

广东世能能源科技有限公司

Guangdong ONE Energy Technology Co., Ltd.

产 品 规 格 书

SPECIFICATION FOR PRODUCTION

产品型号 Model	SNLB-W110
产品规格 Specification	32.4V /23.1Ah
批准 Approved	Yonghua Zhu
审核 Checked	Youqing Liu
拟制 Prepared	Cunlin Tong

AUTHORIZED SIGNATURE&COMPANY/客户认可及签回	

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File Name	产品规格Specification			Model	SNLB-W110
Version	1.0	Date	2026-3-3		

修订履历记录

Version	Modification Reason	Modified By	Audit	App	Valid Date
1.0	First Version Released	Cunlin Tong		Yonhua Zhu	2026-3-3

Guangdong ONE Energy Technology Co., Ltd.	Model: SNLB-W110	Edition: 1. 0
产品规格 Specification	Page: 2 of 13	

1. 适用范围 Scope

本产品规格书适用于世能能源科技有限公司提供的智能电池产品，同时本规格书提供的产品符合：国标 GB31241—2022 的各项要求。

This product specification is applicable to the intelligent battery products provided by ONE Energy Technology Co., Ltd., and the products provided in this specification comply with the requirements of the national standard GB31241-2022.

2. 产品特征介绍

本产品采用全球著名半导体厂家 TI 生产的 BQ34z100 和 BQ76952 作为电量监控及保护， bq34z100 和 BQ76952 具有高度集成，内部同时封装了电量监控及电池保护 IC。同时针对电池在使用过程中的老化，自放电等都有精准的计算方式，针对用电设备不同的使用模式能准确的预测剩余时间。该产品具有高精度的容量计算及高稳定性的安全保障，全面保障用户使用的安全性及可靠性。This product uses the BQ34z100 and BQ76952 produced by the world-renowned semiconductor manufacturer TI as the power monitoring and protection device. The bq34z100 and BQ76952 is highly integrated, and both the power monitoring and battery protection IC are encapsulated internally. At the same time, there are precise calculation methods for the aging and self discharge of batteries during use, which can accurately predict the remaining time for different usage modes of electrical equipment. This product has high-precision capacity calculation and high stability security guarantee, comprehensively ensuring the safety and reliability of user use.

3. 产品描述 Specification

2.1 名称 Name: li-ion Battery Pack

2.2 型号 Model: SNLB-W110

4. 产品配置 production configuration

Model	锂离子电池 li-ion Battery Pack: SNLB-W110/ 9S7P	
结构 Configuration	电芯 Cell	松下 NCR1865GA/3300mAh
	通 讯 协 议 Communication	TI
	生产商 Manufacturer	Shenzhen ONE Energy Technology
	设备名称 Device name	SNLB-W110
	版本 F/W	1.0
充电电压 charge voltage	充电电压: 37.8V charge voltage: 37.8V	
输出电压 Output voltage	电池输出电压:22.5-37.8V Battery output voltage: 22.5-37.8V	

Guangdong ONE Energy Technology Co., Ltd.	Model: SNLB-W110	Edition: 1. 0
产品规格 Specification	Page: 2 of 13	

序号	项目	规格
1.	最小容量 Minimum Capacity	23. 1Ah
2.	额定电压 rated voltage	32. 4V
3.	充电限制电压 Ucl/Limited charge voltage	37. 8V
4.	充电上限电压 Uup/Charging upper limit voltage	38. 07V
5.	放电截止电压 Udo/Discharge Cut-off Voltage	22. 5V
6.	放电终止电压 Ude/Discharge termination voltage	22. 5V
7.	推荐充电电流 Icr/Recommended charging current	13A
8.	最大充电电流 Icm/ Maximum charging current	15A
9.	推荐放电电流 Idr/Recommended discharge current	40A
10.	最大放电电流 Idm/maximum discharge current	60A
11.	过压充电保护电压 Ucp/Overvoltage charging protection voltage	38. 25
12.	过流充电保护电流 Icp/Overcurrent charging protection current	24A
13.	欠压放电保护电压 Udp/Undervoltage discharge protection voltage	22. 5V
14.	过流放电保护电流 Idp/Overcurrent discharge protection current	<80A
15.	上限充电温度 Tcm/Upper limit charging temperature	60℃
16.	下限充电温度 Tcl/Lower limit charging temperature	-10℃
17.	上限放电温度 Tdm/Upper discharge temperature	80℃
18.	下限放电温度 Tdl/Lower discharge temperature	-30℃
19.	贮存温度/短期 (1 个月内): Storage temperature	-20~50℃
	贮存温度/中期 (3 个月内): Storage temperature	-20~40℃
	贮存温度/长期 (1 年内): Storage temperature	-20~30℃
20.	出厂荷电状态/ Factory State of Charge	about:20~30%

