Wireless Module

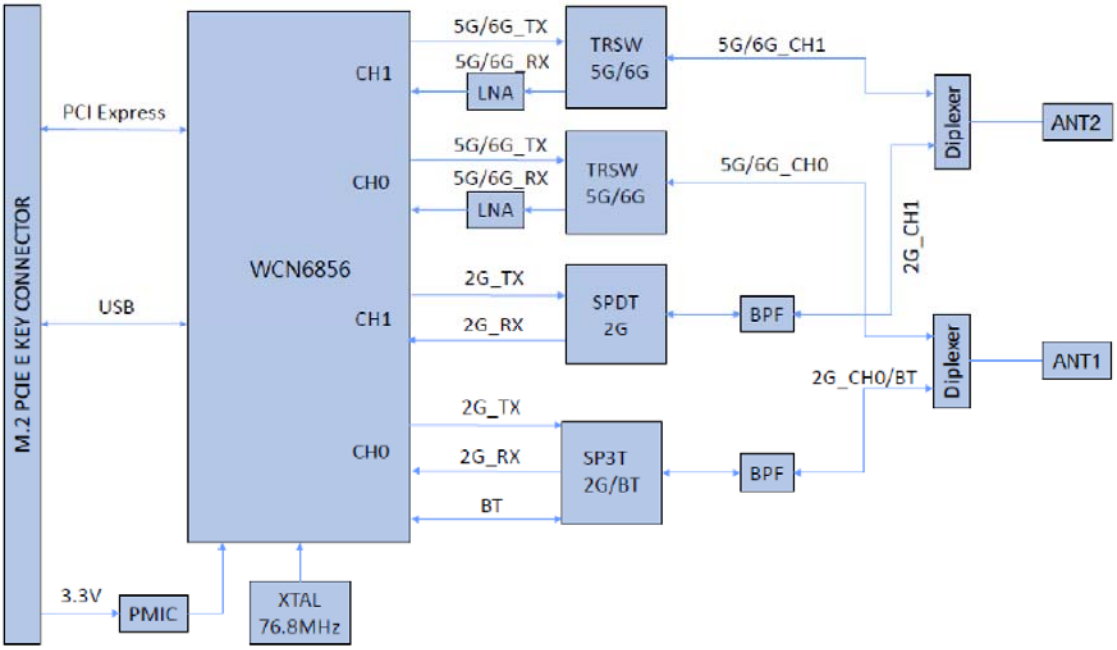
M82-FWA1112WLAN

Standards	IEEE 802.11ax/ac/a/b/g/n (2T2R) Bluetooth V5.2, V5.1, V5.0, V4.2, V4.1, V4.0LE, V3.0, V2.1+EDR
Chipset	Qualcomm Atheros WCN6856
Data Rate	802.11b: 11Mbps 802.11a/g: 54Mbps 802.11n: MCS0~15 802.11ac: MCS0~9 802.11ax: HE0~11 Bluetooth: 1 Mbps, 2Mbps and Up to 3Mbps
Operating Frequency	IEEE 802.11ax/ac/a/b/g/n ISM Band, 2.412GHz~2.484GHz, 5.150GHz~5.850GHz ,5.925~7.125GHz(FCC only) *Subject to local regulations
Interface	WLAN: PCIe Bluetooth: USB
Form Factor	M.2 2230 E Key and AE key
Antenna	2 x IPEX MHF4 connectors Ant 1 for WLAN/BT, Ant 2 for WLAN
Modulation	Wi-Fi: 802.11b: DSSS (DBPSK, DQPSK, CCK) 802.11g: OFDM (BPSK, QPSK, 16-QAM, 64-QAM) 802.11n: OFDM (BPSK, QPSK, 16-QAM, 64-QAM) 802.11a: OFDM (BPSK, QPSK, 16-QAM, 64-QAM) 802.11ac: OFDM (BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM) 802.11ax: OFDMA (BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM,1024-QAM) BT: Header: GFSK Payload 2M: π/4-DQPSK Payload 3M: 8-DPSK
Operating Voltage	DC 3.3V
Operating Temperature Range	WNFQ-268AXI(BT) Operating Temp: -40°C ~75°C; WNFQ-268AX(BT) Operating Temp: -10°C ~65°C
Storage Temperature Range	-45°C~90°C
Humidity (Non-Condensing)	5%~90% (Operating) 5%~90% (Storing)
Dimension L x W x H (in mm)	30mm(± 0.15mm) x 22mm(± 0.15mm) x 3.5mm(± 0.3mm)

