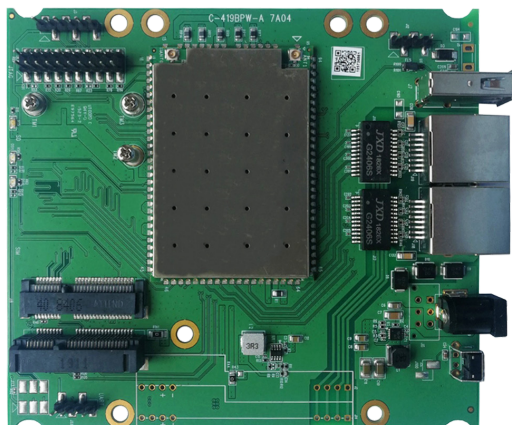## Multi-function IPQ4019 Embedded Board with on-board Wireless
710MHz CPU / 2x 1Gbps Ports / Dual Band / 802.11ac Wave 2

Model: WPJ419 7A04

KEY FEATURES

- Qualcomm Atheros IPQ4019 Quad Core ARM Cortex-A7 at 710MHz processor
- 2x2 on-board 2.4GHz radio, up to 400Mbps physical data rate
- 2x2 on-board 5GHz radio, up to 867Mbps physical data rate
- Supports Dynamic Frequency Selection (DFS)

APPLICATIONS

- 802.11n/ac MU-MIMO Access Point
- Point-to-MultiPoint High Capacity Wireless Bridge
- Transportation Access Point

Specifications

Chipset	Qualcomm Atheros IPQ4019 Quad Core ARM Cortex-A7 at 710MHz processor 'Dakota' Series
Reference Design	Qualcomm Atheros DK04
System Memory	256MB (Up to 1GB)
NAND Flash	128MB
NOR Flash	16MB
Wireless	On-board 2x2 2.4GHz MU-MIMO OFDM 802.11b/g/n, max 23dBm per chain On-board 2x2 5GHz MU-MIMO OFDM 802.11a/n/ac, max 23dBm per chain 4x U.FL Connectors
Frequency Range	2.412~2.472GHz, 5.150~5.825GHz
Modulation Techniques	802.11b: DSSS (DBPSK/DQPSK/CCK) 802.11a/g: OFDM (BPSK/QPSK/16-QAM/64-QAM) 802.11ac/n: OFDM (BPSK/QPSK/16QAM/64-QAM/256-QAM)
MiniPCIe Slot	1x MiniPCIe Slot with USB 3.0 1x MiniPCIe Slot with PCIe 2.0
Interface	2x 1Gbps Ethernet Ports (LAN/WAN) 2x USB 2.0 (port/header) 1x SIM Card Slot 1x MicroSD Card Slot 1x JTAG 20 Pin Connector 2x Serial Ports (UART and H-UART)
Reset Button	1x F/W Reset Button
LED	3x LED Indicators
Power Over Ethernet (PoE)	Support 802.3 af/at POE, IEEE802.3af/IEEE802.3at (48-56V)
DC Power	1x DC Jack Connector: 12V
Power Consumption (Board only)	12W (Max)
Certification	REACH and RoHS Compliance
Environmental Temperature	Operating: -20ºC to 70ºC, Storage: -40ºC to 90ºC
Environmental Humidity, Non-Condensing	Operating: 5% to 95%, Storage: Max. 90%
Dimension (W x H x D) in mm	117 x 105 x 20.4

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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RF Performance Table for 2.4GHz

Data Rate	Data Rate	TX Power (per chain)	TX Power (2 chains)	Tolerance
2.4GHz 802.11b	1Mbps	23dBm	26dBm	±2dB
	2Mbps	23dBm	26dBm	±2dB
	5.5Mbps	23dBm	26dBm	±2dB
	11Mbps	23dBm	26dBm	±2dB
2.4GHz 802.11g	6Mbps	23dBm	26dBm	±2dB
	9Mbps	23dBm	26dBm	±2dB
	12Mbps	23dBm	26dBm	±2dB
	18Mbps	23dBm	26dBm	±2dB
	24Mbps	23dBm	26dBm	±2dB
	36Mbps	22dBm	25dBm	±2dB
	48Mbps	20dBm	23dBm	±2dB
	54Mbps	19dBm	22dBm	±2dB
2.4GHz 802.11n HT20	MCS 0	23dBm	26dBm	±2dB
	MCS 1	23dBm	26dBm	±2dB
	MCS 2	23dBm	26dBm	±2dB
	MCS 3	23dBm	26dBm	±2dB
	MCS 4	22dBm	25dBm	±2dB
	MCS 5	20dBm	23dBm	±2dB
	MCS 6	19dBm	22dBm	±2dB
	MCS 7	18dBm	21dBm	±2dB
2.4GHz 802.11n HT40	MCS 0	23dBm	26dBm	±2dB
	MCS 1	23dBm	26dBm	±2dB
	MCS 2	23dBm	26dBm	±2dB
	MCS 3	23dBm	26dBm	±2dB
	MCS 4	22dBm	25dBm	±2dB
	MCS 5	20dBm	23dBm	±2dB
	MCS 6	19dTBm	22dBm	±2dB
	MCS 7	18dBm	21dBm	±2dB

