



WMI7211

**Wi-Fi 6/6e 802.11ax 2x2 Tri-band
USB Dongle**

Product Datasheet

Version: 0.1.1

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1 Overview

The WMI7211 is a highly integrated wireless local area network (WLAN) USB dongle, the dongle based-on Realtek RTL8852CU and that is supporting 802.11ax Wi-Fi and Bluetooth v5.2.

The WMI7211 supports simultaneous operation on 2.4 GHz and 5 GHz or 2.4GHz and 6 GHz, also known as Dual Band Simultaneous (DBS).

2 Feature

2.1 WLAN

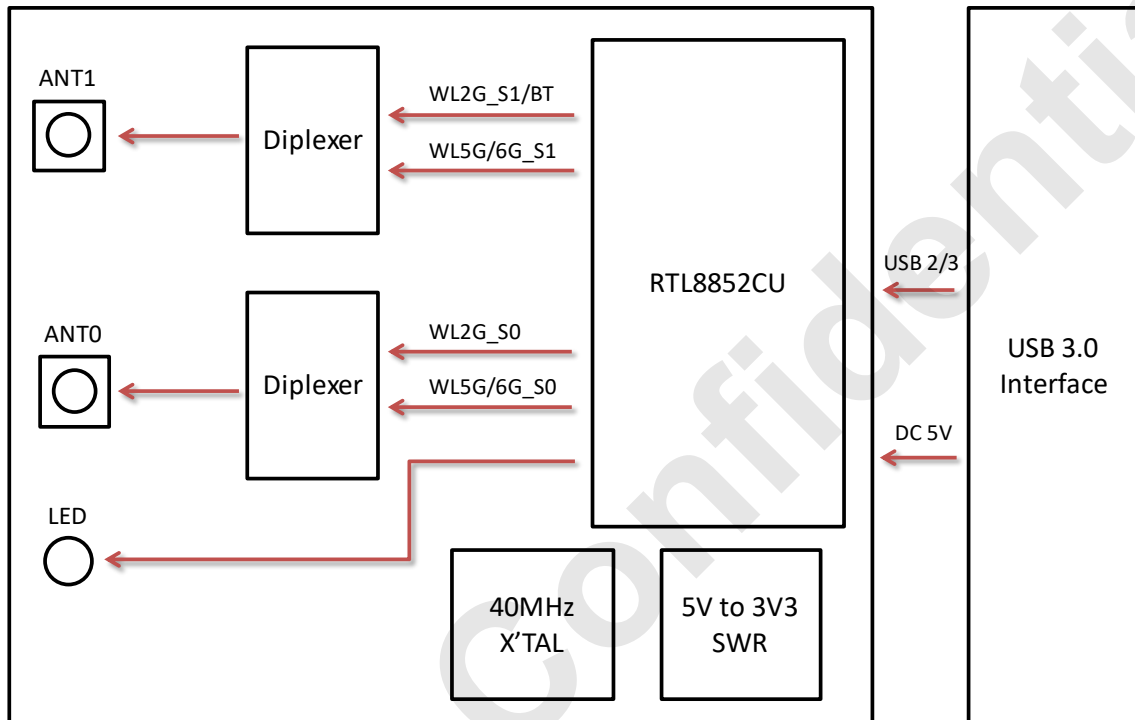
- Compliant with IEEE 802.11a/b/g/n/ac/ax
- Supports 2x2 Multi-User Multiple-Input Multiple-Output (MU-MIMO)
- Dual Band Simultaneous (DBS), up to 3.6 Gbps data rate (2x2+2x2 11ax DBS)
- Tri-band 2.4 GHz/5 GHz/6 GHz support
- 20 MHz/40 MHz channel bandwidth for 2.4 GHz
- 20 MHz/40 MHz/80 MHz/160 MHz channel bandwidth for 5 GHz/6 GHz
- Dynamic Frequency Selection (DFS, radar detection)

2.2 Bluetooth

- Compatible with Bluetooth V5.2, V2.1+EDR
- Enhanced BT/WIFI Coexistence Control to improve transmission quality in different profiles