Guangdong ONE Energy Technology Co., Ltd.	Model: SNLB-W110	Edition: 1. 0
产品规格 Specification	Page: 2 of 13	

5. 校准数据规格 Calibration data

NO.	Items	Specification	Remarks
1	电压精度（不带载） Voltage accuracy (without load)	$\pm 100\text{mV}$	SMBus 读出单节电芯电压 Detect the voltage of a single battery cell: 2.5-4.20V
2	电压精度（最大电流放电） Voltage accuracy (maximum current discharge)	$\pm 200\text{mV}$	放电电芯电压 Discharge cell voltage: 2.5-4.2V
3	电压精度（充电） Voltage accuracy (charging)	$\pm 200\text{mV}$	0.5℃充电电芯电压 Charging cell voltage: 2.5-4.2V
4	电流精度（最大电流放电） Current accuracy (maximum current discharge)	$\pm 100\text{mA}$	1%
5	电流精度（充电） Current accuracy (charging)	$\pm 50\text{mA}$	1%
6	温度精度 Temperature Accuracy	$\pm 5^{\circ}\text{C}$	Operating temperature range

6. 基本参数 Basic parameters

NO.	项目 Items	单位 Unit	要求参数 Parameters	Remarks
1	最小容量 Minimum Capacity	Ah	$\geq 23.1\text{Ah}$	以0.2C ₅ A（4620mA）标准充电后0.2C ₅ A标准放电至22.5V。（0.2C ₅ A（4620mA）standard charge and 0.2C ₅ A standard discharge to 22.5V）。
2	标称电压 Nominal Voltage	V	32.4	
3	充电方式 Charging method		恒流/恒压 CC/CV	以0.2C ₅ A（4.62A）恒流充电至电池电压37.8V，然后转恒压充电至0.025C ₅ A（577mA）截止，Charge the battery at a constant current of 0.2C ₅ A（4.62A）to a voltage of 37.8V, then charge it at a constant voltage of 0.025C ₅ A（577mA）。
4	静态电流 Current consumption (Operation)	uA	200-800	
5	重量 Weight	Kg	About: 4.1 $\pm$ 0.2	
6	内电池包阻 Pack resistance	mΩ	<100	
7	尺寸 size (H×W×L)	mm		单位 Unit: mm

8	工作温度 Operation temperature	充电 Charge	℃	10~45℃	
		放电 Discharge	℃	-20~60℃	
9	出厂带电量 Battery Percentage		%	20-30%	

7. 电池保护功能 Protection Strategy

项目 Items	详细内容 descriptive content	标准 Standard
过充保护 Over charge protection	保护电压 Protection voltage	4. 25±0. 05V/cell
	保护延迟时间 Protection delay time	2±1s
	保护解除电压 Over charge release voltage	4. 05±0. 1V/cell
过放保护 Over discharge protection	保护电压 Over discharge protection voltage	2. 5+0. 1V/cell
	保护延迟时间 Protection delay time	6±1s
	保护解除电压 Over charge release voltage	3. 1±0. 1V/cell
	保护解除电压 Over discharge release	充电恢复 Charging recovery

Guangdong ONE Energy Technology Co., Ltd.	Model: SNLB-W110	Edition: 1. 0
产品规格 Specification	Page: 2 of 13	

放电过流保护 Discharge over current protection	第一级保护电流 First level discharge overcurrent protection	80A
	保护延迟时间 Protection delay time	3±1s
	保护解除条件 Release of protection	解除外部电路后 60S 自动恢复 Release external circuit, Automatic recovery after 60 seconds
	第二级保护电流 Second level discharge overcurrent protection	160A
	保护延迟时间 Protection delay time	33±10mS
	保护解除条件 Release of protection	解除外部电路后 60S 自动恢复 Release external circuit, Automatic recovery after 60 seconds
	第三级保护电流 Third level discharge overcurrent protection	200A
	保护延迟时间 Protection delay time	3. 3±1ms
	保护解除条件 Release of protection	解除外部电路后 60S 自动恢复 Release external circuit, Automatic recovery after 60 seconds
短路保护 Short protection	保护条件 Protection conditions	外部电路短路 External circuit short
	保护值/延迟时间 Protection value/delay time	220-300A/300~500us
	保护解除条件 Protection Release Conditions	充电 60S 以上 Charging for over 60 seconds

