Solar Power Manager

User Manual

OVERVIEW

This solar power management module is designed for 6V~24V solar panel. It can charge the 3.7V Li battery through solar panel or USB connection, and provides 5V/1A regulated output.

The module features MPPT (Maximum Power Point Tracking) function and multi protection circuits, therefore, it is able to keep working with high-efficiency, stability, and safety. It is suited for solar powered, low-power IoT, and other environmental protection projects.

FEATURES

● Supports MPPT (Maximum Power Point Tracking) function, maximizing the efficiency of the solar panel

● Supports solar panel / USB connection battery charging

● For 6V~24V solar panel, DC-002 jack input or screw terminal input

● Onboard MPPT SET switch, select the level closed to input level to improve charging efficiency

● Two 5V output interfaces: pinheaders and USB port

● Onboard high capacity aluminum electrolytic capacitor and SMD ceramic capacitor, reducing the ripple, stable performance

- 14500 battery holder and PH2.0 battery connector, for connecting multi kinds of

  3.7V Li battery

- Several LED indicators, for monitoring the status of solar panel and battery

- Multi protection circuits: over charge / over discharge / reverse protection / over

  heat / over current, stable and safe to use

SPECIFICATIONS

- Solar panel input voltage (SOLAR IN): 6V~24V

- Micro USB input voltage (USB IN): 5V

- Pinheader / USB output (USB OUT): 5V 1A

- Charging cutoff voltage: 4.2V±1%

- Over discharging protection voltage: 2.9V±1%

- Solar panel charge efficiency: ~78%

- USB charge efficiency: ~82%

- 3.7V battery boost output efficiency: ~86%

- Max quiescent current: <2mA

- Operating temperature: -40℃~85℃

- Dimension: 65.2mm × 56.2mm × 22.9mm

WATH'S ON BOARD
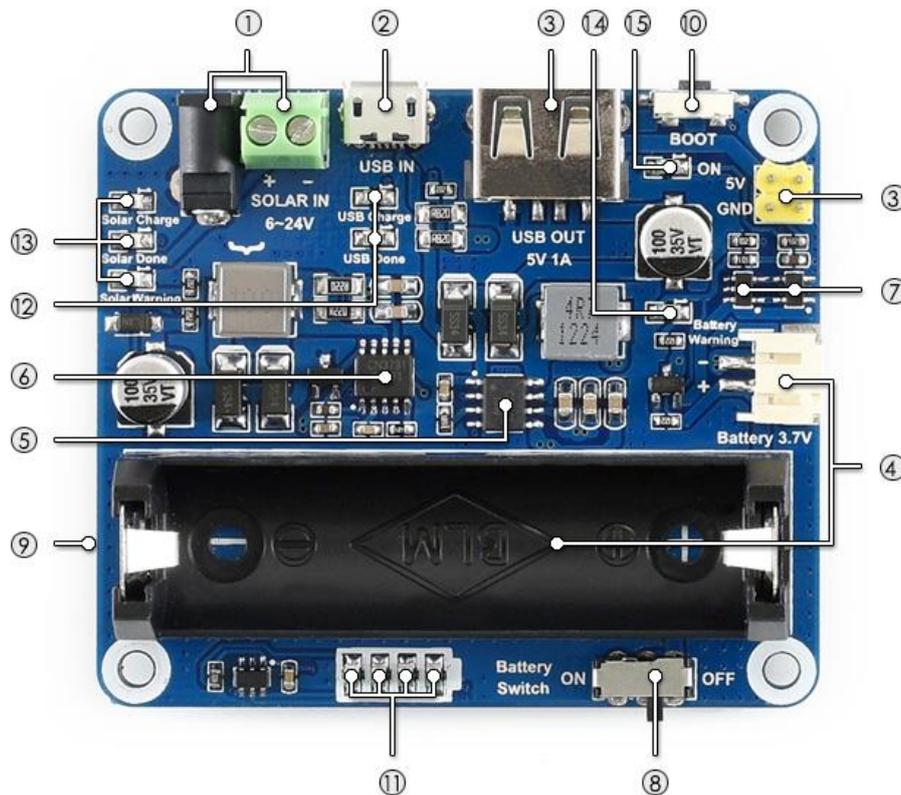
1. **Solar panel charging input:** charged by solar panel, DC-002 jack or screw

   terminal

2. **USB charging input:** charged by USB connection, connect a 5V power adapter

   through the Micro USB port

3. **5V/1A power output:** provides regulated 5V/1A output, USB port or 2.54mm

   pinheader

4. **Battery interfaces:** for connecting 3.7V Li battery, PH2.0 connector or 14500

   battery holder

5. **CS8501:** USB power management chip, for USB charging and 5V/1A boost output

6. **CN3791:** solar power management chip, for solar panel charging and buck input

7. **Li battery protection chip:** Li battery over charge / over discharge protection

8. **Battery switch**

9. **MPPTSET switch (bottom side):**

    supported level: 6V/9V/12V/18V/24V

    select the level closed to input level to improve charging efficiency

10. **BOOT key**

11. **Battery capacity indicators**

12. **USB charging indicators:**

    USB Charge: on when USB charging

    USB Done: on when the battery is full charged by USB

13. **Solar panel charging indicators:**

    Solar Charge: on when solar panel charging

    Solar Done: on when the battery is full charged by solar panel

    Solar Warning: on when solar panel reverse connection

14. **Battery warning:** on when battery reverse connection

15. **Power output indicator:** 5V/1A output

CAPACITY INFICATORS

Voltage (V)	VD1	VD2	VD3	VD4
3.87-4.2	ON	ON	ON	ON
3.7-3.87	ON	ON	ON	OFF
3.55-3.7	ON	ON	OFF	OFF
3.4-3.55	ON	OFF	OFF	OFF
<3.4	OFF	OFF	OFF	OFF

USAGE

1. Mounting battery: Turn Battery Switch into ON, then mount 14500 battery to battery holder in correct direction or connecting battery to PH2.0 DIP socket. If you connect battery incorrectly, the Battery Warning indicator will light on, in this case, you need to change the direction of battery mounted. If battery is mounted correctly, indicator ON will light on. (Note: You cannot connect power adapter for charging when Warning indicator is ON, otherwise Manager board is damaged)

2. Solar panel charging indicator: Connect solar panel to DC-002 socket or KF350-2P green socket. If panel is connected correctly, Solar Charge indicator light on, if panel is connected in wrong direction, Solar Warning light on. Solar Done turns on and Solar Charge turns off when battery is full charged.

3. Micro USB charging indicator: Connect 5V power adapter to Micro USB interface, USB Charger indicator lights on. Solar Done turns on and Solar Charge turns off when battery is full charged.

4. Charge and Done indicator will blink alternately when Power adapter is plugged without battery or the battery switch is turned off.

5. You can power external device via USB Type A interface with USB cable, or connect to the 2x2 yellow pins.

    (Note that, you cannot short 2x2 yellow pins, avoid of circuit damaging)

APPLICATIONS

【Solar energy charging】

Solar Panel

6V~24V

5V/1A

Development Board

14500 Rechargable Battery