
WT9932C5 TINY User Guide

WT9932C5 Development Board User Manual

,

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Revision History

Version	Date	Changed By	Change Item
V1.0	2025/11/21	Kirto	Initial Document Creation

1. Development Board Overview

1.1 Product Categories

1.2 Development Board Introduction

WT9932C5-TINY is a mini development board designed for lightweight IoT development.

It is powered by Espressif's **ESP32-C5** chip and equipped with Wireless-Tag's **WT0132C5-S5** module.

With an ultra-compact size of **23 × 38 mm**, it balances high performance with rich functionality.

The board runs at up to **240 MHz** and supports **Wi-Fi 6 (802.11ax) + Bluetooth 5.3 dual-mode communication**, offering higher throughput, lower latency, and improved communication distance and anti-interference compared to previous generations.

The integrated hardware encryption engine and secure boot mechanism ensure reliability for security-sensitive devices such as smart locks.

All pins are fully broken out for breadboard prototyping.

It integrates a **USB-to-UART chip** for simplified debugging.

Onboard **RGB LED, EN and BOOT buttons, and power indicator** allow functional testing and status monitoring.

The LDO power design supports up to **1 A output** for stable peripheral power.

Shorting EN to GND switches the board into a **USB-to-UART adapter mode**, enhancing versatility.

1.3 Product Features

1. Ultra-compact size, high integration

23×38 mm mini size suitable for space-constrained scenarios.

Integrated module, USB-to-UART, onboard LED/buttons—ready for immediate development.

2. High performance, dual-mode wireless

ESP32-C5 @ 240 MHz, supporting Wi-Fi + Bluetooth dual-mode for smart home, remote control, and data transmission scenarios.

3. Flexible development, easy compatibility

Fully broken-out pins compatible with breadboards, sensors, and actuators.

Built-in USB-to-UART eliminates extra adapters.

Supports rapid development using MicroPython.

4. Multi-function debugging

EN and BOOT buttons for easy download mode entry.

Short EN to GND to switch into USB-to-UART debugging mode.

5. Stable power and visible status

LDO supports up to **1 A output**.

Power LED shows status; RGB LED can indicate network or data transmission.



1.4 Development Board Images

Front view:



Figure 1 – Front

Back view:

