

Multi-function IPQ8074 Embedded Board with 2.2GHz CPU

2x USB 3.0 / Supports 802.11ax / 5x Gigabit LAN / 2x Mini PCIe Slot



Model: HK01.1

KEY FEATURES

- Qualcomm Atheros IPQ8074 ARM Quad Core CPU
- On-board 5GHz radio, up to 4804Mbps physical data rate
- On-board 2.4GHz radio, up to 1147Mbps physical data rate

APPLICATIONS

- Dual Band MU-MIMO 802.11g/n/ac/ax Access Point
- 8x8 MU-MIMO 802.11ac Access Point
- Wireless Base Station

Specifications

Chipset	Qualcomm Atheros Quad Core ARM Cortex 64-bit A53 Processor IPQ8074 2.2GHz CPU
Reference Design	Qualcomm Atheros AP.HK01
System Memory	1GB (2x 512MB) DDR3L 1333MHz 32-bit interface
NAND Flash	256MB QPIC NAND flash, 8GB eMMC NAND flash
NOR Flash	32MB NOR flash for system, 512KB SPI serial flash memory for 10Gbps PHY
Wireless	On-board 4x4 2.4GHz MU-MIMO 802.11b/g/n/ax, max 23dBm per chain On-board 2x(4x4) or 8x8 5GHz MU-MIMO 802.11a/n/ac/ax, max 20dBm per chain 12x U.FL connectors
Frequency Range	2.412GHz to 2.472GHz, 5.150GHz to 5.825GHz
Modulation Techniques	OFDM: BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM, 1024-QAM
Expansion	2x Mini PCI Express v2.0 Slot at 4.0mm Height 1x microSD Card Socket
Optional Onboard Modules	Supports 1x BT module / 1x ZigBee module / 1x Touch pad connector / 1x Audio header / 1x LCD display header
Interface	5x Gigabit Ethernet (GbE) LAN/WAN RJ45 Port (Auto MDI-X) 1x 10Gigabit Ethernet (10GbE) LAN/WAN RJ45 Port (Auto MDI-X) 1x SFP+ Port 2x USB 3.0 Port 1x Serial Port 12 Pin Connector 1x JTAG 20 Pin Connector
Reset Buttons	1x Hardware reset button, 1x Manufacturer default reset button, 1x WPS button
LED	13x LED indicators, and 2 additional LED on Ethernet port
DC Power	1x DC Jack Connector: 12V, 5A
Power Consumption	30W
Supported Operating System	OpenWRT
Certification	REACH and 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	PCBA 168 x 201 x 18, with heatsink 168 x 201 x 42
Other Features	Dynamic Frequency Selection (DFS)

*Configurations are subject to change without notifications.

RF Performance Table at 2.4GHz

	Data Rate	TX Power (per chain)	TX Power (4 chains)	Tolerance
2.4GHz 802.11b	1Mbps	23dBm	29dBm	±2dB
	2Mbps	23dBm	29dBm	±2dB
	5.5Mbps	23dBm	29dBm	±2dB
	11Mbps	23dBm	29dBm	±2dB
2.4GHz 802.11g	6Mbps	23dBm	29dBm	±2dB
	9Mbps	23dBm	29dBm	±2dB
	12Mbps	23dBm	29dBm	±2dB
	18Mbps	23dBm	29dBm	±2dB
	24Mbps	23dBm	29dBm	±2dB
	36Mbps	23dBm	29dBm	±2dB
	48Mbps	23dBm	29dBm	±2dB
	54Mbps	23dBm	29dBm	±2dB
2.4GHz 802.11n HT20	MCS 0	23dBm	29dBm	±2dB
	MCS 1	23dBm	29dBm	±2dB
	MCS 2	23dBm	29dBm	±2dB
	MCS 3	23dBm	29dBm	±2dB
	MCS 4	23dBm	29dBm	±2dB
	MCS 5	23dBm	29dBm	±2dB
	MCS 6	23dBm	29dBm	±2dB
	MCS 7	23dBm	29dBm	±2dB
	MCS 8	21dBm	27dBm	±2dB
2.4GHz 802.11n HT40	MCS 0	23dBm	29dBm	±2dB
	MCS 1	23dBm	29dBm	±2dB
	MCS 2	23dBm	29dBm	±2dB
	MCS 3	23dBm	29dBm	±2dB
	MCS 4	23dBm	29dBm	±2dB
	MCS 5	23dBm	29dBm	±2dB
	MCS 6	23dBm	29dBm	±2dB
	MCS 7	23dBm	29dBm	±2dB
	MCS 8	21dBm	27dBm	±2dB
	MCS 9	21dBm	27dBm	±2dB

