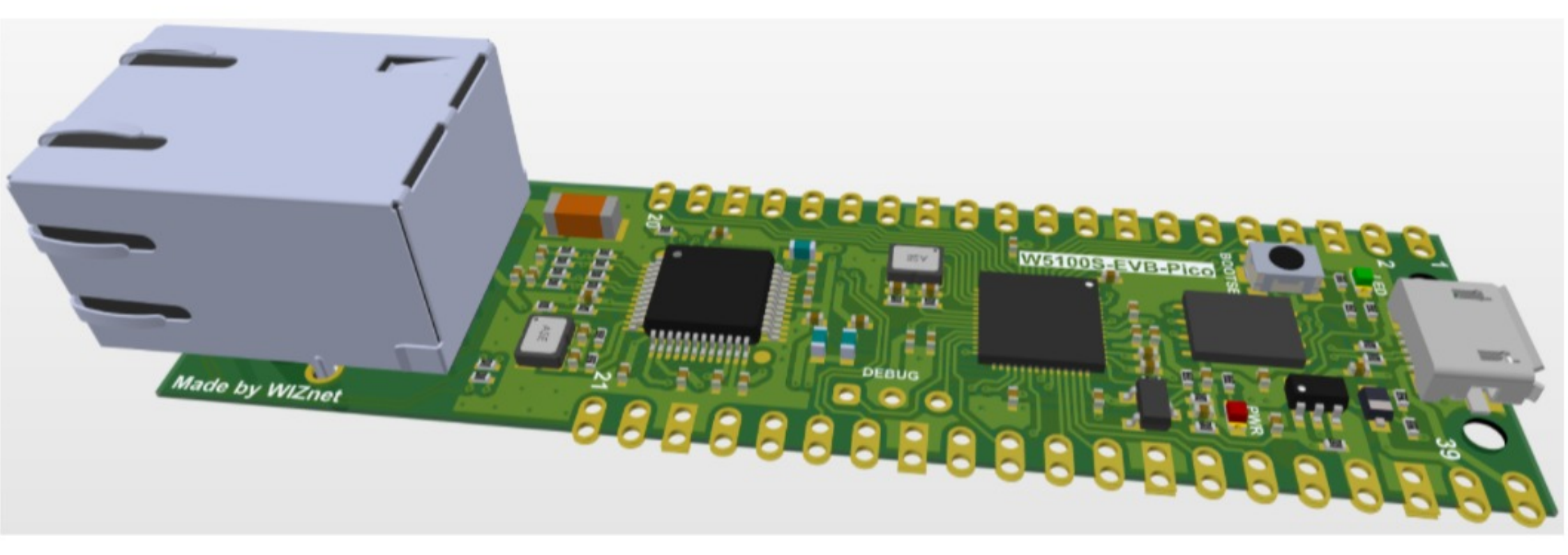
W5100S-EVB-Pico

Overview

The W5100S-EVB-Pico is a microcontroller evaluation board based on the Raspberry Pi RP2040 microcontroller chip and full hardwired TCP/IP controller W5100S chip. The W5100S-EVB-Pico has the same role as the Raspberry Pi Pico platform and includes W5100S, so the Ethernet function is basically included.

- Raspberry Pi Pico Clone
- Ethernet (W5100S Hardwired TCP/IP CHIP)