过温保护 Over Temperature Protection	充电高温 Charging over temperature	60±5℃
	放电高温 Discharge over temperature	80±5℃
	充电低温 Charging low temperature	-10±5℃
	放电低温 Discharge low temperature	-30±5℃
过温保护恢复 Overtemperature protection recovery	充电高温恢复 Charging over temperature recovery	50±5℃
	充电低温恢复 Charging low temperature recovery	0±5℃
	放电高温恢复 Discharge over temperature recovery	70±5℃
	放电低温恢复 Discharge low temperature recovery	-20±5℃

Guangdong ONE Energy Technology Co., Ltd.	Model: SNLB-W110	Edition: 1. 0
产品规格 Specification	Page: 2 of 13	

8. 技术规格 Specifications

8.1 电气性能 Electrical performance:

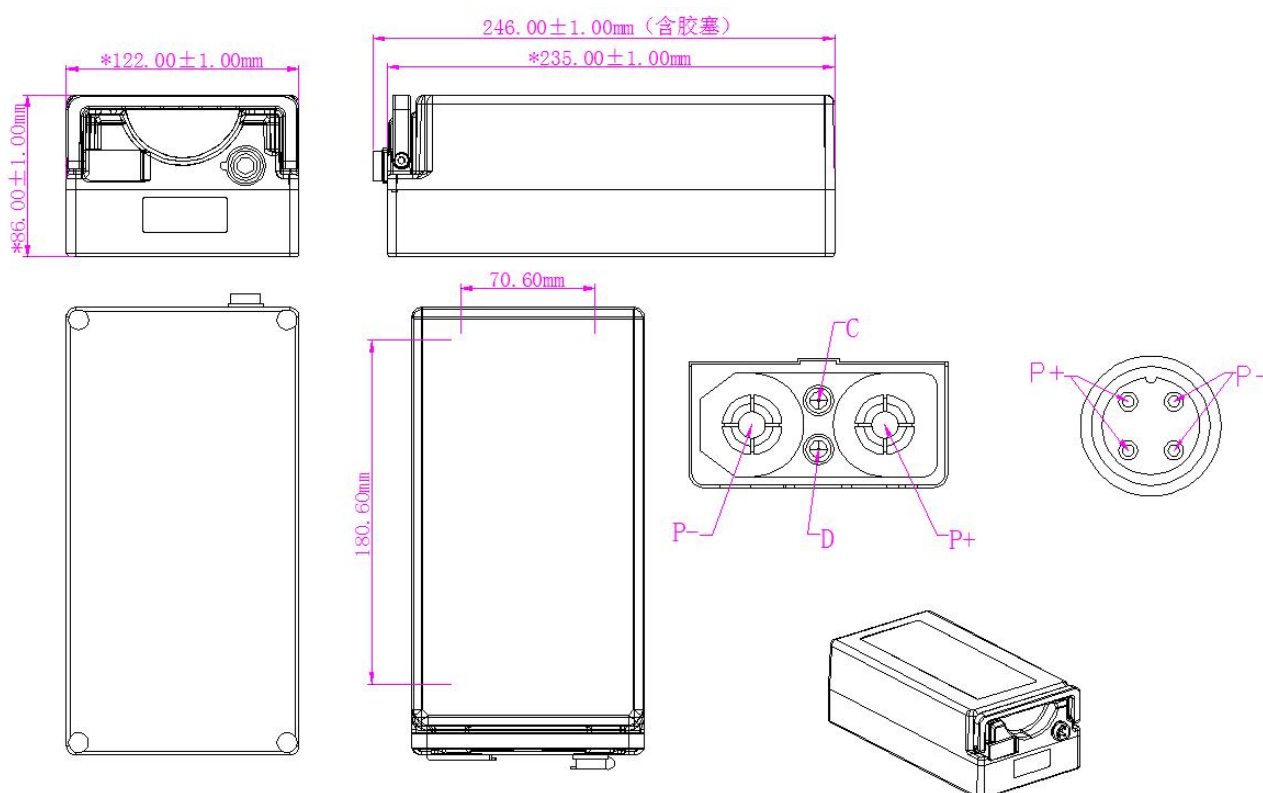
NO .	项目 Items	测试方法 Test method	技术要求 Requirement
1	最小容量 Minimum Capacity	0. 2C ₅ A (4620mA) 标准充电后标准放电至22. 5V Standard charge of 0. 2C ₅ A (4620mA)and standard discharge to 22. 5V	≥23. 1Ah
2	大电流放电性能 High current discharge	0. 2C ₅ A (4620mA) 标准充电后1C ₅ A放电至22. 5V. Standard charge of 0. 2C ₅ A (4620mA)and discharge of 1C ₅ A to 22. 5V	≥54min
3	低温放电性能 Low temperature discharge performance	标准充电结束后，在-10±2℃低温箱中恒温 2h，以 0. 2C ₅ A 恒流放电，测量放电时间。然后将电池在 20±5℃环境温度下搁置 2h，目测外观。 After the end of standard charging, maintain a constant temperature of -10 ± 2 °C in a low-temperature box for 2 hours, discharge at a constant current of 0. 2C ₅ A, and measure the discharge time. Then leave the battery at an ambient temperature of 20 ± 5 °C for 2 hours and visually inspect its appearance.	放电时间应不低于3. 5H。电池外观应无变形、无爆裂。 The discharging time should not be less than 3. 5h. No cosmetic deformation , no rupture.
4	高温放电性能 High temperature discharge performance	标准充电结束后，在 55±2℃的高温箱中搁置 2h，然后以 0. 2C ₅ A 恒流放电，测量放电时间。结束后将电池在 20±5℃环境温度下搁置 2h，目测外观。After the standard charging is completed, place it in a high-temperature box at 55 ± 2 °C for 2 hours, and then discharge at a constant current of 0. 2C5A to measure the discharge time. After completion, leave the battery at an ambient temperature of 20 ± 5 °C for 2 hours and visually inspect its appearance.	放电时间应不低于4H。电池外观 应无变形、无爆裂。 The discharging time should not be less than 4h. No cosmetic deformation , no rupture

