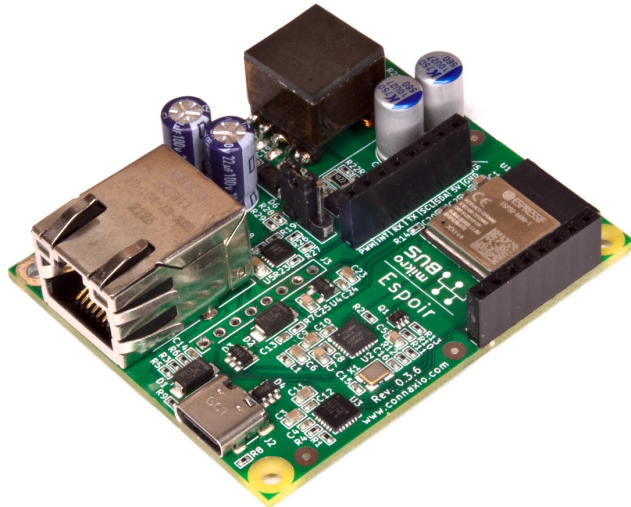


Espoir



Espoir is a Power over Ethernet+ (PoE+ 802.3af/at) mikroBUS™ mainboard based on the ESP32-MINI-1 microcontroller. Espoir reduces risk, cost, and time to market by allowing developers to jump to application development straight away.

Powerful 15 Watts of PI-filtered, isolated power available at a distance of 100 meters with a single cable.

Connectible Interacts via Ethernet, USB-C, Wi-Fi and Bluetooth.

Programmable With only a USB-C cable, or a full-featured JTAG programmer.

Versatile Hardware-compatible with over 1,300 mikroBUS™ add-on boards and software-compatible with ESP-IDF, Arduino and microPython libraries.

Robust Industrial temperature range and four copper layers for better heat dissipation and EMC.

Open source Espoir is licensed under CERN-OHL-W-2.0 and is certified by the Open Source Hardware Association (OSHW).

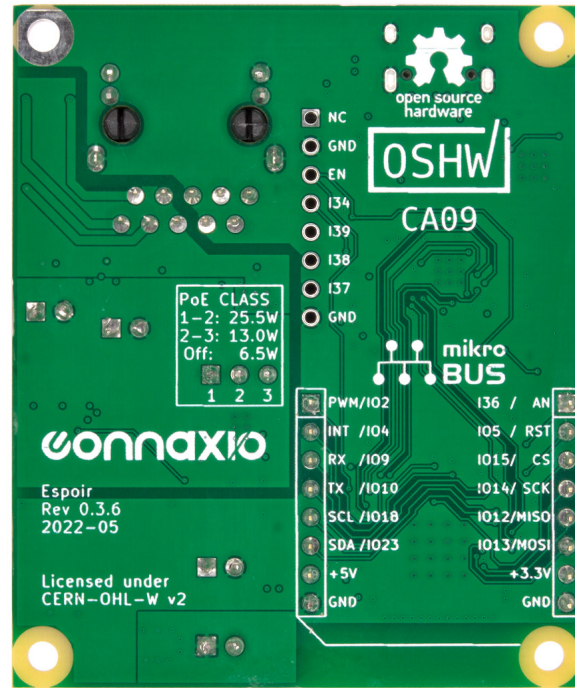
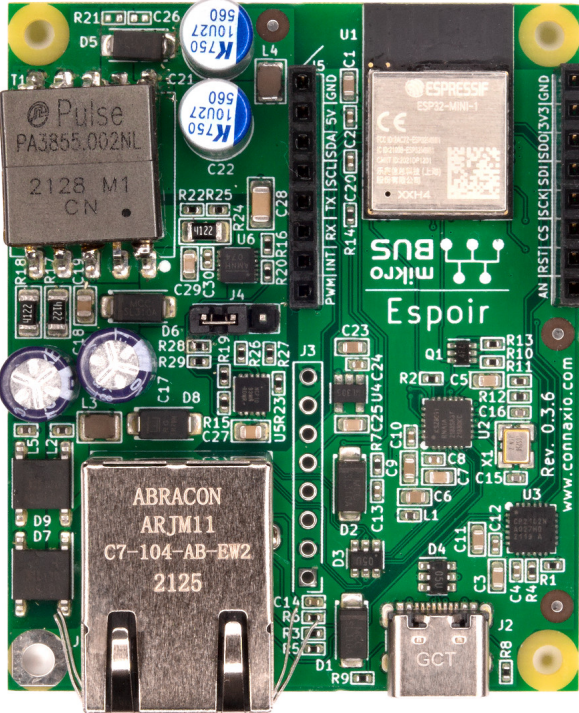
Specifications

- Processing
 - ESP32-MINI-1: Single core 240 MHz
 - 520 KB SRAM
 - 4 MB flash
- Power
 - Input: 37 V - 57 V PoE+ through the Ethernet connector, with 2,250 V isolation, and jumper-selectable PoE Class 2, 3, and 4
 - Input: 5 V through the USB-C connector¹
 - Output: 5 V at 3 A (15 W) from the PoE+ input²
 - Output: 3.3 V at 0.7 A (2.3 W) from the 5 V output
- Connectivity
 - Wifi 2.4 GHz 802.11b/g/n & integrated antenna
 - Bluetooth 4.2 BLE
 - Ethernet 10/100-BaseT (80+ mbps throughput)
 - USB 2.0 via USB-C connector (up to 2 MBaud)
 - A mikroBUS™ socket with two grounds, 5 V, 3.3 V and 12 IOs
 - An extension header with two grounds, four input only pins, and the ESP32 reset signal
- Mechanical
 - Weight: 33 g
 - Size: 50.8 x 61.0 mm², thickness 1.6 mm, four copper layers
 - Mounting holes: 5x M2.5 / 4-40. The bottom-center hole is plated and connected to local ground.
 - 1 mikroBUS™ socket and a 1x8 optional extension header. An L format (57.15 mm / 2.25 in) mikroBUS™ add-on board arrives flush with the bottom of the PCB.
- Operating temperature range: -40°C to +85°C

