AIW-172BQ-GC1
User manual

Applicability Type

AIW PN	MPN	Description
AIW-172BQ-GC1		802.11 be/ax/ac/a/b/g/n M.2 2230 Key E solution based on QCC2072 chipset

Revision History

Version	Owner	Date	Description
0.9	Paddy Lin	2026/1/20	Initial issue
1.0	Paddy Lin	2026/1/28	1. Product introduction: - Antenna connectors: Added detailed info (J1&J2) - Revised standard spec - Revised driver OS spec 3.5 Power sequence: Added timing specifications 3.3 Revised wording 3.6 Label: Updated label info
1.1	Paddy Lin	2026/04/08	1. Updated the product introduction 2. Updated output power & sensitivity 3.1 Updated mechanical dimension 3.3 Updated block diagram 3.4 Updated M.2 Pin Description

1 Product Introduction

Item	Description
Standard	IEEE 802.11be/ax/ac/a/b/g/n (2T2R) Bluetooth 5.3, 5.0, 4.2, V4.1, V4.0LE, V3.0, V2.1+EDR
Chipset solution	Qualcomm QCC2072
Data Rate	802.11b: 11Mbps 802.11a/g: 54Mbps 802.11n: MCS 0~7 802.11ac: MCS 0~9 802.11ax: MCS 0~11 802.11be: MCS 0~13 Bluetooth: 1 Mbps, 2Mbps and Up to 3Mbps
Operating Frequency	IEEE 802.11be/ax/ac/a/b/g/n ISM Band, 2.412GHz~2.484GHz, 5.150GHz~5.850GHz 5.925~7.125GHz *Subject to local regulations
Interface	WLAN: PCIe Gen3 x1 Bluetooth: USB
Form Factor	M.2 2230 E Key
Antenna connector	2x IPEX MHF4 connectors (Marked J1/J2 on PCBA) : ● ANT1 (J1) : Wi-Fi + BT ● ANT2 (J2) : Wi-Fi + BT
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)

Item	Description
Modulation	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) 802.11be: OFDMA (BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM, 1024-QAM, 4096-QAM)
	BT: Header: GFSK Payload 2M: π/4-DQPSK Payload 3M: 8-DPSK
Power Consumption	TX mode: 1.531A (Max) RX mode: 1.434A (Max)
Operating Voltage	DC 3.3V ± 5%
Operating Temperature Range	0°C~70°C
Storage Temperature Range	-40°C~85°C
Humidity (Non-Condensing)	95%@40°C (Operating)
Dimension L x W x H (in mm)	30mm(±0.2mm)x22mm(±0.2mm) x 2.19mm(±0.3mm)
Weight (g)	3.2g
Driver Support	Linux
Security	64/128-bits WEP, WPA, WPA2, WPA3, 802.1x
MLO Type	MLSR

Table 1-1 Product Introduction

Note: *The storing condition is only for product functionality, no included for parts appearance.*

Windows support is subject change

2 Output Power & Sensitivity

2.1 Wi-Fi

802.11b		
Data Rate	**Tx ± 2dBm**	**Rx Sensitivity**
11Mbps	18	-90

802.11g		
Data Rate	**Tx ± 2dBm**	**Rx Sensitivity**
54Mbps	15	-77

802.11n / 2.4GHz				
HT20	**Data Rate**	**Tx ± 2dBm (1TX)**	**Tx ± 2dBm (2TX)**	**Rx Sensitivity**
	MCS7	12	15	-65
HT40	MCS7	12	15	-63

802.11a		
Data Rate	**Tx ± 2dBm**	**Rx Sensitivity**
54Mbps	13	-76

802.11n / 5GHz				
HT20	Data Rate	Tx ± 2dBm (1TX)	Tx ± 2dBm (2TX)	Rx Sensitivity
	MCS7	11	14	-65
HT40	MCS7	11	14	-62

802.11ac				
VHT80	Data Rate	Tx ± 2dBm (1TX)	Tx ± 2dBm (2TX)	Rx Sensitivity
	MCS9	10	13	-59
VHT160	MCS9	9	12	-57

802.11ax / 2.4 GHz				
HE40	Data Rate	Tx ± 2dBm (1TX)	Tx ± 2dBm (2TX)	Rx Sensitivity
	MCS11	12	15	-63

802.11ax / 5 GHz				
HE20	Data Rate	Tx ± 2dBm (1TX)	Tx ± 2dBm (2TX)	Rx Sensitivity
	MCS11	11	14	-65
HE40	MCS11	11	14	-62
HE80	MCS11	10	13	-59
HE160	MCS11	9	12	-57

