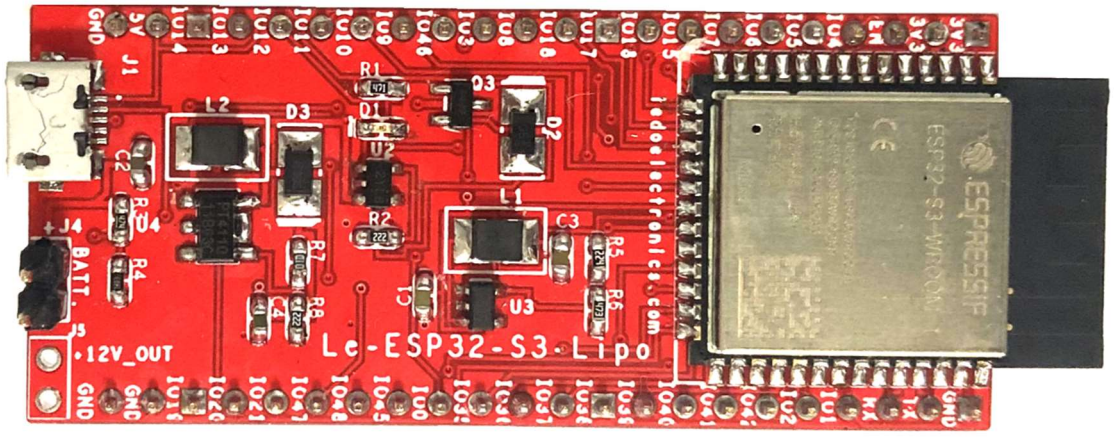
Le-ESP32-S3-Lipo

IoT Module



- **For IoT application development, simple WEB server, TCP/IP station**
- **Wifi, Bluetooth, SPI, I2C, CAN, UART, USB, RGB LED (neopixel LED)**
- **Power supply from a 3.7V Li-Po battery**
- **Charging management (BMS)of Li-Po battery incorporated on board**
- **Based on Espressif ESP32-S3 WROOM module**
- **240 MHz 32 bits CPU, 320 KB RAM, 4 MB/8MB Flash**
- **0 / 8MB PSRAM**
- **12V Step Up DC-DC On-board Converter**
- **Programming from PC via USB port**
- **Access to all pins of ESP32-S3 WROOM module**
- **Espressif, Arduino and PlatformIo compatible**
- **Compatible with Google and Amazon IoT platforms, among others**

The module is based on Espressif Systems' ESP32-S3 32-bit wifi processor, and differs from other commercial modules in that it incorporates a 3.7V Li-Po battery charge management and monitoring circuit, so it can be used in the design of stand-alone IoT devices that are not dependent on AC mains power. In addition, it features a step-up DC-DC regulator, which provides an output voltage of 12V DC and up to 80 mA, which can be used to power sensors and other low-power electronic circuits.

The Le-Esp32-S3 module can be powered with 5V from the microUSB connector present on the board, or from any source offering a voltage between 4.5V and 7V applied to pins 21 and 22 of the board.

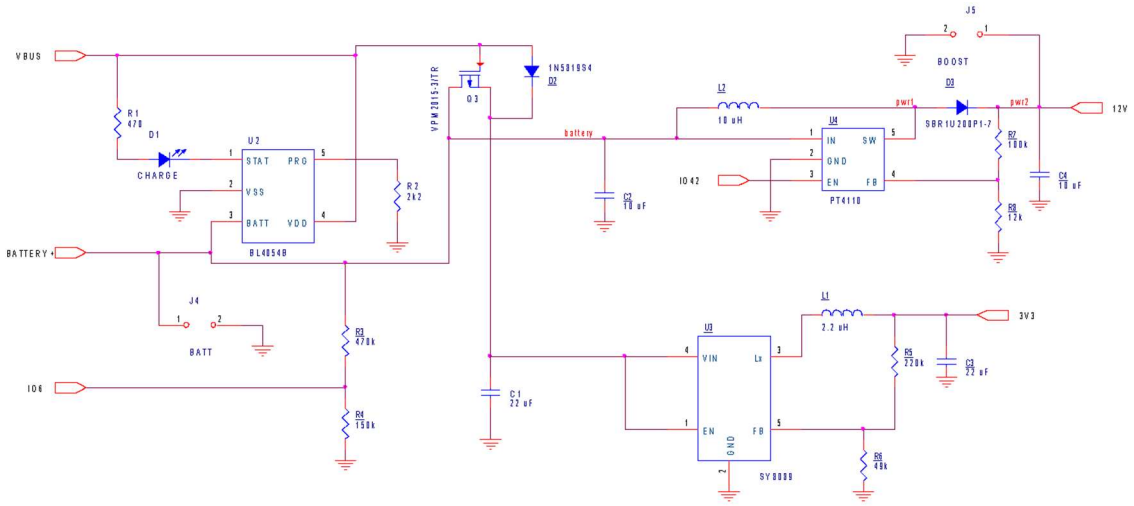


Fig.1. Power supply circuits.

