



JWW6051

802.11ac/abgn 2T2R WIFI & BT 4.2 M.2 Combo Module

Technical Specifications

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System Information

Wireless: IEEE 802.11ac/a/b/g/n (2T2R)

Bluetooth v5.0, v4.2, v4.1, v4.0 LE, v3.0+HS, v2.1+EDR (Note: Supports to v4.1 for Windows)

MU-MIMO

Chipset: Qualcomm Atheros QCA6174A-5

Antenna: MHF4 x2 for 2T2R (2.4GHz & 5GHz dual band antenna)

Data Rate

802.11b : 11Mbps

802.11a/g : 54Mbps

802.11n : 300Mbps

802.11ac : 867Mbps

Operating Frequency

IEEE 802.11 b/g/n: 2.412GHz ~ 2.484GHz

IEEE 802.11 an/ac: 5.150GHz ~ 5.850GHz

Interface

M.2 Key A+E (2230) (PCIe for WiFi, USB for BT)

Antenna Ports : MHF4 x 2 for 2T2R

Modulation

802.11a : BPSK, QPSK, 16-QAM, 64-QAM
802.11b : DBPSK, DQPSK, CCK
802.11g : BPSK, QPSK, 16-QAM, 64-QAM
802.11n : BPSK, QPSK, 16-QAM, 64-QAM
802.11ac : BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM

Recommended Operating Conditions

Operating Voltage: DC 3.3V \pm 10%
Operating Temperature Range: -40°C ~ 85°C
Storage Temperature Range: -45° ~ 135°C
Operating Humidity (non-condensing): 5% ~ 95%
Storage Humidity (non-condensing): 5% ~ 90%
Power consumption: TX: 806mA, RX: 205mA, Max: 3.5W
Dimension (in mm): 22.0(W) x 30.0(L) mm

Noted: The best RF performance specified in the data sheet, that's guaranteed only between -20° and 70° without reducing performance.

Driver Support

Windows:

Windows 7 (32bit/64bit)
Windows 8/8.1 (32bit/64bit)
Windows 10 (32bit/64bit)

Linux:

Kernel version 4.4.15
Kernel version 4.9.11
Kernel version 4.11

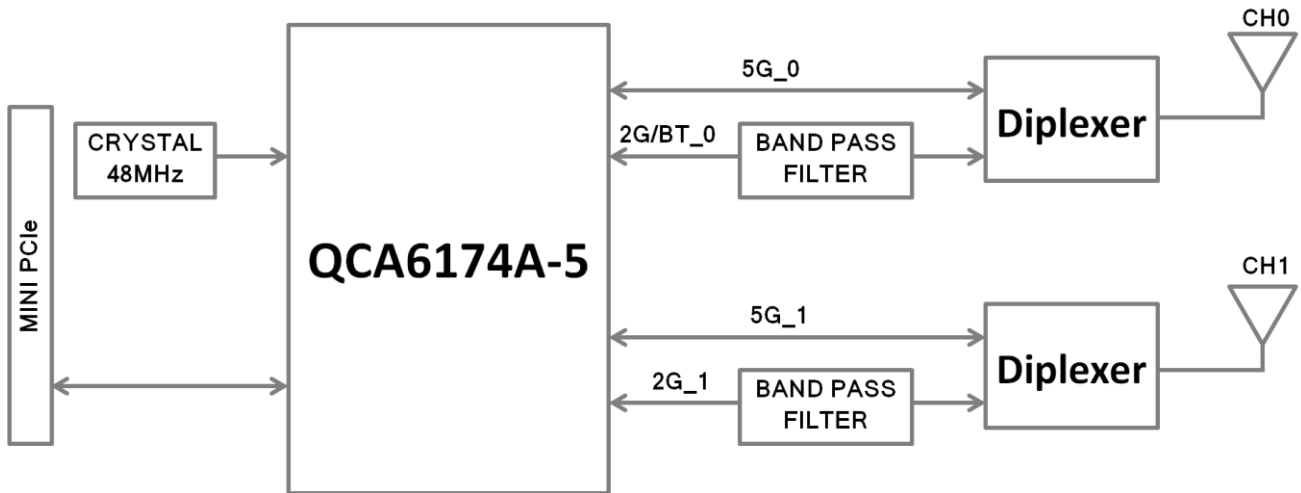
Android N: (WiFi Only)

