



RAK9154 Solar Battery Datasheet

Overview

Description

The RAK9154 Solar Battery is created especially to power RAK Sensor Hub or provide backup power for the WisGate Edge Pro V2 and Prime V2. Designed to provide an eco-friendly and sustainable power solution, this innovative device utilizes a small but powerful solar panel and integrates a 5.2 Ah battery, and a solar charge controller in one compact unit.

Features

- Battery capacity: 5200 mAh
- Operating temperature: -20 ~ 60° C
- Dimensions: 180 x 130 x 60 mm
- Outputs: one 12 V_{DC} output for Sensor Hub; one 9-12 V_{DC} output for WisGate Edge Pro/Prime
- Integrated BMS and heater
- Supported mounting pole diameter: 55 ~ 80 mm

Specifications

Overview

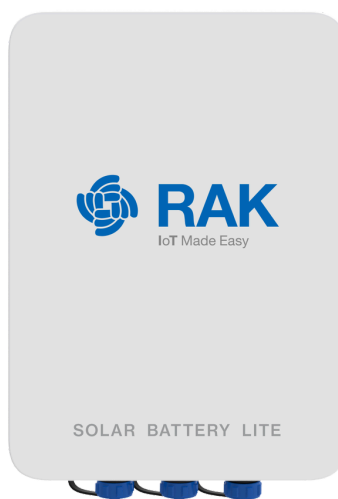


Figure 1: RAK9154 Solar Battery Overview

Parameter	Value	Notes
Cell type	Rechargeable Lithium-Ion	
Nominal capacity	5200 mAh	5.2 Ah
Rated voltage	10.8 V	Single cell voltage 3.6 V
Operating voltage range	9 ~ 13.2 V	Output 1 – if SensorHub is connected – 12V DC Output 1 and 2 – if used with other devices, the connected device should withstand a voltage of up to 16 V DC.
Rated energy	56.16 Wh	
SOC transportation range	50%	
Operating temperature	Charging temperature: 0 ~ 45° C Discharge temperature: -20 ~ 60° C	

Parameter	Value	Notes
Storage temperature	-20 ~ 55° C	Longer than three months at 25° C
Working humidity	20 ~ 80% RH	
PV input	18 V / 1.0 A	Typical
Max PV input voltage	30 V	Open-circuit voltage max
Max charging continuous current	0.25 C (1.3 A)	Limited by the solar charger
Max discharge continuous current	0.6 C (3.12 A)	
Dimensions (L, W, H)	180 x 130 x 60 mm (±3 mm)	

Hardware

Dimensions and External Surface Requirements

The appearance of the RAK9154 battery system is shown in **Figure 2**. The battery system consists of two groups of 2600 mAh cells connected in serial and one BMS board which integrated 18 V input solar charger.

The appearance of the assembly has no obvious processing flaws or bumps, no cracks on the surface, and no burrs on the weld.

