

### Qualcomm's IPQ8072A WiFi 6 (802.11ax) Embedded Board Supporting 5G Cellular Modem

Dual Band Dual Concurrent WiFi 6 (802.11ax) / Support SDX55 Qualcomm's 5G NR NSA / MU-MIMO OFDMA



Model: WPQ873

#### **KEY FEATURES**

- Qualcomm Atheros IPQ8072A Quad Core ARM 64 bit A53
   2.2GHz processor
- 4x4 on-board 2.4GHz radio, up to 1182Mbps physical data rate
- 4x4 on-board 5GHz radio, up to 2475Mbps physical data rate
- M.2 (NGFF) B Key Socket with PCle 3.0 to support 5G cellular modem with 4G LTE backward compatible
- Supports Dynamic Frequency Selection (DFS)

#### APPLICATIONS

- 802.11ax MU-MIMO OFDMA Access Point
- Smart AP TWT
- 5G (Cellular Modem) + WiFi Enhanced Gateway

### **Specifications**

Chipset	Qualcomm Atheros IPQ8072A Quad Core ARM 64 bit A53 2.2GHz processor 'Hawkeye' Series
Reference Design	Qualcomm Atheros HK09
System Memory	1x 512MB, DDR4 16-bit interface
NAND Flash	256MB
NOR Flash	8MB
Wireless	On-board 4x4 2.4GHz MU-MIMO OFDMA 802.11b/g/n/ax, max 17dBm per chain On-board 4x4 5GHz MU-MIMO OFDMA 802.11a/n/ac/ax, max 17dBm per chain 8x U.FL Connectors
Frequency Range	2.412~2.472GHz, 5.150~5.825GHz
Modulation Techniques	OFDMA: BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM,1024-QAM
NGFF Slot	1x M.2 (NGFF) B Key Socket with PCle 3.0 supporting 5G cellular modem 1x M.2 (NGFF) B Key Socket with USB 3.0 and PCle 2.0
Interface  3x 1Gbps Ethernet Ports, 1x 2.5Gbps Ethernet Port 1x USB 3.0 Port 4x SIM Card Slots 1x JTAG 20 Pin Connector 1x Serial Port 4 Pin Connector	
Reset Button	1x S/W Reset Button
LED	1x RGB LED Indicators
Power over Ethernet (PoE)	Supports IEEE 802.3af/at/bt 48~56V
DC Power	1x DC Jack Connector: 12V
Power Consumption (Board only)	22.5W (Including Bluetooth)

<sup>1.</sup> The Serial Port is a 4-pin header (TTL). A Serial Converter is available to change the TTL signals on the board to RS-232 signals for debugging.

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<sup>2.</sup> The JTAG Port is a 20-pin header. A JTAG kit is for writing your self-developed loader and firmware directly.

<sup>\*</sup>Configurations are subject to change without notifications.



### **Specifications**

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Bluetooth	QCA4024 BLE 5.0
Certification	REACH & RoHS Compliance
Environmental Temperature	Operating: -20°C to 70°C, Storage: -40°C to 90°C
Environmental Humidity, Non-Condensing	Operating: 5% to 95%, Storage: Max. 90%
Dimensions (W x H x D) in mm	128 x 255 x 36.8

### RF Performance Table for 2.4GHz

	Data Rate	TX Power (per chain)	TX Power (4 chains)	Tolerance
	1Mbps	17dBm	23dBm	±2dB
2.4GHz	2Mbps	17dBm	23dBm	±2dB
802.11b	5.5Mbps	17dBm	23dBm	±2dB
	11Mbps	17dBm	23dBm	±2dB
	6Mbps	17dBm	23dBm	±2dB
	9Mbps	17dBm	23dBm	±2dB
	12Mbps	17dBm	23dBm	±2dB
2.4GHz	18Mbps	17dBm	23dBm	±2dB
802.11g	24Mbps	15dBm	21dBm	±2dB
	36Mbps	15dBm	21dBm	±2dB
	48Mbps	15dBm	21dBm	±2dB
	54Mbps	15dBm	21dBm	±2dB
	MCS 0	17dBm	23dBm	±2dB
	MCS 1	17dBm	23dBm	±2dB
	MCS 2	17dBm	23dBm	±2dB
2.4GHz 802.11n	MCS 3	17dBm	23dBm	±2dB
HT20	MCS 4	17dBm	23dBm	±2dB
	MCS 5	15dBm	21dBm	±2dB
	MCS 6	15dBm	21dBm	±2dB
	MCS 7	15dBm	21dBm	±2dB
	MCS 0	16dBm	22dBm	±2dB
	MCS 1	16dBm	22dBm	±2dB
	MCS 2	16dBm	22dBm	±2dB
2.4GHz 802.11n	MCS 3	16dBm	22dBm	±2dB
802.11h HT40	MCS 4	16dBm	22dBm	±2dB
	MCS 5	14dBm	20dBm	±2dB
	MCS 6	14dBm	20dBm	±2dB
	MCS 7	14dBm	20dBm	±2dB