Guangdong ONE Energy Technology Co., Ltd.		Model: SNLB-W110	Edition: 1. 0
产品规格 Specification		Page: 2 of 13	
6	循环寿命 Cycle life	试验前电池放完电。而后在$20\pm 5^{\circ}\text{C}$下, 以$0.2\text{C}_5\text{A}$恒流充电, 当电压达到充电限制电压时, 改恒压充电, 直到电流小于$0.025\text{C}_5\text{A}$停止。搁置$0.5\text{h}\sim 1\text{h}$, 然后以$1\text{C}_5\text{A}$放电至终止电压。搁置$0.5\text{h}\sim 1\text{h}$, 再进行下一个充放电循环。直至连续两次放电时间$<36\text{min}$, 则认为寿命终止。The battery is fully discharged before the test. Then charge at a constant current of $0.2\text{C}_5\text{A}$ at $20\pm 5^{\circ}\text{C}$. When the voltage reaches the charging limit voltage, switch to constant voltage charging until the current is $\leq 0.025\text{C}_5\text{A}$ and stop. Leave for 0.5h to 1h, then discharge at $1\text{C}_5\text{A}$ to the termination voltage. Leave it for $0.5\sim 1$ hour before proceeding to the next charging and discharging cycle. If the discharge time is less than 36 minutes for two consecutive times, the service life is considered to have ended.	500 次循环, 剩余容量 $\geq 60\%$ (500 cycles, remaining capacity $\geq 60\%$)
7	温度循环 Temperature cycling	电芯按照标准充电方式充满电后, 放入测试箱内, 按如下方式测试: (1) 30 分钟内升温至$72\pm 2^{\circ}\text{C}$, 保持6 小时; (2) 30 分钟内降温至$-20\pm 2^{\circ}\text{C}$, 保持6 小时; (3) 重复以上步骤9 次; (4) 10 次循环后, 在$20\pm 5^{\circ}\text{C}$下观察电芯至少6小时。 After fully charging the battery according to the standard charging method, place it in the testing box, Test as follows: (1) Heat up to $72\pm 2^{\circ}\text{C}$ within 30 minutes and maintain for 6 hours; (2) Cool to $-20\pm 2^{\circ}\text{C}$ within 30 minutes and maintain for 6 hours; (3) Repeat step up Sudden 9 times; (4) After 10 cycles, observe the battery cell at $20\pm 5^{\circ}\text{C}$ for at least 6 hours.	电池应不泄露、不泄气、不破裂、不起火 和不爆炸。 The battery should not leak, deflate, rupture, catch fire, or explode.
8	跌落测试 Drop Test	将电芯按标准充电方式充满电后; $25^{\circ}\text{C}\pm 2^{\circ}\text{C}$下, 将电芯从$1.0\text{m}$高度处自由跌落三次到水泥地面上, 以此获得随机方向的冲击; 观察1 小时。Fully charge the battery cells according to the standard charging method; At $25^{\circ}\text{C}\pm 2^{\circ}\text{C}$, apply The battery cell falls freely three times from a height of 1.0m onto the cement floor, in order to Obtain a random direction of impact; Observe for 1 hour.	电池不起火、不漏液不爆炸 The battery does not catch fire or leak liquid No explosion
9	ESD放电测试 ESD discharge test	电池标准充满电后, 对电池端子进行4kV接触放电测试和8kV空气放电测试, 各测试10次。 After the battery is fully charged according to the standard, perform a 4kV contact discharge test and an 8kV air discharge test on the battery terminals, each testing 10 times.	电池可以正常充放电, 保护功能正常; The battery can be charged and discharged normally, and the protection function is normal

