Multi-function IPQ8074A Embedded Board with 2.2GHz CPU

2x USB 3.0 / Supports 802.11ax / 5x 1Gbps Ports/ 10Gbps Port

Model: HK01.2

KEY FEATURES

- Qualcomm Atheros IPQ8074A Quad Core ARM Cortex 64-bit A53 2.2GHz processor
- 4x4 on-board 2.4GHz radio, up to 1147Mbps physical data rate
- 2x (4x4) or 8x8 on-board 5GHz radio, up to 4804Mbps physical data rate
- Support 11ax TX Beamforming
- Support 11ac/ax MU-MIMO DL and UL
- Support OFDMA DL and UL
- Tri-band support with 5G SBS (4x4/5GHz + 4x4/5GHz) + 4x4/2.4GHz
- Supports Dynamic Frequency Selection (DFS)

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 IPQ8074A Quad Core ARM Cortex 64-bit A53 2.2GHz processor 'Hawkeye' Series
Reference Design	Qualcomm Atheros HK01.2
System Memory	1GB (2x 512MB) DDR3L 32-bit interface
Flash	NAND Flash: 256MB NOR Flash: 32MB eMMC: 8GB
Wireless	On-board 4x4 2.4GHz MU-MIMO OFDMA 802.11b/g/n/ax, max 23dBm per chain On-board 2x (4x4) or 8x8 5GHz MU-MIMO OFDMA 802.11a/n/ac/ax, max 20dBm per chain 12x 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 for 5G Module	1x M.2 (NGFF) B Key Socket with PCIe 3.0
MiniPCIe Slot	1x MiniPCIe Slot with PCIe 2.0
Optional Onboard Modules	Supports 1x BT module, 1x ZigBee module, 1x Touch pad connector, 1x Audio header, 1x LCD display header
Interface	5x 1Gbps Ethernet Ports LAN/WAN RJ45 (Auto MDI-X) 1x 10Gbps Ethernet Port LAN/WAN RJ45 (Auto MDI-X) 2x USB 3.0 Ports 1x MicroSD Card Slot 1x SFP+ Port 1x JTAG 20 Pin Connector 1x Serial Port 12 Pin Connector
Reset Button	2x H/W Reset Buttons, 1x WPS Reset Button
LED	13x LED Indicators, 2 additional LED on Ethernet port

1.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.

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

**Configurations are subject to change without notifications.*

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Specifications

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DC Power	1x DC Jack Connector: 12V
Power Consumption	30W
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 × H × D) in mm	165 × 200 × 32.9

**Configurations are subject to change without notifications.*

RF Performance Table for 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
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

	Data Rate	RX Specifications Sensitivity	Tolerance
2.4GHz 802.11b	1Mbps	-104dBm	±2dB
	2Mbps	-102dBm	±2dB
	5.5Mbps	-99dBm	±2dB
	11Mbps	-97 dBm	±2dB
2.4GHz 802.11g	6Mbps	-97dBm	±2dB
	9Mbps	-96dBm	±2dB
	12Mbps	-94dBm	±2dB
	18Mbps	-92dBm	±2dB
	24Mbps	-89dBm	±2dB
	36Mbps	-87dBm	±2dB
	48Mbps	-85dBm	±2dB
	54Mbps	-83dBm	±2dB
2.4GHz 802.11n HT20	MCS 0	-97dBm	±2dB
	MCS 1	-96dBm	±2dB
	MCS 2	-95dBm	±2dB
	MCS 3	-93dBm	±2dB
	MCS 4	-90dBm	±2dB
	MCS 5	-87dBm	±2dB
	MCS 6	-85dBm	±2dB
	MCS 7	-83dBm	±2dB
2.4GHz 802.11n HT40	MCS 0	-95dBm	±2dB
	MCS 1	-94dBm	±2dB
	MCS 2	-92dBm	±2dB
	MCS 3	-90dBm	±2dB
	MCS 4	-87dBm	±2dB
	MCS 5	-84dBm	±2dB
	MCS 6	-82dBm	±2dB
	MCS 7	-80dBm	±2dB