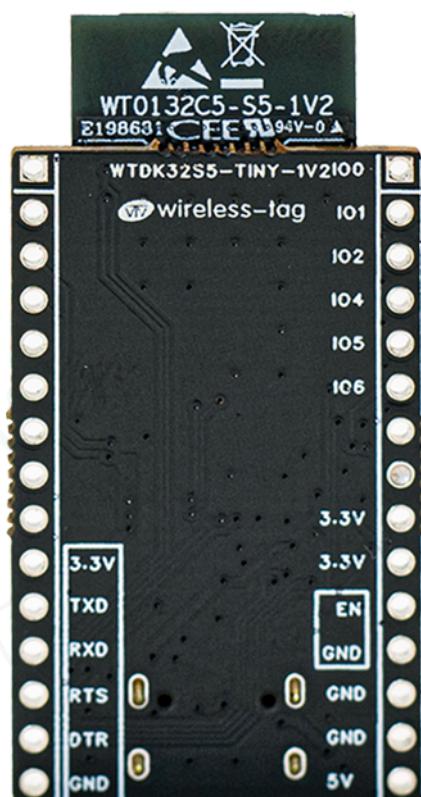


Figure 2 – Back

2. Hardware Reference

2.1 Functional Block Diagram

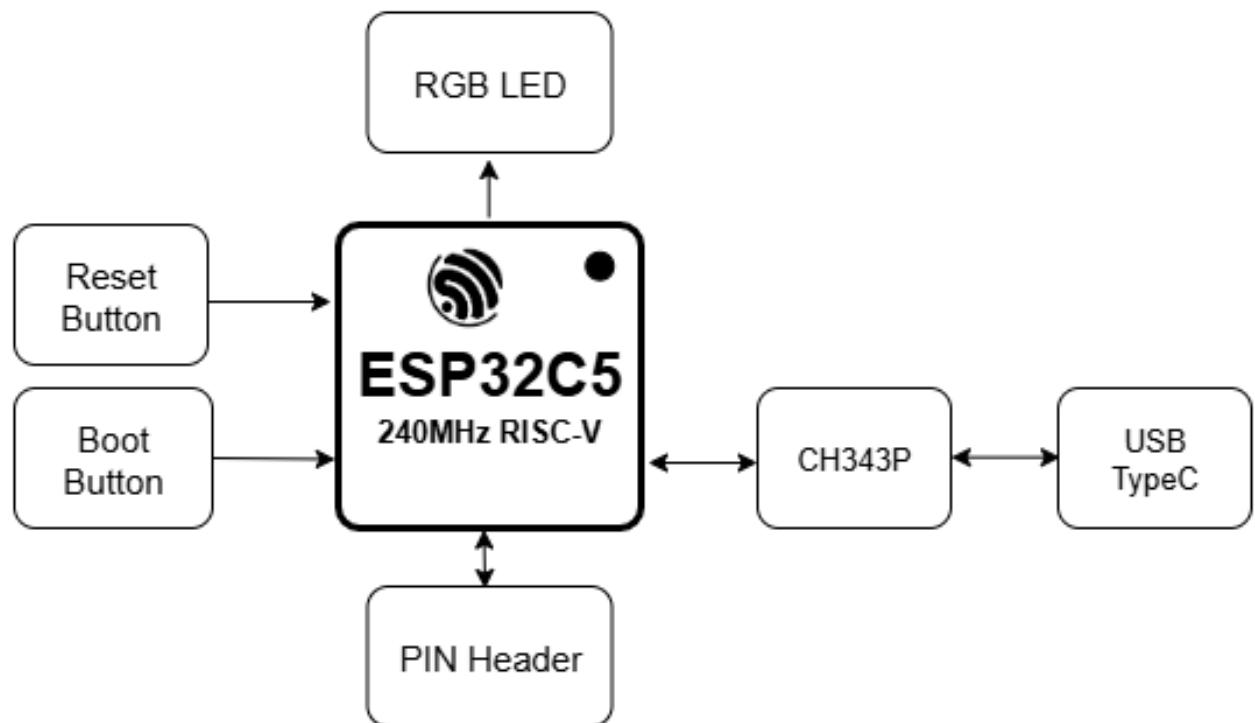


Figure 3 – Block Diagram

2.2 Hardware Peripherals

Peripheral	Description
WS2812	Single-wire RGB LED connected to IO6
RESET Button	Reset
BOOT Button	Enter download mode (on IO9)
USB	USB-to-UART for power and flashing
CH343P	USB-to-UART converter