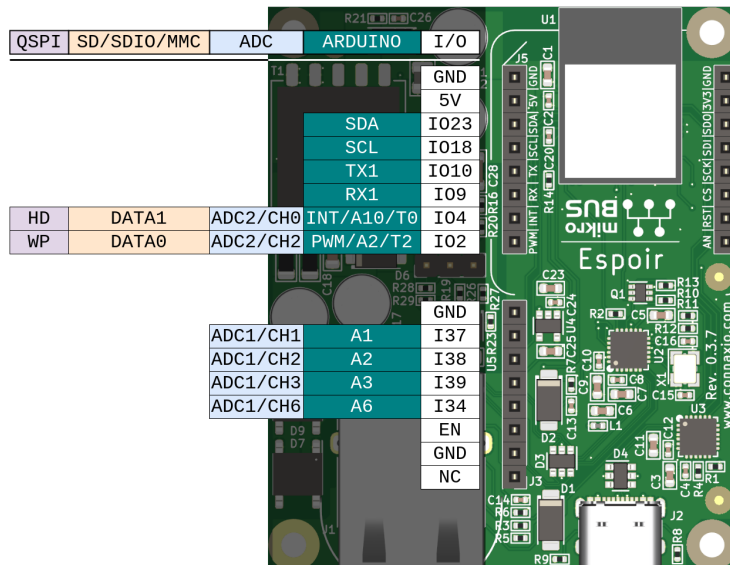
¹ USB VBUS (5 V) is connected to the 5 V rail through a schottky diode. When only USB power is connected, the voltage on the 5 V rail is 4.6 V.

² The 3.3 V rail is derived from the 5 V supply. Current consumed by the 3.3 V rail counts towards the 5 V rail's maximum current supply.

Top and bottom views



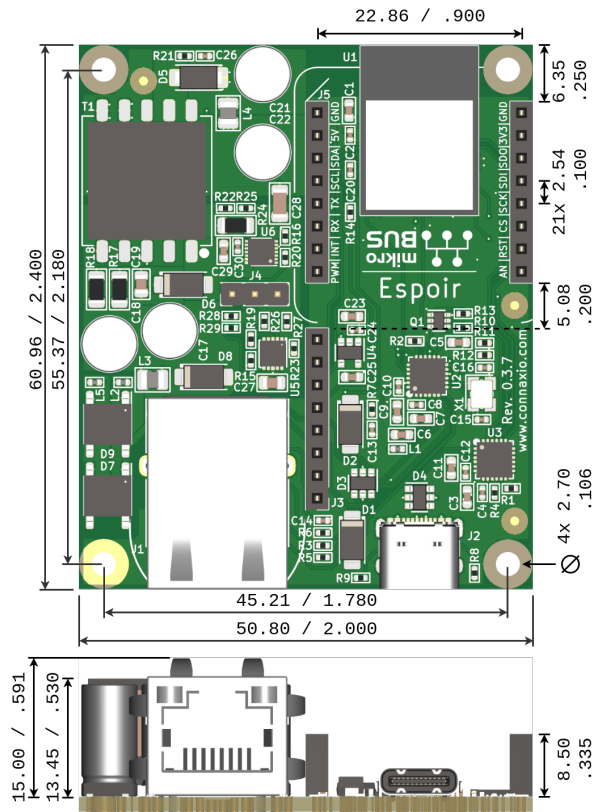
Pinout



I/O	ARDUINO	ADC	SD/SDIO/MMC	QSPI	JTAG
GND					
3.3V					
I013	MOSI/SD0/A14/T4	ADC2/CH4	DATA3	D	MTCK
I012	MISO/SDI/A15/T5	ADC2/CH5	DATA2	Q	MTDI
I014	SCK/A16/T6	ADC2/CH6	CLK	CLK	MTMS
I015	CS/SS/A13/T3	ADC2/CH3	CMD	CS0	MTDO
I05	RST				
I36	AN/A0	ADC1/CH0			

- UART, I²C, SPI, PWM, I²S, RMT, TWAI(CAN2.0): Any I/O
- I34-I39 are input-only pins

Dimensions



The main dimensions of Espoir are presented here. Complete 3D models can be found in Espoir's repository on Github.

Connector shields and the bottom-left mounting hole are connected to the local ground. It is therefore safe (and recommended) to connect them to a metal case.

Care must be taken to leave enough spacing under the PCB to avoid accidental contact of the through-hole pins with the case. A 1 mm gap should be observed between the pins and any conductive material to maintain proper isolation. 3 mm between the bottom of the PCB and the mounting surface is typically a good starting point.

Quick links

Connaxio's website <https://www.connaxio.com>

Espoir's web page <https://www.connaxio.com/electronics/espoir/>

Espoir's launch page at Crowd Supply <https://www.crowdsupply.com/connaxio/espoir>

Connaxio's Github profile <https://github.com/Connaxio>

Espoir's repository at Github <https://github.com/Connaxio/espoir>

Espoir's open source certification <https://certification.oshwa.org/ca000009.html>

Datasheet for the ESP32-MINI-1 https://www.espressif.com/sites/default/files/documentation/esp32-mini-1-datasheet_en.pdf

Datasheet for the ESP32-U4WDH https://www.espressif.com/sites/default/files/documentation/esp32-datasheet_en.pdf