT-1, 105°C	UL 817 CSA-C22.2 No. 21	UL E365821
	(Alternative)	DONGGUAN PUMING WIRE CO.,LTD	PM-610	Plug: 5-15P, 125V, 15A, Cord: 14AWG, 300V, FT-1, 105°C	UL 817 CSA-C22.2 No. 21	UL5021173
	(Alternative)	SHENZHEN YI ELECTRZCAL FACTORY	SY-18B/SPT-1	Plug: 5-15P, 125V, 15A, Cord: 14AWG, 300V, FT-1, 105°C	UL 817 CSA-C22.2 No. 21	UL4006319
	Connector	DONGGUAN E-JUN WIRE CO LTD (CHINA)	EJ-303	C13, 125V, 15A, 70°C	UL 60320-1	UL E365821
2	DC fan (four provided for external air flow)	Shenzhen Fuxi Deshuo Electronics Co. LTD	FDF7015M12	12V, 0.26A，20.5CFM	UL 507 CSA-C22.2 No. 113	UL E518266
	(Alternative)	SHENZHENHAO ZHITECHNOLOG YCO..LTD	FD6020(X)L-(A)	12V, 0.26A，20.5CFM	UL 507 CSA-C22.2 No. 113	E495404
	(Alternative)	Guangzhou Sanfengda Electronic Technology Co. , Ltd.	GPWV2	12V, 0.26A，20.5CFM	UL 507 CSA-C22.2 No. 113	E520492
3	DC fan (two provided for external air flow)	Shenzhen Fuxi Deshuo Electronics Co. LTD	FDF7015L12	12V, 0.11A，5.8CFM	UL 507 CSA-C22.2 No. 113	UL E518266
	(Alternative)	SHENZHENHAO ZHITECHNOLOG YCO..LTD	FD3010(X)L-(A)	12V, 0.11A，5.8CFM	UL 507 CSA-C22.2 No. 113	E495404
	(Alternative)	Guangzhou Sanfengda Electronic Technology Co. , Ltd.	GPWV8	12V, 0.11A，5.8CFM	UL 507 CSA-C22.2 No. 113	E520492

Item No.	Object/part no.	Manufacturer/ Trademark	Type/Model	Technical Data	Standard	Mark(s) of Conformity
4	Display panel	Shenzhen Yearn Electronic Technology Co.,Ltd	FOGB423918B	PC/ABS, min. 8.2 mm thick, rated V-0, 80 °C (RTI)	UL94, UL746C, CAN/CSA C22.2 No. 0.17	UL
	(Alternative)	SHENZHEN CHUANGXIANDA Electronic Technology Co.,Ltd 司	CXD12832LCD	PC/ABS, min. 8.2 mm thick, rated V-0, 80 °C (RTI)	UL94, UL746C, CAN/CSA C22.2 No. 0.17	UL
5	PCB	HUIZHOU GOSPEED TECHNOLOGIES CO LTD	JF-M	V-0, 130°C	UL 94 UL 796	UL E309386
	(Alternative)	Interchangeable	Interchangeable	V-0, 130°C	UL 94 UL 796	UL
6	AC outlet	Shenzhen B-Star Technology Co Ltd	BS-U20	125Vac, 20A	UL498 UL60320-1	UL E476907
7	Internal wire connecting AC outlet	DONGGUAN YIAO ELECTRONICS CO LTD	1015	Min. 14AWG, 600V, VW-1, 105°C	UL 758 CSA-C22.2 No. 127	UL E348933
8	Internal wire connecting AC outlet - Alternate	Interchangeable	Interchangeable	Min. 14AWG, ，min. 300V, VW-1, 105°C	UL 758 CSA-C22.2 No. 127	UL
	Earthing wire	DONGGUAN YIAO ELECTRONICS CO LTD	1015	VW-1, min. 105°C, min. 18 AWG, green/yellow	UL 758 CSA-C22.2 No. 127	UL E348933
	(Alternate)	Interchangeable	Interchangeable	VW-1, min. 105°C, min. 18 AWG, green/yellow	UL 758 CSA-C22.2 No. 127	UL
Main board (SYD-N029-AC-PCB)						
	Relay (JK1, JK2, JK3)	XIAMEN HONGFA ELECTROACOUSTIC CO LTD	HF161F-W	26A, 277VAC, T85	UL 508 CSA-C22.2 No. 14	UL E134517
	NTC (NTC2, NTC3, NTC4)	Huizhou Lianshuo Electronics Technology Co Ltd	XGPU8	10k 1%		E526869
	-Insulation tape used under NTC	SHENZHEN UNION TENDE TECHNOLOGY CO LTD	0.23mm color;GY.PK	150°C	UL 510	UL E494686