Guangdong ONE Energy Technology Co., Ltd.	Model: SNLB-W110	Edition: 1. 0
产品规格 Specification	Page: 2 of 13	

9. 成品电池的外型尺寸图及实物图 Outline dimensional drawings and physical objects:

单位 Unit:mm

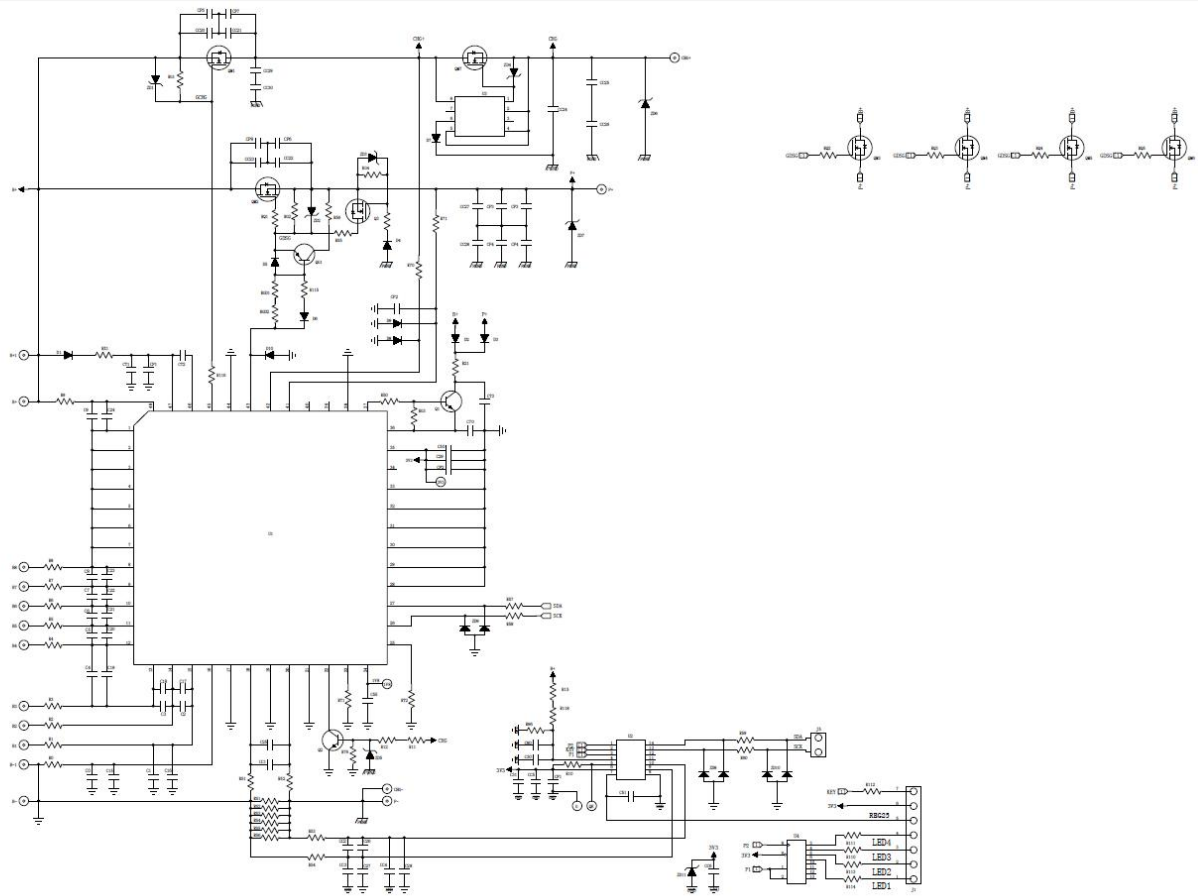


10. 电池标签 label

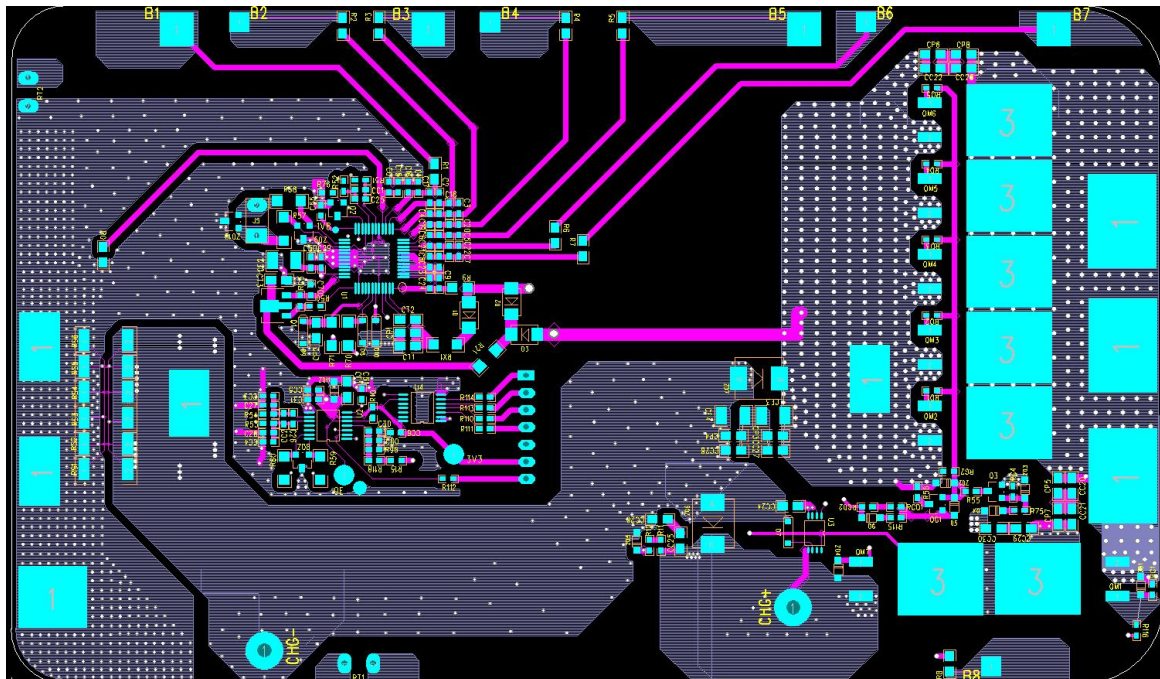


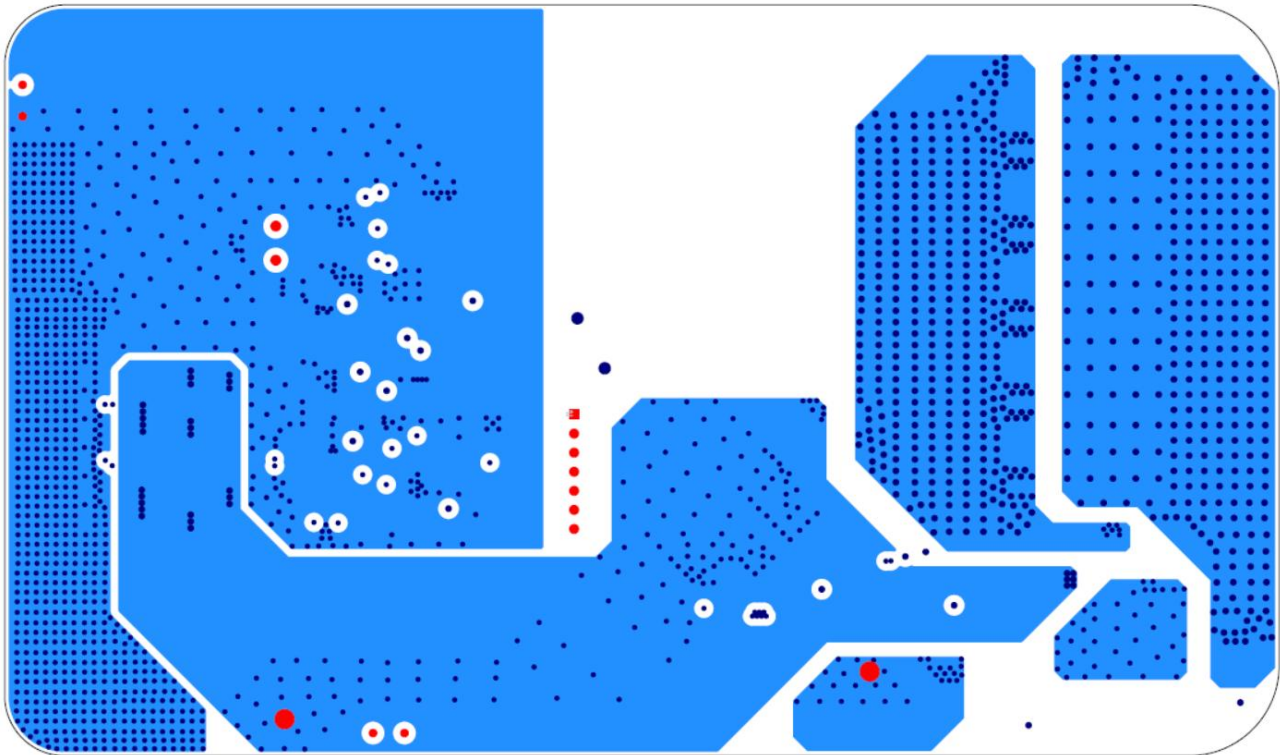
尺寸 Size: 180x70mm, 误差 Error: ± 1 mm

11.保护板原理图 Schematic diagram



12.保护板丝印图 Screen printing of protective plate





13. 电池通讯窗口 Battery communication window

Battery Management Studio (bqStudio) 1.3.86

File View Window Help

Registers Data Memory Commands Calibration Advanced Comm Chemistry Programming Golden Image I2C To HDQ Watch Data Graph Errors