To achieve maximum battery utilization, the SY8089 high-performance regulator is used, which can also operate with input voltage lower than the 3.3V output voltage required to power the entire digital system.

The output of the voltage divider formed by resistors R3 and R4 is connected to the IO06 pin of the microcontroller (ADC1_CH5), so we can monitor the battery status.

The step-up DC-DC converter (U4) gives us a 12V DC output, which we can use to power sensors and other circuits, as long as the current does not exceed 80 mA continuously. The control input of this converter is connected to the IO42 output of the microcontroller, this allows to disable it when not needed, thus saving battery power.

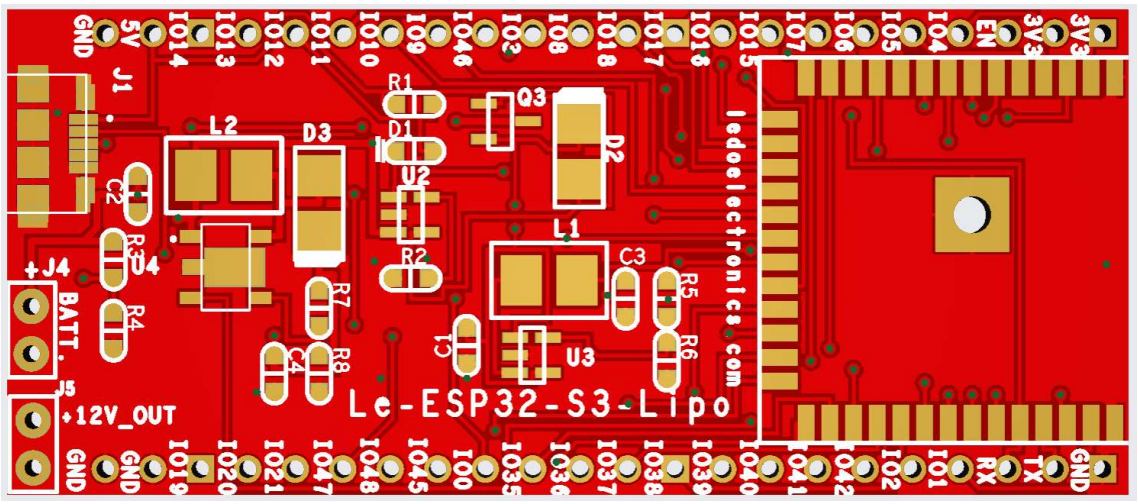


Fig.2. Top Layer.

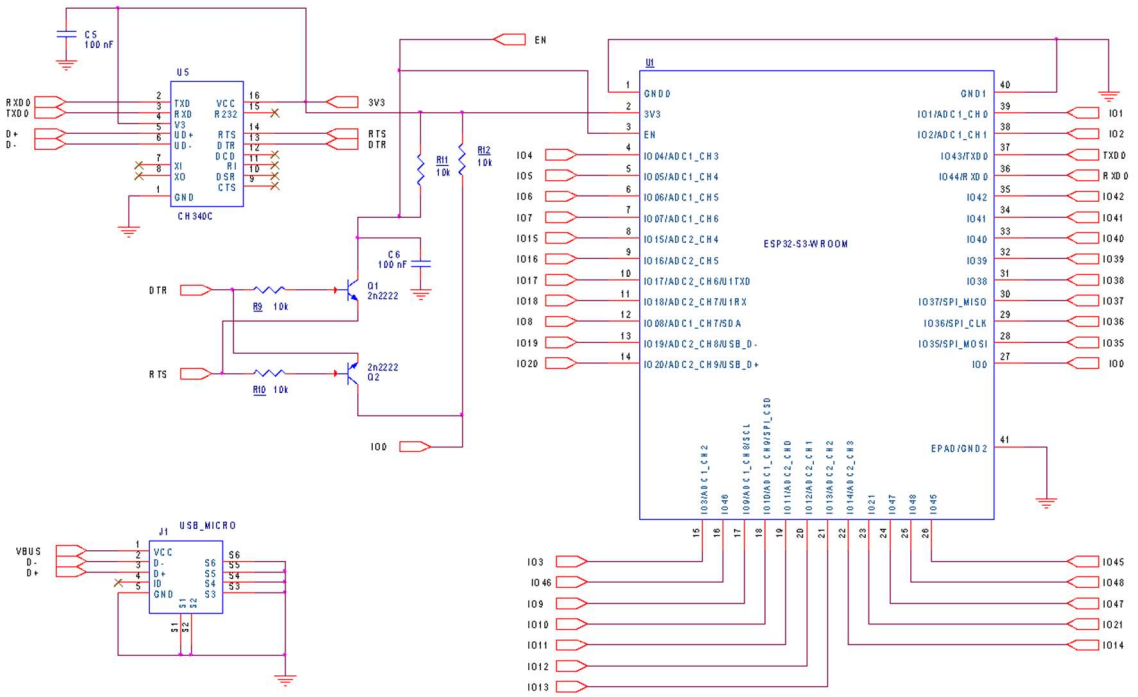


Fig.3. CPU and USB programming circuit.