2.3 Component Overview

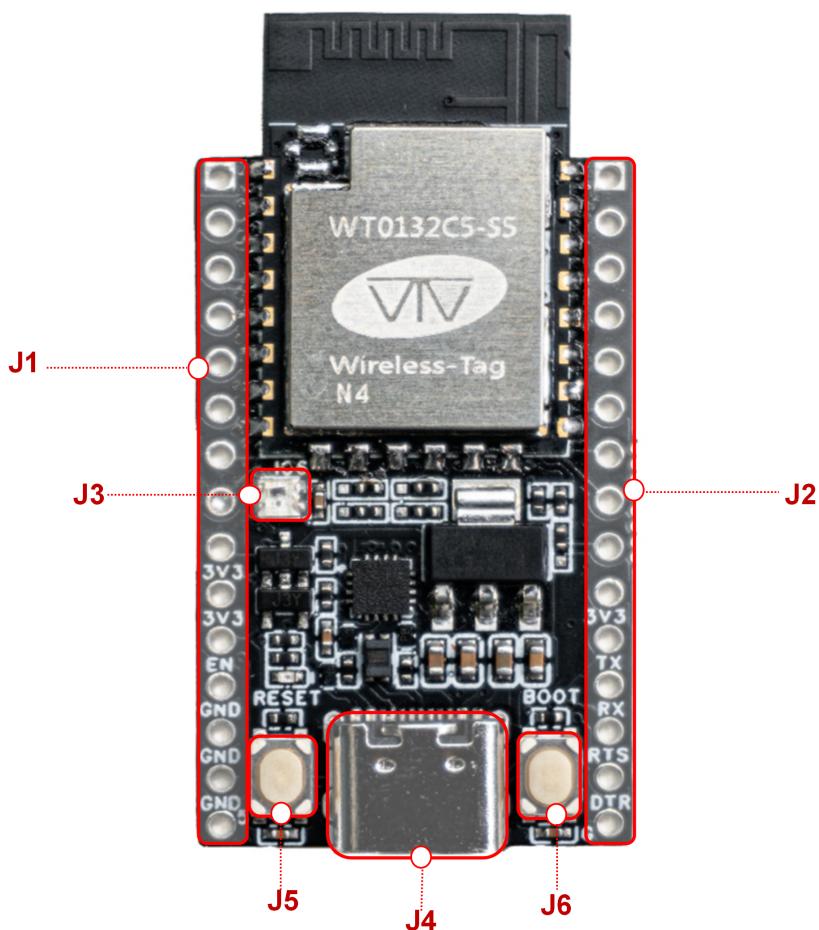


Figure 4 – Components

No.	Component Name	Description
J1/J2	Pin Headers	2.54 mm headers; short EN and GND to use board as USB-to-UART adapter
J3	RGB LED	SMD 2020 single-wire LED connected to IO6
J4	USB 2.0 Type-C Port	USB-to-UART debugging interface
J5/J6	Tactile Buttons	RESET and BOOT mode

2.4 Interface Footprints

Interface	Footprint	Notes
Pin Headers ×2	HDR-TH_15P-P2.54-V-M	Breadboard compatible
USB Type-C	USB-C-SMD_TYPE-C	USB-to-UART debugging

2.5 Interface Descriptions

[J1] Pin Header

No.	Pin	Description	Voltage	Notes
1	IO0	GPIO 0	0/3.3V	
2	IO1	GPIO 1	0/3.3V	
3	IO2	GPIO 2	0/3.3V	
4	IO4	GPIO 4	0/3.3V	
5	IO5	GPIO 5	0/3.3V	
6	IO6	GPIO 6	0/3.3V	
7	IO13	GPIO 13	0/3.3V	
8	IO14	GPIO 14	0/3.3V	
9	3.3V	Power Output	3.3V	
10	3.3V	Power Output	3.3V	
11	EN	Reset/Enable	0V	

No.	Pin	Description	Voltage	Notes
12-14	GND	Ground	0V	
15	5V	Power Output	5V	

[J2] Pin Header

No.	Pin	Description	Voltage	Notes
1	IO25	GPIO 25	0/3.3V	
2	IO26	GPIO 26	0/3.3V	
3	IO28	GPIO 28	0/3.3V	
4	IO27	GPIO 27	0/3.3V	
5	IO24	GPIO 24	0/3.3V	
6	IO10	GPIO 10	0/3.3V	
7	IO9	GPIO 9	0/3.3V	
8	IO8	GPIO 8	0/3.3V	
9	IO7	GPIO 7	0/3.3V	
10	3.3V	Power Output	3.3V	
11	RXD	CH343P UART RX	0/3.3V	
12	TXD	CH343P UART TX	0/3.3V	
13	RTS	CH343P flow control	0/3.3V	
14	DTR	CH343P flow control	0/3.3V	
15	GND	Ground	0V	

[J3] RGB LED

Single-wire **WS2812** LED connected to IO6.

[Datasheet](#)

[J4] Type-C Port

USB-to-UART chip: **CH343P**

[Datasheet](#)

Short EN to GND to use as USB-to-UART converter.