Kernel version 4.9.31
Kernel version 4.4.62

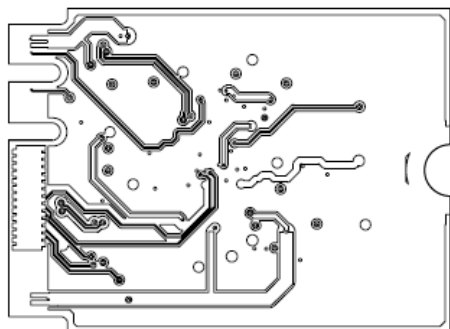
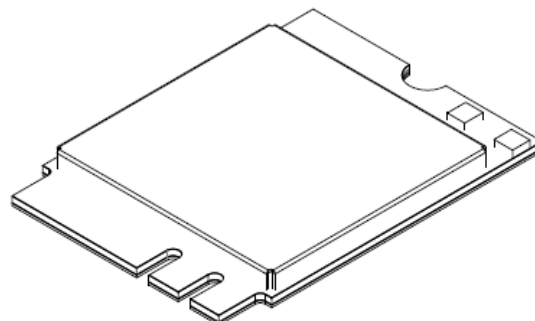
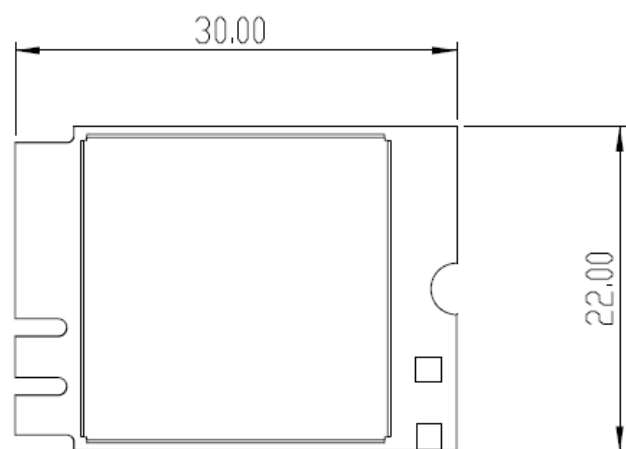
Certification

CE / FCC / IC

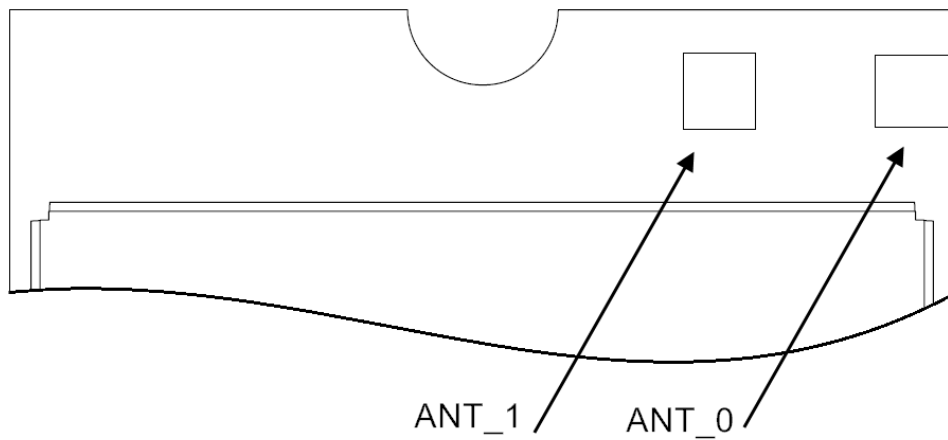
Block Diagram



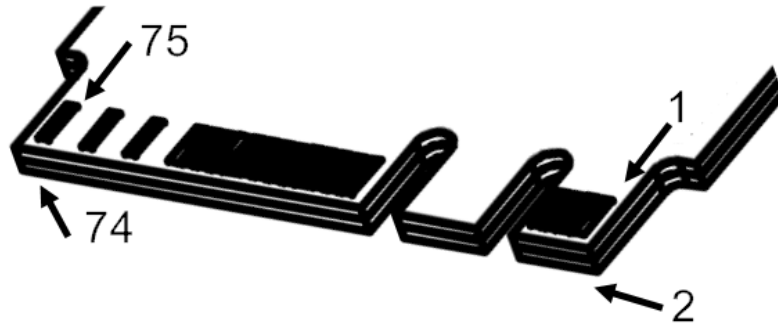
Dimension



Pin Assignment



Pin Name	Description
Ant_0	RF Antenna for WiFi 2.4GHz/5GHz & Bluetooth
Ant_1	RF Antenna for WiFi 2.4GHz/5GHz