	Data Rate	RX Specifications Sensitivity	Tolerance
2.4GHz 802.11b	6Mbps	-104	±2dB
	9Mbps	-102	±2dB
	12Mbps	-99	±2dB
	18Mbps	-97	±2dB
2.4GHz 802.11g	6Mbps	-97	±2dB
	9Mbps	-96	±2dB
	12Mbps	-94	±2dB
	18Mbps	-92	±2dB
	24Mbps	-89	±2dB
	36Mbps	-87	±2dB
	48Mbps	-85	±2dB
	54Mbps	-83	±2dB
2.4GHz 802.11n HT20	MCS 0	-97	±2dB
	MCS 1	-96	±2dB
	MCS 2	-95	±2dB
	MCS 3	-93	±2dB
	MCS 4	-90	±2dB
	MCS 5	-87	±2dB
	MCS 6	-85	±2dB
	MCS 7	-83	±2dB
	MCS 8	-80	±2dB
2.4GHz 802.11n HT40	MCS 0	-95	±2dB
	MCS 1	-94	±2dB
	MCS 2	-92	±2dB
	MCS 3	-90	±2dB
	MCS 4	-87	±2dB
	MCS 5	-84	±2dB
	MCS 6	-82	±2dB
	MCS 7	-80	±2dB
	MCS 8	-78	±2dB
	MCS 9	-76	±2dB

RF Performance Table at 2.4GHz

	Data Rate	TX Power (per chain)	TX Power (4 chains)	Tolerance
2.4GHz 802.11ax HE20	MCS 0	23dBm	29dBm	±2dB
	MCS 1	23dBm	29dBm	±2dB
	MCS 2	23dBm	29dBm	±2dB
	MCS 3	23dBm	29dBm	±2dB
	MCS 4	23dBm	29dBm	±2dB
	MCS 5	23dBm	29dBm	±2dB
	MCS 6	23dBm	29dBm	±2dB
	MCS 7	23dBm	29dBm	±2dB
	MCS 8	21dBm	27dBm	±2dB
	MCS 9	21dBm	27dBm	±2dB
	MCS 10	19dBm	25dBm	±2dB
	MCS 11	19dBm	25dBm	±2dB
2.4GHz 802.11ax HE40	MCS 0	23dBm	29dBm	±2dB
	MCS 1	23dBm	29dBm	±2dB
	MCS 2	23dBm	29dBm	±2dB
	MCS 3	23dBm	29dBm	±2dB
	MCS 4	23dBm	29dBm	±2dB
	MCS 5	23dBm	29dBm	±2dB
	MCS 6	23dBm	29dBm	±2dB
	MCS 7	23dBm	29dBm	±2dB
	MCS 8	21dBm	27dBm	±2dB
	MCS 9	21dBm	27dBm	±2dB
	MCS 10	19dBm	25dBm	±2dB
	MCS 11	19dBm	25dBm	±2dB

	Data Rate	RX Specifications Sensitivity	Tolerance
2.4GHz 802.11ax HE20	MCS 0	-97	±2dB
	MCS 1	-96	±2dB
	MCS 2	-94	±2dB
	MCS 3	-93	±2dB
	MCS 4	-91	±2dB
	MCS 5	-89	±2dB
	MCS 6	-86	±2dB
	MCS 7	-83	±2dB
	MCS 8	-80	±2dB
	MCS 9	-77	±2dB
	MCS 10	-74	±2dB
	MCS 11	-71	±2dB
2.4GHz 802.11ax HE40	MCS 0	-95	±2dB
	MCS 1	-93	±2dB
	MCS 2	-90	±2dB
	MCS 3	-88	±2dB
	MCS 4	-85	±2dB
	MCS 5	-82	±2dB
	MCS 6	-80	±2dB
	MCS 7	-77	±2dB
	MCS 8	-74	±2dB
	MCS 9	-72	±2dB
	MCS 10	-70	±2dB
	MCS 11	-68	±2dB

