

WISHTREE-DUO

Technical Manual



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1. Introduction

"**wishTree-duo**" is a quick prototyping and PoC development board that enable makers to use all IoT connectivity options- WiFi, Bluetooth, BLE, LoRa and 2G on a single board. It can house both ESP12 and ESP32.

It will help numerous enterprises, engineers, innovators, hobbyist and advanced users to build and test any idea before serious money and effort is put in. Wish any use case, and build the MVP in just hours without much ado.

The board is built by **wiseThingz** after 3 years of IoT deployment experience. We know the pain points of a real IoT deployment. So all the fine points have been taken care during design- be it longer battery life, or operation mode options.



2. Brief feature set

Notable features are as follows:

- Credit card sized board (a little bigger in length actually)
- Runs 5v and 3v3 on-board to connect all types of sensors and displays
- Wired communication: I2C, URAT, micro-USB
- Wireless communication: WiFi, BT, BLE, GSM, LoRa
- Micro-amp level deep-sleep
- Power connections: Screw terminals, USB
- Powered by: AA-battery, LiPo with CC-CV charger, Mobile charger, Solar panel
- On-board 1.5A MOSFET switch; Transistor switch and MOSFET driver
- Coding through Arduino IDE
- Free breadboard space
- Replaceable IC's

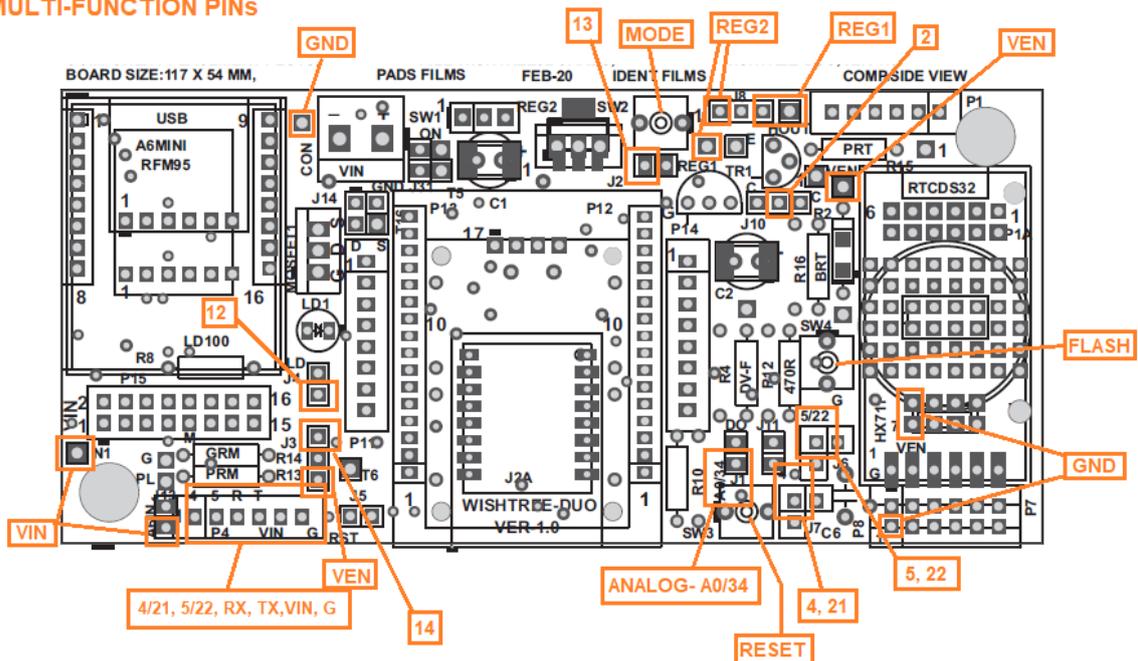
USP: A compact PoC board to quickly deploy a concept with finished look. With jumper combinations, it facilitates efficient GPIO usage, enable low power deep-sleep by detaching all peripherals during sleep for longer battery life. Connect with USB, start exploring.