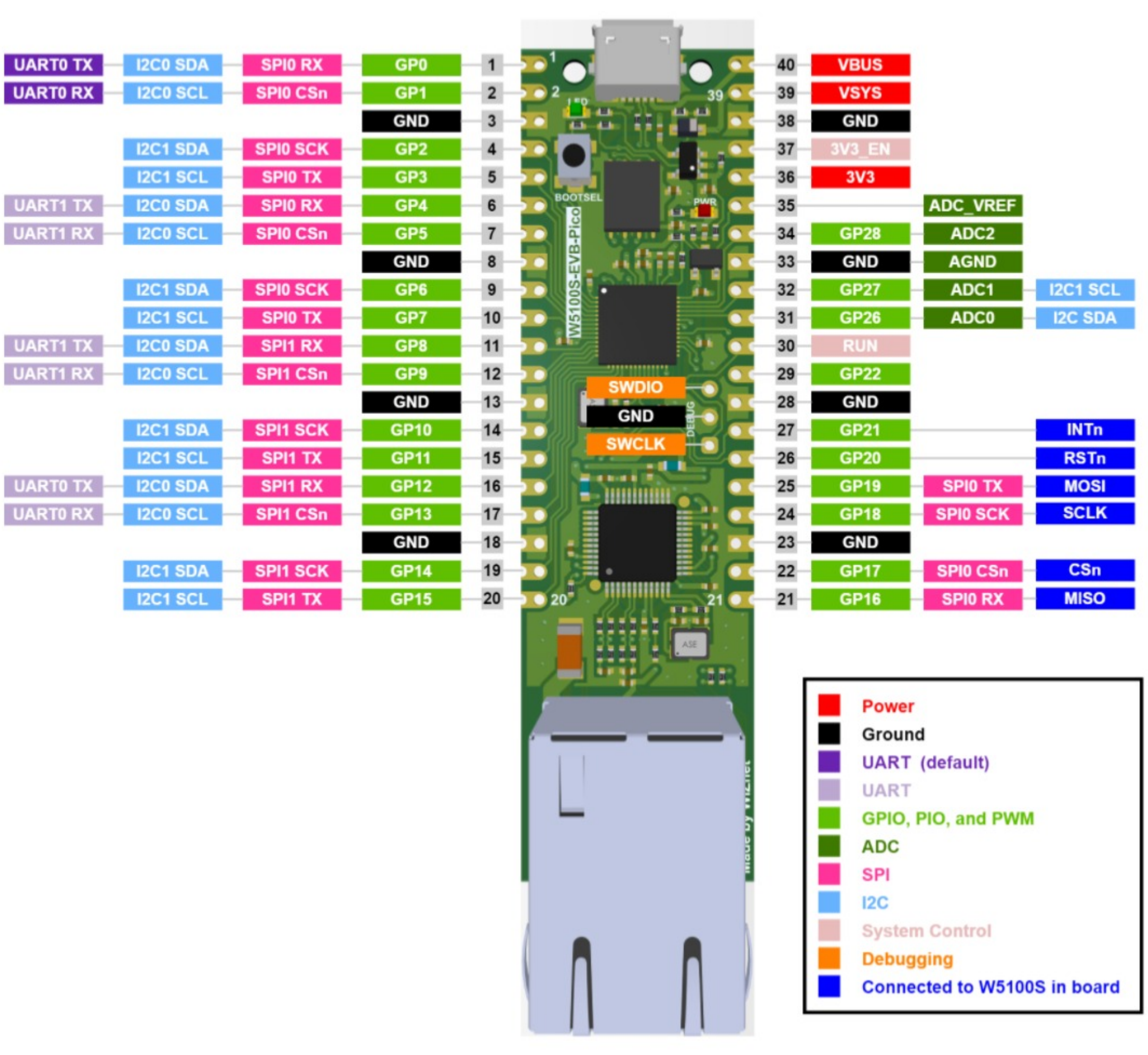


Features

- RP2040 microcontroller with 2MByte Flash
    - Dual-core cortex M0+ at up to 133MHz
    - 264kByte multi-bank high performance SRAM
    - External Quad-SPI Flash with eXecute In Place (XIP)
    - High performance full-crossbar bus fabric
    - 30 multi-function General Purpose IO (4 can be used for ADC)
        - 1.8-3.3V IO Voltage (NOTE. Pico IO voltage is fixed at 3.3V)
    - 12-bit 500ksps Analogue to Digital Converter (ADC)
    - Various digital peripherals
        - 2 × UART, 2 × I2C, 2 × SPI, 16 × PWM channels
        - 1 × Timer with 4 alarms, 1 × Real Time Counter
    - 2 × Programmable IO (PIO) blocks, 8 state machines total
    - Flexible, user-programmable high-speed IO
    - Can emulate interfaces such as SD Card and VGA
- Includes W5100S
    - Supports Hardwired Internet Protocols: TCP, UDP, WOL over UDP, ICMP, IGMPv1/v2, IPv4, ARP, PPPoE
    - Supports 4 Independent Hardware SOCKETs simultaneously
    - Internal 16 Kbytes Memory for TX/ RX Buffers
    - SPI Interface
- Micro-USB B port for power and data (and for reprogramming the Flash)
- 40 pin 21x51 'DIP' style 1mm thick PCB with 0.1" through-hole pins also with edge castellations
- 3-pin ARM Serial Wire Debug (SWD) port
- 10 / 100 Ethernet PHY embedded
- Supports Auto Negotiation
    - Full / Half Duplex
    - 10 / 100 Based
- Built-in RJ45(RB1-125BAG1A)
- Built-in LDO (LM8805SF5-33V)

Hardware Specification

Pin-out



W5100S-EVB-Pico pinout is directly connected to the GPIO of RP2040 as shown in the picture above. It has the same pinout as the Raspberry Pi Pico board. However, GPIO16, GPIO17, GPIO18, GPIO19, GPIO20, GPIO21 are connected to W5100S inside the board. These pins enable SPI communication with W5100S to use Ethernet function. If you are using the Ethernet function, these pins cannot be used for any other purpose.