	Data Rate	RX Specifications Sensitivity	Tolerance
	1Mbps	-102	±2dB
2.4GHz	2Mbps	-99	±2dB
802.11b	5.5Mbps	-97	±2dB
	11Mbps	-95	±2dB
	6Mbps	-97	±2dB
	9Mbps	-95	±2dB
	12Mbps	-93	±2dB
2.4GHz	18Mbps	-91	±2dB
802.11g	24Mbps	-89	±2dB
	36Mbps	-87	±2dB
	48Mbps	-85	±2dB
	54Mbps	-83	±2dB
	MCS 0	-95	±2dB
	MCS 1	-93	±2dB
	MCS 2	-90	±2dB
2.4GHz 802.11n HT20	MCS 3	-87	±2dB
	MCS 4	-85	±2dB
	MCS 5	-82	±2dB
	MCS 6	-80	±2dB
	MCS 7	-78	±2dB
	MCS 0	-93	±2dB
	MCS 1	-90	±2dB
	MCS 2	-87	±2dB
2.4GHz 802.11n	MCS 3	-94	±2dB
HT40	MCS 4	-81	±2dB
	MCS 5	-78	±2dB
	MCS 6	-75	±2dB
	MCS 7	-73	±2dB



<sup>\*</sup>Configurations are subject to change without notifications.



### RF Performance Table for 2.4GHz

	Data Rate	TX Power (per chain)	TX Power (4 chains)	Tolerance
	MCS 0	17dBm	23dBm	±2dB
	MCS 1	17dBm	23dBm	±2dB
	MCS 2	17dBm	23dBm	±2dB
	MCS 3	17dBm	23dBm	±2dB
	MCS 4	17dBm	23dBm	±2dB
2.4GHz 802.11ax	MCS 5	15dBm	21dBm	±2dB
HE20	MCS 6	15dBm	21dBm	±2dB
	MCS 7	15dBm	21dBm	±2dB
	MCS 8	14dBm	20dBm	±2dB
	MCS 9	14dBm	20dBm	±2dB
	MCS 10	10dBm	16dBm	±2dB
	MCS 11	10dBm	16dBm	±2dB
	MCS 0	16dBm	22dBm	±2dB
	MCS 1	16dBm	22dBm	±2dB
	MCS 2	16dBm	22dBm	±2dB
	MCS 3	16dBm	22dBm	±2dB
	MCS 4	16dBm	22dBm	±2dB
2.4GHz	MCS 5	14dBm	20dBm	±2dB
802.11ax HE40	MCS 6	14dBm	20dBm	±2dB
	MCS 7	14dBm	20dBm	±2dB
	MCS 8	14dBm	20dBm	±2dB
	MCS 9	14dBm	20dBm	±2dB
	MCS 10	11dBm	17dBm	±2dB
	MCS 11	11dBm	17dBm	±2dB

	Data Rate	RX Specifications Sensitivity	Tolerance
	MCS 0	-95	±2dB
	MCS 1	-93	±2dB
	MCS 2	-91	±2dB
	MCS 3	-89	±2dB
	MCS 4	-86	±2dB
2.4GHz 802.11ax	MCS 5	-84	±2dB
HE20	MCS 6	-82	±2dB
	MCS 7	-80	±2dB
	MCS 8	-77	±2dB
	MCS 9	-75	±2dB
	MCS 10	-72	±2dB
	MCS 11	-69	±2dB
	MCS 0	-92	±2dB
	MCS 1	-90	±2dB
	MCS 2	-87	±2dB
	MCS 3	-85	±2dB
	MCS 4	-82	±2dB
2.4GHz 802.11ax	MCS 5	-80	±2dB
802.11ax HE40	MCS 6	-78	±2dB
	MCS 7	-77	±2dB
	MCS 8	-75	±2dB
	MCS 9	-72	±2dB
	MCS 10	-69	±2dB
	MCS 11	-66	±2dB





