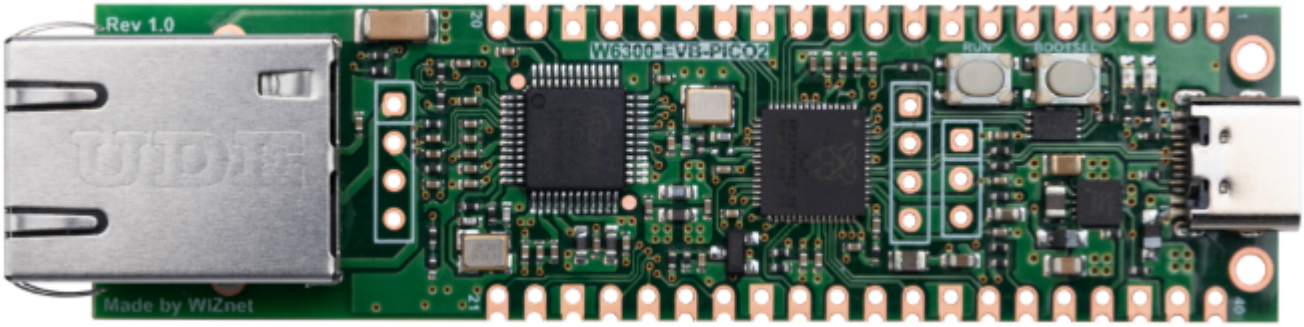
W6300-EVB-Pico2

Overview

W6300-EVB-Pico2 is a microcontroller evaluation board based on the Raspberry Pi RP2350 and fully hardwired TCP/IP controller W6300 – and basically works the same as Raspberry Pi Pico board but with additional Ethernet via W6300.

- Raspberry Pi Pico2 Clone
- Ethernet (W6300 Hardwired TCP/IP CHIP)



Revision history

Date	Version	Description
May 2025	1.0	Initial board release

Features

- **RP2350 Microcontroller with Integrated 16Mbit Flash**
  - Symmetric dual Arm Cortex-M33 cores at up to 150MHz
  - 520kByte multi-bank high performance SRAM
  - External Quad-SPI Flash with eXecute In Place (XIP) capabilities
  - Enhanced performance full-crossbar bus fabric

    - Up to 48 multi-function General Purpose IO (8 can be used for ADC on RP2350-B)
        - 1.8-5.0V IO Voltage

- **Security Features**

    - **One Time Programmable (OTP) Memory:** Used for boot configuration and secure key storage.
    - **Secure Boot:** Ensures that only authenticated software can run on the device, utilizing OTP for key verification.
    - **Arm TrustZone Technology:** Provides hardware isolation between secure and non-secure software, enhancing security for critical applications.

- **Analog and Digital Peripherals**

    - 12-bit 500ksps Analogue to Digital Converter (ADC)
    - 2 × UART, 2 × I2C, 2 × SPI, 16 × PWM channels
    - 1 × Timer with 4 alarms, 1 × Real Time Counter
    - 3 × Programmable IO (PIO) blocks, 12 state machines total
    - Flexible, user-programmable high-speed IO
    - Can emulate interfaces such as SD Card and VGA

- **W6300 Ethernet Controller**

    - Support Hardwired TCP/IP Protocols : TCP, UDP, IPv6, IPv4, ICMPv6, ICMPv4, IGMP, MLDv1, ARP, PPPoE
    - Support IPv4/IPv6 Dual Stack
    - Support 8 independent SOCKETs simultaneously with 64KB Memory
    - Support SOCKET-less Command: ARP, PING, ICMPv6(PING, ARP,DAD,NA,RS) Command for IPv6 Auto-configuration& Network Monitoring
    - Support Ethernet Power Down Mode & System Clock Switching for power save
    - Support Wake on LAN over UDP
    - Support Serial & Parallel Host Interface: High Speed QSPI(MODE 0/3), System Bus with 2 Address signal & 8bit Data
    - Internal 32Kbytes Memory for TX/ RX Buffers(total 64Kbytes Memory)
    - 10BaseT / 10BaseTe / 100BaseTX Ethernet PHY Integrated
    - Support Auto Negotiation (Full and half duplex, 10 and 100-based)
    - Support Auto-MDIX only on Auto-Negotiation Mode
    - Not support IP Fragmentation