Item No.	Object/part no.	Manufacturer/ Trademark	Type/Model	Technical Data	Standard	Mark(s) of Conformity
	-Insulation tape used under NTC (Alternative)	SUZHOU MATLADUONA ELECTRIC MATERIAL CO.,LTD	JY313	130°C	UL 510	UL E188295
	NTC (NTC2, NTC3, NTC4) (Alternative)	GUANGZHOU NEWLIFE MAGNE ELECTRICITY CO.,LTD	NL103F3435	10k 1%	UL 434	UL E505719
	-Insulation tape used under NTC (Alternative)	WU XI HUA RUN SPECIAL CO LTD	HR-310Y	130°C	UL 510	UL E214552
	E-cap (C50)	--	--	330uF, 400Vdc, 105°C	--	Test with appliance
	E-cap (C56, C99)	--	--	680uF, 400Vdc, 105°C	--	Test with appliance
	Line choke (L1, L3)	--	--	180°C	--	Test with appliance
	-winding	TAI-I ELECTRIC WIRE & CABLE CO LTD	EIW, SMEIW	180°C	UL 1446	UL E85640
	Line choke (LF2, LF3)	--	--	155°C		
	-winding	Dong Guan Yida industrial Co., Ltd	xUEW/155, QA-x/155	155°C	UL 1446	UL E344055
	(Alternative)	GuangDong jinyan Electrotechnics Joint stock Co.,Ltd	xUEW, QA-x/155	155°C	UL 1446	UL E238500
	Fuse (F3)	ZHONG SHAN LANBAO ELECTRICAL APPLIANCES CO LTD	LB630P-30A	30A, 250V	UL 248-1 UL 248-14 CSA-C22.2 No. 248-1-00	UL E213695
	Fuse (F1, F2)	Littelfuse	287040.PXCN	40A 32V	UL 248-1 UL 248-14 CSA-C22.2 No. 248-1-00	UL AU1410
	(Alternative)	DONGGUAN TLC ELECTRONIC TECHNOLOGY	AB19U040	40A 32V	UL 248-1 UL 248-14 CSA-C22.2 No. 248-1-00	E360382

Item No.	Object/part no.	Manufacturer/ Trademark	Type/Model	Technical Data	Standard	Mark(s) of Conformity
	X-cap (CX5, CX4)	DONG GUAN AJC INDUSTRIAL CO LTD	MPX, MKP	X2, min. 275Vac, 110°C, 1uF	UL 60384-14 CAN/CSA-E60384-1 (2003)	UL E477850
	(Alternative)	CHIEFCON ELECTRONICS CO LTD	MKP	X2, min. 275Vac, 110°C, 1uF	UL 60384-14 CAN/CSA-E60384-1 (2003)	E209251
	(Alternative)	Macrofar Electronics Technology（HK) Limited	MPX	X2, min. 275Vac, 110°C, 1uF	UL 60384-14 CAN/CSA-E60384-1 (2003)	UL E481054
	(Alternative)	DONGGUAN QINHONG(QBR) ELECTRONIC TECHNOLOGY CO LTD	MPX	X2, min. 275Vac, 110°C, 1uF	UL 60384-14 CAN/CSA-E60384-1 (2003)	E488626
	Ycap (CY4, CY5)	DONG GUAN AJC INDUSTRIAL CO.,LTD	JT	Y1, 2.2nF, 250VAC, 85°C	UL 60384-14 CAN/CSA-E60384-1 (2003)	UL E477850
	(Alternative)	Macrofar Electronics Technology(HK) Limited	HY	Y1, 2.2nF, 250VAC,85°C	UL 60384-14 CAN/CSA-E60384-1 (2003)	E481054
	(Alternative)	DONGGUAN CITY DERSONIC ELECTRONIC CO LTD	Y1,CD	Y1, 2.2nF, 250VAC,85°C	UL 60384-14 CAN/CSA-E60384-1 (2003)	E472525
	(Alternative)	DONGGUAN QINHONG(QBR) ELECTRONIC TECHNOLOGY CO LTD	CT7	Y1, 2.2nF, 250VAC,85°C	UL 60384-14 CAN/CSA-E60384-1 (2003)	E488626
	Opto-coupler (U1，U15)	SHENZHEN ORIENT COMPONENTS CO.,LTD	ORPC-817SC	Ext. cr./cl. >7.0mm, 110°C	EN60747-5-5	UL E323844
	(Alternative)	EVERLIGHT ELECTRONICS CO., LTD	EL817S1-C	Ext. cr./cl. >7.0mm, 110°C	EN60747-5-5	UL E214129