3. Board Layout and Pin-map

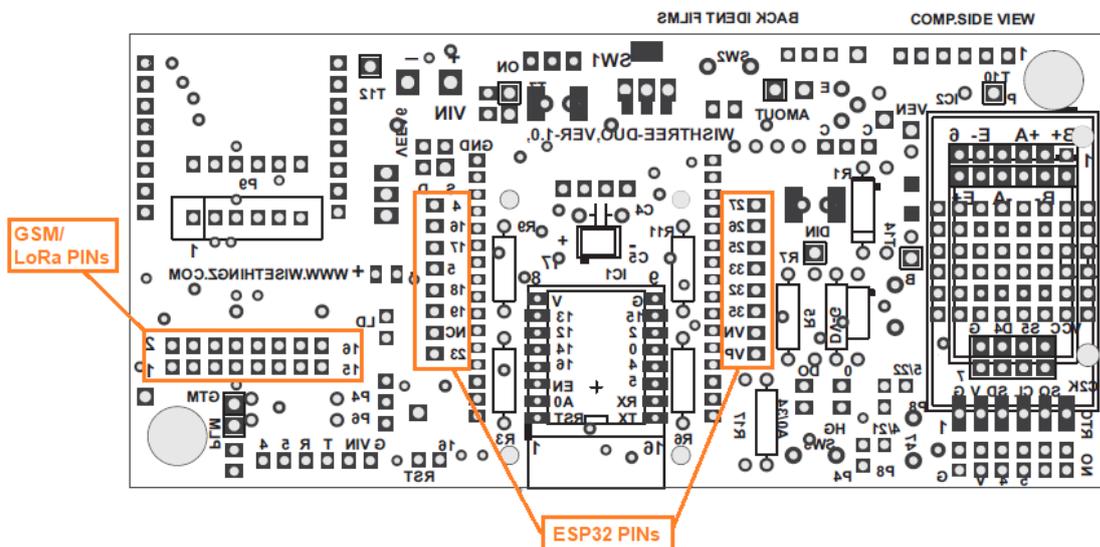
Usable pins are divided in 2-parts:

1. Multifunction: This allows boot options, direct sensor conn, battery status etc.
2. Direct Pins: These are directly exposed GPIO's of ESP32-WROOM