- 3V operation with 5V I/O signal tolerance
- Network Indicator LEDs (Full/Half Duplex, Link, 10/100 Speed, Active)
- 48 Pin LQFP & QFN Lead-Free Package

- **Connectivity**
  - C-Type USB 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
- **Networking**
  - 10 / 100 Ethernet PHY embedded
  - Supports Auto Negotiation
    - Full / Half Duplex(10 / 100 Based)
  - Built-in RJ45(RB1-125BAG1A)
- **Power Supply**
  - Built-in Switch-mode DC-DC converter (replacing LDO for enhanced power efficiency)

Hardware Specification

Pin-out v1.0

PIN-OUT IMAGE COMMING SOON

W6300-EVB-Pico2 pinout is directly connected to the GPIO of RP2350 as shown in the picture above. It has the same pinout as the Raspberry Pi Pico2 board. However, GPIO15, GPIO16, GPIO17, GPIO18, GPIO19, GPIO20, GPIO21, GPIO22 are connected to W6300 inside the board. These pins enable QSPI communication with W6300 to use the Ethernet function. If you are using the Ethernet function, these pins cannot be used for any other purpose.

The RP2350 GPIO used inside W6300-EVB-Pico is as follows.

I/O	Pin Name	Description
O	GPIO15	Connected to INTn on W6300

I/O	Pin Name	Description
O	GPIO16	Connected to CSn on W6300
O	GPIO17	Connected to SCLK on W6300
I/O	GPIO18	Connected to IO0 (MOSI) on W6300 (QSPI)
I/O	GPIO19	Connected to IO1 (MISO) on W6300 (QSPI)
I/O	GPIO20	Connected to IO2 on W6300 (QSPI)
I/O	GPIO21	Connected to IO3 on W6300 (QSPI)
O	GPIO22	Connected to RSTn on W6300
I	GPIO24	VBUS sense - high if VBUS is present, else low
O	GPIO25	Connected to user LED
I	GPIO29	Used in ADC mode (ADC3) to measure VSYS/3

QSPI Mode IO Lines

The IO lines for each QSPI mode are as follows.

Mode	I/O	Pin Name	Description
Single	O	GPIO18	Connected to IO0 (MOSI) on W6300
Single	I	GPIO19	Connected to IO1 (MISO) on W6300

Mode	I/O	Pin Name	Description
Dual	I/O	GPIO18	Connected to IO0 on W6300 (Dual Mode)
Dual	I/O	GPIO19	Connected to IO1 on W6300 (Dual Mode)

Mode	I/O	Pin Name	Description
Quad	I/O	GPIO18	Connected to IO0 on W6300 (Quad Mode)
Quad	I/O	GPIO19	Connected to IO1 on W6300 (Quad Mode)
Quad	I/O	GPIO20	Connected to IO2 on W6300 (Quad Mode)

Mode	I/O	Pin Name	Description
Quad	I/O	GPIO21	Connected to IO3 on W6300 (Quad Mode)

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 RP2350 and W6300), short this pin low.
PIN36	3V3	Main 3.3V supply to RP2350 and W6300, generated by the on-board LDO.
PIN35	ADC_VREF	ADC power supply (and reference) voltage, and is generated on W6300-EVB-Pico2 by filtering the 3.3V supply.
PIN33	AGND	Ground reference for GPIO26-29.
PIN30	RUN	RP2350 enable pin, To reset RP2350, 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.

Technical Reference

RP2350 Datasheet

W6300 Datasheet

- Download

Schematic v1.0

- Reference Schematics

Schematic & Part list & Gerber File

Dimension v1.0 (Unit : mm)

Certification

CE

FCC

How to buy

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