Item No.	Object/part no.	Manufacturer/ Trademark	Type/Model	Technical Data	Standard	Mark(s) of Conformity
	Bridge resistor (R36, R37, R38, R96, R97, R98, R99, R103, R104, R105, R106, R144, R146, R147, R156, R160, R170, R172, R177, R178, R182, R183, R184, R185)	--	0805	3.3MΩ, 0805	--	Test with appliance
	Y-cap (CY1, CY3，CY8)	Prosperity Dielectrics CO., Ltd	Fk08X102K502EFQ	1nF, 250V, Y2 125°C	UL 60384-14 CAN/CSA-E60384-1 (2003)	UL E346791
	(Alternative)	HOLY STONE ENTERPRISE CO.,LTD	SCC1808N102#302T	1nF, 250V, Y2 125°C	UL 60384-14 CAN/CSA-E60384-1 (2003)	E229738
	MOSFET (Q3, Q9, Q15, Q17)	--	--	650V 60A	--	Test with appliance
	MOSFET (Q5, Q6, Q7, Q8)	--	--	100V 150A	--	Test with appliance
	MOSFET (Q21, Q22, Q24, Q25)	--	--	60V 380mA	--	Test with appliance
	MOSFET (Q13, Q14, Q7, Q8)	--	--	100V 150A	--	Test with appliance
	Power board output wire to BMS board	DONGGUAN YIAO ELECTRONICS CO LTD	3512	3000V, 200°C, 10AWG	UL 758 CSA-C22.2 No. 127	UL E348933
	(Alternative)	Interchangeable	Interchangeable	3000V, 200°C, 10AWG	UL 758 CSA-C22.2 No. 127	UL
	Power board output wire to secondary board SYD-N029-PV	DONGGUAN YIAO ELECTRONICS CO LTD	3512	3000V, 200°C, 16AWG	UL 758 CSA-C22.2 No. 127	UL E348933
	(Alternative)	Interchangeable	Interchangeable	3000V, 200°C, 10AWG	UL 758 CSA-C22.2 No. 127	UL
9	Transformer (T4)	Shenzhen Hicoil Electronic Co., Ltd	SYD-N029-BYQ-110-2	Class B, 130°C	--	Test with appliance
10	- Bobbin	CHANG CHUN PLASTLCS CO.,LTD	T375HF	PMC, min. thickness 0.43mm, 150°C	UL 94, UL 746C CSA-C22.2 No. 0.17	UL E59481

