Groundstudio Carbon D4 development board

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Board Pinout

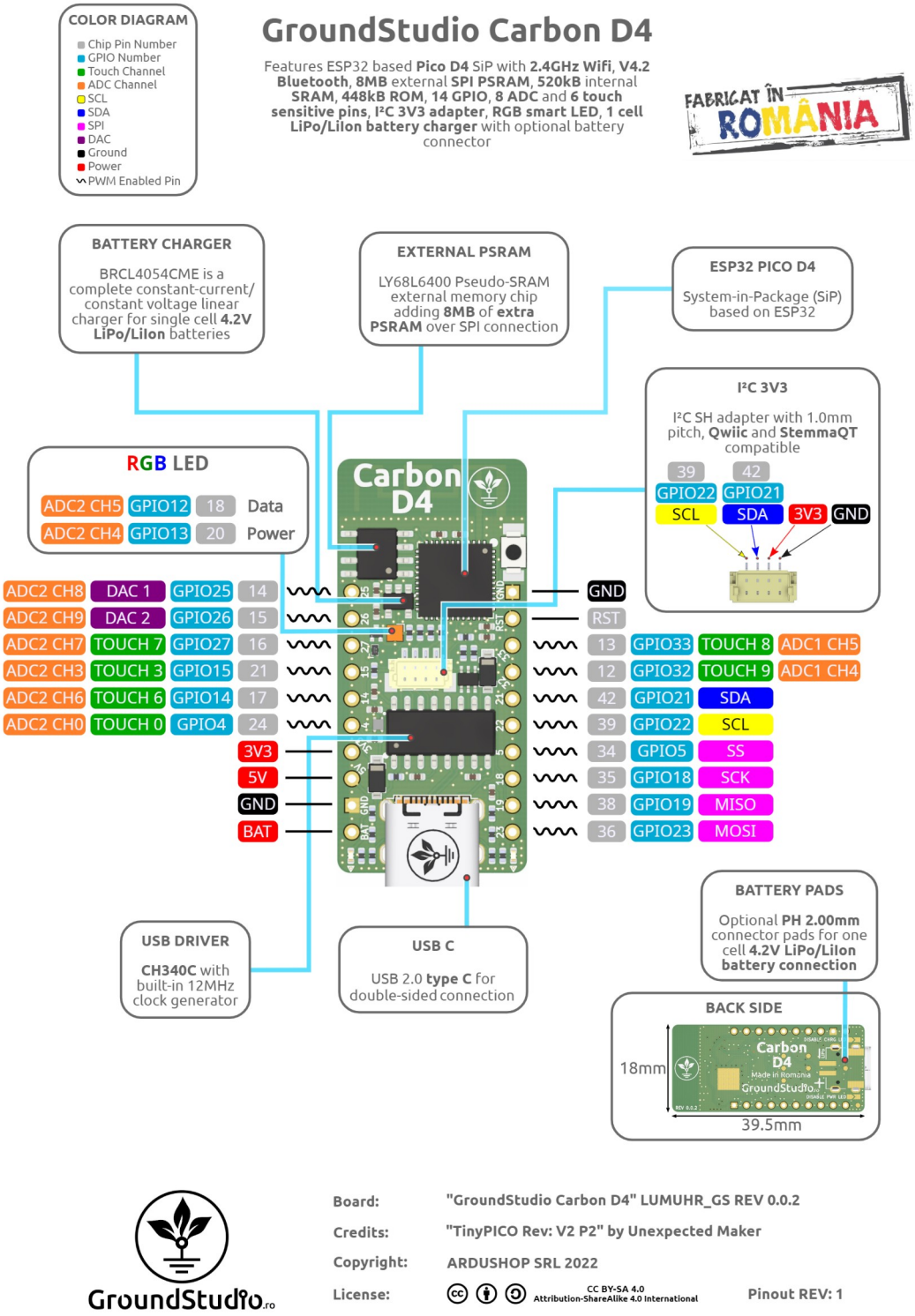

Figure 1: GroundStudio Carbon D4 pinout [Revision 1]