The RP2040 GPIO used inside W5100S-EVB-Pico is as follows.

I/O	Pin Name	Description
I	GPIO16	Connected to MISO on W5100S
O	GPIO17	Connected to CSn on W5100S
O	GPIO18	Connected to SCLK on W5100S
O	GPIO19	Connected to MOSI on W5100S
O	GPIO20	Connected to RSTn on W5100S
I	GPIO21	Connected to INTn on W5100S
I	GPIO24	VBUS sense - high if VBUS is present, else low
O	GPIO25	Connected to user LED
I	GPIO25	Used in ADC mode (ADC3) to measure VSYS/3

Apart from GPIO and ground pins, there are 7 other pins on the main 40-pin interface:

Pin No.	Pin Name	Description
PIN40	VBUS	Micro-USB input voltage, connected to micro-USB port pin 1. Nominally 5V.
PIN39	VSYS	Main system input voltage, which can vary in the allowed range 4.3V to 5.5V, and is used by the on-board LDO to generate the 3.3V .
PIN37	3V3_EN	Connects to the on-board LDO enable pin. To disable the 3.3V (which also de-powers the RP2040 and W5100S), short this pin low.
PIN36	3V3	Main 3.3V supply to RP2040 and W5100S, generated by the on-board LDO.
PIN35	ADC_VREF	ADC power supply (and reference) voltage, and is generated on W5100S-EVB-Pici by filtering the 3.3V supply.
PIN33	AGND	Ground reference for GPIO26-29.
PIN30	RUN	RP2040 enable pin, To reset RP2040, short this pin low.

Operation Condition

Item	Description
Operation Temperature MAX	85C (including self-heating)
Operation Temperature MIN	-20C
VBUS	DC 5V (+/- 10%)
VSYS Min	DC 4.3V
VSYS Max	DC 5.5V

Recommended maximum ambient temperature of operation is 70C.