Item No.	Object/part no.	Manufacturer/ Trademark	Type/Model	Technical Data	Standard	Mark(s) of Conformity
	(Alternative)	SUMIOMO BAKELITE(NANTONG)CO.,LTD	PM-9630	Phenolic, min. thickness 0.43mm, 150°C	UL 94, UL 746C CSA-C22.2 No. 0.17	UL E41429
11	-Winding	ZHEJIANG HONGBO TECHNOLO CO.,LTD	xUEW@/155	155°C	UL 1446	UL E221719
12	(Alternative)	SHENZHEN JINMA NEW MATERIALS TECHNOLOGY CO.,LTD	UEW/180@	180°C	UL 1446	UL E514717
	(Alternative)	Interchangeable	Interchangeable	Min. 155°C	UL 1446	UL
13	-Tape	SUZHOU MATLADUONA ELECTRIC MATERIAL CO.,LTD	JY313	130°C	UL 510	UL E188295
14	(Alternative)	SHENZHEN GUNGYE ELECTRONICS TECHNOLOGY CO.,LTD	511/519	200°C	UL 510	UL E309332
15	-Tube	GREAT HOLDING INDUSTRIAL CO LTD	TFL	200°C	UL 224	UL E156256
16	-Varnish	ZHUHAI CHANGXIAN CHEMICAL TECHNOLOGY CO.,LTD	E962	130°C	UL 1446	UL E335405
	Transformer (T3, T5)	Shenzhen Hicoil Electronic Co., LTD	SYD-N029-BYQ-4	Class B, 130°C	--	Test with appliance
	- Bobbin	CHANG CHUN PLASTLCS CO.,LTD	T375HF	PMC, min. thickness 0.43mm, 150°C	UL 94, UL 746C CSA-C22.2 No. 0.17	UL E59481
	-Winding (Triple insulation wire)	SHENZHEN KAIZHONG HEDONG NEW MATERLAL	TIW-B	130°C	UL 2353	UL E35240
	(Alternative)	SHENZHEN DARUN SCIENCE AND TECHNOLOGY CO.,LTD	DRTIW-B	130°C	UL 2353	UL E335841

Item No.	Object/part no.	Manufacturer/ Trademark	Type/Model	Technical Data	Standard	Mark(s) of Conformity
	-Tape	SUZHOU MAILADUONA ELECTRIC MATERIAL CO.,LTD	JY313	130°C	UL 510	UL E188295
	-Varnish	ZHUHAI CHANGXIAN CHEMICAL TECHNOLOGY CO.,LTD	E962	130°C	UL 1446	UL E335405
	Transformer T2	Shenzhen Hicoil Electronic Co., Ltd	SYD-N029-BYQ-3	Class B, 130°C	--	Test with appliance
	-Bobbin	CHANG CHUN PLASTLCS CO.,LTD	T375HF	PMC, min. thickness 0.43mm, 150°C	UL 94, UL 746C CSA-C22.2 No. 0.17	UL E59481
	(Alternative)	SUMITOMO BAKELITE CO.,LTD	PM-9820	Pehnolic, min. thickness 0.43mm, 150°C	UL 94, UL 746C CSA-C22.2 No. 0.17	UL E41429
	-Winding	HUIZHOU DENGGAODA ELECTROTECH CO.,LTD	X UEWF/ 155	155°C	UL 1446	UL E253843
	(Alternative)	SHANTOU SHENGANG ELECTRICAC INDUSTRIAL CO.,LTD	X UEWF/155	155°C	UL 1446	UL E239508
	- Insulation tape	SUZHOU MAILADUONA ELECTRIC MATERIAL CO.,LTD	JY313	130°C	UL 510	UL E188295
	- Tube	GREAT HOLDING INDUSTRIAL CO LTD	TFL	200°C	UL 224	UL E156256
	-Varnish	ZHUHAI CHANGXIAN CHEMICAL TECHNOLOGY CO.,LTD	E962	130°C	UL 1446	UL E335405
	Transformer T1	Shenzhen Hicoil Electronic Co., Ltd	SYD-N029-BYQ-2	Class B, 130°C	--	Test with appliance