RF Performance Table for 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	-97dBm	±2dB
	MCS 1	-96dBm	±2dB
	MCS 2	-94dBm	±2dB
	MCS 3	-93dBm	±2dB
	MCS 4	-91dBm	±2dB
	MCS 5	-89dBm	±2dB
	MCS 6	-86dBm	±2dB
	MCS 7	-83dBm	±2dB
	MCS 8	-80dBm	±2dB
	MCS 9	-77dBm	±2dB
	MCS 10	-74dBm	±2dB
	MCS 11	-71dBm	±2dB
2.4GHz 802.11ax HE40	MCS 0	-95dBm	±2dB
	MCS 1	-93dBm	±2dB
	MCS 2	-90dBm	±2dB
	MCS 3	-88dBm	±2dB
	MCS 4	-85dBm	±2dB
	MCS 5	-82dBm	±2dB
	MCS 6	-80dBm	±2dB
	MCS 7	-77dBm	±2dB
	MCS 8	-74dBm	±2dB
	MCS 9	-72dBm	±2dB
	MCS 10	-70dBm	±2dB
	MCS 11	-68 dBm	±2dB

RF Performance Table for 5GHz

	Data Rate	TX Power (per chain)	TX Power (4 chains)	Tolerance
5GHz 802.11a	6Mbps	20dBm	26dBm	±2dB
	9Mbps	20dBm	26dBm	±2dB
	12Mbps	20dBm	26dBm	±2dB
	18Mbps	20dBm	26dBm	±2dB
	24Mbps	20dBm	26dBm	±2dB
	36Mbps	20dBm	26dBm	±2dB
	48Mbps	20dBm	26dBm	±2dB
	54Mbps	20dBm	26dBm	±2dB
5GHz 802.11n/ac VHT20	MCS 0	20dBm	26dBm	±2dB
	MCS 1	20dBm	26dBm	±2dB
	MCS 2	20dBm	26dBm	±2dB
	MCS 3	20dBm	26dBm	±2dB
	MCS 4	20dBm	26dBm	±2dB
	MCS 5	20dBm	26dBm	±2dB
	MCS 6	20dBm	26dBm	±2dB
	MCS 7	20dBm	26dBm	±2dB
	MCS 8	19dBm	25dBm	±2dB
5GHz 802.11n/ac VHT40	MCS 0	20dBm	26dBm	±2dB
	MCS 1	20dBm	26dBm	±2dB
	MCS 2	20dBm	26dBm	±2dB
	MCS 3	20dBm	26dBm	±2dB
	MCS 4	20dBm	26dBm	±2dB
	MCS 5	20dBm	26dBm	±2dB
	MCS 6	20dBm	26dBm	±2dB
	MCS 7	20dBm	26dBm	±2dB
	MCS 8	19dBm	25dBm	±2dB
	MCS 9	19dBm	25dBm	±2dB
5GHz 802.11ac VHT80	MCS 0	20dBm	26dBm	±2dB
	MCS 1	20dBm	26dBm	±2dB
	MCS 2	20dBm	26dBm	±2dB
	MCS 3	20dBm	26dBm	±2dB
	MCS 4	20dBm	26dBm	±2dB
	MCS 5	20dBm	26dBm	±2dB
	MCS 6	20dBm	26dBm	±2dB
	MCS 7	20dBm	26dBm	±2dB
	MCS 8	19dBm	25dBm	±2dB
	MCS 9	19dBm	25dBm	±2dB