Dashboard Registers

Auto Refresh is ON - Click to Turn Off

bqStudio Version: 1.3.86

EV2400 Version: 0.28

I2C

bq34z100G1
0100 0 16
Addr: 0xAA
32.5 °C

18180 mV

100 1000
-2000
0

Registers

Name	Value	Units	Name	Value	Units	Name	Value	Units	Name	Value	Units
Control	0x0013	Hex	Average Current	0	mA	Cycle Count	3	Co..	Ostart	5646	mAh
State Of Charge	46	%	Temperature	32.6	°C	State Of Health	100	%	True RC	4724	mAh
Max Error	1	%	Average Time to Empty	65535	Min	Charge Voltage	21000	mV	True FCC	10370	mAh
Remaining Capacity	4724	mAh	Average Time to Full	65535	Min	Charge Current	5300	mA	State Time	4	sec
Full Charge Capacity	10370	mAh	Available Energy	1608	mWh	Grid Number	0	-	DOD0 Passed Q	0	mAh
Voltage	18180	mV	Average Power	0	mW	Learned Status	6	hex	DOD0 Time	0	hr...
Current	0	mA	Internal Temperature	32.6	°C	DoDatEOC	0	-	DOD0	8672	-
									Qmax DOD0	8672	-
									Qmax Passed Q	0	mAh
									Qmax Time	0	hr...

Bit Registers

Name	Value	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Control Status (...)	0x0013	RSVD	FAS	SS	CALEN	CCA	BCA	CSV	RSVD
Pack Configura...	0x09E0	RESCAP	CAL_EN	SCALED	RSVD	VOLSEL	IWAKE	RSNS1	RSNS0
Pack Configura...	0x0100	RFACTSTEP	SLEEP	RMFCC	NIDT	NIDV	PB_RESTART	GNDSSEL	TEMPS
Flags (low)	0x2400	OTC	OTD	BATHI	BATLOW	CHG_INH	XCHG	FC	CHG
Flags B (high)		OCVTAKEN	RSVD	RSVD	CF	RSVD	SOC1	SOCF	DSG
Flags B (low)		SOH	LIFE	FIRSTDOD	RSVD	RSVD	DODEOC	DTRC	RSVD
		RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD

Commands

- CHEM_ID
- BOARD_OFFSET
- CC_OFFSET
- CC_OFFSET_SAVE
- DF_VERSION
- SET_FULLSLEEP
- STATIC_CHEM_CHKSUM
- ALL_DF_CHKSUM
- STATIC_DF_CHKSUM
- SEALED
- IT_ENABLE
- CAL_ENABLE
- RESET
- EXIT_CAL
- ENTER_CAL
- OFFSET_CAL

Log Panel

Transaction Log

Na...	Cmd	Res...	Rea...
RES...	0x41	N/A	N/A
RES...	0x41	N/A	N/A
RES...	0x41	N/A	N/A
IT_E...	0x21	N/A	N/A

TEXAS INSTRUMENTS

ENG 15:54

14. 电池 BOM 清单 Battery BOM List

材料	NO.	名称 Name	规格型号 Specification	数量 number	备注 Remarks
	1	电芯 Cell	松下 NCR18650GA-3300mAh	63PCS	
	2	PCB	PCM-SN-W110-01	1PCS	E529464
	3	PCB	PCM-SN-W110LED-01	1PCS	E529464
	4	插头 Plug	XT90PW (2+2) -M	1PCS	E482722
	5	导线 wire	3239-10AWM	2PCS	E355578
	6	导线 wire	3239-14AWM	2PCS	E355578
	7	导线 wire	3239-26AWM	1PCS	E355578
	8	不锈钢 SUS304	30mm*11mm*2.0mm	1PCS	可耐 1000℃
	9	防水透气膜	/	1PCS	
	10	螺柱	M4x13 螺柱	1PCS	
	11	外壳	P-W110-01		E162823
	12	标签 label	LAB-W110-01	1PCS	

15. 运输、贮存 Transportation and storage

15.1 运输 Transportation

电池应包装成箱进行运输，在运输过程中应防止剧烈振动、冲击或挤压，防止日晒雨淋，严禁与易燃、易爆、易腐蚀的物品同车装运，可使用汽车、火车、轮船、飞机等交通工具进行运输。

The battery should be packaged into boxes for transportation. Excess vibration, shock, crush, direct sunlight and drenching should be avoided in transit. The battery must not ship together with things that are flammable, explosive or corrosive on the same vehicle. The battery can be transported on trucks, trains, ships, aircraft or other transportation vehicles.