802.11ax / 6 GHz				
HE20	**Data Rate**	**Tx ± 2dBm (1TX)**	**Tx ± 2dBm (2TX)**	**Rx Sensitivity**
	MCS11	0	3	-65
HE40	MCS11	3	6	-62
HE80	MCS11	6	9	-59
HE160	MCS11	7	10	-56

802.11be / 2.4 GHz				
EHT40	**Data Rate**	**Tx ± 2dBm (1TX)**	**Tx ± 2dBm (2TX)**	**Rx Sensitivity**
	MCS13	12	15	-57

802.11be / 5 GHz				
EHT20	**Data Rate**	**Tx ± 2dBm (1TX)**	**Tx ± 2dBm (2TX)**	**Rx Sensitivity**
	MCS13	11	14	-58
EHT40	MCS13	11	14	-56
EHT80	MCS13	10	13	-53
EHT160	MCS13	9	12	-51

802.11be / 6 GHz				
EHT20	Data Rate	Tx ± 2dBm (1TX)	Tx ± 2dBm (2TX)	Rx Sensitivity
	MCS13	0	3	-58
EHT40	MCS13	3	6	-56
EHT80	MCS13	6	9	-52
EHT160	MCS13	7	10	-50
EHT320	MCS13	6	9	-47

2.2 Bluetooth

Bluetooth		
Data Rate	Tx ± 2dBm (Class 1 Device)	Rx Sensitivity
3Mbps	0≦ Output Power ≦18dBm	<0.1% BR, BER at -91dBm

1. Hardware Specification

3.1 Mechanical Dimension

30mm(±0.2mm)x22mm(±0.2mm) x 2.19mm(±0.3mm)