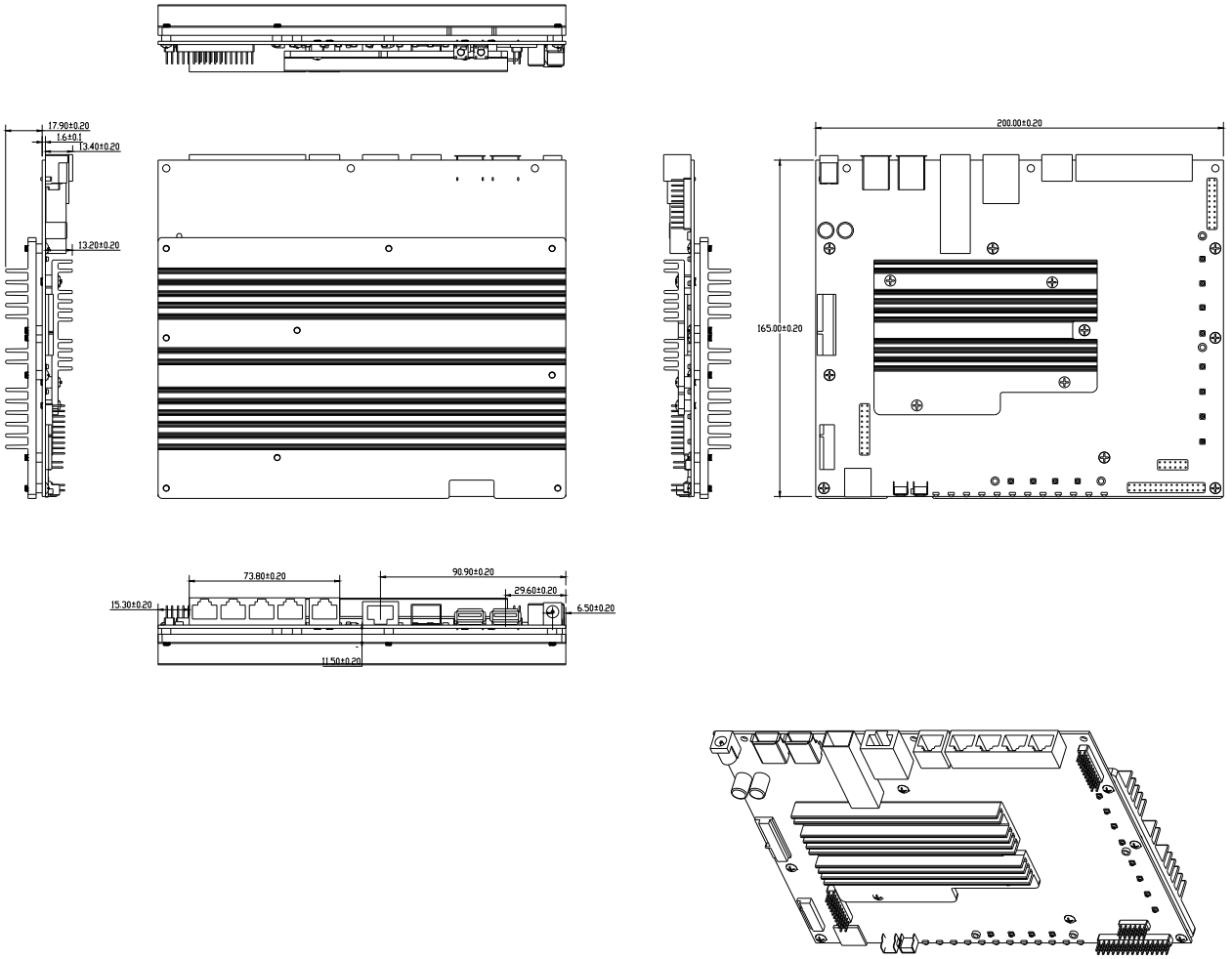
	Data Rate	RX Specifications Sensitivity	Tolerance
5GHz 802.11a	6Mbps	-98dBm	±2dB
	9Mbps	-97dBm	±2dB
	12Mbps	-96dBm	±2dB
	18Mbps	-94dBm	±2dB
	24Mbps	-92dBm	±2dB
	36Mbps	-90dBm	±2dB
	48Mbps	-87dBm	±2dB
	54Mbps	-84dBm	±2dB
5GHz 802.11n/ac VHT20	MCS 0	-98dBm	±2dB
	MCS 1	-97dBm	±2dB
	MCS 2	-95dBm	±2dB
	MCS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

