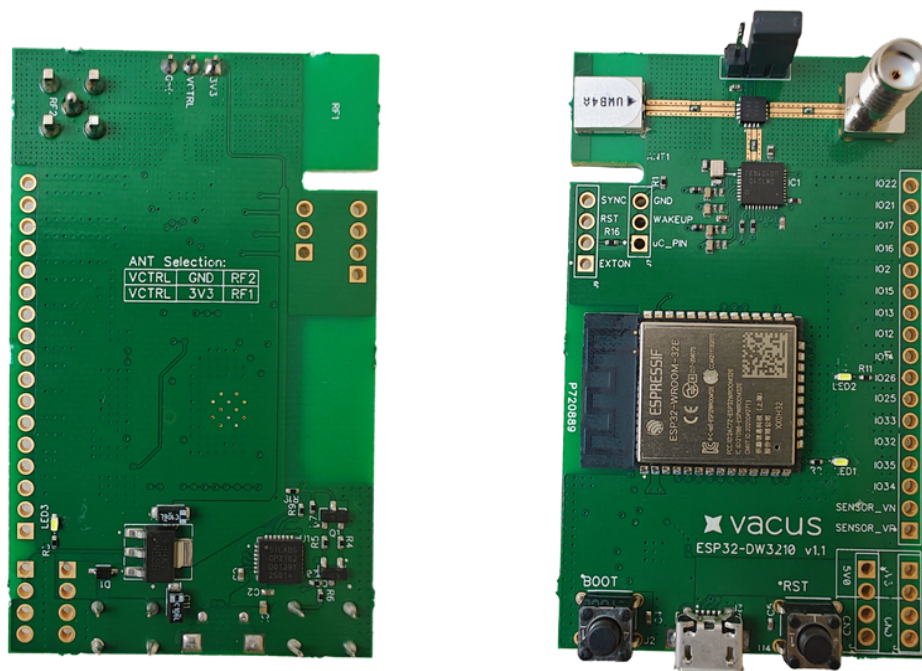




Vacus UWB DW3210 + ESP32 Evaluation Board With Selectable Antenna

Revision: 1.0 – July 2025



DW3210 + ESP32 with Selectable
Antenna Path (Chip / SMA)

1. Overview

This evaluation board integrates the ESP32 microcontroller with the DW3210 UWB transceiver and includes a flexible RF output configuration. A high-performance ADRF5019 SPDT RF switch enables users to select between:

- Onboard UWB Chip Antenna (ACS5200HFAUWB) — for compact and integrated evaluation
- External Antenna via SMA Connector — for improved range using a high-gain or custom antenna

The antenna path is selectable via an onboard jumper header, giving developers the freedom to trade off range vs. form factor during evaluation.

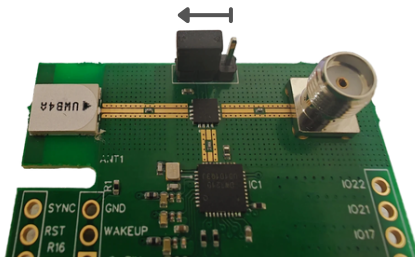
2. Key Components

Component	Description
ESP32 Module	Wireless microcontroller for data processing and control
DW3210	Ultra-Wideband (UWB) transceiver for precise positioning
ADRF5019BCPZN	High-linearity SPDT RF switch for antenna path selection
ACS5200HFAUWB	Compact chip antenna optimized for UWB operation
SMA Connector	For connecting external dipole/fat-dipole/high-gain UWB antennas

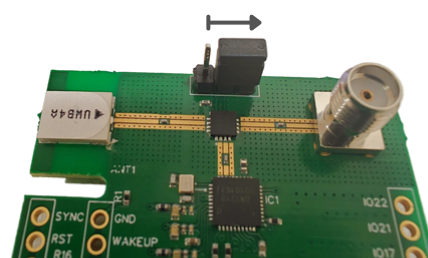
3. Applications

- UWB-based indoor positioning system (IPS) prototyping
- UWB ranging experiments
- Antenna performance comparison
- Wireless sensor network development

4. Antenna Selection (Jumper Setting)



Position 1



Position 2

Jumper Setting

RF Path Selected

Position 1 (Connected to ACS5200HFAUWB)

Onboard UWB chip antenna

Position 2 (Connected to SMA)

External antenna via SMA connector

Note: Power down the board before changing jumper position to avoid switch state inconsistencies.

5. Use Case Recommendations

- Onboard Chip Antenna: Use for compact, embedded form-factor tests or when testing in confined indoor spaces.
- External Antenna (SMA): Use for range testing, high-accuracy positioning, or directional antenna experiments (e.g., fat dipole, horn).

6. Important Notes

- Ensure 50-ohm impedance matching on any external antenna connected via SMA.
- Antenna selection is done manually via jumper—there is no software control for antenna path switching in this version.
- When using the SMA antenna, place the evaluation board in an orientation that avoids obstruction from nearby ground planes or enclosures for optimal UWB performance.