Item No.	Object/part no.	Manufacturer/ Trademark	Type/Model	Technical Data	Standard	Mark(s) of Conformity
	-Bobbin	CHANG CHUN PLASTLCS CO.,LTD	T375HF	PMC, min. thickness 0.43mm, 150°C	UL 94, UL 746C CSA-C22.2 No. 0.17	UL E59481
	(Alternative)	SUMITOMO BAKELITE CO.,LTD	PM-9820	Pehnolic, min. thickness 0.43mm, 150°C	UL 94, UL 746C CSA-C22.2 No. 0.17	UL E41429
	- Winding	HUIZHOU DENGGAODA ELECTROTECH CO.,LTD	xUEW/155	155°C	UL 1446	UL E253843
	(Alternative)	SHANTOU SHENGANG ELECTRICAC INDUSTRIAL CO.,LTD	xUEW/155	155°C	UL 1446	UL E239508
	- Insulation tape	SUZHOU MATLADUONA ELECTRIC MATERIAL CO.,LTD	JY313	130°C	UL 510	UL E188295
	- Tube	GREAT HOLDING INDUSTRIAL CO LTD	TFL	200°C	UL 224	UL E156256
	-Varnish	ZHUHAI CHANGXIAN CHEMICAL TECHNOLOGY CO.,LTD	E962	130°C	UL 1446	UL E335405
	Transformer (TX3)	Shenzhen Hicoil Electronic Co., Ltd	Uu1015	Class B, 130°C	--	Test with appliance
	-Bobbin	Chang Chun Plastics Co., Ltd	4130	PBT, min. 0.38mm thickness, 140°C	UL 94, UL 746C CSA-C22.2 No. 0.17	UL E59481
	-winding	HUIZHOU DENGGAODA ELECTROTECH CO.,LTD	xUEW/155	155°C	UL 1446	UL E253843
	(Alternative)	SHANTOU SHENGANG ELECTRICAC INDUSTRIAL CO.,LTD	xUEW/155	155°C	UL 1446	UL E239508

Item No.	Object/part no.	Manufacturer/ Trademark	Type/Model	Technical Data	Standard	Mark(s) of Conformity
14	Plastic panel between power board and BMS board.	ZHEN JIANG CHI MEI CHEMICAL CO LTD	PC-540(Y)	PC/ABS, min. 1.5 mm thick, rated V-0, 80°C (RTI)	UL94, UL746C, CAN/CSA C22.2 No. 0.17	UL E194560
	Secondary board (SYD-N029-PV)					
15	Line choke (L3, L4)	Shenzhen Motto technology CO.,LTD	MT106125-400Y-2P-PT-W-X-X	180°C	--	Test with appliance
16	-winding	TAI-I ELECTRIC WIRE & CABLE CO LTD	EIW, SMEIW	180°C	UL 1446	UL E85640
17	BMS board (SYD-N029-BMS)					
18	MOSFET (Q37, Q38, Q28, Q35, Q34, Q36, Q40, Q33, Q31, Q30, Q46, Q45)	--	--	100V, 150A	--	Test with appliance
19	NTC (NTC1,NTC3,NTC5, NTC9,NTC12)	Nanjing Shiheng Electronic Technology Co. , Ltd.	XGPUS	10k 1%		E526869
	(Alternative)	GUANGZHOU NEWLIFE MAGNE ELECTRICITY CO.,LTD	NL103F3435	10k 1%		E505719
20	Fuse (F1, F2, F3)	Asiacom technology Ltd	S1032-F-40.0A	72V, 40A	UL 248-1 UL 248-14 CSA-C22.2 No. 248-1-00	UL E10480
49	Output connector					
50	PV charging connector	GUANGDONG WEIPU ELECTRICAL APPLIANCE CO LTD	SA20	150V, 12A	--	Test with appliance
	(Alternative)	Interchangeable	Interchangeable	150V, 12A	--	Test with appliance
51	AC inlet	LECI Electronics Co., LTD	DB-14	250V, 15A	UL 498 UL 60320-1	UL E302229
53	Cigarette Lighter Socket	Dong guan liu shi electronics CO.,LTD	D type	12V, 10A	--	Test with appliance
54	USB port	Dongguan SenYi	USB AF	5Vdc, 3A	--	Test with appliance

Item No.	Object/part no.	Manufacturer/ Trademark	Type/Model	Technical Data	Standard	Mark(s) of Conformity
55	(Alterntive)	Shenzhen Brixine Electronics Co. LTD	USB AF	5Vdc, 3A	--	Test with appliance
56	Type C port	DONGGUAN SHENGKUN ELECTRONICS TECHNOLOGY	TYPE C	20Vdc, 3A	--	Test with appliance
57	DC 5521 output port	Huizhou WS Electronic Technology Co Ltd	5521JL80	12Vdc, 3A	--	Test with appliance
58	XT60 connector	CHANGZHOU AMASS ELECTRONICS CO.,LTD	XT60UPB-M	500V, 35A	UL 1977	UL E482722
	cell	EVE ENERGY CO.,LTD	C40	40135		