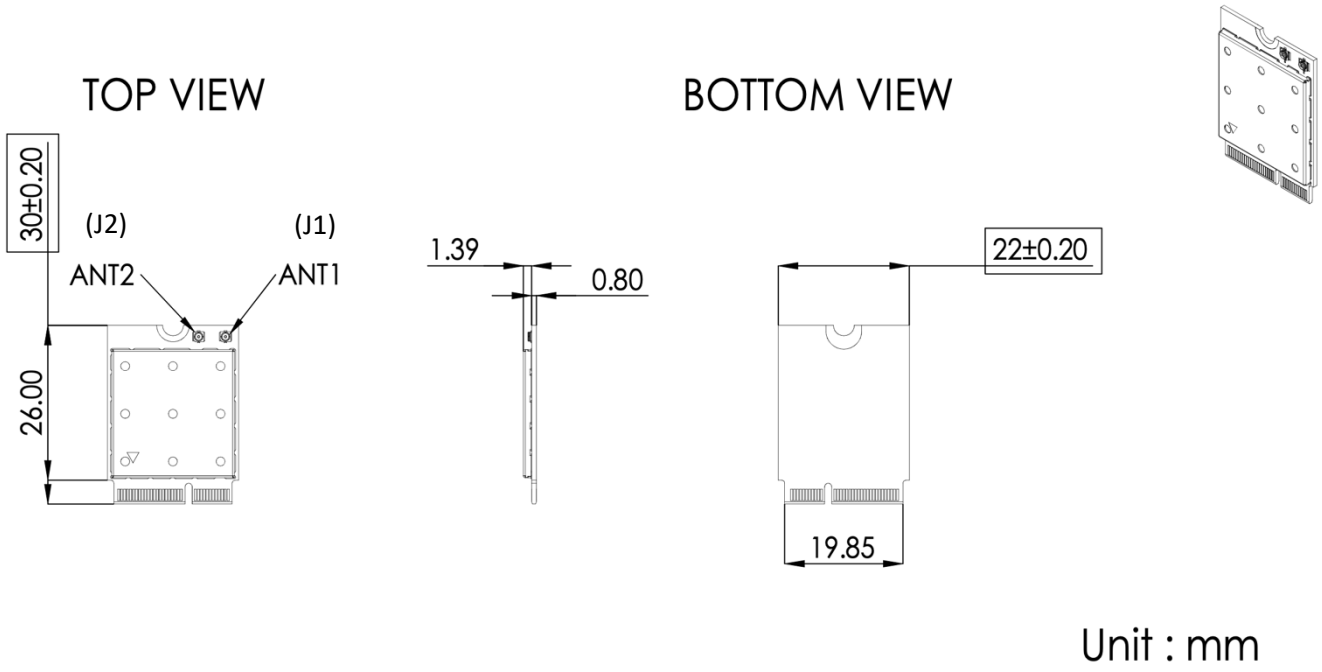


Figure 3-1: Hardware Dimension

3.2 MHF4 connector spec

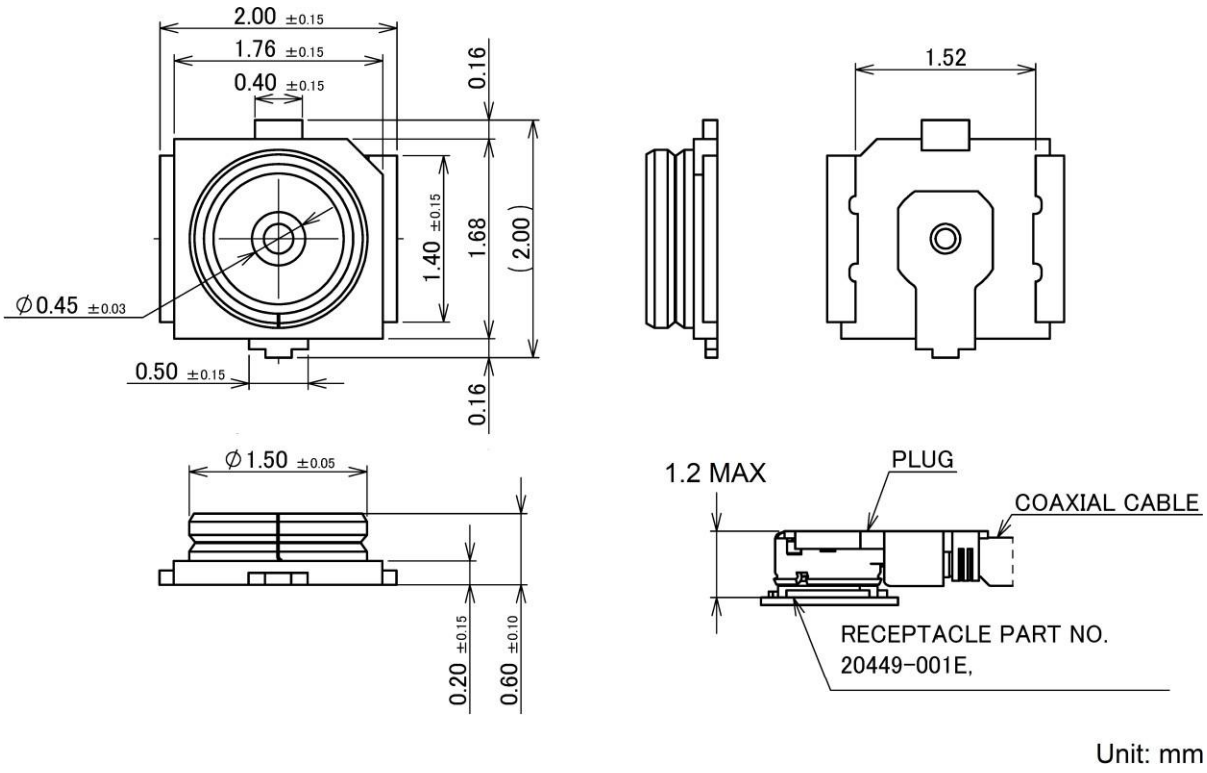


Figure 3-2: MHF4 connector spec

3.3 Block Diagram

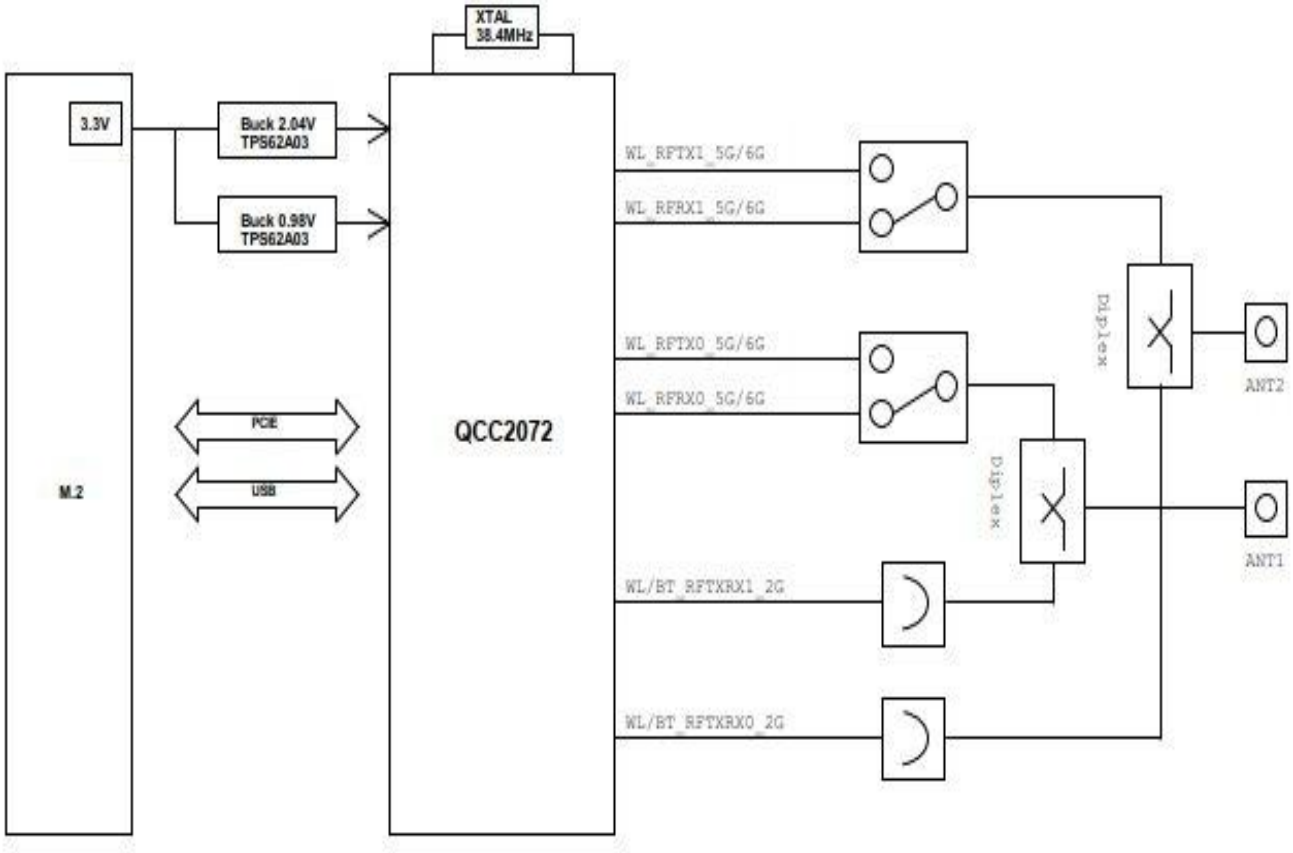


Figure 3-3: Block Diagram

3.4 M.2 Pin Description

TOP

M.2 2230 pin number	Pin name	Voltage	I/O		Function description
1	GND				
3	USB_D+	-	-	A	USB1.1 interface to support full-speed only (no lowspeed mode) and peripheral device mode only (no master mode). 1.5 KΩ pull-up to D+ is integrated in the device. No external resistor is required. Ensure that the host has 15 KΩ pull-down resistor on both D+ and Daccording to USB 1.1 specification.
5	USB_D-	-	-	A	USB1.1 interface to support full-speed only (no lowspeed mode) and peripheral device mode only (no master mode). 1.5 KΩ pull-up to D+ is integrated in the device. No external resistor is required. Ensure that the host has 15 KΩ pull-down resistor on both D+ and Daccording to USB 1.1 specification.
7	GND				
