
WT9932C5 TINY User Guide

WT9932C5 Development Board User Manual

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Contents

Disclaimer 2

Note 2

1. Development Board Overview 4

1.1 Product Categories 4

1.2 Development Board Introduction 4

1.3 Product Features 4

1.4 Development Board Images 6

2. Hardware Reference 8

2.1 Functional Block Diagram 8

2.2 Hardware Peripherals 9

2.3 Component Overview 9

2.4 Interface Footprints 10

2.5 Interface Descriptions 10

[J1] Pin Header 10

[J2] Pin Header 11

[J3] RGB LED 11

[J4] Type-C Port 12

3. Schematic 13

4. Mechanical Support 14

4.1 PCBA Dimensions 14

5. User Guide 15

5.1 Preparation 15

5.2 Hardware Setup 15

5.3 Usage Instructions 15

6. Related Documents 16

7. Contact Us 16

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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.

 wireless-tag
深圳市启明云端科技有限公司

1.4 Development Board Images

Front view:



Figure 1 – Front

Back view:

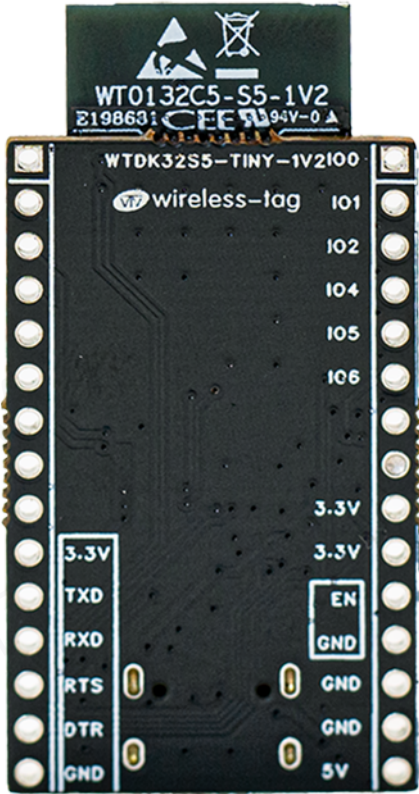


