Groundstudio Carbon D4 development board
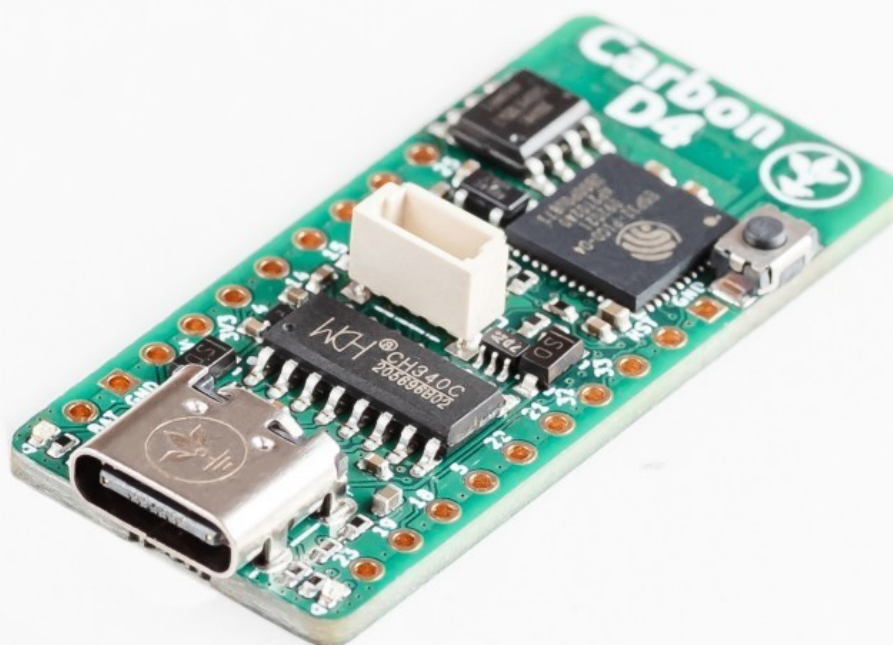
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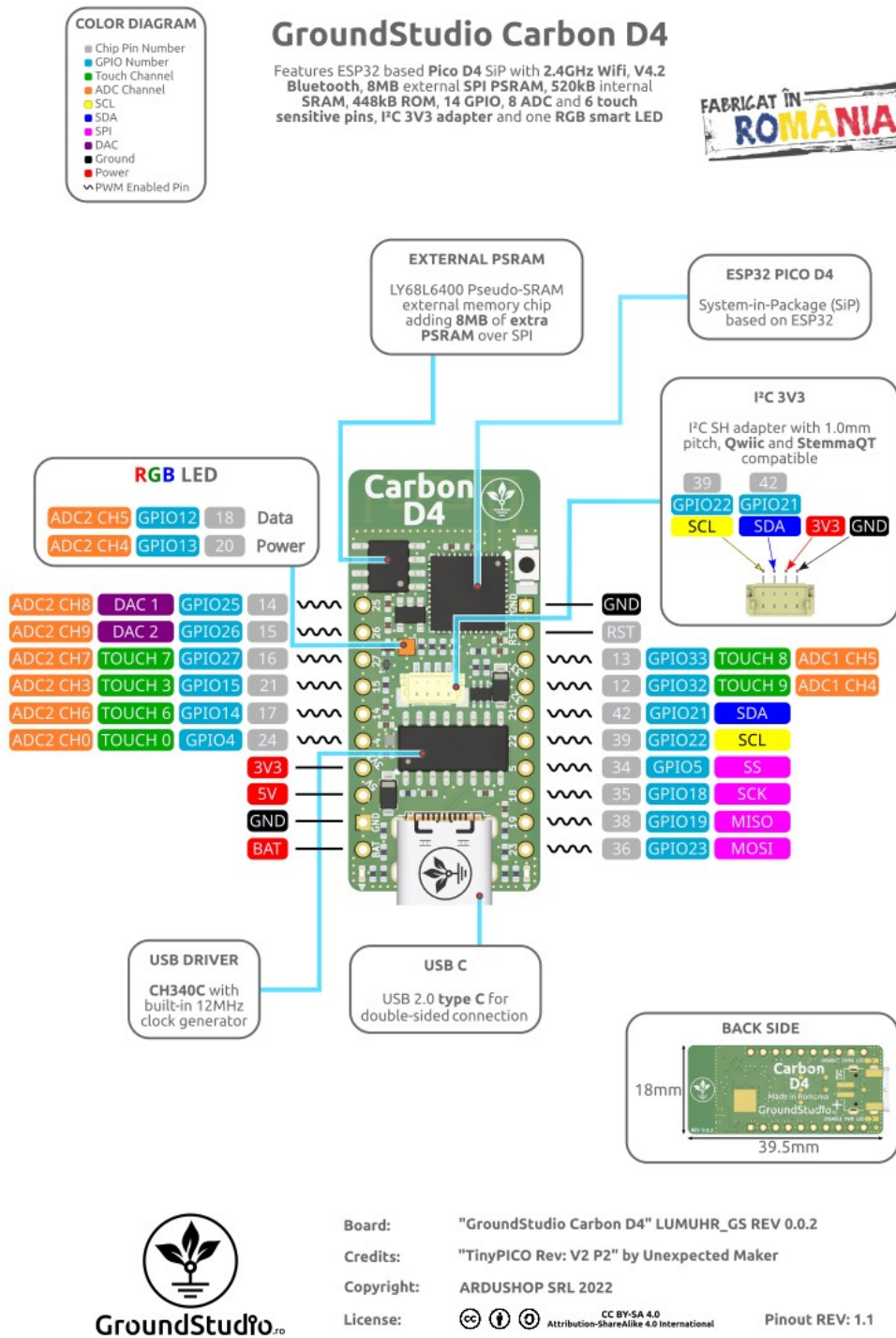
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Board Pinout