RF Performance Table at 5GHz

	Data Rate	TX Power (per chain)	TX Power (8 chains)	Tolerance
5GHz 802.11a	6Mbps	20dBm	29dBm	±2dB
	9Mbps	20dBm	29dBm	±2dB
	12Mbps	20dBm	29dBm	±2dB
	18Mbps	20dBm	29dBm	±2dB
	24Mbps	20dBm	29dBm	±2dB
	36Mbps	20dBm	29dBm	±2dB
	48Mbps	20dBm	29dBm	±2dB
	54Mbps	20dBm	29dBm	±2dB
5GHz 802.11n/ac VHT20	MCS 0	20dBm	29dBm	±2dB
	MCS 1	20dBm	29dBm	±2dB
	MCS 2	20dBm	29dBm	±2dB
	MCS 3	20dBm	29dBm	±2dB
	MCS 4	20dBm	29dBm	±2dB
	MCS 5	20dBm	29dBm	±2dB
	MCS 6	20dBm	29dBm	±2dB
	MCS 7	20dBm	29dBm	±2dB
5GHz 802.11n/ac VHT40	MCS 8	18dBm	27dBm	±2dB
	MCS 0	20dBm	29dBm	±2dB
	MCS 1	20dBm	29dBm	±2dB
	MCS 2	20dBm	29dBm	±2dB
	MCS 3	20dBm	29dBm	±2dB
	MCS 4	20dBm	29dBm	±2dB
	MCS 5	20dBm	29dBm	±2dB
	MCS 6	20dBm	29dBm	±2dB
5GHz 802.11ac VHT80	MCS 7	20dBm	29dBm	±2dB
	MCS 8	18dBm	27dBm	±2dB
	MCS 9	18dBm	27dBm	±2dB
	MCS 0	20dBm	29dBm	±2dB
	MCS 1	20dBm	29dBm	±2dB
	MCS 2	20dBm	29dBm	±2dB
	MCS 3	20dBm	29dBm	±2dB
	MCS 4	20dBm	29dBm	±2dB
5GHz 802.11ac VHT160	MCS 5	20dBm	29dBm	±2dB
	MCS 6	20dBm	29dBm	±2dB
	MCS 7	20dBm	29dBm	±2dB
	MCS 8	18dBm	27dBm	±2dB
	MCS 9	18dBm	27dBm	±2dB
	MCS 0	20dBm	29dBm	±2dB
	MCS 1	20dBm	29dBm	±2dB
	MCS 2	20dBm	29dBm	±2dB