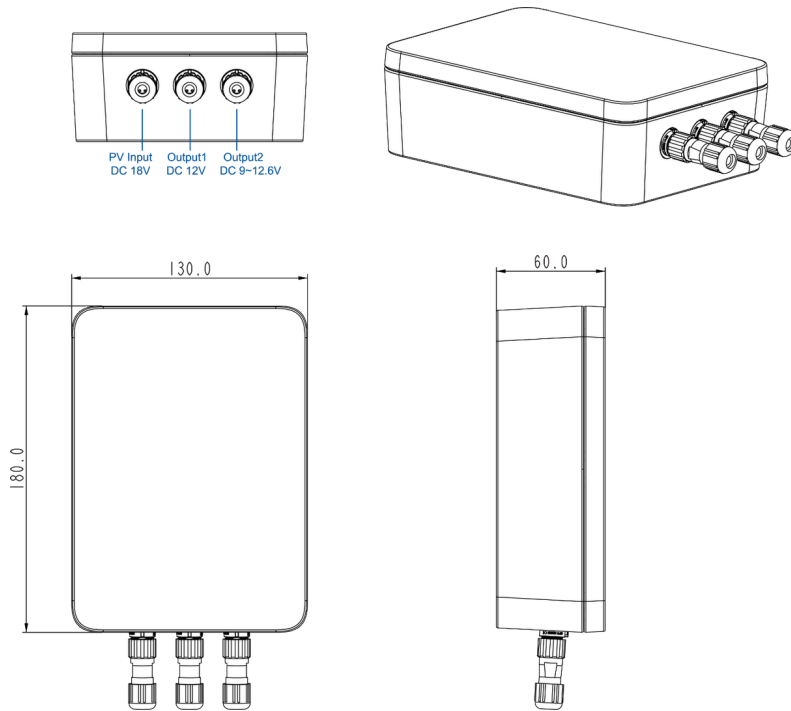


Figure 2: RAK9154 Dimensions and interfaces

Electrical Characteristics

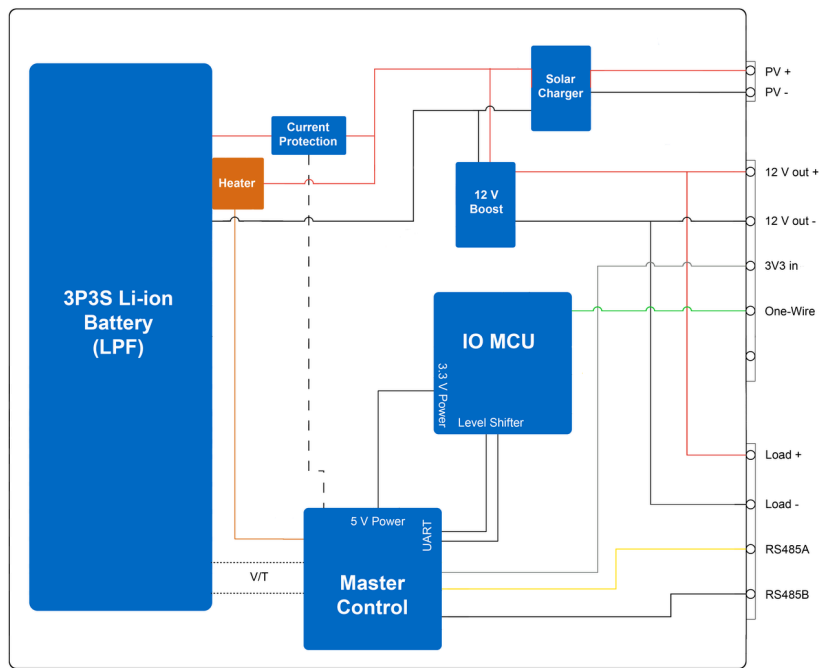


Figure 3: RAK9154 Electrical diagram

NOTE

For reference only, this module does not contain a sampling wiring harness.



Figure 4: RAK9154 Wiring diagram

Panel Connector Definition

Connector	Connector Socket Model	Connector Plug Type	Definition	Note
Gateway Load	SP1110/P4	SP1110/P4-N	Pin1: P+; Pin2: P-; Pin3: RS485A; Pin4: RS485B	SP11; IP67; Rate current 2 A; Contact diameter 0.75 mm*4
Sensor Hub Load	SP1110/P5	SP1110/P5-N	Pin1: P+; Pin2: P-; Pin3: TXD; Pin4: 3V3_In; Pin5: RXD	SP11; IP67; Rate current 2 A; Contact diameter 0.75 mm*5
PV INPUT	SP1110/P2	SP1110/P2-N	Pin1: PV+; Pin2: PV-	SP11; IP67; Rate current 1 A; Contact diameter 1.0 mm*2

Environmental Requirements

Standard Experiment Condition

Unless otherwise stated, all specifications are performed under the following environmental conditions:

- Temperature: 25±3° C
- Humidity: 65±20% RH

Transportation and Storage

Transportation Requirements

During transportation, the battery should be protected from severe vibration, shock, sun, and rain. It should not be inverted to avoid short circuits from happening. During the loading and the unloading process, it should be handled gently to prevent falling, rolling, heavy pressure, and inversion.

Storage Requirements

The module is stored in an incompletely charged state, typically around 40% SOC. Product storage environment requirements are as follows:

- **Storage temperature:** Storage time < 3 months, then stored at -20 ~ 55° C, 40% SOC; Storage time > 3 months, then 0 ~ 25° C, 40% SOC.

- **Storage humidity:** Humidity is 2 ~ 90% RH, it is recommended to store in the range of no more than 85% RH.
- **Storage environment:** The product should be stored in a clean, ventilated, and cool environment, avoiding direct sunlight, high temperature, corrosive gas, severe vibration, mechanical shock, and heavy pressure; away from heat source; altitude is less than 1500 meters, atmospheric pressure is 86~106 kPa.
- **Maintenance:** In a dry and ventilated environment, recharging is required once a month during storage. The maintenance test method during product storage is as follows: Under normal temperature conditions, the product should be charged and discharged once a month with standard charging. If the module is expected to be stored for more than 30 days, the SOC will be adjusted to 40% after the charging is completed.

WARNING

This product must comply with the operating instructions. Any installation, maintenance, and use of this product must strictly comply with the relevant safety regulations.

- Do not store or use at high temperatures, and must be kept away from heat. These environments above the safe temperature range can cause significant degradation in the performance and life of the product, and even cause serious consequences such as burning and explosion.
- Storage and use in environments with high static or high electromagnetic radiation are prohibited. Otherwise, the electronic components in this product may be damaged, which may cause safety hazards.
- Do not get it wet or even soak it in water. Otherwise, it may cause internal short circuits, loss of function, or abnormal chemical reactions of the product, and cause fire, smoke, explosion, and other accidents.
- If you find any abnormalities such as smoke, high heat, discoloration or deformation, while in use, storage, transportation, and service, you should contact the professional department immediately to further observe and control the risks.
- Do not dispose discarded products in fire or hot furnaces. Waste batteries should be recycled and recycling should be done by professional agencies or organizations.
- Do not let the product carry heavy load or pressure. It should not be stacked on top of each other.
- Although this battery is not a high-pressure energy storage device, non-professionals, and improper operation and use may still cause serious consequences such as burning and explosion. The installation and maintenance of the battery system must be operated by

professional technicians. Its usage must strictly abide by the relevant safety regulations; non-professionals are strictly prohibited to install, repairing battery systems and abuse.

Certification



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