WT9932C3 TINY User Guide

WT9932C3 Development Board User Manual

,

2025/11/21

Contents

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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

WT9932C3-TINY is a mini development board designed for lightweight IoT development, powered by Espressif's ESP32-C3 chip and equipped with Wireless-Tag's WT0132C3-S5 module.
With an ultra-compact size of just **23 × 38 mm**, it balances powerful performance with rich functionality in a very small footprint.

The board runs at up to **160 MHz**, supports **Bluetooth + Wi-Fi dual-mode wireless communication**, making it suitable for smart home devices, low-power IoT terminals, and more.
All pins are fully broken out and breadboard-compatible, and the onboard **USB-to-UART chip** greatly simplifies debugging.
It also includes an RGB LED, EN and BOOT buttons, and a power indicator LED for status monitoring.
The power supply uses an LDO design capable of providing up to **1 A output**, ensuring stable power for peripherals.
Additionally, by shorting the EN pin to GND, the board can switch into a **USB-to-UART adapter mode**, further improving hardware versatility.

1.3 Product Features

1. **Ultra-compact size with high integration**
   23×38 mm mini size suitable for space-constrained applications (small smart devices, embedded modules).
   Integrated module, USB-to-UART, onboard LED/buttons—ready to use without extra external components.
2. **Strong performance with dual-mode wireless**
   Based on the ESP32-C3 chip with a 160 MHz CPU, supporting Wi-Fi + Bluetooth dual-mode communication for IoT connectivity scenarios such as smart home, remote control, and data transmission.
3. **Flexible development and easy compatibility**
   All pins are fully broken out and compatible with breadboards, sensors, and actuators.
   Built-in USB-to-UART eliminates the need for external adapters.
   Preloaded with **MicroPython**, allowing rapid scripting development.
4. **Multi-function debugging — one board, two purposes**
   Onboard EN (reset) and BOOT buttons make entering download mode simple.
   Short EN to GND to switch the board into **USB-to-UART adapter mode**, useful for debugging other devices.

5. **Stable power supply with visible status**
   LDO supports up to **1 A** output for powering external peripherals.
   Power indicator LED shows power status; onboard RGB LED can be used for functional testing or status indication (Wi-Fi connection, data transmission, etc.).

1.4 Development Board Images

Front View:

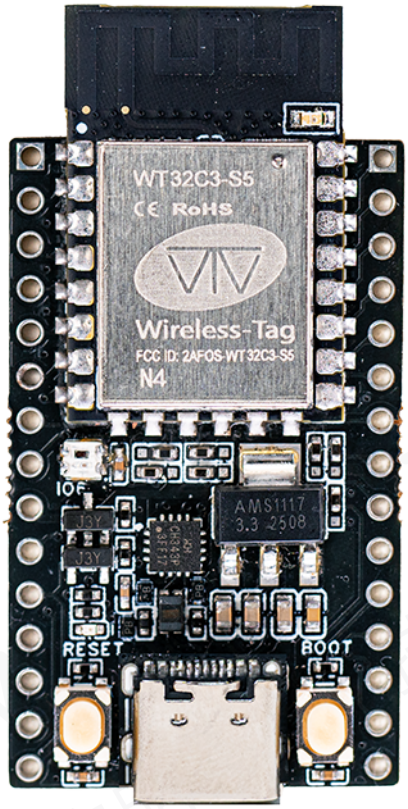

Figure 1 – Development Board Front

Back View:

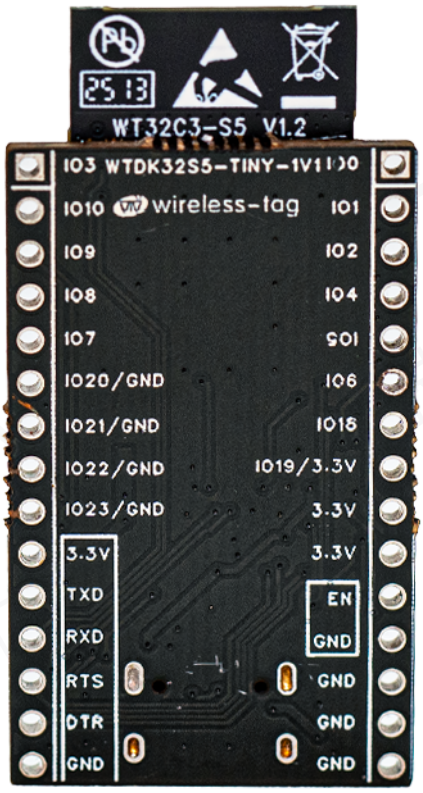

Figure 2 – Development Board Back

2. Hardware Reference

2.1 Functional Block Diagram

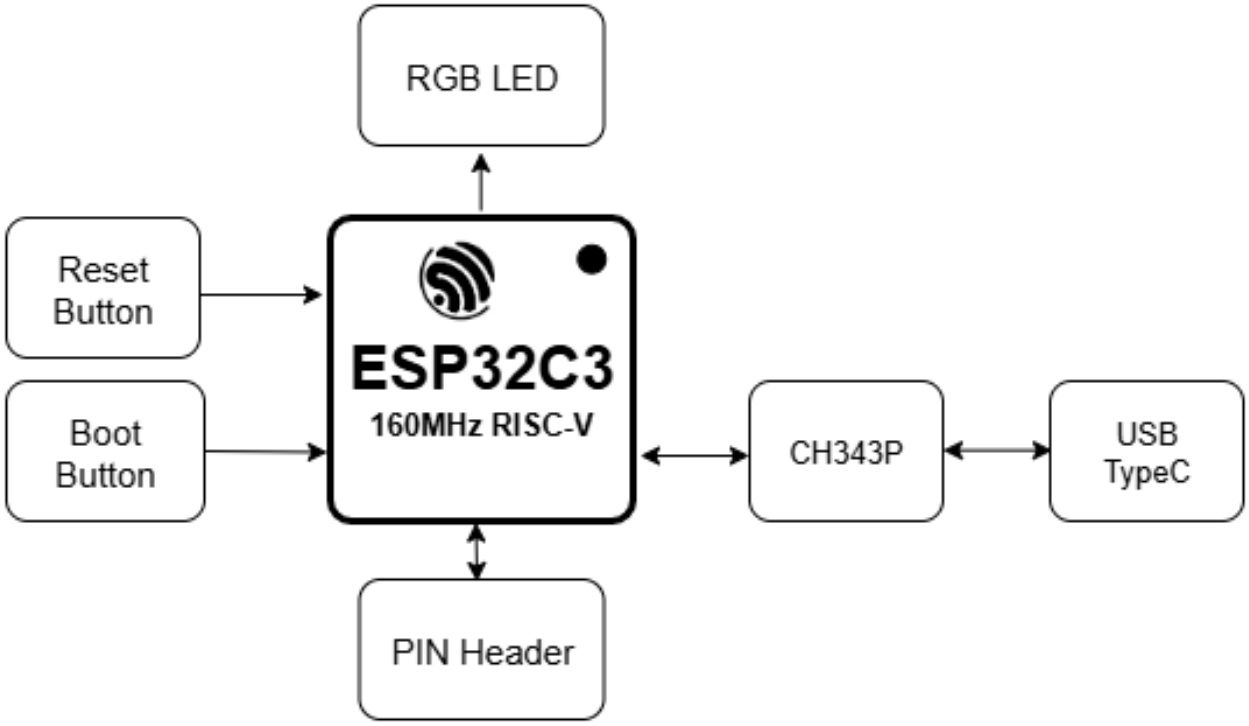

Figure 3 – Block Diagram

2.2 Hardware Peripherals

Peripheral	Description
WS2812	Single-bus RGB LED connected to IO6.
RESET Button	Used for resetting the board
BOOT Button	Used for entering download mode, on IO9.
USB	USB-to-UART for power and firmware upload
CH343P	USB-to-UART converter chip