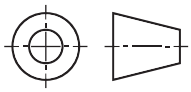
RF Performance Table for 5GHz

	Data Rate	TX Power (per chain)	TX Power (4 chains)	Tolerance
5GHz 802.11ax HE20	MCS 0	20dBm	26dBm	±2dB
	MCS 1	20dBm	26dBm	±2dB
	MCS 2	20dBm	26dBm	±2dB
	MCS 3	20dBm	26dBm	±2dB
	MCS 4	20dBm	26dBm	±2dB
	MCS 5	20dBm	26dBm	±2dB
	MCS 6	20dBm	26dBm	±2dB
	MCS 7	20dBm	26dBm	±2dB
	MCS 8	19dBm	25dBm	±2dB
	MCS 9	19dBm	25dBm	±2dB
	MCS 10	17dBm	23dBm	±2dB
	MCS 11	17dBm	23dBm	±2dB
5GHz 802.11ax HE40	MCS 0	20dBm	26dBm	±2dB
	MCS 1	20dBm	26dBm	±2dB
	MCS 2	20dBm	26dBm	±2dB
	MCS 3	20dBm	26dBm	±2dB
	MCS 4	20dBm	26dBm	±2dB
	MCS 5	20dBm	26dBm	±2dB
	MCS 6	20dBm	26dBm	±2dB
	MCS 7	20dBm	26dBm	±2dB
	MCS 8	19dBm	25dBm	±2dB
	MCS 9	19dBm	25dBm	±2dB
	MCS 10	17dBm	23dBm	±2dB
	MCS 11	17dBm	23dBm	±2dB
5GHz 802.11ax HE80	MCS 0	20dBm	26dBm	±2dB
	MCS 1	20dBm	26dBm	±2dB
	MCS 2	20dBm	26dBm	±2dB
	MCS 3	20dBm	26dBm	±2dB
	MCS 4	20dBm	26dBm	±2dB
	MCS 5	20dBm	26dBm	±2dB
	MCS 6	20dBm	26dBm	±2dB
	MCS 7	20dBm	26dBm	±2dB
	MCS 8	19dBm	25dBm	±2dB
	MCS 9	19dBm	25dBm	±2dB
	MCS 10	17dBm	23dBm	±2dB
	MCS 11	17dBm	23dBm	±2dB
5GHz 802.11ax HE160	MCS 0	20dBm	26dBm	±2dB
	MCS 1	20dBm	26dBm	±2dB
	MCS 2	20dBm	26dBm	±2dB
	MCS 3	20dBm	26dBm	±2dB
	MCS 4	20dBm	26dBm	±2dB
	MCS 5	20dBm	26dBm	±2dB
	MCS 6	20dBm	26dBm	±2dB
	MCS 7	20dBm	26dBm	±2dB
	MCS 8	19dBm	25dBm	±2dB
	MCS 9	19dBm	25dBm	±2dB
	MCS 10	17dBm	23dBm	±2dB
	MCS 11	17dBm	23dBm	±2dB