3 System Specification

3.1 Block Diagram



3.2 Chip Solution

- Realtek RTL8852CU-CG

3.3 Protocol & Interface

- USB 3.0 Type-A interface for WLAN
- USB 2.0 Type-A interface for Bluetooth
- Antenna Port: Internet Antenna for 2T2R

3.4 Temperature

- Operating Temperature: -20°C to +45°C
- Storage Temperature: -40°C to +70°C

3.5 Humidity

- Operating Humidity (non-condensing): 5% ~ 90%
- Storage Humidity (non-condensing): 5% ~ 90%

4 WLAN Specification

4.1 WLAN Standard

- IEEE 802.11a/b/g/n/ac/ax compatible WLAN
- Support 802.11ac 2x2, Wave-2 compatible with MU-MIMO
- Support 802.11ax 2x2, with OFDMA and MU-MIMO, by 4 types PPDU format, such as HE-SU-PPDU, HE-ER-SU-PPDU, HEMU-PPDU, and HE-TB-PPDU
- Complete 802.11n MIMO solution for 2.4GHz, 5GHz and 6GHz band
- IEEE 802.11e QoS Enhancement (WMM)
- IEEE 802.11i (WPA, WPA2, WPA3). Open, shared key, and pair-wise key authentication services
- IEEE 802.11h DFS, TPC, Spectrum Measurement
- IEEE 802.11k Radio Resource Measurement
- WAPI (Wireless Authentication Privacy Infrastructure) certified.

4.2 Frequency Range

- Support 2.4GHz frequency range: 2412MHz ~ 2484MHz
- Support 5GHz frequency range: 5180MHz - 5850MHz
- Support 6GHz frequency range: 5925MHz - 7125MHz

4.3 Band Width

- 20 MHz/40 MHz channel bandwidth for 2.4 GHz
- 20 MHz/40 MHz/80 MHz/160 MHz channel bandwidth for 5 GHz/6 GHz

4.4 Data Rate

- 2.4GHz
802.11n HT40 2SS: 300Mbps
802.11ax HE40 2SS: 573Mbps
- 5GHz/6GHz
802.11n HT40 2SS: 300Mbps
802.11ac VHT160 2SS: 1733Mbps
802.11ax HE160 2SS: 2402Mbps

4.5 Modulation

- 802.11n:
OFDM (BPSK, QPSK, 16-QAM, 64-QAM)
- 802.11ac:
OFDM (BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM)
- 802.11ax:
OFDM (BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM, 1024-QAM)

4.6 Software Features

Category	Description
Wi-Fi Mode	STA Mode AP Mode (Soft AP) STA + AP Mode Wi-Fi Direct Monitor Mode
Concurrent Mode	Station mode + Station mode Station mode + AP mode Station mode + P2P mode
Encryption/Decryption	WEP TKIP AES
Security Modes	Open WEP/Shared Key WPA/WPA2/WPA3

Noted: these features based on Realtek Linux driver

4.7 Output Power & Sensitivity

2.4GHz

2.4GHz 802.11b		
Data Rate	Tx \pm 2dB	Rx Sensitivity \pm 2dB
1M	20.0dBm	-98.0dBm
11M	20.0dBm	-89.5dBm

2.4GHz 802.11g		
Data Rate	Tx \pm 2dB	Rx Sensitivity \pm 2dB
6M	20.0dBm	-94.5dBm
54M	18.0dBm	-77.0dBm

2.4GHz 802.11n				
Data Rate	Tx \pm 2dB	Tx \pm 2dB(2TX)	Rx Sensitivity \pm 2dB	
HT20	MCS 0	20.0dBm	23.0dBm	-94.5dBm
	MCS 7	17.0dBm	20.0dBm	-75.0dBm
HT40	MCS 0	20.0dBm	23.0dBm	-91.5dBm
	MCS 7	17.0dBm	20.0dBm	-72.0dBm

2.4GHz 802.11ax				
Data Rate	Tx \pm 2dB	Tx \pm 2dB(2TX)	Rx Sensitivity \pm 2dB	
HE20	MCS 0	20.0dBm	23.0dBm	-95.5dBm
	MCS 11	13.0dBm	16.0dBm	-67.5dBm
HE40	MCS 0	20.0dBm	23.0dBm	-92.5dBm
	MCS 11	13.0dBm	16.0dBm	-63.0dBm