9	N/C				
11	N/C				
13	N/C				
15	N/C				
17	N/C				
19	N/C				
21	N/C				
23	N/C				
25	Key E				
27	Key E				
29	Key E				
31	Key E				
33	GND				
35	PERp0	-	-	I	WLAN PCIe receive input differential signals
37	PERn0	-	-	I	WLAN PCIe receive input differential signals
39	GND				
41	PETp0	-	-	O	WLAN PCIe transmit output differential signals
43	PETn0	-	-	O	WLAN PCIe transmit output differential signals
45	GND				
47	REFCLKp0	-	-	I	WLAN PCIe reference clock input differential signals
49	REFCLKn0	-	-	I	WLAN PCIe reference clock input differential signals
51	GND				
53	CLKREQ0#	3.3V	PUOD	B	WLAN PCIe clock request signal is a bidirection signal. It is an open-drain signal that requires an external 10 KΩ pull-up resistor, USB=3.3V

55	PEWAKE0#	3.3V	PUOD	O	WLAN PCIe wake-up signal is an output signal. It is an open-drain signal that requires an external 10 KΩ pull-up resistor, USB=3.3V
57	GND				
59	N/C				
61	N/C				
63	GND				
65	N/C				
67	N/C				
69	GND				
71	N/C				
73	N/C				
75	GND				

