



## PRODUCT SPECIFICATION DOCUMENT

IEEE 802.11 b/g/n

Wi-Fi & Bluetooth MODULE

MODULE NAME: CW\_ESP

CHIPSET: ESP32-D0WDQ6-V3

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## Table of Contents

- 1. INTRODUCTION ..... 3
  - 1.1 General Specifications ..... 3
- 2. HARDWARE BLOCK DIAGRAM ..... 3
- 3. MODULE SPECIFICATIONS ..... 4
  - 3.1 KN1 Pin Order – Communication and Power Connector ..... 4
  - 3.2 KN2 Pin Order – Programming Connector ..... 5
- 4. On-Board Antenna / External Antenna ..... 5
  - 4.1 Antenna Configuration ..... 5
  - 4.2 Antenna Placement ..... 6
- 5. PROTOCOL DETAILS ..... 6

## 1. INTRODUCTION

Most of the connected products require Bluetooth and WI-FI. For this purpose, CW\_ESP module uses a single chip WIFI, Bluetooth, MCU solution from Espressif Systems, ESP32-D0WDQ6-V3.

CW\_ESP module is available in three different configurations according to the target appliance type.

### 1.1 General Specifications

- Main Chipset ESP32-D0WDQ6-V3
- Integrated HSM Microchip ECC608
- Crystal Frequency 40MHz
- Host Interface SPI/UART/I2C
- Transmitter/Receiver 1 TX/ 1 RX
- Maximum Data Rate 150Mbps
- Operating Voltage 5.0VDC +/-5%
- Average Current 150mA
- Peak Current 500mA
- Operating Temperature -10°C ~ +85°C
- Operating Humidity 5% ~ 95%
- PCB Dimension 41(+/- 0.2)mm x 45(+/-0.2)mm
- PCBA Height 4.1(+/-0.2)mm

## 2 HARDWARE BLOCK DIAGRAM

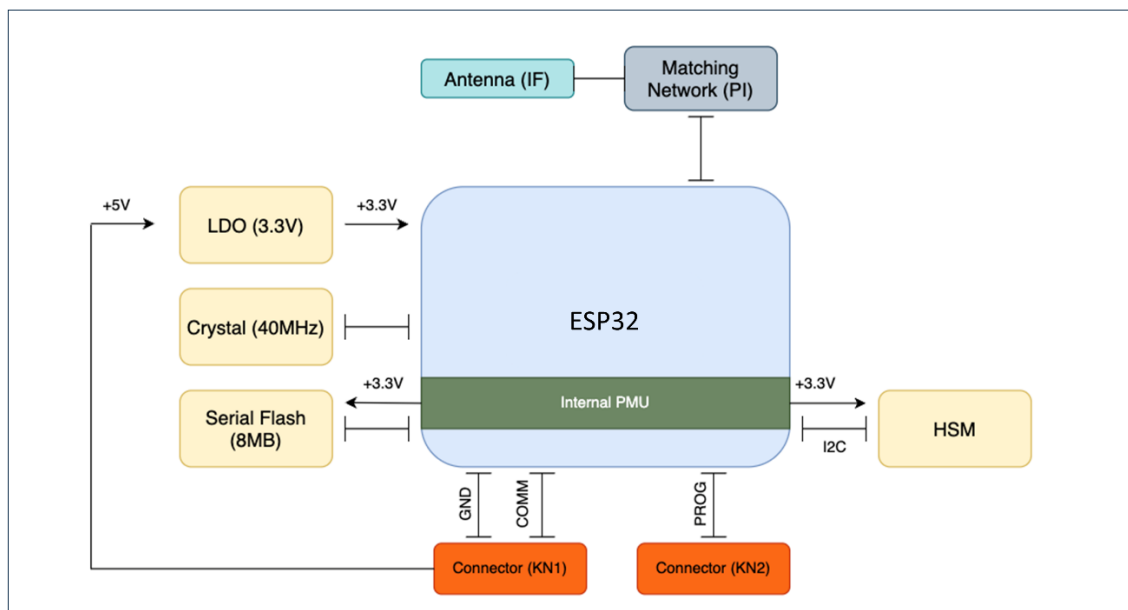


Figure 1: Block Diagram for the Module

### 3 MODULE SPECIFICATIONS

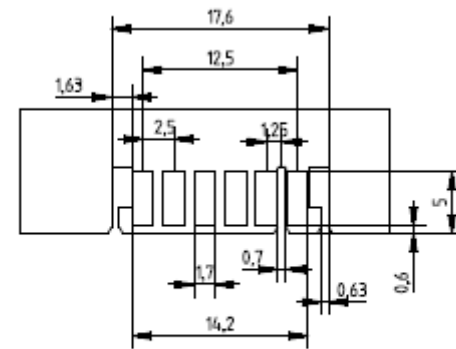
#### 3.1 KN1 Pin Order – Communication and Power Connector

CW\_ESP module will support UART, SPI and I2C Communication protocols. Only one of these three protocols will be active in the module. The protocol to be used will be managed by software and BOM variation.