2.(1)	TABLE: - Continuous Low Rate Charge Test (Cell)				P
Sample number	**Recommended Charging Method, CC, CV, or CC/CV**	**Recommended Charging Voltage Vc, (Vdc)**	**Recommended Charging Current Irec, (mA)**	**OCV at Start of Test, (Vdc)**	**Results**
C1	CC and CV	3.65	10000	3.64	NF, NE, NL
C2	CC and CV	3.65	10000	3.63	NF, NE, NL
C3	CC and CV	3.65	10000	3.63	NF, NE, NL
C4	CC and CV	3.65	10000	3.63	NF, NE, NL
C5	CC and CV	3.65	10000	3.64	NF, NE, NL
supplementary information: NF: No fire, NE: No explosion, NL: No leakage, OCV: open-circuit voltage					

3.(1)	TABLE:– External Short Circuit Test (Cell)				P
Sample number	**Ambient (ºC)**	**OCV at start of test, (Vdc)**	**Resistance of Circuit, (mΩ)**	**Maximum Case Temperature (°C)**	**Results**
Samples charged at the highest test temperature (60°C)					
C16	55.5	3.64	88.1	98.5	NF, NE
C17	55.5	3.64	86.7	96.8	NF, NE
C18	55.5	3.63	84.6	97.4	NF, NE
C19	55.5	3.63	86.3	98.9	NF, NE
C20	55.5	3.62	85.5	97.0	NF, NE
Samples charged at the lowest test temperature (-5°C)					
C21	55.2	3.55	86.3	98.6	NF, NE
C22	55.2	3.56	88.3	99.3	NF, NE
C23	55.2	3.53	83.8	101.4	NF, NE
C24	55.2	3.56	86.2	101.5	NF, NE
C25	55.2	3.58	85.0	99.3	NF, NE
supplementary information: NF: No fire, NE: No explosion					

3.(1)	TABLE: – External Short Circuit Test (Battery)				P
Sample number	**Ambient (ºC)**	**OCV at start of test, (Vdc)**	**Resistance of Circuit, (mΩ)**	**Maximum Case Temperature (°C)**	**Results**
Samples charged at the highest test temperature (60°C)					
B14	23.5	5.10	86.5	23.3	NF, NE
B15	23.5	5.12	85.2	23.3	NF, NE
B16	23.5	5.09	85.6	23.3	NF, NE
B17	23.5	5.10	87.2	23.3	NF, NE
B18	23.5	5.08	83.0	23.3	NF, NE
Samples charged at the lowest test temperature (-5°C)					
B19	23.3	5.09	85.3	23.5	NF, NE
B20	23.3	5.10	85.7	23.5	NF, NE
B21	23.3	5.10	86.4	23.5	NF, NE
B22	23.3	5.10	85.6	23.5	NF, NE
B23	23.3	5.11	88.0	23.5	NF, NE
supplementary information: NF: No fire, NE: No explosion					

3.(5)	TABLE: – Crush (Cell)				P
Sample number	**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 (60°C)					
C44	3.64	3.64	--	--	NF, NE
C45	3.64	3.63	--	--	NF, NE
C46	3.63	3.63	--	--	NF, NE
C47	3.64	3.64	--	--	NF, NE
C48	3.63	3.62	--	--	NF, NE
Samples charged and tested at the lowest test temperature (-5°C)					
C49	3.55	3.55	--	--	NF, NE
C50	3.55	3.55	--	--	NF, NE
C51	3.55	3.52	--	--	NF, NE
C52	3.54	3.53	--	--	NF, NE
C53	3.53	3.53	--	--	NF, NE
Supplementary information: NF: No fire, NE: No explosion, OCV: open-circuit voltage Remark 1: C44-C48 The maximum force of 13kN has been applied. Remark 2: C49-C53 Rotating a cell 90°around its longitudinal axis there was 10% deformation.					