7. Hardware

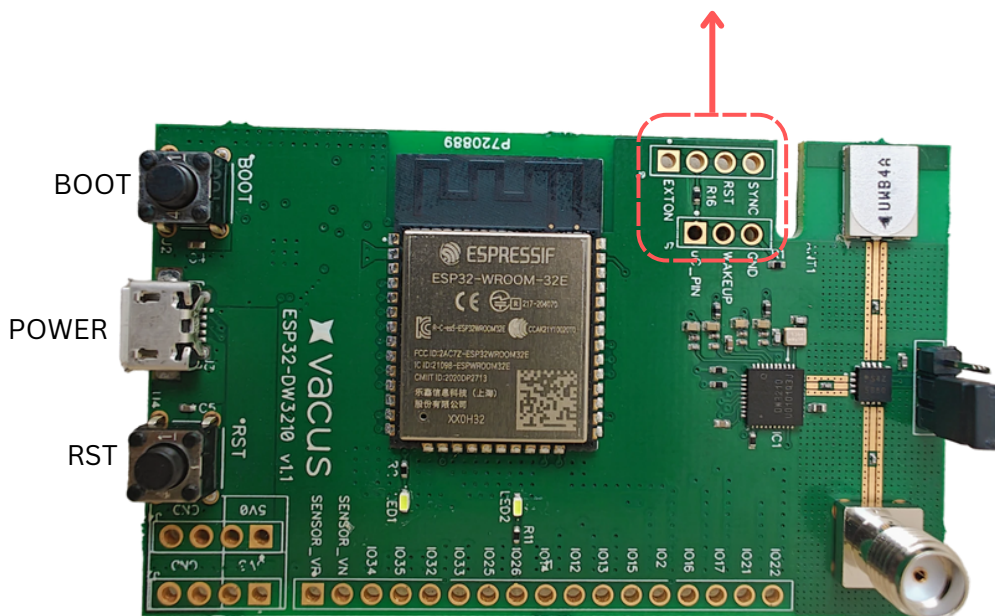
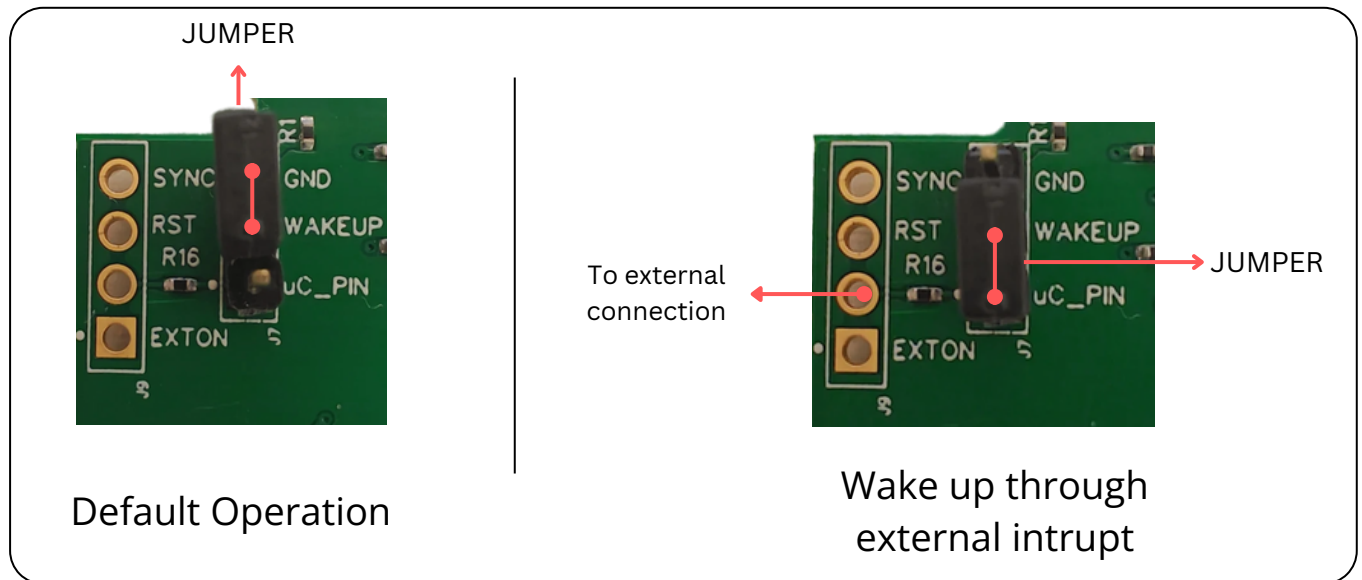


Fig: UWB DW3210 + ESP32 Evaluation Board

Pin connection
(ESP32 - DW3210)

RST	IO 27
IRQ	IO 4
SS	IO 5
SPI_CLK	IO 18
SPI_MOSI	IO 23
SPI_MISO	IO 19

LED 1	IO 17
LED 2	IO 26