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

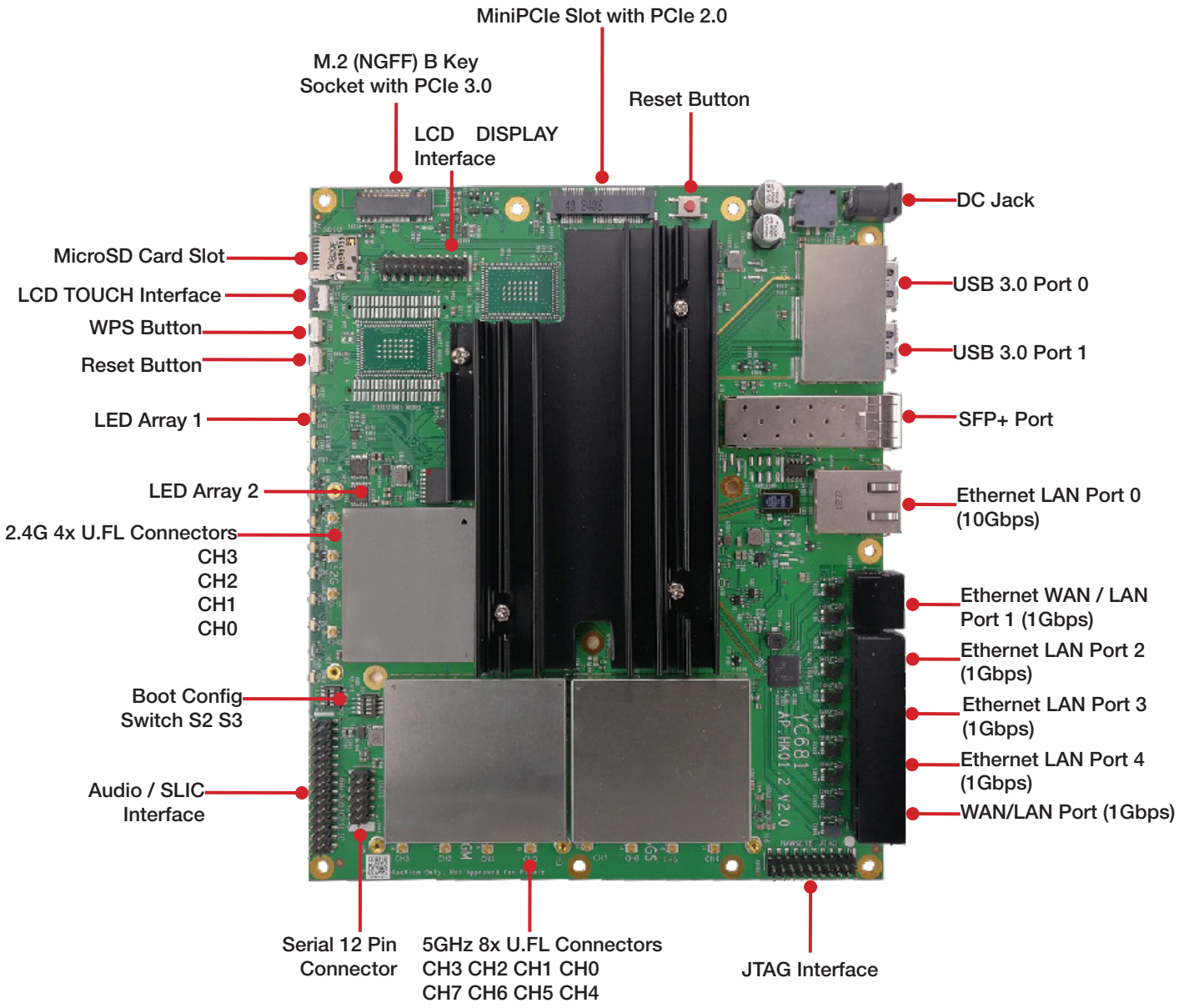
Mechanical Dimensions



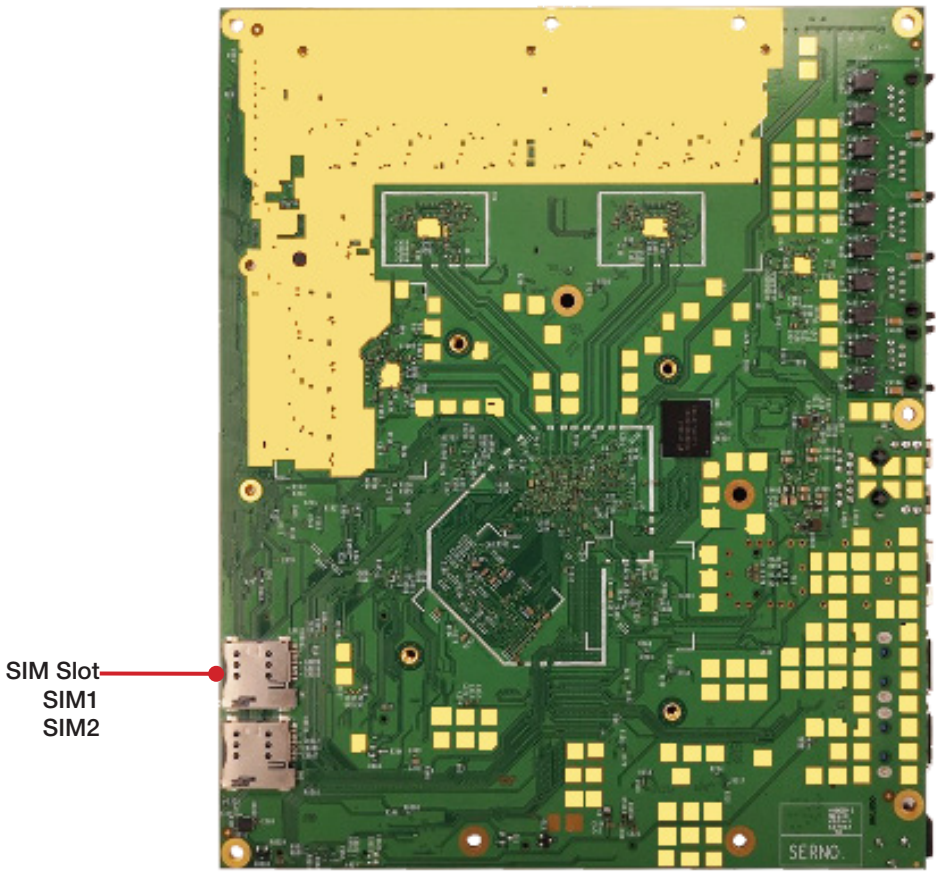


All dimensions are in mm.

Component Map



Component Map



Software Information

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

Firmware	OpenWRT Barrier Breaker

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

Development Kits

Accessory	JTAG Programmer, Serial Converter, Power Supply Only if available
SDK	SDKs with QCA binary drivers are available for software developers.

Ordering Options

Item Code	Processor	Power Solutions
HK01.2-EVK PR321R2.00-TE	IPQ8074A	12V DC, NO adapter
HK01.2-EVK PR321R2.00-ETE	IPQ8074A	12V DC, EU adapter
HK01.2-EVK PR321R2.00-UTE	IPQ8074A	12V DC, US adapter