Electrical Specification

Power Consumption

TBA

Technical Reference

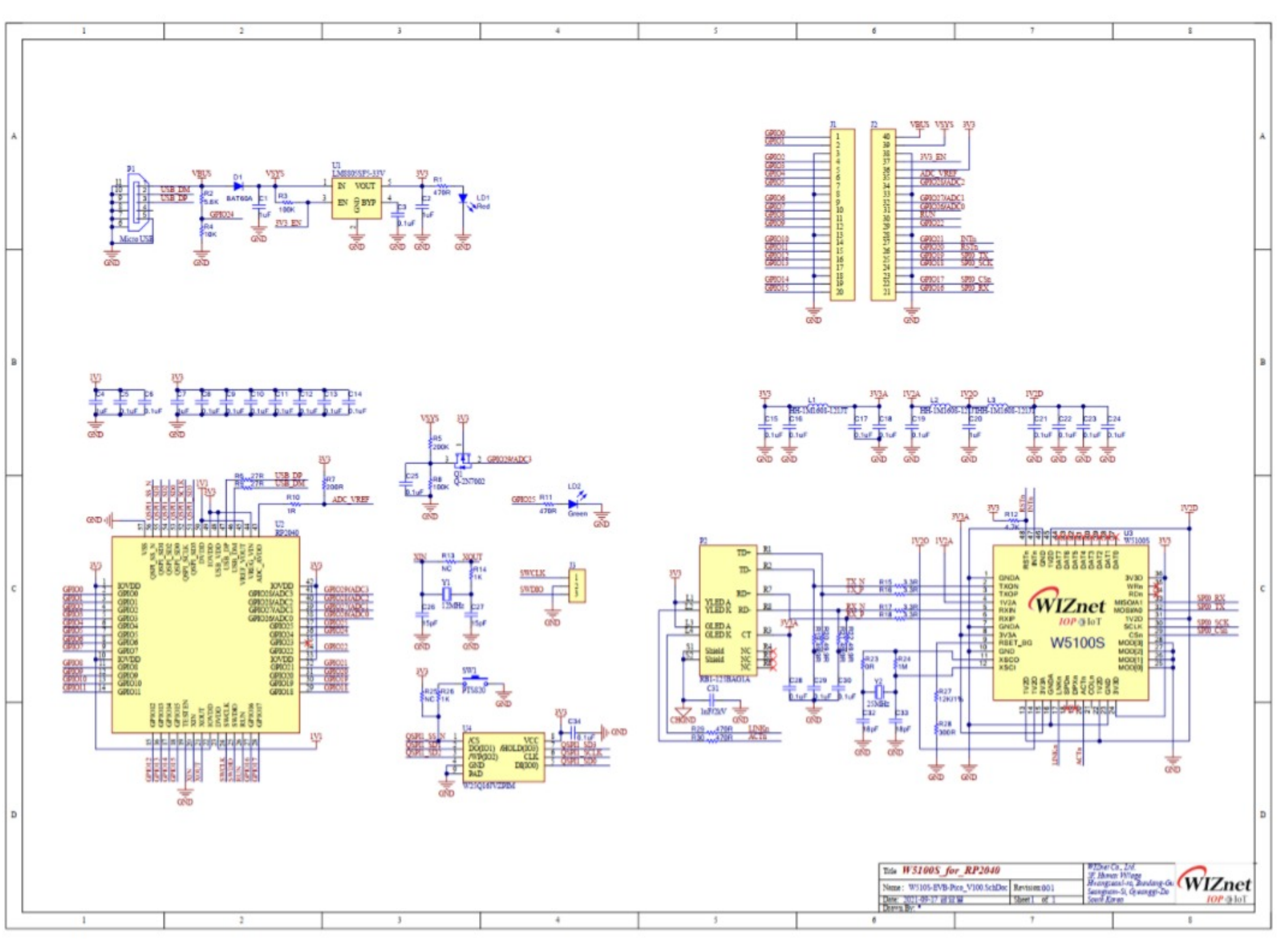
RP2040 Datasheet

- Download

W5100S Datasheet

- Download

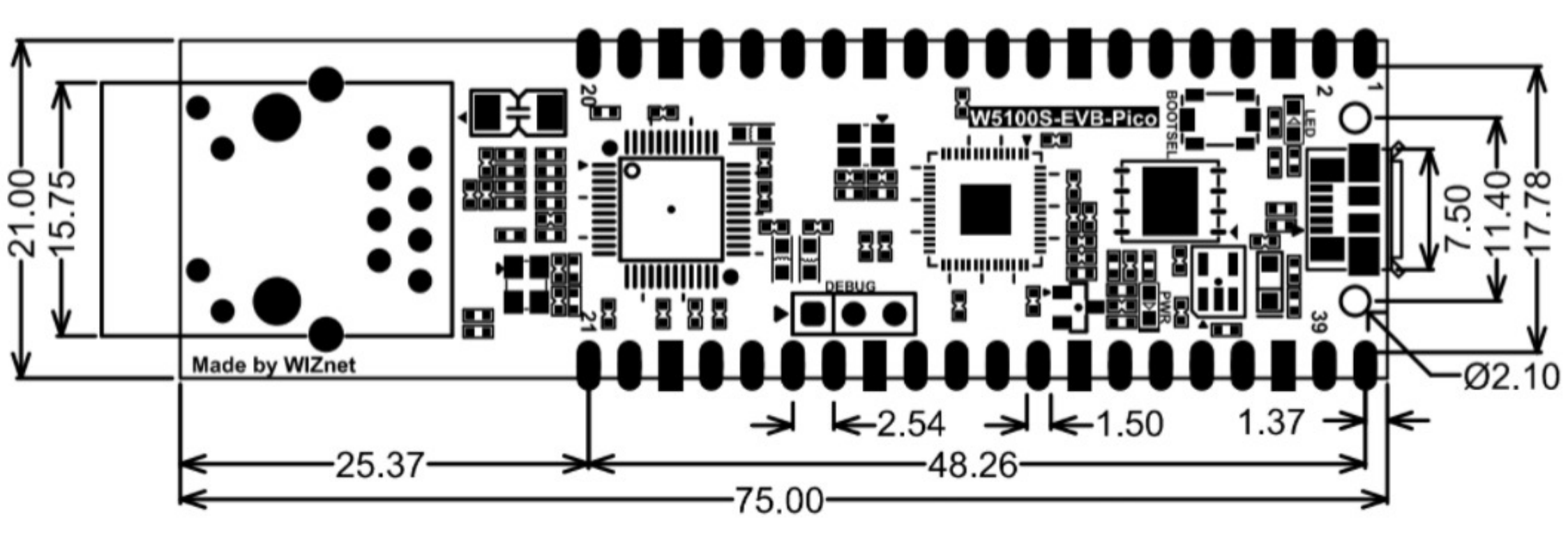
Schematic



Schematic & Part list & Gerber File

- Go to Github

Dimension (Unit : mm)



Firmware Example

Please refer to below links to find firmware example.

- C/C++ Examples

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