3.(7)	TABLE: – Overcharge (Cell)				P
Sample number	**OCV at start of test, (Vdc)**	**Max. Charging Current, (mA)**	**Maximum Charging Voltage, (Vd)c**	**Total Time of Charging,(h)**	**Results**
Samples tested at the highest test temperature (60°C)					
C57	2.36	20000	10.0	2.5	NF, NE
C58	2.35	20000	10.0	2.5	NF, NE
C59	2.36	20000	10.0	2.5	NF, NE
C60	2.34	20000	10.0	2.5	NF, NE
C61	2.35	20000	10.0	2.5	NF, NE
Samples tested at the lowest test temperature (-5°C)					
C62	2.37	20000	10.0	2.5	NF, NE
C63	2.35	20000	10.0	2.5	NF, NE
C64	2.35	20000	10.0	2.5	NF, NE
C65	2.36	20000	10.0	2.5	NF, NE
C66	2.36	20000	10.0	2.5	NF, NE
supplementary information: NF: No fire, NE: No explosion					

3.(8)	TABLE: – Forced discharge (Cell)			P
Sample number	**OCV before application of reverse charge, (Vdc)**	**Measured Reverse Charge It,(mA)**	**Total Time for Reversed Charge Application, (Min)**	**Results**
Samples tested at the highest test temperature (60°C)				
C67	2.35	20000	90	NF, NE
C68	2.33	20000	90	NF, NE
C69	2.36	20000	90	NF, NE
C70	2.35	20000	90	NF, NE
C71	2.36	20000	90	NF, NE
Samples tested at the lowest test temperature (-5°C)				
C72	2.36	20000	90	NF, NE
C73	2.37	20000	90	NF, NE
C74	2.36	20000	90	NF, NE
C75	2.36	20000	90	NF, NE
C76	2.35	20000	90	NF, NE
supplementary information: NF: No fire, NE: No explosion				