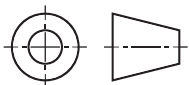
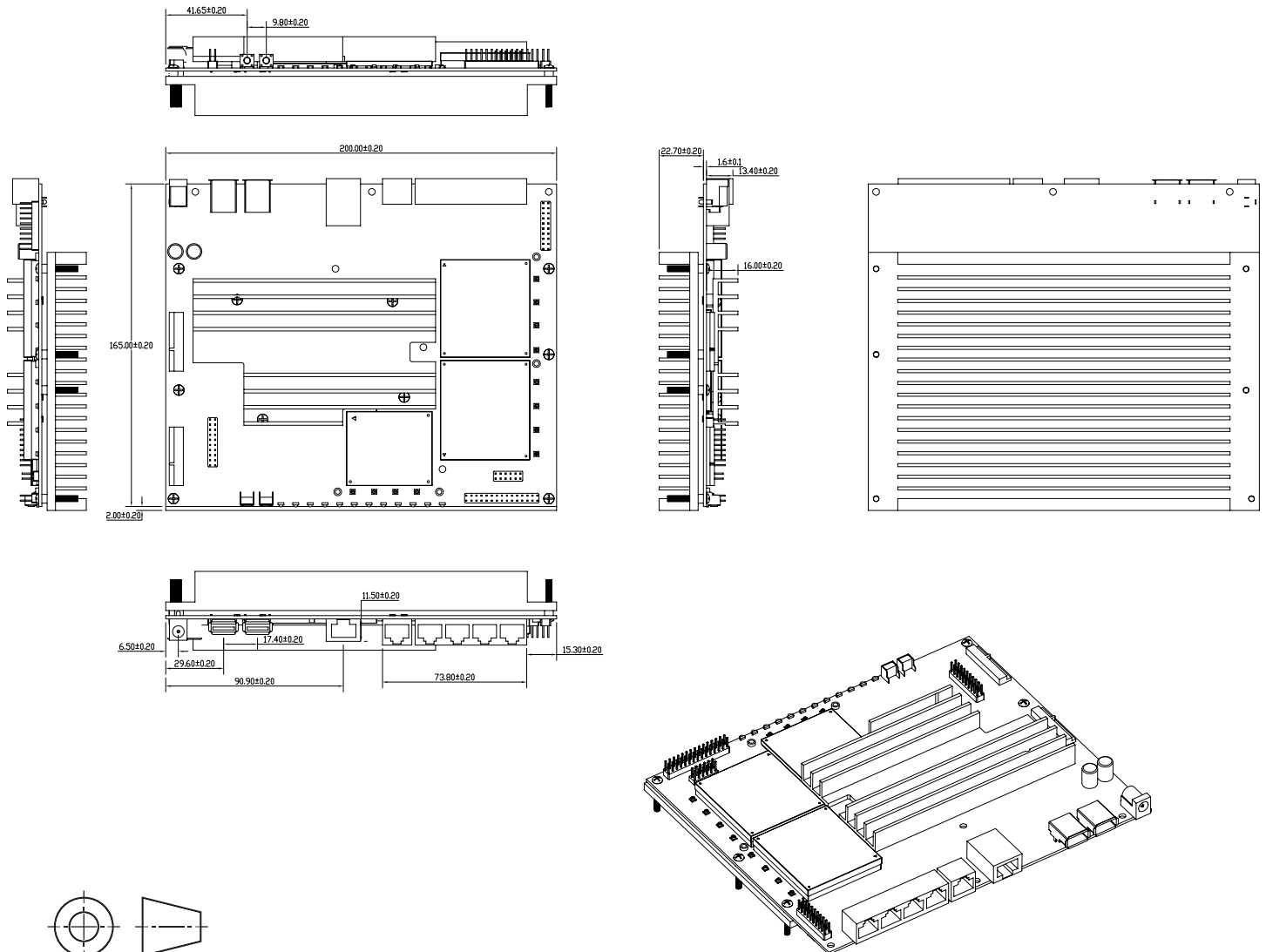
	Data Rate	RX Specifications Sensitivity	Tolerance
5GHz 802.11a	6Mbps	-98	±2dB
	9Mbps	-97	±2dB
	12Mbps	-96	±2dB
	18Mbps	-94	±2dB
	24Mbps	-92	±2dB
	36Mbps	-90	±2dB
	48Mbps	-87	±2dB
	54Mbps	-84	±2dB
5GHz 802.11n/ac VHT20	MCS 0	-98	±2dB
	MCS 1	-97	±2dB
	MCS 2	-95	±2dB
	MCS 3	-93	±2dB
	MCS 4	-91	±2dB
	MCS 5	-89	±2dB
	MCS 6	-87	±2dB
	MCS 7	-84	±2dB
5GHz 802.11n/ac VHT40	MCS 8	-81	±2dB
	MCS 0	-96	±2dB
	MCS 1	-95	±2dB
	MCS 2	-93	±2dB
	MCS 3	-90	±2dB
	MCS 4	-88	±2dB
	MCS 5	-85	±2dB
	MCS 6	-82	±2dB
5GHz 802.11ac VHT80	MCS 7	-80	±2dB
	MCS 8	-78	±2dB
	MCS 9	-75	±2dB
	MCS 0	-93	±2dB
	MCS 1	-92	±2dB
	MCS 2	-90	±2dB
	MCS 3	-88	±2dB
	MCS 4	-86	±2dB
5GHz 802.11ac VHT160	MCS 5	-83	±2dB
	MCS 6	-80	±2dB
	MCS 7	-77	±2dB
	MCS 8	-75	±2dB
	MCS 9	-72	±2dB
	MCS 0	-88	±2dB
	MCS 1	-86	±2dB
	MCS 2	-84	±2dB
	MCS 3	-81	±2dB
	MCS 4	-78	±2dB
	MCS 5	-75	±2dB
	MCS 6	-73	±2dB
	MCS 7	-70	±2dB
	MCS 8	-68	±2dB
	MCS 9	-65	±2dB