SPI and UART interfaces are 5V logic and I2C interface is 3.3V logic. Main board or display board communication interfaces must be compatible with the required logic level of CW\_ESP module.

Pin No.	CW_ESP (SPI)	CW_ESP (UART)	CW_ESP (I2C)
1	5V	5V	5V
2	GND	GND	GND
3	MISO(module input)	UART RX (module input)	SDA (module IO)
4	SS(module output)	NC	NC
5	MOSI(module output)	NC	NC
6	CLK(module output)	UART TX (module output)	SCL (module output)

KN1 connector must have 0.7mm notch between pins 5 and 6. When preparing the cable assembly edge connector must comply with the following technical drawing.



PCB LAYOUT FOR 6 CCT CONNECTOR

Figure 2: KN1 Connector Details

### 3.2 KN2 Pin Order – Programming Connector

Programming connector will be used only during the development. In final product, this connector will not be used.

Pin No.	Net Label
1	5V
2	EN
3	GND
4	IO0
5	RXD (module input)
6	TXD (module output)

## 4 On-Board Antenna / External Antenna

Wi-Fi and BT connection in the module is provided by a single antenna operating at 2.4Ghz. The module has two different antenna options, internal and external. Default antenna is on-board (PCB trace) antenna. External antenna is reserved option for future use.

### 4.1 Antenna Configuration

The CW\_ESP module supports external and on-board antenna. Antenna option to be used and the placement of the antenna is one of the most critical parameters in terms of Wi-Fi performance of the final product. By default, module uses on-board (PCB Trace) antenna. To use the external antenna, position and placement in the final product should be decided with the approval of the Central R&D RF specialist.

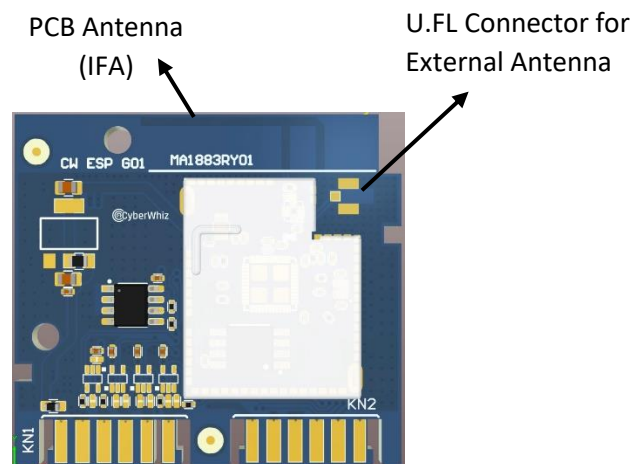
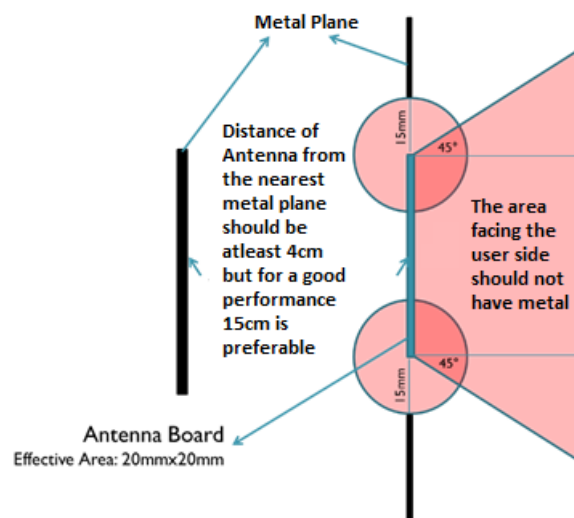


Figure 3: 3D data showing on-board antenna and connection for external antenna.

## 4.2 Antenna Placement

Following figure shows desired position of antenna for good RF performance. Similarly, if another metal structure is present, the same conditions apply. In cases where this guide cannot be followed, support should be requested from central R&D RF engineer for antenna placement. In cases where the mechanical structure is not suitable, an external antenna solution can also be applied, explained in previous section.



## 5 PROTOCOL DETAILS

Any custom protocol can be defined according to the specific requirements.