Figure 2 – Back

2. Hardware Reference

2.1 Functional Block Diagram

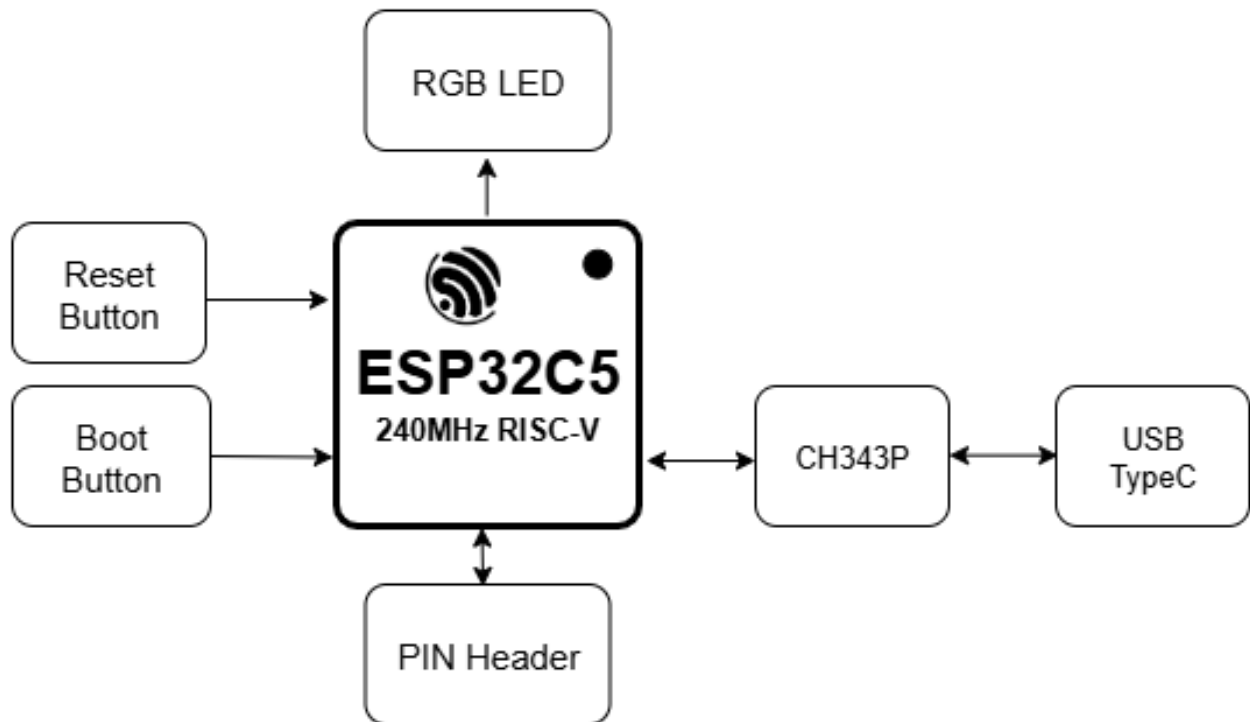


Figure 3 – Block Diagram

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

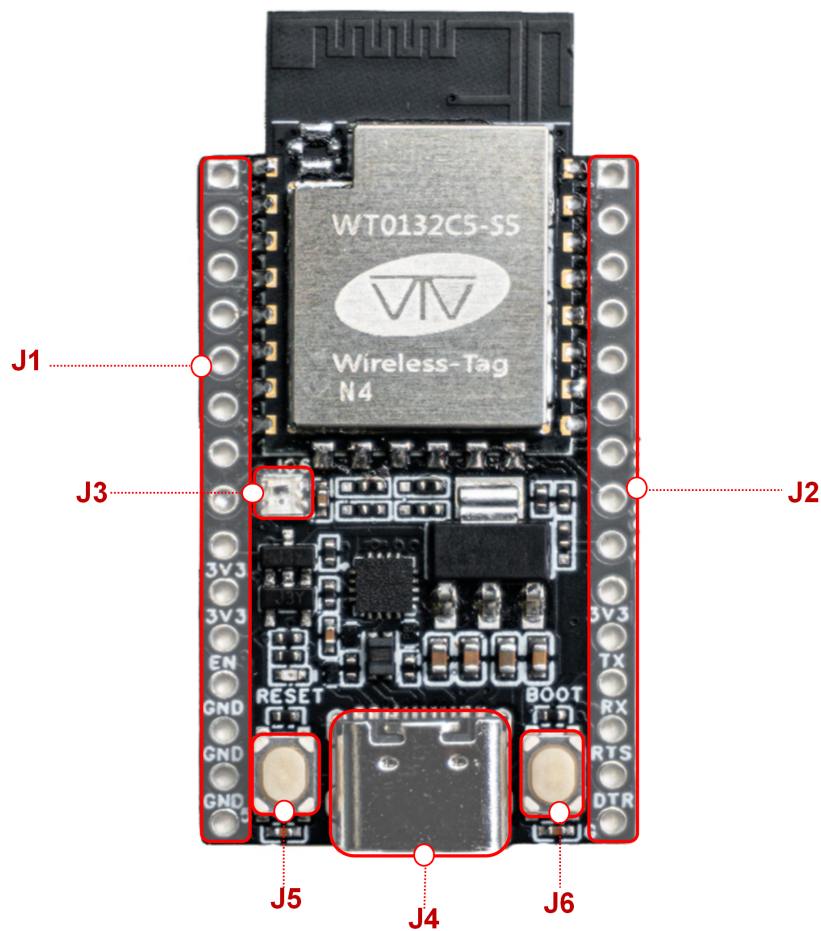


Figure 4 – Components

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

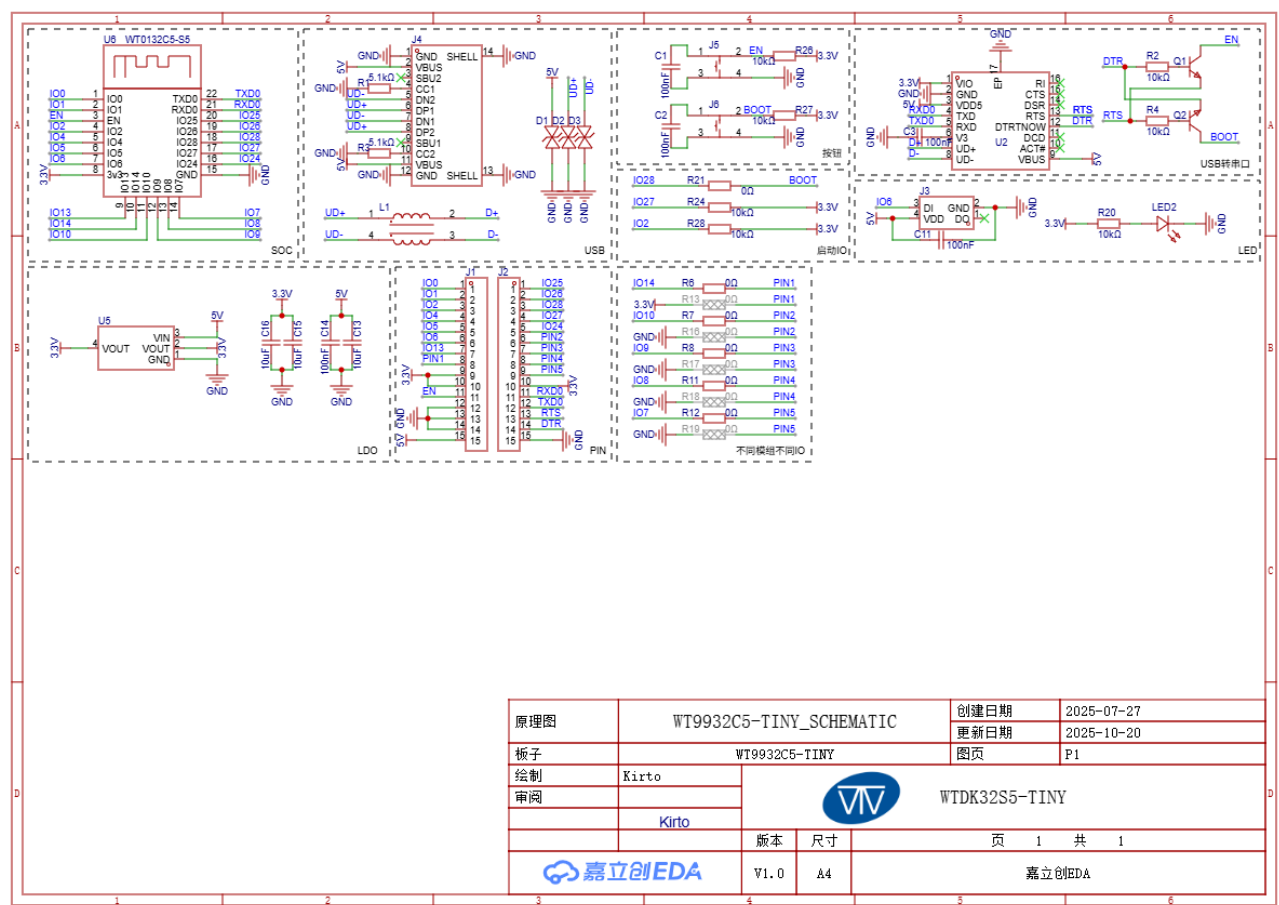


Figure 5 – Schematic

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/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