MULTI-FUNCTION PINS



ESP32 DIRECT PINS

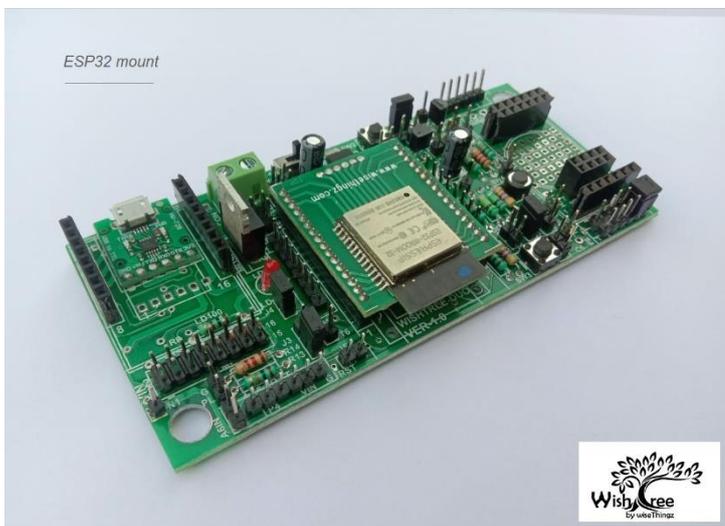


4. Feature comparison table

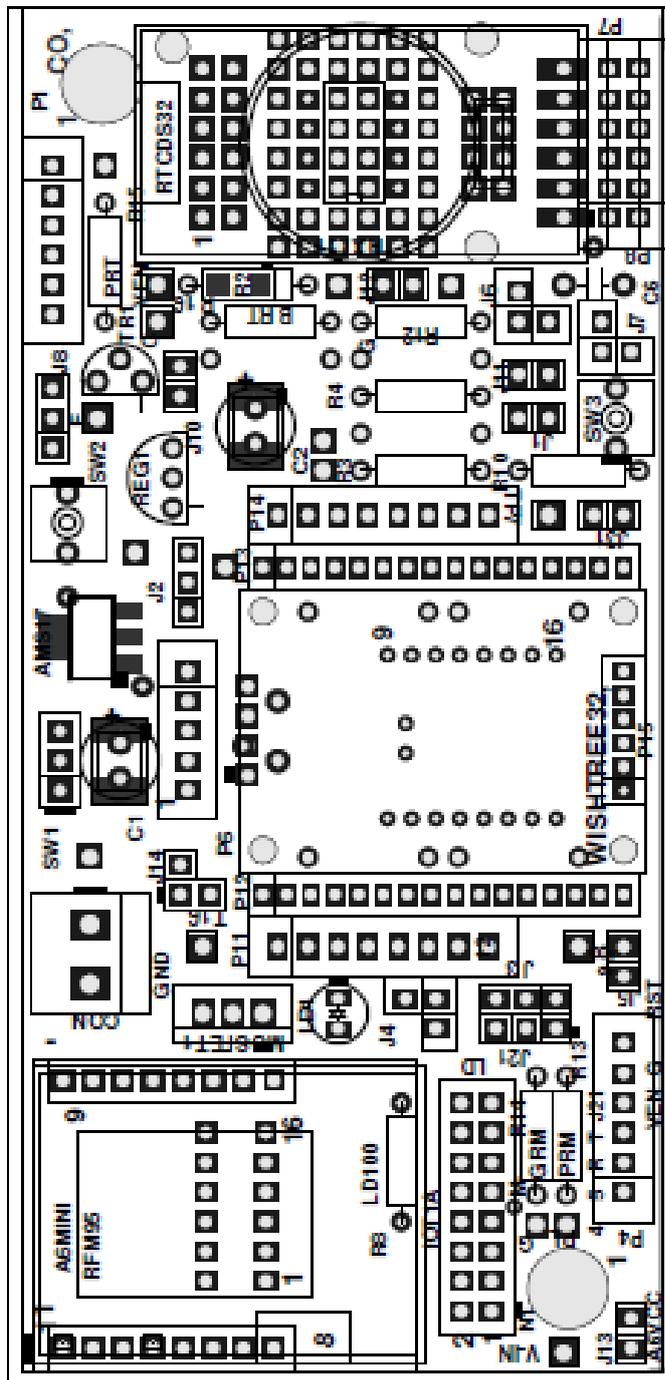
Features	wishTree-12 (WT12)	wishTree-32 (WT32)	Comes with board?
Controller	ESP8266 (ESP12F)	ESP32 (WROOM)	yes
WiFi	yes	yes	yes
Bluetooth	need to attach HC-05	Yes	yes (WT32 only)
LoRa	no	attach RFM95 thru on-board adapter	no
2G	thru on-board A6-mini adapter	thru on-board A6-mini adapter	no
HTTP	yes	yes	NA
MQTT	yes	yes	NA
On-board voltages	3v3, 5v	3v3, 5v	yes
Vin output	yes	yes	yes
1.5amp MOSFET switch	yes	yes	yes
Transistor switch	yes	yes	yes
Battery run	yes	yes	NA
Wall socket run	yes	yes	NA
GPIO's	5	20	yes
Ready slots for	ADC, RTC, Memory card, GPS patch antenna	ADC, RTC, Memory card, GPS patch antenna	yes (slots only)
USB port	yes	yes	yes
LiPo battery	attachable	attachable	no
Buck/Boost	attachable	attachable	no
battery % sensing	yes	yes	yes
RS485/RS232	no	no	no
Breadboard space	yes	yes	yes
Jumper configurations	yes	yes	yes
Attachable sensors	almost all types (subject to GPIO limit)	all types	no
Attachable displays	OLED, 7-segment, LCD (subject to GPIO limit)	OLED, 7-segment, LCD and other types	no
Suitable casing	yes	yes	no
On-board test LED	yes	yes	yes

- For easy to use tutorials/videos, please refer www.wisethingz.com/wishtree
 - Refer enclosed **API** documentation for building your own application.
- Happy learning!!!**