### RF Performance Table for 5GHz

	Data Rate	TX Power (per chain)	TX Power (4 chains)	Tolerance
	6Mbps	17dBm	23dBm	±2dB
	9Mbps	17dBm	23dBm	±2dB
	12Mbps	17dBm	23dBm	±2dB
5GHz	18Mbps	17dBm	23dBm	±2dB
802.11a	24Mbps	16dBm	22dBm	±2dB
	36Mbps	16dBm	22dBm	±2dB
	48Mbps	16dBm	22dBm	±2dB
	54Mbps	16dBm	22dBm	±2dB
	MCS 0	17dBm	23dBm	±2dB
	MCS 1	17dBm	23dBm	±2dB
	MCS 2	17dBm	23dBm	±2dB
5GHz	MCS 3	17dBm	23dBm	±2dB
802.11n/ac	MCS 4	17dBm	23dBm	±2dB
VHT20	MCS 5	16dBm	22dBm	±2dB
	MCS 6	16dBm	22dBm	±2dB
	MCS 7	16dBm	22dBm	±2dB
	MCS 8	15dBm	21dBm	±2dB
	MCS 0	17dBm	23dBm	±2dB
	MCS 1	17dBm	23dBm	±2dB
	MCS 2	17dBm	23dBm	±2dB
	MCS 3	17dBm	23dBm	±2dB
5GHz	MCS 4	17dBm	23dBm	±2dB
802.11n/ac VHT40	MCS 5	15dBm	21dBm	±2dB
	MCS 6	15dBm	21dBm	±2dB
	MCS 7	15dBm	21dBm	±2dB
	MCS 8	14dBm	20dBm	±2dB
	MCS 9	14dBm	20dBm	±2dB
	MCS 0	17dBm	23dBm	±2dB
	MCS 1	17dBm	23dBm	±2dB
	MCS 2	17dBm	23dBm	±2dB
	MCS 3	17dBm	23dBm	±2dB
5GHz	MCS 4	17dBm	23dBm	±2dB
802.11ac VHT80	MCS 5	14dBm	20dBm	±2dB
	MCS 6	14dBm	20dBm	±2dB
	MCS 7	14dBm	20dBm	±2dB
	MCS 8	13dBm	19dBm	±2dB
	MCS 9	13dBm	19dBm	±2dB

	Data Rate	RX Specifications Sensitivity	Tolerance
	6Mbps	-97	±2dB
	9Mbps	-95	±2dB
	12Mbps	-93	±2dB
5GHz	18Mbps	-91	±2dB
802.11a	24Mbps	-89	±2dB
	36Mbps	-87	±2dB
	48Mbps	-85	±2dB
	54Mbps	-82	±2dB
	MCS 0	-97	±2dB
	MCS 1	-96	±2dB
	MCS 2	-94	±2dB
5GHz	MCS 3	-92	±2dB
802.11n/ac	MCS 4	-90	±2dB
VHT20	MCS 5	-88	±2dB
	MCS 6	-85	±2dB
	MCS 7	-83	±2dB
	MCS 8	-81	±2dB
	MCS 0	-95	±2dB
	MCS 1	-93	±2dB
	MCS 2	-91	±2dB
	MCS 3	-89	±2dB
5GHz	MCS 4	-87	±2dB
802.11n/ac VHT40	MCS 5	-85	±2dB
	MCS 6	-83	±2dB
	MCS 7	-80	±2dB
	MCS 8	-77	±2dB
	MCS 9	-74	±2dB
	MCS 0	-91	±2dB
	MCS 1	-89	±2dB
	MCS 2	-87	±2dB
	MCS 3	-85	±2dB
5GHz	MCS 4	-82	±2dB
802.11ac VHT80	MCS 5	-79	±2dB
	MCS 6	-77	±2dB
	MCS 7	-75	±2dB
	MCS 8	-72	±2dB
	MCS 9	-69	±2dB