3. Schematic

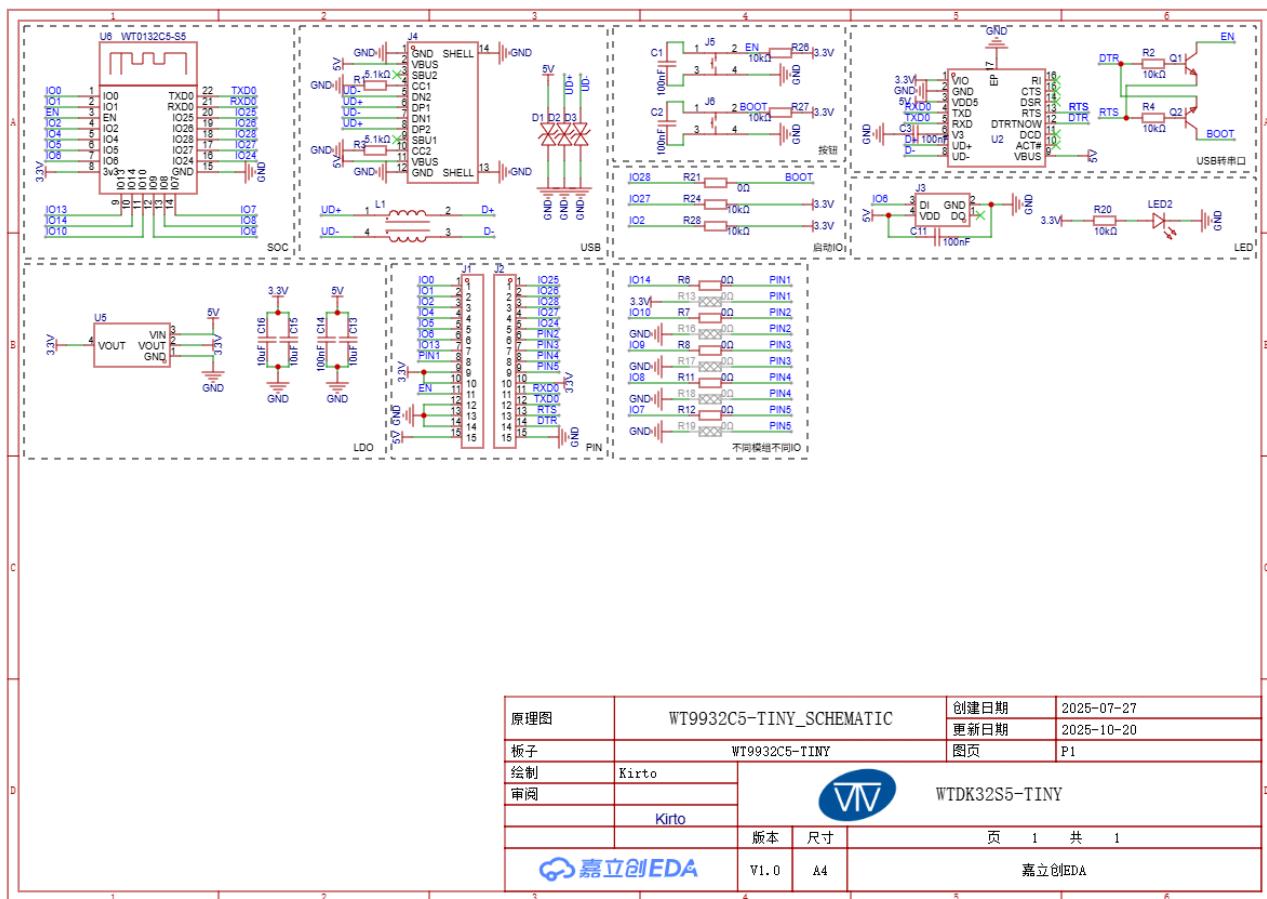


Figure 5 – Schematic

4. Mechanical Support

4.1 PCBA Dimensions

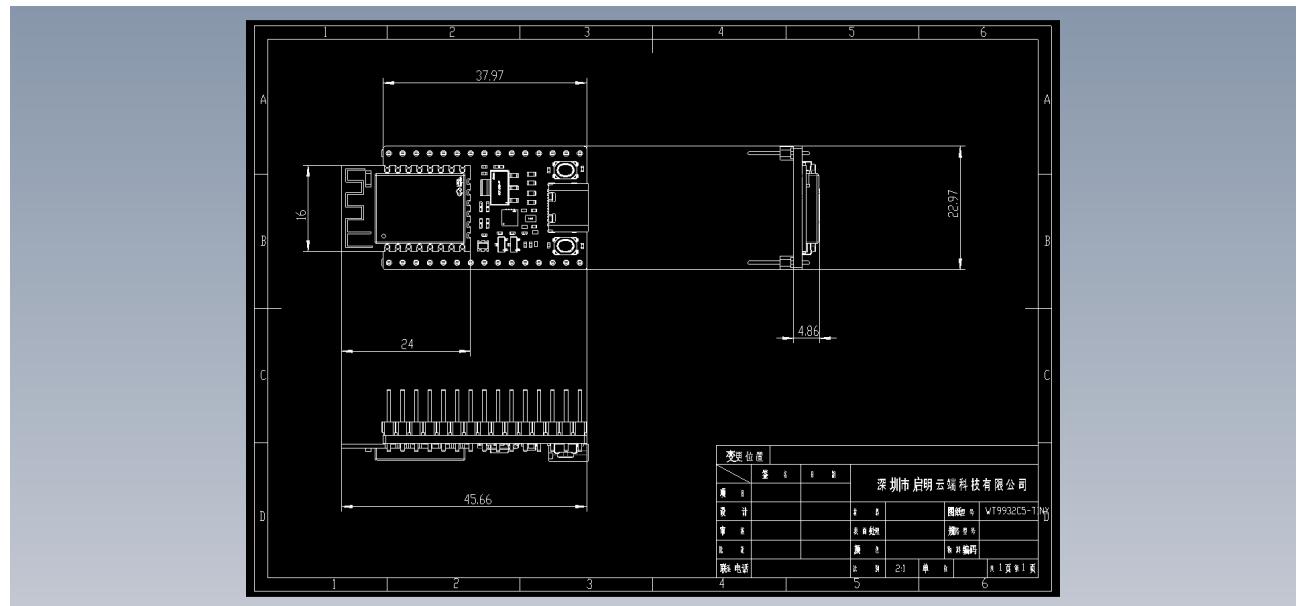


Figure 6 – Dimensions

5. User Guide

5.1 Preparation

Prepare the following before use:

1. **USB-C cable × 1**
For power or PC connection. High-quality cable recommended.
2. **WT9932C5-TINY board × 1**

5.2 Hardware Setup

1. Power the board

- Connect to PC or USB adapter (5V/1A or higher recommended).
- Power on, indicator LED lights up.

5.3 Usage Instructions

1. Set up IDF environment

[Official Quick Start](#)

2. Clone example

Clone the official blink example and export esp-idf.

3. Build and flash example

Connect via USB-C:

```
1 idf.py set-target esp32c5
2 idf.py build
```

Set IO to 6 in menuconfig:

```
1 idf.py menuconfig
```

Flash the example:

```
1 idf.py flash
```

RGB LED will blink on the board.

6. Related Documents

Document Name	Link	Description
WT9932C5-TINY User Guide	WT9932C5-TINY - Device User Guide	
ESP32-C5 IDF Documentation	https://docs.espressif.com/projects/esp-idf/zh_CN/v5.5.1/esp32c5/get-started/index.html	ESP-IDF Programming Guide & API Docs
ESP32-C5 Technical Reference	https://www.espressif.com.cn/sites/default/files/documentation/esp32-c5_datasheet_cn.pdf	ESP32-C5 Chip Specifications
Micropython Documentation	https://docs.micropython.org/en/latest/	

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Figure 7 – Wireless-Tag QR Code