RF Performance Table at 5GHz

	Data Rate	TX Power (per chain)	TX Power (8 chains)	Tolerance
5GHz 802.11ax HE20	MCS 0	20dBm	29dBm	±2dB
	MCS 1	20dBm	29dBm	±2dB
	MCS 2	20dBm	29dBm	±2dB
	MCS 3	20dBm	29dBm	±2dB
	MCS 4	20dBm	29dBm	±2dB
	MCS 5	20dBm	29dBm	±2dB
	MCS 6	20dBm	29dBm	±2dB
	MCS 7	20dBm	29dBm	±2dB
	MCS 8	18dBm	27dBm	±2dB
	MCS 9	18dBm	27dBm	±2dB
	MCS 10	17dBm	26dBm	±2dB
	MCS 11	17dBm	26dBm	±2dB
5GHz 802.11ax HE40	MCS 0	20dBm	29dBm	±2dB
	MCS 1	20dBm	29dBm	±2dB
	MCS 2	20dBm	29dBm	±2dB
	MCS 3	20dBm	29dBm	±2dB
	MCS 4	20dBm	29dBm	±2dB
	MCS 5	20dBm	29dBm	±2dB
	MCS 6	20dBm	29dBm	±2dB
	MCS 7	20dBm	29dBm	±2dB
	MCS 8	18dBm	27dBm	±2dB
	MCS 9	18dBm	27dBm	±2dB
	MCS 10	17dBm	26dBm	±2dB
	MCS 11	17dBm	26dBm	±2dB
5GHz 802.11ax HE80	MCS 0	20dBm	29dBm	±2dB
	MCS 1	20dBm	29dBm	±2dB
	MCS 2	20dBm	29dBm	±2dB
	MCS 3	20dBm	29dBm	±2dB
	MCS 4	20dBm	29dBm	±2dB
	MCS 5	20dBm	29dBm	±2dB
	MCS 6	20dBm	29dBm	±2dB
	MCS 7	20dBm	29dBm	±2dB
	MCS 8	18dBm	27dBm	±2dB
	MCS 9	18dBm	27dBm	±2dB
	MCS 10	17dBm	26dBm	±2dB
	MCS 11	17dBm	26dBm	±2dB
5GHz 802.11ax HE160	MCS 0	20dBm	29dBm	±2dB
	MCS 1	20dBm	29dBm	±2dB
	MCS 2	20dBm	29dBm	±2dB
	MCS 3	20dBm	29dBm	±2dB
	MCS 4	20dBm	29dBm	±2dB
	MCS 5	20dBm	29dBm	±2dB
	MCS 6	20dBm	29dBm	±2dB
	MCS 7	20dBm	29dBm	±2dB
	MCS 8	18dBm	27dBm	±2dB
	MCS 9	18dBm	27dBm	±2dB
	MCS 10	17dBm	26dBm	±2dB
	MCS 11	17dBm	26dBm	±2dB