2.3 Component Overview

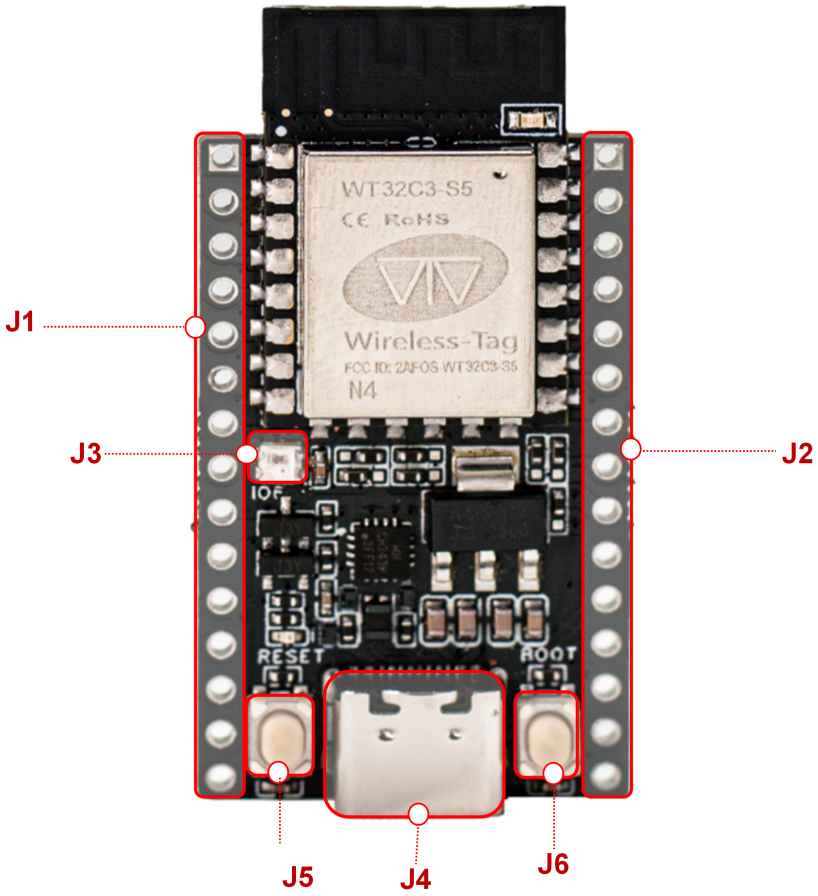

Figure 4 – Interface Components

No.	Component Name	Description
J1/J2	Pin Header Interface	2.54 mm headers; short EN and GND to use board as USB-to-UART adapter
J3	RGB LED	SMD 2020 RGB LED connected to IO6
J4	USB 2.0 Type-C Port	USB-to-UART debugging interface
J5/J6	Tactile Buttons	For 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	General-purpose I/O 0	0/3.3V	
2	IO1	General-purpose I/O 1	0/3.3V	
3	IO2	General-purpose I/O 2	0/3.3V	
4	IO4	General-purpose I/O 4	0/3.3V	
5	IO5	General-purpose I/O 5	0/3.3V	
6	IO6	General-purpose I/O 6	0/3.3V	
7	IO18	General-purpose I/O 18	0/3.3V	
8	IO19	General-purpose I/O 19	0/3.3V	
9	3.3V	Power Output	3.3V	
10	3.3V	Power Output	3.3V	
11	EN	Reset/Enable	0V	
12	GND	Ground	0V	

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

[J2] Pin Header

No.	Pin	Description	Voltage	Notes
1	IO3	General-purpose I/O 3	0/3.3V	
2	IO10	General-purpose I/O 10	0/3.3V	
3	IO9	General-purpose I/O 9	0/3.3V	
4	IO8	General-purpose I/O 8	0/3.3V	
5	IO7	General-purpose I/O 7	0/3.3V	
6–9	GND	Ground	0V	
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 UART flow control	0/3.3V	
14	DTR	CH343P UART flow control	0/3.3V	
15	GND	Ground	0V	

[J3] RGB LED

The RGB LED uses a single-wire interface (**WS2812**) connected to IO6.
Datasheet:
https://atta.szlcsc.com/upload/public/pdf/source/20241202/DEE3FC35B8AD87F3BB1718ACD77EDECD.pdf

[J4] Type-C Port

This board uses the **CH343P** USB-to-UART chip:
https://atta.szlcsc.com/upload/public/pdf/source/20250526/E5D5661F81329277E82D637D359EA112.pdf

Short EN to GND to switch the board into USB-to-UART converter mode.