5GHz

2.4GHz 802.11g		
Data Rate	Tx \pm 2dB	Rx Sensitivity \pm 2dB
6M	20.0dBm	-93.0dBm
54M	16.0dBm	-76.0dBm

5GHz 802.11n				
Data Rate		Tx \pm 2dB	Tx \pm 2dB(2TX)	Rx Sensitivity \pm 2dB
HT20	MCS 0	20.0dBm	23.0dBm	-93.0dBm
	MCS 7	15.0dBm	18.0dBm	-74.0dBm
HT40	MCS 0	19.0dBm	22.0dBm	-90.0dBm
	MCS 7	15.0dBm	18.0dBm	-71.5dBm

5GHz 802.11ac				
Data Rate		Tx \pm 2dB	Tx \pm 2dB(2TX)	Rx Sensitivity \pm 2dB
VHT20	MCS 0	20.0dBm	23.0dBm	-92.5dBm
	MCS 8	14.0dBm	17.0dBm	-70.0dBm
VHT40	MCS 0	19.0dBm	12.0dBm	-90.5dBm
	MCS 9	13.0dBm	16.0dBm	-66.0dBm
VHT80	MCS 0	18.0dBm	21.0dBm	-87.5dBm
	MCS 9	13.0dBm	16.0dBm	-62.5dBm

5GHz 802.11ax				
Data Rate		Tx \pm 2dB	Tx \pm 2dB(2TX)	Rx Sensitivity \pm 2dB
HE20	MCS 0	19.0dBm	22.0dBm	-93.5dBm
	MCS 11	11.0dBm	14.0dBm	-66.0dBm
HE40	MCS 0	18.0dBm	21.0dBm	-91.0dBm
	MCS 11	11.0dBm	14.0dBm	-62.0dBm
HE80	MCS 0	17.0dBm	20.0dBm	-88.5dBm
	MCS 11	11.0dBm	14.0dBm	-60.5dBm
HE160	MCS 0	14.0dBm	17.0dBm	-86.0dBm
	MCS 11	11.0dBm	14.0dBm	-56.5dBm

6GHz

5GHz/6GHz 802.11ax				
Data Rate		Tx ± 2dB	Tx ± 2dB(2TX)	Rx Sensitivity ± 2dB
HE20	MCS 0	18.0dBm	21.0dBm	-91.0dBm
	MCS 11	9.0dBm	12.0dBm	-62.0dBm
HE40	MCS 0	17.0dBm	20.0dBm	-88.5dBm
	MCS 11	9.0dBm	12.0dBm	-59.0dBm
HE80	MCS 0	15.0dBm	18.0dBm	-86.5dBm
	MCS 11	9.0dBm	12.0dBm	-58.0dBm
HE160	MCS 0	12.0dBm	15.0dBm	-83.0dBm
	MCS 11	9.0dBm	12.0dBm	-54.5dBm

5 Bluetooth Specification

5.1 Bluetooth Standard

- Bluetooth Core Specification v5.3/v4.2/v2.1

5.2 Frequency Range

- 2.4~2.4835GHz (2.4GHz ISM Band)

5.3 Channels

- Bluetooth Classic: Ch0~Ch78 (For 1MHz Channels)
- Bluetooth Low Energy: Ch0~Ch39 (For 2MHz Channels)

5.4 Data Rate & Modulation

- BR_1Mbps: GFSK
- EDR_2Mbps: $\pi/4$ -DQPSK
- EDR_3Mbps: 8DPSK
- LE_125Kbps: GFSK (Coded_S=8)
- LE_500Kbps: GFSK (Coded_S=2)
- LE_1Mbps: GFSK (Uncoded)
- LE_2Mbps: GFSK (Uncoded)

5.5 Tx Power

Items	Min (dBm)	Typ (dBm)	Max (dBm)
BR_1M	2	5	8
EDR_2/3M	2	5	8
LE_125K/500K/1M/2M 11	2	5	8