Figure 1: GroundStudio Carbon D4 pinout [Revision 1.1]
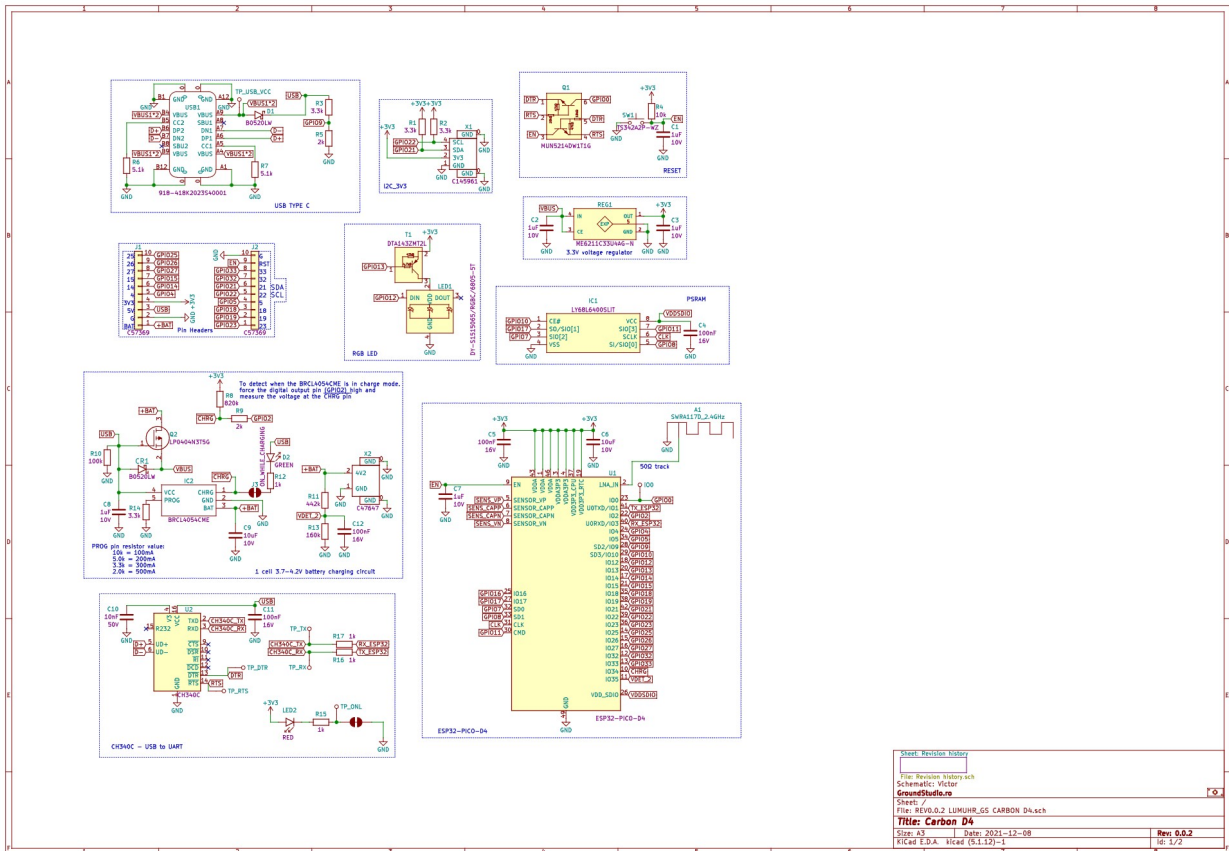
Board Circuit Schematic

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

All documentation for GroundStudio Carbon D4 is released under the Attribution-ShareAlike 4.0 International (CC BY-SA 4.0) license. You are welcome to use this for commercial purposes.

Please consider contributing back to this project or others to help the open-source hardware community continue to thrive and grow!

Overview

GroundStudio Carbon D4 is a very small and fully equipped board, designed to unlock the power of the 240MHz dual-core ESP32 with 2.4GHz WiFi connectivity in a miniaturized package.

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

- 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.

This development board also features an integrated RGB LED.

Technical specifications

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

USB-Serial Converter: **CH340C**

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

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**

Wi-Fi frequency: **2.4GHz**

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

Definitions

Development board - is a hardware platform equipped with the necessary components, interfaces, and connectors for creating and testing prototypes of electronic devices or systems. These boards are designed to simplify the process of developing and testing new hardware and software applications. They typically contain a microcontroller, microprocessor, or system on a chip (SoC), along with various input/output interfaces.

They are a platform without independent functionality that can be used for testing, prototyping, or even as components for manufacturing final products (in which case it is the responsibility of the developer/manufacturer to obtain all necessary certifications).

System on Chip (SoC) - refers to an integrated circuit that combines all the components of a typical microcontroller within a single chip. It includes a processor core, memory (RAM and ROM) and other functionalities making them suitable for various embedded systems where space, power consumption, and cost are crucial factors.

Microcontroller (uC) - is a compact integrated circuit (IC) designed to function as the central processing unit (CPU) of embedded systems. It consists of a processor core, memory (both volatile RAM and non-volatile ROM or flash memory), and various peripherals, such as input/output interfaces, timers, serial communication ports, and other essential components, all on a single chip.

Developer info

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Datasheet Revision History

[Revision 1] - Initial version release

[Revision 1.1] - Updated pinout to REV 1.1