3. Schematic

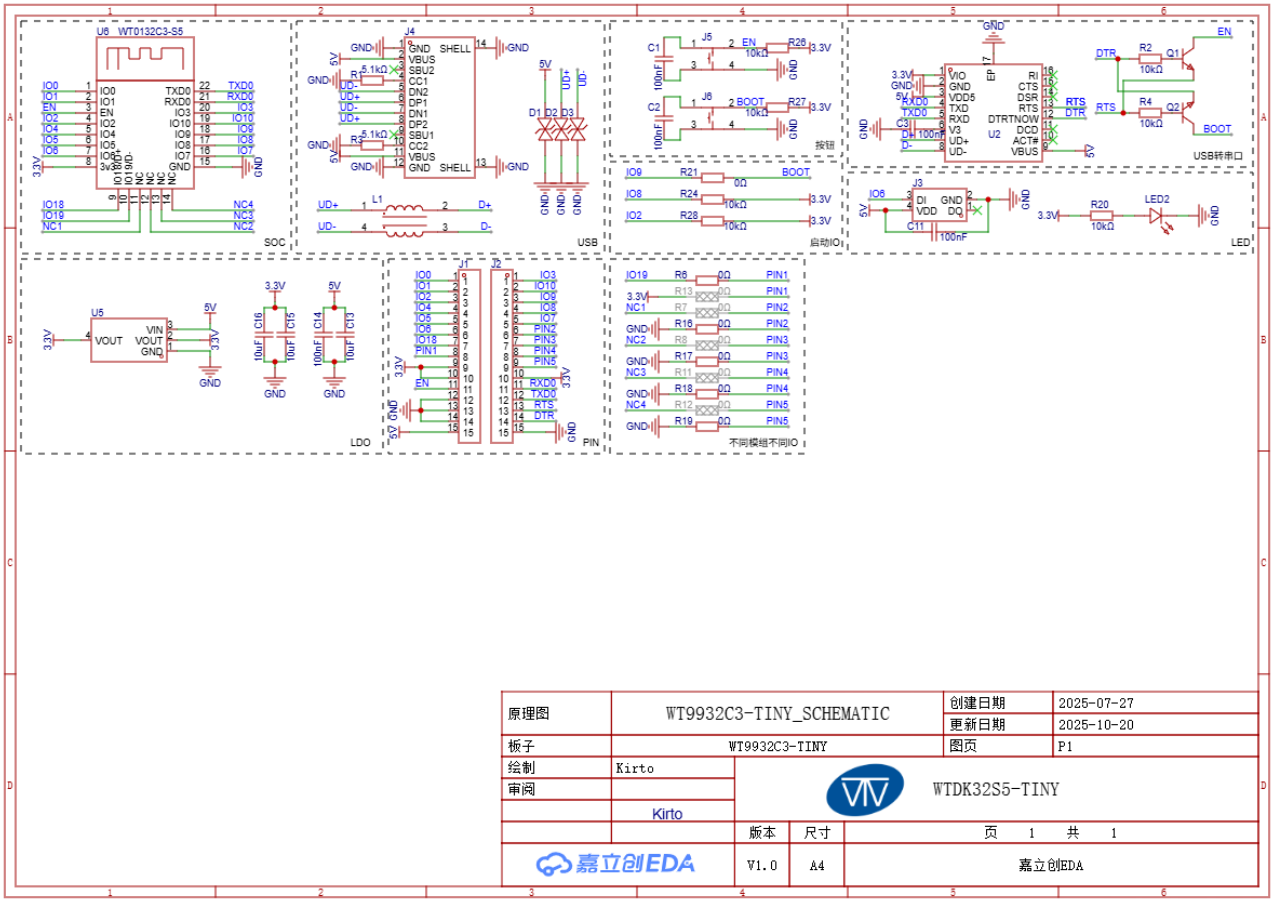

Figure 5 – Schematic

4. Mechanical Support

4.1 PCBA Dimensions

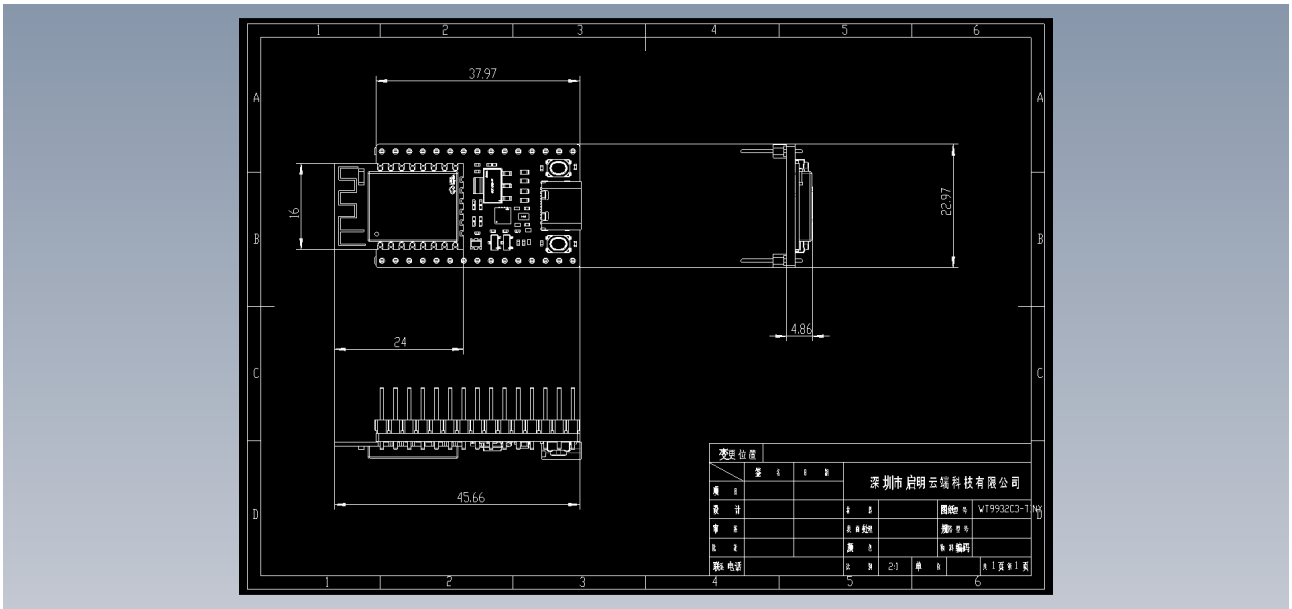

Figure 6 – Dimensions

5. User Guide

5.1 Preparation

Before using the device, please prepare the following:

1. **USB-C cable × 1**
   Used for powering the board or connecting to a PC. High-quality cables are recommended.
2. **WT9932C3-TINY development board × 1**
3. **Serial terminal tool**
   For viewing logs and debugging.

5.2 Hardware Setup

1. **Powering the board**
   - Connect the board to a PC or USB adapter using a USB-C cable.
   - Once powered, the indicator LED will turn on.

5.3 Usage Instructions

1. **Connect the board to the computer**
   Use a USB-C cable.
   > Note: Some computers may require installing the driver
2. **Open a serial terminal**
   Find the COM port and set baud rate to **115200**.
   Since the board ships with **MicroPython**, you can run scripts directly via the REPL.

6. Related Documents

Document Name	Link	Description
WT9932C3-TINY User Guide	WT9932C3-TINY - Device User Guide	
ESP32-C3 IDF Documentation	https://docs.espressif.com/projects/esp-idf/zh_CN/v5.4.2/esp32c3/get-started/index.html	ESP-IDF Programming Guide & API Docs
ESP32-C3 Technical Reference	https://www.espressif.com.cn/sites/default/files/documentation/esp32-c3_datasheet_cn.pdf	ESP32-C3 Chip Specifications
Micropython Documentation	https://docs.micropython.org/en/latest/	

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Figure 7 – Wireless-Tag_qrcode