### RF Performance Table for 5GHz

	Data Rate	TX Power (per chain)	TX Power (4 chains)	Tolerance
	MCS 0	17dBm	23dBm	±2dB
	MCS 1	17dBm	23dBm	±2dB
	MCS 2	17dBm	23dBm	±2dB
	MCS 3	17dBm	23dBm	±2dB
5GHz	MCS 4	17dBm	23dBm	±2dB
802.11ac VHT80+80	MCS 5	14dBm	20dBm	±2dB
	MCS 6	14dBm	20dBm	±2dB
	MCS 7	14dBm	20dBm	±2dB
	MCS 8	11dBm	17dBm	±2dB
	MCS 9	11dBm	17dBm	±2dB
	MCS 0	17dBm	23dBm	±2dB
	MCS 1	17dBm	23dBm	±2dB
	MCS 2	17dBm	23dBm	±2dB
	MCS 3	17dBm	23dBm	±2dB
	MCS 4	17dBm	23dBm	±2dB
5GHz	MCS 5	16dBm	22dBm	±2dB
802.11ax HE20	MCS 6	16dBm	22dBm	±2dB
	MCS 7	16dBm	22dBm	±2dB
	MCS 8	15dBm	21dBm	±2dB
	MCS 9	15dBm	21dBm	±2dB
	MCS 10	12dBm	18dBm	±2dB
	MCS 11	12dBm	18dBm	±2dB
	MCS 0	17dBm	23dBm	±2dB
	MCS 1	17dBm	23dBm	±2dB
	MCS 2	17dBm	23dBm	±2dB
	MCS 3	17dBm	23dBm	±2dB
	MCS 4	17dBm	23dBm	±2dB
5GHz 802.11ax	MCS 5	15dBm	21dBm	±2dB
HE40	MCS 6	15dBm	21dBm	±2dB
	MCS 7	15dBm	21dBm	±2dB
	MCS 8	14dBm	20dBm	±2dB
	MCS 9	14dBm	20dBm	±2dB
	MCS 10	12dBm	18dBm	±2dB
	MCS 11	12dBm	18dBm	±2dB

	Data Rate	RX Specifications Sensitivity	Tolerance
	MCS 0	-86	±2dB
	MCS 1	-84	±2dB
	MCS 2	-82	±2dB
	MCS 3	-80	±2dB
5GHz 802.11ac	MCS 4	-77	±2dB
VHT80+80	MCS 5	-74	±2dB
	MCS 6	-71	±2dB
	MCS 7	-68	±2dB
	MCS 8	-65	±2dB
	MCS 9	-63	±2dB
	MCS 0	-96	±2dB
	MCS 1	-95	±2dB
	MCS 2	-93	±2dB
	MCS 3	-91	±2dB
	MCS 4	-89	±2dB
5GHz 802.11ax	MCS 5	-87	±2dB
HE20	MCS 6	-85	±2dB
	MCS 7	-82	±2dB
	MCS 8	-79	±2dB
	MCS 9	-77	±2dB
	MCS 10	-74	±2dB
	MCS 11	-71	±2dB
	MCS 0	-94	±2dB
	MCS 1	-93	±2dB
	MCS 2	-91	±2dB
	MCS 3	-89	±2dB
	MCS 4	-86	±2dB
5GHz 802.11ax	MCS 5	-83	±2dB
802.11ax HE40	MCS 6	-81	±2dB
	MCS 7	-79	±2dB
	MCS 8	-76	±2dB
	MCS 9	-74	±2dB
	MCS 10	-71	±2dB
	MCS 11	-68	±2dB





### RF Performance Table for 5GHz

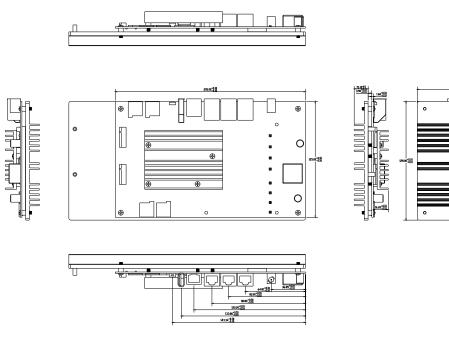
	Data Rate	TX Power (per chain)	TX Power (4 chains)	Tolerance
	MCS 0	17dBm	23dBm	±2dB
	MCS 1	17dBm	23dBm	±2dB
	MCS 2	17dBm	23dBm	±2dB
	MCS 3	17dBm	23dBm	±2dB
	MCS 4	17dBm	23dBm	±2dB
5GHz 802.11ax	MCS 5	14dBm	20dBm	±2dB
HE80	MCS 6	14dBm	20dBm	±2dB
	MCS 7	14dBm	20dBm	±2dB
	MCS 8	13dBm	19dBm	±2dB
	MCS 9	13dBm	19dBm	±2dB
	MCS 10	10dBm	16dBm	±2dB
	MCS 11	10dBm	16dBm	±2dB
	MCS 0	17dBm	23dBm	±2dB
	MCS 1	17dBm	23dBm	±2dB
	MCS 2	17dBm	23dBm	±2dB
	MCS 3	17dBm	23dBm	±2dB
	MCS 4	17dBm	23dBm	±2dB
5GHz 802.11ax	MCS 5	14dBm	20dBm	±2dB
HE160	MCS 6	14dBm	20dBm	±2dB
	MCS 7	14dBm	20dBm	±2dB
	MCS 8	11dBm	17dBm	±2dB
	MCS 9	11dBm	17dBm	±2dB
	MCS 10	10dBm	16dBm	±2dB
	MCS 11	10dBm	16dBm	±2dB