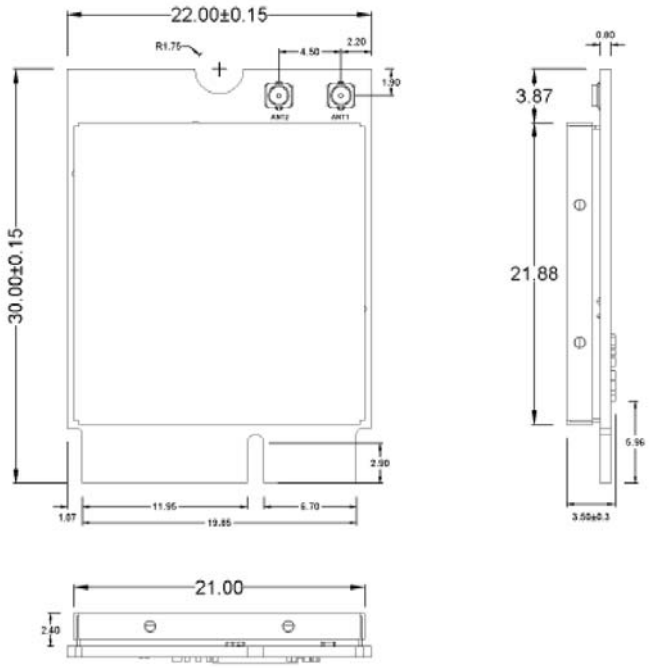
Weight (g)	3.2g
Security	64/128-bits WEP, WPA, WPA2, WPA3, 802.1x

ADVANTECH / Model No.:AIW-170BQ-001

Block Diagram



Mechanical Dimension (mm)



Pin Assignment (TBD)

The following section illustrate signal pin-outs for the module connector.

TOP

Pin#	Pin Name	Type	Description
1	GND	G	Ground connections
3	USB_D+	I/O	USB serial differential data Positive
5	USB_D-	I/O	USB serial differential data Negative
7	GND	G	Ground connections
9	SDIO_CLK/SYSCLK	NC	No Connection
11	SDIO_CMD	NC	No Connection
13	SDIO_DATA0	NC	No Connection
15	SDIO_DATA1	NC	No Connection
17	SDIO_DATA2	NC	No Connection
19	SDIO_DATA3	NC	No Connection
21	SDIO_WAKE#	NC	No Connection
23	SDIO_RESET#/TX_BLANKING	NC	No Connection
25	NOTCH FOR KEY E	NC	No Connection
27	NOTCH FOR KEY E	NC	No Connection
29	NOTCH FOR KEY E	NC	No Connection
31	NOTCH FOR KEY E	NC	No Connection

33	GND	G	Ground connections
35	PERp0	I	PCI Express receive data-Positive
37	PERn0	I	PCI Express receive data-Negative
39	GND	G	Ground connections
41	PETp0	O	PCI Express transmit data- Positive
43	PETn0	O	PCI Express transmit data- Negative
45	GND	G	Ground connections
47	REFCLKp0	I	PCI Express differential clock input- Positive
49	REFCLKn0	I	PCI Express differential clock input- Negative
51	GND	G	Ground connections
53	CLKREQ0# (3.3V)	OD	PCIe clock request
55	PEWAKE0# (3.3V)	OD	PCIe wake signal
57	GND	G	Ground connections
59	RESERVED/PERp1	NC	No Connection
61	RESERVED/PERn1	NC	No Connection
63	GND	G	Ground connections
65	RESERVED/PETp1	NC	No Connection
67	RESERVED/PETn1	NC	No Connection
69	GND	G	Ground connections
71	RESERVED/REFCLKp1	NC	No Connection
73	RESERVED/REFCLKn1	NC	No Connection
75	GND	G	Ground connection

Pin Assignment

BOTTOM

Pin#	Pin Name	Type	Description
2	3.3 V	P	VDD system power supply input
4	3.3 V	P	VDD system power supply input
6	LED_1#	O	WLAN LED
8	PCM_CLK/I2S_SCK (1.8V)	I	I2S Continuous Serial Clock (SCK).
10	PCM_SYNC/I2S_WS (1.8V)	I	I2S Word Select.
12	PCM_OUT/I2S_SD_OUT (1.8V)	O	I2S Serial Data IN.
14	PCM_IN/I2S_SD_IN (1.8V)	I	I2S Serial Data OUT.
16	LED_2#	O	Bluetooth LED
18	GND	G	Ground connections
20	UART_WAKE# (3.3V)	NC	No Connection
22	UART_TXD	NC	No Connection
24	NOTCH FOR KEY E	NC	No Connection