The U5 IC and the Q1 and Q2 transistors allow the automatic programming of the ESP32-S3 microcontroller from the Espressif, Arduino and PlatformIO IDEs, so that to load the project it is only necessary to connect the module to the PC via a USB cable. In these development environments, one of the ESP32-S3-WROOM, ESP32-S3-DevKitC, etc. boards must be chosen.

Fig.4. Board pins.

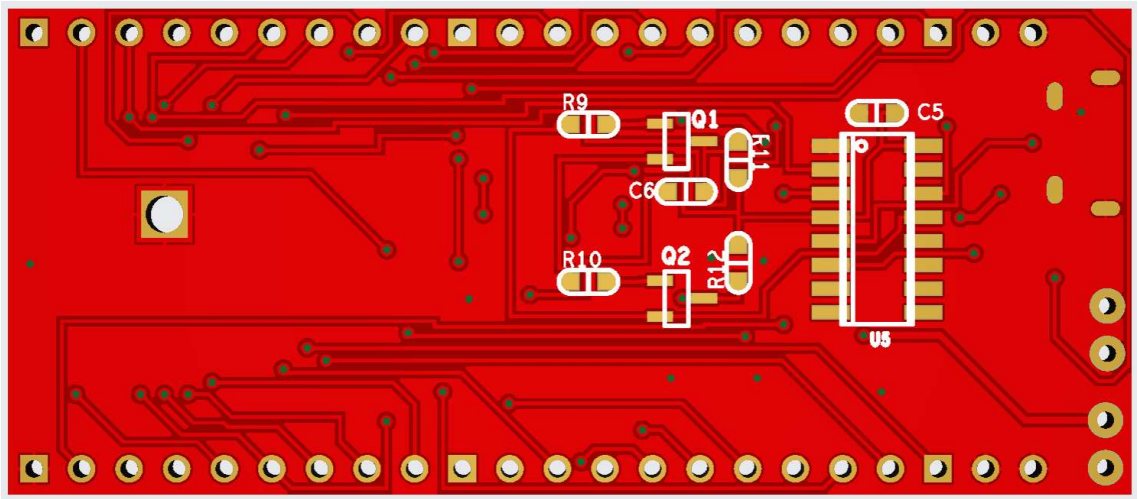


Fig.5. Bottom Layer.

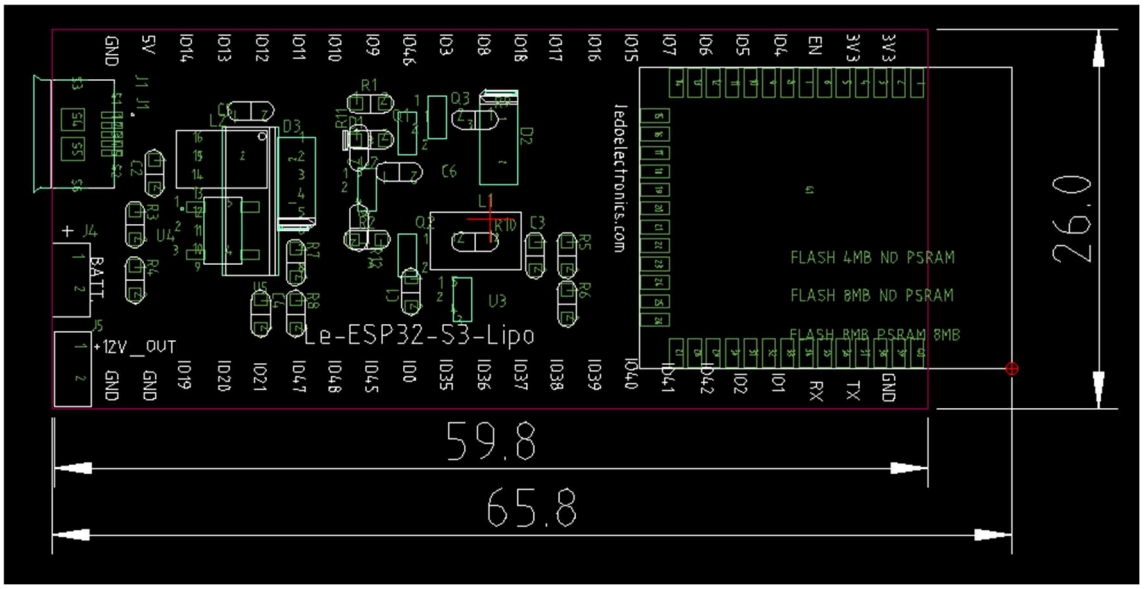


Fig.4. Module dimensions.