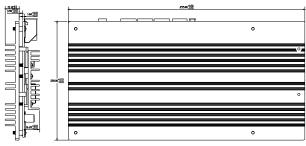
	Data Rate	RX Specifications	Tolerance
	MODA	Sensitivity	0.10
	MCS 0	-91	±2dB
	MCS 1	-90	±2dB
	MCS 2	-88	±2dB
	MCS 3	-86	±2dB
	MCS 4	-84	±2dB
5GHz 802.11ax	MCS 5	-82	±2dB
HE80	MCS 6	-79	±2dB
	MCS 7	-77	±2dB
	MCS 8	-74	±2dB
	MCS 9	-71	±2dB
	MCS 10	-69	±2dB
	MCS 11	-66	±2dB
	MCS 0	-86	±2dB
	MCS 1	-84	±2dB
	MCS 2	-82	±2dB
	MCS 3	-79	±2dB
	MCS 4	-77	±2dB
5GHz	MCS 5	-75	±2dB
802.11ax HE160	MCS 6	-72	±2dB
	MCS 7	-70	±2dB
	MCS 8	-67	±2dB
	MCS 9	-65	±2dB
	MCS 10	-62	±2dB
	MCS 11	-59	±2dB

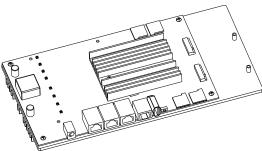


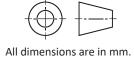


### **Mechanical Dimensions**





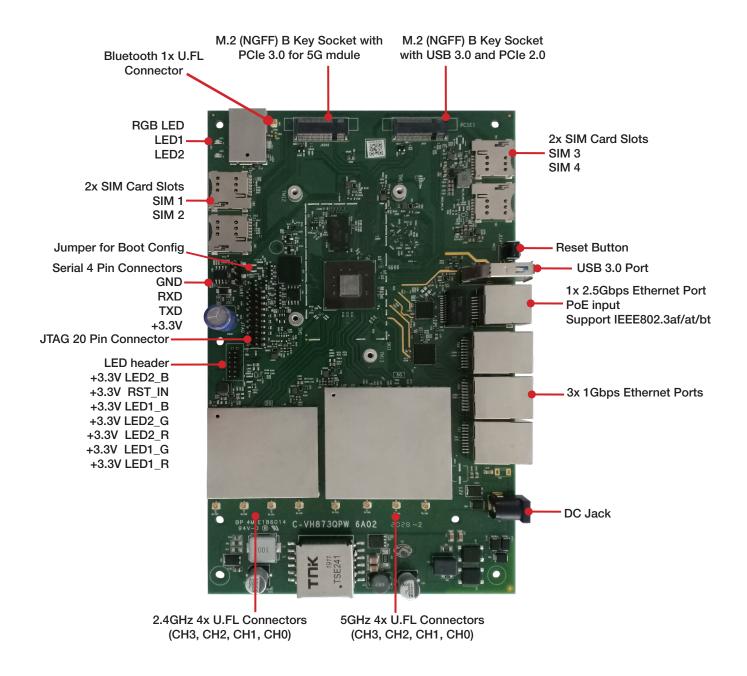








### Component Map







#### Firmware / Software

Firmware CompexWRT

### **Development Kits**

SDK SDKs with QCA binary drivers are available for software developers.

Accessory JTAG Programmer, Serial Converter, Power Supply Only if available

### **Ordering Options**

I	tem Code	Processor	Power Solutions
WPQ873HV	6A02PR8F1GBR-TE	IPQ8072A	12V DC