15.2 贮存 Storage

电池贮存应保持原有包装，存放产品仓库环境温度为-5℃~+35℃，相对湿度不大于 75%的清洁、干燥、通风并设有防潮、防尘、防震、防腐蚀措施的室内，避免与腐蚀性物质接触，应远离火源及热源。

The battery should be kept in their original package and stored in a warehouse with ambient temperature in the range between -5℃ and +35℃, and relative humidity no more than 75%. The battery should be kept indoors in a place that is clean, dry, ventilated and equipped with measures against moisture, dust, vibration and corrosion, and kept from contact with corrosive substance and sources of ignition and heating.

16. 安全注意事项 Safety precautions

16.1 请在正常的环境中使用电池：温度：-10℃~+40℃，相对湿度：65±5%。

Please use batteries in normal indoor environment with temperature of -10℃~+40℃ and relative humidity of 65% ±5%.

16.2 在使用过程中，应远离热源、高压，避免儿童玩弄电池，切勿摔打电池。

Stay away from heating sources, high pressure when using the battery. Keep the battery out of

Guangdong ONE Energy Technology Co., Ltd.	Model: SNLB-W110	Edition: 1. 0
产品规格 Specification	Page: 2 of 13	
reach of children. Do not strike the battery. 16.3 本电池只能使用配套充电器充电。 Charge the battery with the specified charger only. 16.4 长期不用时，请将电池储存完好。让电池处于半荷电状态，即不充满，也别放完。 Store the battery in a good condition when do not use for an extended period of time. Store the battery in a half charged state. This means do not completely charge and discharge the battery. 16.5 请用不导电材料包裹电池，以避免金属直接接触电池，造成电池损坏。将电池保存在阴凉干燥处。 Package the battery with non-conductive material to avoid direct contact with metal objects and resultant damage. Store the battery in a cool and dry place 16.6 废弃电池请安全妥当处理，不要投入火中或水中。 Please dispose of depleted batteries in a safe and proper way. Do not throw the battery into fire or water. 16.7 禁止拆装电电池。内部具有保护结构和保护电路可以避免发生危险。不合适的拆装将会损坏保护功能，会造成电池发热、冒烟、变形或燃烧。 Do not dissemble or assemble the battery. Protection structures and circuits contained in the battery can prevent occurrence of dangers. Incorrect dissembling and assembling will damage the protection functions and cause heat generation, smoking, deformation or burning. 16.8 禁止让电池短路。 不要将电池的正负极用金属连接，也不要将电池与金属放在一起存贮移动。如果电池被短路，将会有超大电 流流过，将会损坏电池，造成电池发热、冒烟、变形或燃烧。 Do not short-circuit the battery. Do not connect the positive and negative terminals of the battery with metal object. Do not store and carry the battery together with metal objects. If the battery is short-circuited, the generated excessively large current may damage the battery and the short-circuit may also cause heat generation, smoking, deformation or burning. 16.9 严禁加热和焚烧电池 加热和焚烧电池将会造成电池隔离物的熔化，安全功能丧失或电解质燃烧。过热就会使电池发热、冒烟、变形或燃烧。 Do not heat or burn the battery. Heating or burning the battery will result in the melting of the battery separator, loss of safety protection functions or burning of electrolyte. Over-heat may lead to the battery heating, smoking, deformation or burning. 16.10 避免在热源附近使用电池 不要在火源，烤炉附近或超过 80℃ 的环境中使用电池，过热将会导致电池内部短路，使电池发热、冒烟、变形或燃烧。 Do not use the battery near a heat source. Do not use the battery near fire or an oven, or in an ambient temperature exceeding 80 ℃ .Over-heat may cause internal short-circuit, heat generation, Smoking, deformation or burning. 16.11 禁止弄湿电池 不要弄湿电池，更不能将电池投入水中。否则会造成电池内部保护电路功能丧失和发生不正 常的化学反应， 电池有可能发热、冒烟、变形或燃烧。 Do not wet the battery. Do not wet the battery and do not throw it into water. Otherwise, it may damage the battery' s circuit protection function, create abnormal chemical reaction, and even cause heating, smoking, deformation or burning.		