5.6 Rx Sensitivity

Items	Typ (dBm)	EBR
BR_1M (DH1)	-92	$\leq 0.1\%$
EDR_2M (DH1)	-90	$\leq 0.01\%$
EDR_3M (3DH5)	-80	$\leq 0.01\%$
LE_125/500K	-92	$\leq 5\%$
LE_1M	-90	$\leq 5\%$
LE_2M	-88	$\leq 5\%$

6 Electrical characteristics

6.1 Power Consumption

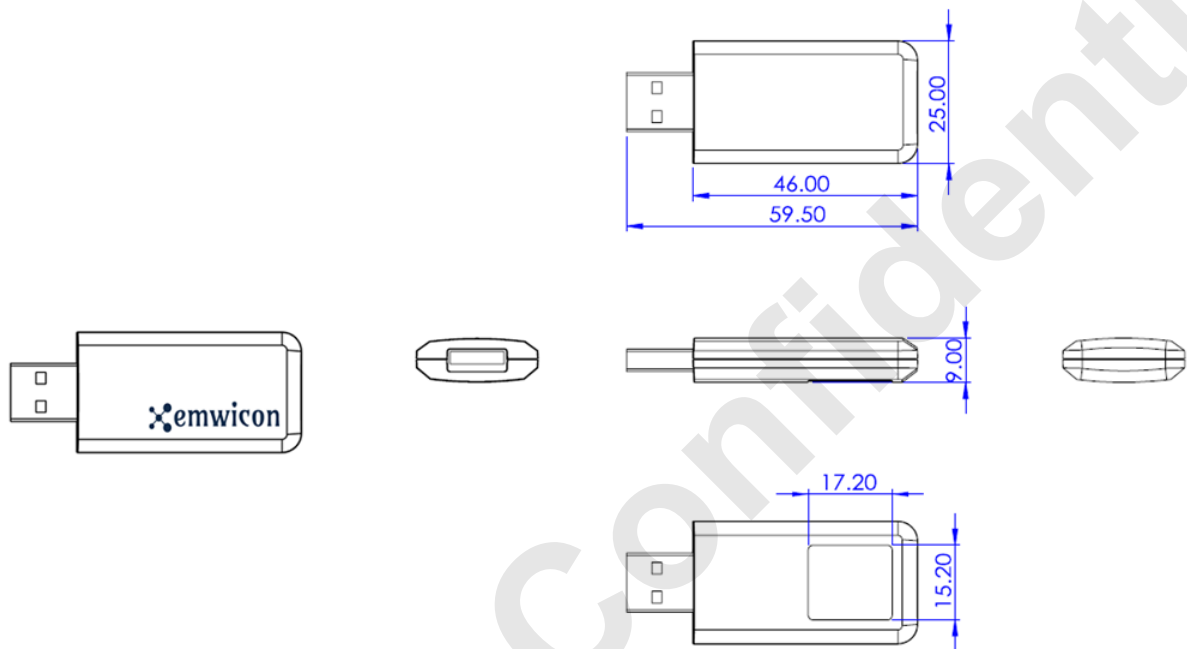
- Max Power Consumption: 5W

6.2 Operating Voltage

- USB 3.0 Type-A: DC 5V $\pm 5\%$

7 Mechanical Specification

7.1 Mechanical Outline Drawing



General tolerance: $\pm 0.2\text{mm}$

7.2 Interface & Dimension

- Interface: USB 3.0 Type-A
- Typical Dimension: (W)25.0mm x (L)59.0mm x (H)9.0mm

8 Product Appearance

8.1 Product Picture



9 Software & Driver

9.1 Driver Support

- Windows:
Support Windows 10 / Windows 11 (32bit/64bit)
- Linux:
Support kernel 3.13 ~ 5.15
- Android:
Support 8,9,10,11 and 12

9.2 Platform Support List

- Intel x86(Verified)
- ARM/MIPS

9.3 RF Tool

- RF test tool consultant service available

10 Certification

CE/NCC

Module Only: FCC/IC/TELEC

11 Package

- One module per one static bag



- One static bag in one lattice and 100pcs per inner box



- 5 inner boxes per 1 carton and 500pcs per carton



12 Ordering Information

12.1 Main Parts

Part Number	Description
WMI7211	Wi-Fi 6/6e 802.11ax 2x2 Tri-band USB Dongle

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