PIN#	Pin Name	Design Status	PIN#	Pin Name	Design Status
1	GND	GND			
3	USB_D+	HSDP_	2	3.3V	VDD33
5	USB_D-	HSDM_	4	3.3V	VDD33
7	GND	GND	6	LED_1#	WiFi LED
9		Module Key A	8		Module Key A
11		Module Key A	10		Module Key A
13		Module Key A	12		Module Key A
15		Module Key A	14		Module Key A
17	NC	NC	16	LED_2#	BT_LED
19	NC	NC	18	GND	GND
21	NC	NC	20	UART WAKE	NC
23	NC	NC	22	UART TX	NC
25		Module Key E	24		Module Key E
27		Module Key E	26		Module Key E
29		Module Key E	28		Module Key E
31		Module Key E	30		Module Key E
33	GND	GND	32	UART RX	NC
35	PERp0	PERXp0	34	UART RTS	NC
37	PERn0	PERXn0	36	UART CTS	NC
39	GND	GND	38	VENDOR DEFINED	NC
41	PETp0	PETXp0	40	VENDOR DEFINED	NC
43	PETn0	PETXn0	42	VENDOR DEFINED	NC
45	GND	GND	44	COEX3(I/O)	LTE_ACTIVE
47	REFCLKp0	REFCLKp0	46	COEX_TXD(O)	LTE_PRI
49	REFCLKn0	REFCLKn0	48	COEX_RXD(O)	LTE_SYNC
51	GND	GND	50	SUSCLK(32kHz)	32KHz_CLK_IN
53	CLKREQ0#(I/O)	CLKREQ	52	PERST0#(I)	PERST
55	PEWAKE0#(I/O)	PEWAKE	54	W_DISABLE2#(I)	BT_RF_KILL_L
57	GND	GND	56	W_DISABLE1#(I)	WLAN_RF_KILL_L
59	PERp1	NC	58	I2C DATA(I)	NC
61	PERn1	NC	60	I2C CLK(I)	NC
63	GND	GND	62	ALERT#(O)	NC
65	PETp1	NC	64	RESERVED	NC
67	PETn1	NC	66	RESERVED	NC
69	GND	GND	68	RESERVED	NC
71	REFCLKp1	NC	70	RESERVED	NC
73	REFCLKn1	NC	72	3.3Vaux	3.3V
75	GND	GND	74	3.3Vaux	3.3V

Output Power & Sensitivity

Bluetooth

Data Rate	Tx +/- 2dB	Rx Sensitivity +/- 2dB
3Mbps	$0 \leq \text{Output Power} \leq +4\text{dBm}$	<0.1% BER at -70dBm

802.11bg / 2.4GHz

Data Rate	Tx +/- 2dB	Rx Sensitivity +/- 2dB
1~11Mbps	18dBm	-95~-85dBm
6Mbps	18dBm	-90dBm
24Mbps	17dBm	-83dBm
54Mbps	16dBm	-76dBm

802.11n / 2.4GHz

Data Rate		Tx +/- 2dB (1TX)	Tx +/- 2dB (2TX)	Rx Sensitivity +/- 2dB
HT 20	MCS 0	17dBm	20dBm	-88dBm
	MCS 4	16dBm	19dBm	-77dBm
	MCS 7	15dBm	18dBm	-72dBm
HT 40	MCS 0	17dBm	20dBm	-86dBm
	MCS 4	16dBm	19dBm	-76dBm
	MCS 7	15dBm	18dBm	-70dBm

802.11a / 5GHz		
Data Rate	Tx +/- 2dB	Rx Sensitivity +/- 2dB
6Mbps	12dBm	-90dBm
24Mbps	11dBm	-83dBm
54Mbps	10dBm	-76dBm

802.11n / 5GHz				
Data Rate		Tx +/- 2dB (1TX)	Tx +/- 2dB (2TX)	Rx Sensitivity +/- 2dB
HT 20	MCS 0	13dBm	16dBm	-88dBm
	MCS 4	11dBm	14dBm	-77dBm
	MCS 7	10dBm	13dBm	-72dBm
HT 40	MCS 0	12dBm	15dBm	-86dBm
	MCS 4	11dBm	14dBm	-76dBm
	MCS 7	10dBm	13dBm	-70dBm

802.11ac				
Data Rate		Tx +/- 2dB (1TX)	Tx +/- 2dB (2TX)	Rx Sensitivity +/- 2dB
VHT 20	MCS 0	13dBm	16dBm	-88dBm
	MCS 4	12dBm	15dBm	-77dBm
	MCS 8	7dBm	10dBm	-69dBm
VHT 40	MCS 0	12dBm	15dBm	-86dBm
	MCS 4	12dBm	15dBm	-76dBm
	MCS 9	6dBm	9dBm	-64dBm
VHT 80	MCS 0	12dBm	15dBm	-83dBm
	MCS 4	12dBm	15dBm	-74dBm
	MCS 9	6dBm	9dBm	-61dBm