Board Circuit Schematic

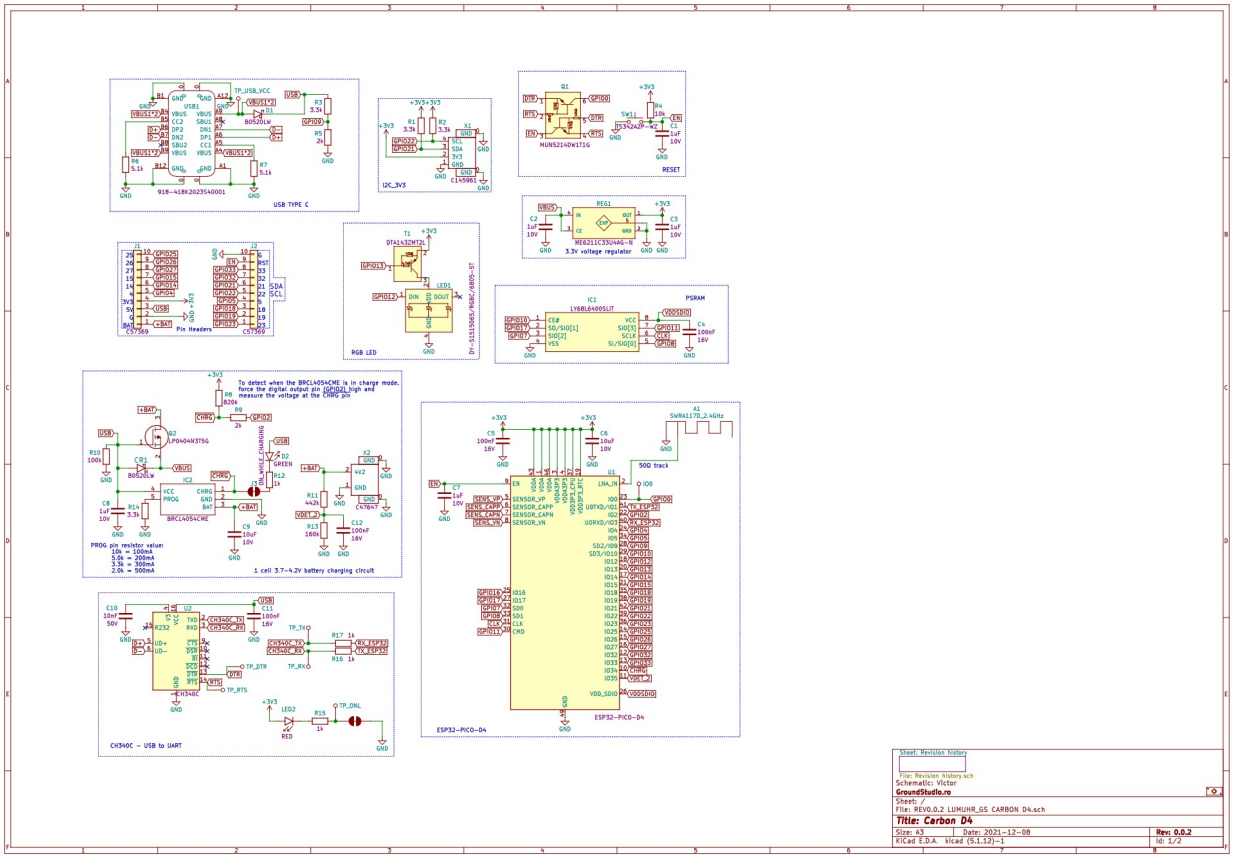

Figure 2: GroundStudio Carbon D4 schematic circuit [Revision 0.0.2]

Open Source

This is an Open Source project, you can find all the technical documents online:

https://github.com/GroundStudio/GroundStudio_Carbon_D4

License

Overview

GroundStudio Carbon D4 is a very small and fully equipped board, designed to unlock the power of the 240MHz dual-core ESP32 with internet connectivity in a miniaturized package.

The Carbon D4 development board basically uses the ESP32-PICO-D4 chip which is basically an ESP32 microcontroller plus a series of decoupling capacitors, power supply filter, matching for the antenna and two important components included in the same integrated:

- 4MB spi flash memory
- 40MHz crystal

Equipped with a usb type C adapter, it uses the CH340C chip for usb 2.0 to Serial (UART) conversion and an I²C 3V3 adapter compatible with STEMMA QT or Qwiic connectors.

To detect when the BRCL4054CME is in charging mode (if you have a 3.7-4.2V Lithium-Ion (LiIon) or Lithium-Polymer (LiPo) cell connected to the connector on the back of the board), the GPIO2 pin must be set as digital output in high state and measure the analog voltage level on the CHRG pin.

This development board also includes an integrated RGB LED.

NOTE:

The development board does not have under-voltage protection, it only has a charging circuit for a single Lithium-Ion (LiIon) or Lithium-Polymer (LiPo) cell of 3.7-4.2V.

If a battery without a protection circuit is connected, it will be destroyed after the first use!

If the board is powered by a battery without an additional protection circuit for under-voltage, the voltage level will drop below its minimum voltage, which will lead to its irreparable destruction.

Technical specifications

Microcontroller system: **ESP32-PICO-D4**

USB-Serial Converter: **CH340C**

Voltage regulator 3.3V: **ME6211C33U4AG-N**

Battery charging circuit: a single 3.7-4.2V Lithium-Ion (LiIon) or Lithium-Polymer (LiPo) cell. **The battery must include a discharge protection circuit.**

GPIO pins: **14**

ADC Pins: **8**

Touch pins: **6**

DAC pins: **2**

USB 2.0 **type C** adapter

Addressable **RGB** LED

FLASH memory: **4 MB**

SRAM memory: **520 kB**

External memory SPI PSRAM: **8MB**

Maximum processor frequency: **240 MHz**

Dimensions approx. pcb: **40mm x 18mm**

Legal disclaimer notice

This development board is considered a subassembly in accordance with FCC CFR Title 47 §15.101(e):

https://www.ecfr.gov/current/title-47/chapter-I/subchapter-A/part-15/subpart-B/section-15.101#p-15.101(e)

The device does not have a standalone functionality and does not include an enclosure or power supply.

The device is mainly intended for development and prototyping but it can be integrated into a product. In this case it is the responsibility of the developer/manufacturer to obtain all the necessary certifications.

GroundStudio is a registered trademark of ARDUSHOP SRL:

https://www.tmdn.org/tmview/#/tmview/detail/EM500000018364087

Developer info

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Datasheet Revision History

[Revision 1] - Initial version release