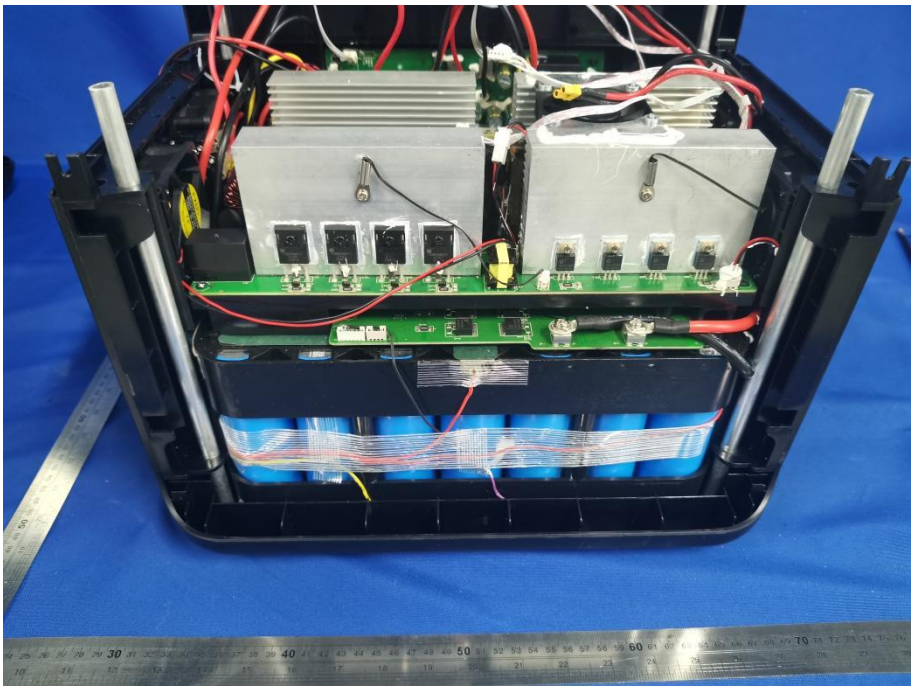
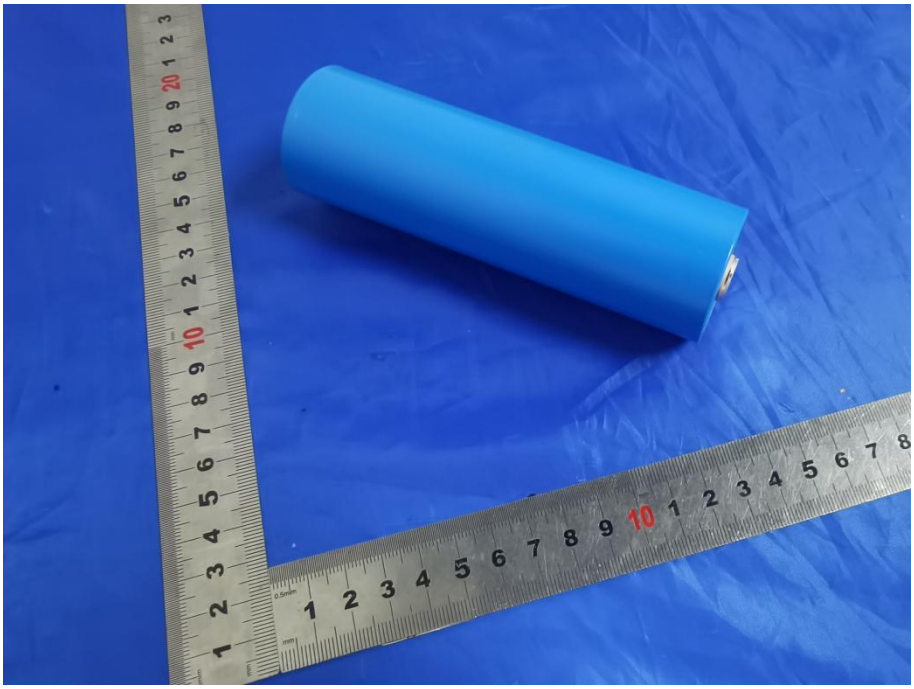
3.(9)	TABLE: – Cell Protection Against a High Charging Rate			P
Sample number	**OCV at start of test, (Vdc)**	**Charing Current, (mA)**	**Maximum Charging Voltage, (Vdc)**	**Results**
Samples tested at the highest test temperature (60°C)				
C77	2.35	30000	3.65	NF, NE
C78	2.34	30000	3.65	NF, NE
C79	2.36	30000	3.65	NF, NE
C80	2.35	30000	3.65	NF, NE
C81	2.35	30000	3.65	NF, NE
Samples tested at the lowest test temperature (-5°C)				
C82	2.36	30000	3.65	NF, NE
C83	2.33	30000	3.65	NF, NE
C84	2.36	30000	3.65	NF, NE
C85	2.36	30000	3.65	NF, NE
C86	2.36	30000	3.65	NF, NE
supplementary information: NF: No fire, NE: No explosion				

3.(10)	TABLE: – Forced internal short circuit of cells					P
Sample number	**Test Temperature (°C)**	**OCV at start of test, (Vdc)**	**Particle location [1)]**	**Maximum applied pressure, (N)**	**Voltage drop, (mV)**	**Results**
Samples charged at the highest test temperature (60°C)						
C87	60	3.64	1	800	5	NF
C88	60	3.63	1	800	6	NF
C89	60	3.62	1	800	5	NF
C90	60	3.63	1	800	7	NF
C91	60	3.63	1	800	5	NF
Samples charged at the lowest test temperature (-5°C)						
C92	-5	3.56	1	800	6	NF
C93	-5	3.55	1	800	4	NF
C94	-5	3.58	1	800	5	NF
C95	-5	3.55	1	800	5	NF
C96	-5	3.58	1	800	5	NF
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. NF: No fire						

Photos of The Sample

Photo 1 **[√] General view of Production**	
Photo 2 **[√] General view of Production**	

Photo 3 **[√]General view of Production**	
Photo 4 **[√] General view of Production**	

Photo 5 [√] **General view of Production**	
Photo 6 [√] **General view of Production**	

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