5. Board options

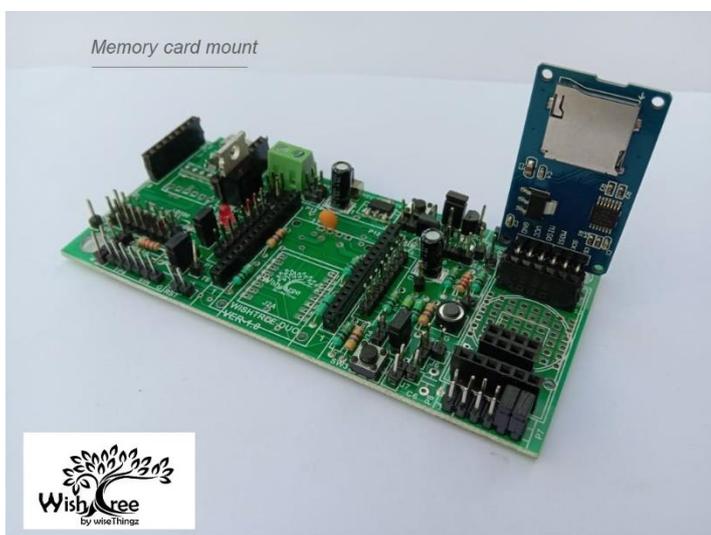


6. Board Layout

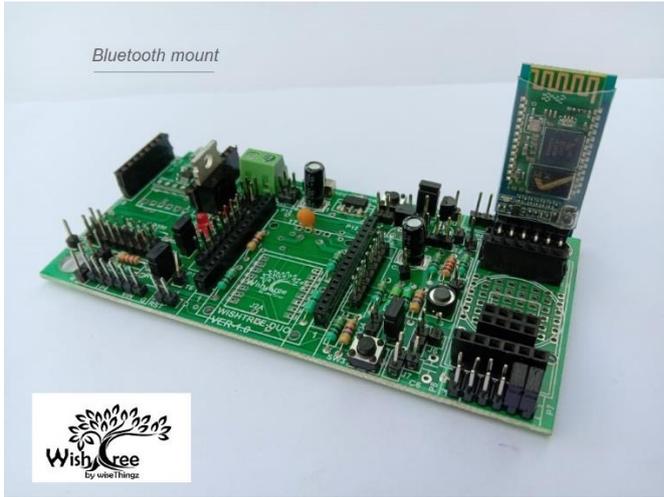


Component side view

7. Sample communication/Sensor module mounts

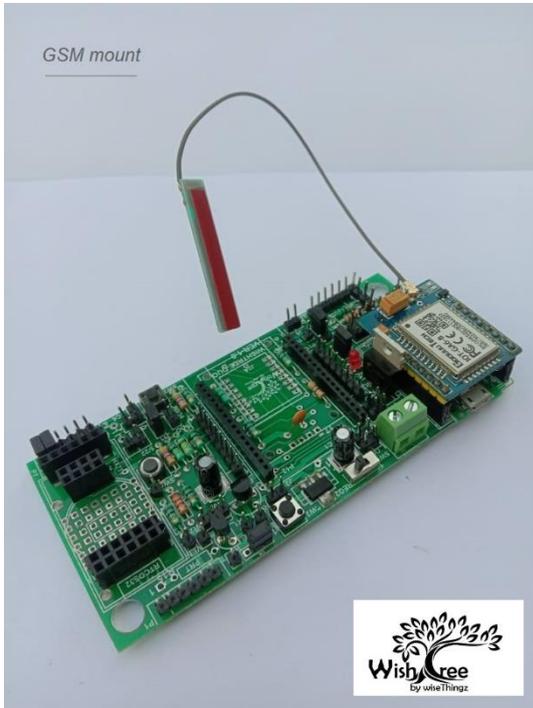


Bluetooth mount



LoRa mount

GSM mount



Testing

8. Safety and specification

Main MCU's used in wishTree are ESP12F and ESP32-WROOM-32. These modules are produced by Espressif, and both are FC and CE certified.

Table 1: ESP32-WROOM-32 Specifications

Categories	Items	Specifications
Certification	RF certification	FCC/CE-RED/IC/TELEC/KCC/SRRC/NCC
	Wi-Fi certification	Wi-Fi Alliance
	Bluetooth certification	BQB
	Green certification	RoHS/REACH

Refer to ESP32-WROOM-32 Specification available on the internet

Other than the MCU, the board is mainly composed of non-active components like connectors and switches. The capacitors and voltage regulators used are well-known and mass produced items. They are rated well above the specified max. voltage input.

9. Coding Platform and Language

The board provides numerous options to code it and debug.

The most common is to code it in C, C++ using Arduino IDE- the most popular and wide-spread IDE among makers.

It can also be coded using Micropython from Python prompt or using Thonny, uPyCraft or other IDE's.

Additionally, advance users can code it using ESP-IDF which is the proprietary "integrated development framework (idf)" by Espressif.

10. Example of applications



11. User guide, pin-map, and example projects

Refer to www.wisethingz.com/wishtree for guide documentation, pin-map and a lot of example projects- complete circuits, codes and videos.

Example projects depict how wishTree-duo can be used with different sensors, displays and communication mediums- e.g. WiFi, Bluetooth, BLE, GSM and LoRa. Ask your questions through the enquiry page at www.wisethingz.com or in video comments, or through whatsapp @9339818158.

It is now on your imaginations to use **wishTree-duo** in many innovative ways to solve real-life problems and feel proud about it. The possibilities are endless....

Keep Making, cheers!!!