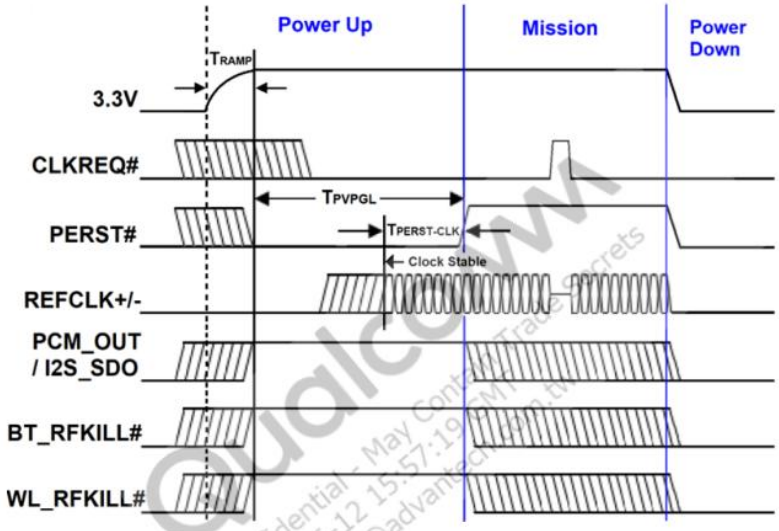
BOT

M.2 2230 pin number	Pin name	Voltage	I/O		Function description
2	VCC_1	3.3 V			
4	VCC_2	3.3 V			
6	N/C				
16	N/C				
18	GND				
20	N/C				
22	N/C				
24	Key E				
26	Key E				
28	Key E				
30	Key E				
32	N/C				
34	N/C				
36	N/C				
38	NC				
40	NC				
42	NC				
44	NC				
46	COEX_TXD	1.8 V	PD	O	WSI interface for LTE coexisting interface to enable firmware communication with LTE modem
48	COEX_RXD	1.8 V	NP	I	WSI interface for LTE coexisting interface to enable firmware communication with LTE modem

50	N/C				
52	PERST0#	3.3V	PD	I	WLAN PCIe reset signal is an input signal, USB=3.3V
54	W_DISABLE2#/BT_EN	1.8 V	PU	I	Turn off Bluetooth RF analog and front-end. Active low. Bluetooth enable signal. It is an input, active high to enable Bluetooth operation. The platform must add pullup (1.8 V) for the I/O voltage level selection.
56	W_DISABLE1#	1.8 V	PU	I	It is an interrupt pin to the WLAN CPU. When WLAN detects an interrupt, it turns off WLAN MAC/PHY/RF for power save application. The platform must add pullup (1.8 V) for the I/O voltage level selection, even if this is NC from the platform.
58	N/C				
60	N/C				
62	N/C				
64	N/C				
66	N/C				
68	N/C				
70	N/C				
72	VCC_3	3.3 V			
74	VCC_4	3.3 V			

3.5 Power-on Sequence

QCC2072 Module Power Sequence Timing

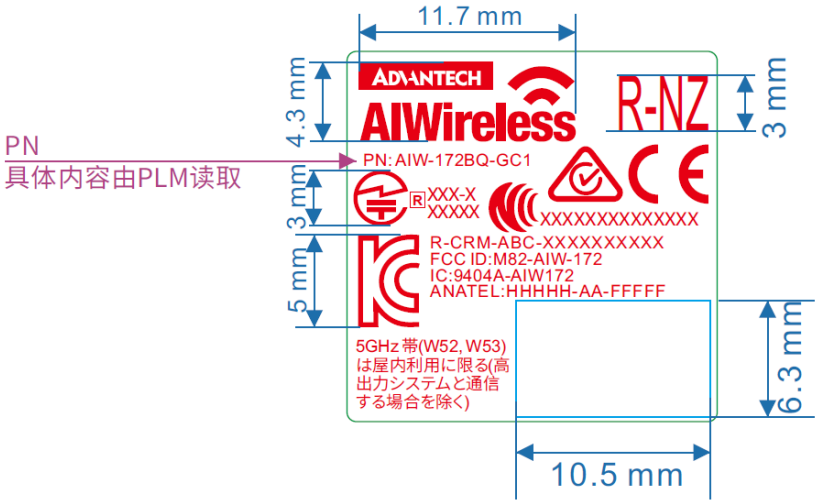


Symbol	Parameter	Minimum	Maximum	Unit
TRAMP	Power supply ramp on 3.3 V	-	100	ms
TPVPGL	Power (3.3 V) valid to PERST# input de-asserted	50	-	ms
TPERSRT#-CLK	REFCLK stable before PERST# de-asserted	100	-	µs

3.6 Label

Label size: 20X20MM

* May be subject to change



3.7 Packing information

25pcs in one box; 6 boxes in one carton. SPQ is 25pcs.