26	NOTCH FOR KEY E	NC	No Connection
28	NOTCH FOR KEY E	NC	No Connection
30	NOTCH FOR KEY E	NC	No Connection
32	UART_RXD	NC	No Connection
34	UART_RTS	NC	No Connection
36	UART_CTS	NC	No Connection
38	VENDOR DEFINED	NC	No Connection
40	VENDOR DEFINED	NC	No Connection
42	VENDOR DEFINED	NC	No Connection
44	COEX3	NC	No Connection
46	COEX_TXD	DNC	Do Not Connect
48	COEX_RXD	DNC	Do Not Connect
50	SUSCLK	NC	No Connection
52	PERST0#	I	PCIe host indication to reset the device Active low.
54	W_DISABLE2#	I	BT enable signal.
56	W_DISABLE1#	I	WLAN enable signal.
58	I2C_DATA	NC	No Connection
60	I2C_CLK	NC	No Connection
62	ALERT#	NC	No Connection
64	RESERVED	NC	No Connection
66	UIM_SWP/PERST1#	NC	No Connection
68	UIM_POWER_SNK/CLKREQ1#	NC	No Connection
70	UIM_POWER_SRC/GPIO_1/PEWAKE1#	NC	No Connection
72	3.3 V	P	VDD system power supply input
74	3.3 V	P	VDD system power supply input

Note: Power (P), Ground (G), Open-Drain (OD), Input (I), Output (O), Do Not Connect (DNC), No Connection (NC)

Installation

- Connect the Module to the PCIe slot of the computer.

Install Wi-Fi driver driver.

After the Wi-Fi Driver is installed , click the Network icon on the Windows, then search the network , and connect the Wireless Network you want.

Federal Communication Commission Interference Statement:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential

installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

—Reorient or relocate the receiving antenna.

—Increase the separation between the equipment and receiver.

—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

—Consult the dealer or an experienced radio/TV technician for help.

Any changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

RF exposure statements

This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body or nearby persons.

CFR 47 FCC PART 15 SUBPART C (15.247) and SUBPART E (15.407) has been investigated. It is applicable to the modular transmitter.

The devices must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product.

This radio transmitter M82-FWA1112WLAN has been approved by Federal Communications Commission to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly

prohibited for use with this device.

Unique antenna connector must be used on the Part 15 authorized transmitters used in the host product.

Antenna Type	Brand	Antenna Model	Maximum Gain (dBi)			Remark
			2.4GHz	5GHz	6GHz	
Dipole	ADVANTECH	AD-500AX	2.65 dBi	4.81 dBi	4.98 dBi	Length of Antenna cable:550mm Connector type of Antenna cable: I-PEX/MHF4
Dipole	ADVANTECH	AD-501AX	3.7 dBi	5 dBi	5 dBi	Length of Antenna cable:150mm Connector type of Antenna cable: I-PEX/MHF4 to RP-SMA
PIFA	ADVANTECH	AD-502AX	3.5 dBi	5 dBi	3.9 dBi	Length of Antenna cable:300mm Connector type of Antenna cable: I-PEX/MHF4
Dipole	ADVANTECH	AD-503AX	3.7 dBi	5 dBi	5 dBi	Length of Antenna cable:150mm Connector type of Antenna cable: I-PEX/MHF4
CHIP	ADVANTECH	2450AD18A6050	2 dBi	1.5 dBi	2.7 dBi	N/A
Dipole	ADVANTECH	AD-504AX	2.67dBi	4.87 dBi	4.94 dBi	Length of Antenna cable:150mm Connector type of Antenna cable: I-PEX/MHF4
Dipole	ADVANTECH	AD-505AX	2.67dBi	4.87 dBi	4.94 dBi	Length of Antenna cable:250mm Connector type of Antenna cable: I-PEX/MHF4

If the FCC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: “Contains Transmitter Module FCC ID:M82-FWA1112WLAN.

The modular transmitter is only FCC authorized for the specific rule parts (i.e., FCC transmitter rules) listed on the grant, and the host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification. The final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed.

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual.

The module is for indoor applications only.

The module may not be used for the purposes of remote control of drones

The antenna must be installed into the host device so that the end user does not have access to the antenna or its connector.

Minimum antenna gain, including any cable losses, for the 6GHz bands must exceed 0dBi.

Industry Canada statement:

This device complies with Industry Canada license-exempt RSSs. Operation is subject to the following two conditions:

1) This device may not cause interference, and

2) This device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

1) l'appareil ne doit pas produire de brouillage;

2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, meme si le brouillage est susceptible d'en compromettre le fonctionnement.

Caution:

1) The device for operation in the band 5150–5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems;

2) For devices with detachable antenna(s), the maximum antenna gain permitted for devices in the bands 5250-5350 MHz and 5470-5725 MHz shall be such that the equipment still complies with the e.i.r.p. limit;

3) For devices with detachable antenna(s), the maximum antenna gain permitted for devices in the band 5725-5850 MHz shall be such that the equipment still complies with the e.i.r.p. limits specified for point-to-point and non-point-to-point operation as appropriate; and

Operation of transmitters in the 5.925-7.125 GHz band is prohibited for control of or communications with unmanned aircraft systems.”