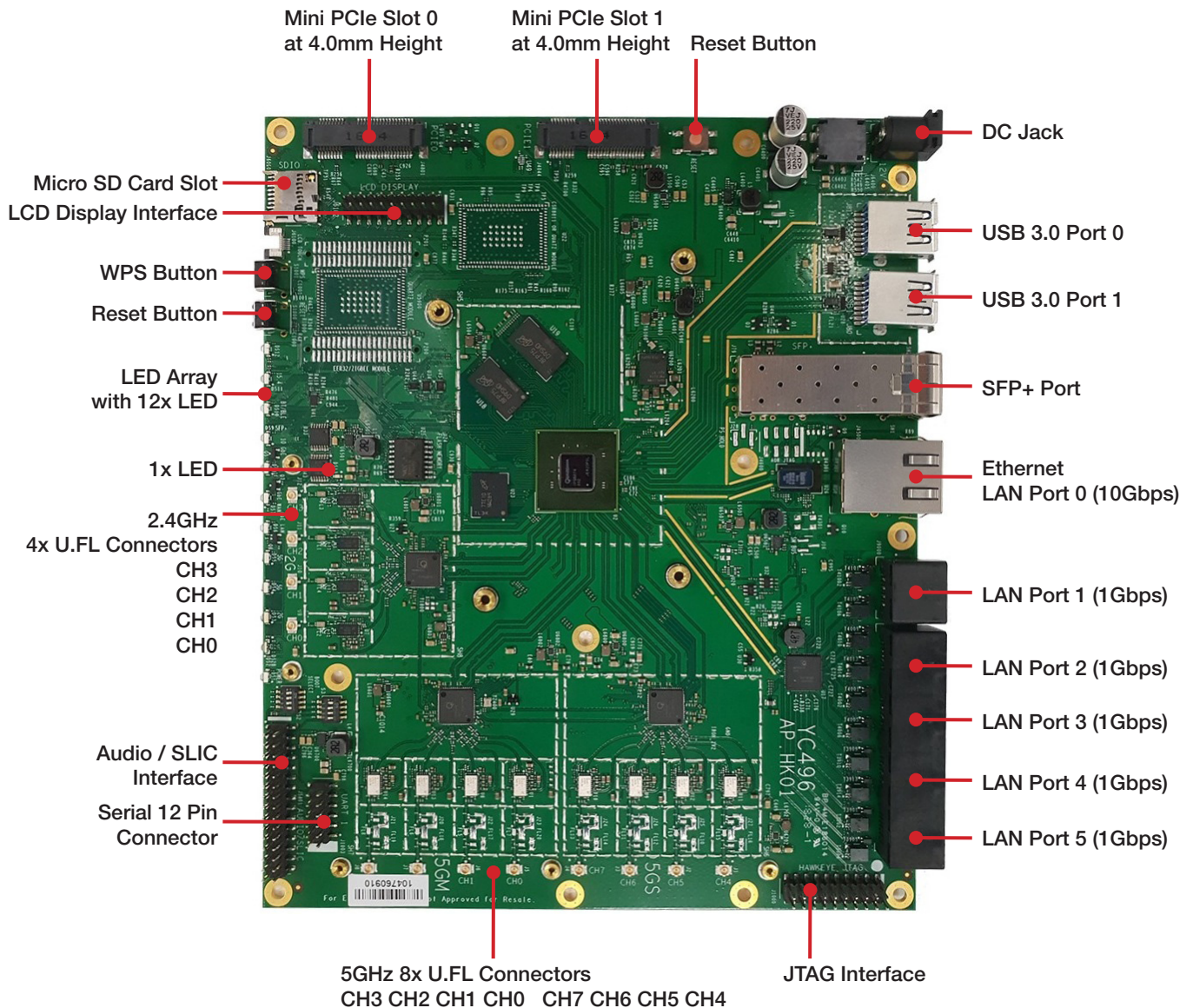
	Data Rate	RX Specifications Sensitivity	Tolerance
5GHz 802.11ax HE20	MCS 0	-98	±2dB
	MCS 1	-96	±2dB
	MCS 2	-94	±2dB
	MCS 3	-93	±2dB
	MCS 4	-90	±2dB
	MCS 5	-88	±2dB
	MCS 6	-85	±2dB
	MCS 7	-83	±2dB
	MCS 8	-81	±2dB
	MCS 9	-79	±2dB
	MCS 10	-76	±2dB
	MCS 11	-73	±2dB
5GHz 802.11ax HE40	MCS 0	-95	±2dB
	MCS 1	-94	±2dB
	MCS 2	-92	±2dB
	MCS 3	-90	±2dB
	MCS 4	-88	±2dB
	MCS 5	-86	±2dB
	MCS 6	-83	±2dB
	MCS 7	-81	±2dB
	MCS 8	-79	±2dB
	MCS 9	-76	±2dB
	MCS 10	-73	±2dB
	MCS 11	-70	±2dB
5GHz 802.11ax HE80	MCS 0	-92	±2dB
	MCS 1	-90	±2dB
	MCS 2	-88	±2dB
	MCS 3	-86	±2dB
	MCS 4	-84	±2dB
	MCS 5	-82	±2dB
	MCS 6	-80	±2dB
	MCS 7	-77	±2dB
	MCS 8	-75	±2dB
	MCS 9	-73	±2dB
	MCS 10	-70	±2dB
	MCS 11	-67	±2dB
5GHz 802.11ax HE160	MCS 0	-87	±2dB
	MCS 1	-85	±2dB
	MCS 2	-83	±2dB
	MCS 3	-81	±2dB
	MCS 4	-78	±2dB
	MCS 5	-76	±2dB
	MCS 6	-74	±2dB
	MCS 7	-71	±2dB
	MCS 8	-69	±2dB
	MCS 9	-66	±2dB
	MCS 10	-63	±2dB
	MCS 11	-61	±2dB

Mechanical Dimensions



All dimensions are in mm.

Component and Connector Map



Customization Options

The HK01 can be customized for volume applications. Contact our sales representatives for more information.

Custom Embedded Board layout

For more customization, contact us at sales@compex.com.sg

Firmware / Software

The HK01 is shipped with QCA reference firmware.
SDKs with QCA binary drivers are available for software developers.

Supported Operating System

- OpenWRT

1. OpenWRT SDK is available without any technical support by Compex unless otherwise stated.

Ordering Options

Item Code	Model	Description
HK01-EVK PR321GBR1.00-ETE	HK01	Board using 12V DC, EU power plug
HK01-EVK PR321GBR1.00-UTE	HK01	Board using 12V DC, US power plug