Data Rate	Data Rate	RX Specifications Sensitivity	Tolerance
2.4GHz 802.11b	1Mbps	-94dBm	±2dB
	2Mbps	-93dBm	±2dB
	5.5Mbps	-93dBm	±2dB
	11Mbps	-91dBm	±2dB
2.4GHz 802.11g	6Mbps	-96dBm	±2dB
	9Mbps	-96dBm	±2dB
	12Mbps	-94dBm	±2dB
	18Mbps	-90dBm	±2dB
	24Mbps	-87dBm	±2dB
	36Mbps	-85dBm	±2dB
	48Mbps	-81dBm	±2dB
	54Mbps	-78dBm	±2dB
2.4GHz 802.11n HT20	MCS 0	-94dBm	±2dB
	MCS 1	-93dBm	±2dB
	MCS 2	-90dBm	±2dB
	MCS 3	-87dBm	±2dB
	MCS 4	-84dBm	±2dB
	MCS 5	-81dBm	±2dB
	MCS 6	-77dBm	±2dB
	MCS 7	-74dBm	±2dB
2.4GHz 802.11n HT40	MCS 0	-92dBm	±2dB
	MCS 1	-89dBm	±2dB
	MCS 2	-86dBm	±2dB
	MCS 3	-84dBm	±2dB
	MCS 4	-79dBm	±2dB
	MCS 5	-75dBm	±2dB
	MCS 6	-72dBm	±2dB
	MCS 7	-71dBm	±2dB

RF Performance Table for 5GHz

	Data Rate	TX Power (per chain)	TX Power (2 chains)	Tolerance
5GHz 802.11a	6Mbps	23dBm	26dBm	±2dB
	9Mbps	23dBm	26dBm	±2dB
	12Mbps	23dBm	26dBm	±2dB
	18Mbps	23dBm	26dBm	±2dB
	24Mbps	23dBm	26dBm	±2dB
	36Mbps	23dBm	26dBm	±2dB
	48Mbps	22dBm	25dBm	±2dB
	54Mbps	20dBm	23dBm	±2dB
5GHz 802.11n/ac VHT20	MCS 0	23dBm	26dBm	±2dB
	MCS 1	23dBm	26dBm	±2dB
	MCS 2	23dBm	26dBm	±2dB
	MCS 3	23dBm	26dBm	±2dB
	MCS 4	23dBm	26dBm	±2dB
	MCS 5	22dBm	25dBm	±2dB
	MCS 6	20dBm	23dBm	±2dB
	MCS 7	19dBm	22dBm	±2dB
	MCS 8	18dBm	21dBm	±2dB
5GHz 802.11n/ac VHT40	MCS 0	23dBm	26dBm	±2dB
	MCS 1	23dBm	26dBm	±2dB
	MCS 2	23dBm	26dBm	±2dB
	MCS 3	23dBm	26dBm	±2dB
	MCS 4	23dBm	26dBm	±2dB
	MCS 5	23dBm	26dBm	±2dB
	MCS 6	20dBm	23dBm	±2dB
	MCS 7	19dBm	22dBm	±2dB
	MCS 8	18dBm	21dBm	±2dB
	MCS 9	17dBm	20dBm	±2dB
5GHz 802.11ac VHT80	MCS 0	22dBm	25dBm	±2dB
	MCS 1	22dBm	25dBm	±2dB
	MCS 2	22dBm	25dBm	±2dB
	MCS 3	22dBm	25dBm	±2dB
	MCS 4	22dBm	25dBm	±2dB
	MCS 5	21dBm	24dBm	±2dB
	MCS 6	20dBm	23dBm	±2dB
	MCS 7	18dBm	21dBm	±2dB
	MCS 8	17dBm	20dBm	±2dB
	MCS 9	16dBm	19dBm	±2dB

	Data Rate	RX Specifications Sensitivity	Tolerance
5GHz 802.11a	6Mbps	-93dBm	±2dB
	9Mbps	-92dBm	±2dB
	12Mbps	-91dBm	±2dB
	18Mbps	-88dBm	±2dB
	24Mbps	-87dBm	±2dB
	36Mbps	-84dBm	±2dB
	48Mbps	-81dBm	±2dB
	54Mbps	-79dBm	±2dB
5GHz 802.11n/ac VHT20	MCS 0	-91dBm	±2dB
	MCS 1	-90dBm	±2dB
	MCS 2	-88dBm	±2dB
	MCS 3	-86dBm	±2dB
	MCS 4	-82dBm	±2dB
	MCS 5	-79dBm	±2dB
	MCS 6	-76dBm	±2dB
	MCS 7	-73dBm	±2dB
	MCS 8	-70dBm	±2dB
5GHz 802.11n/ac VHT40	MCS 0	-92dBm	±2dB
	MCS 1	-90dBm	±2dB
	MCS 2	-88dBm	±2dB
	MCS 3	-86dBm	±2dB
	MCS 4	-85dBm	±2dB
	MCS 5	-83dBm	±2dB
	MCS 6	-79dBm	±2dB
	MCS 7	-75dBm	±2dB
	MCS 8	-73dBm	±2dB
	MCS 9	-70dBm	±2dB
5GHz 802.11ac VHT80	MCS 0	-86dBm	±2dB
	MCS 1	-85dBm	±2dB
	MCS 2	-83dBm	±2dB
	MCS 3	-79dBm	±2dB
	MCS 4	-76dBm	±2dB
	MCS 5	-73dBm	±2dB
	MCS 6	-71dBm	±2dB
	MCS 7	-69dBm	±2dB
	MCS 8	-67dBm	±2dB
	MCS 9	-66dBm	±2dB

Mechanical Dimensions for HV Version
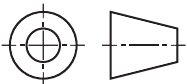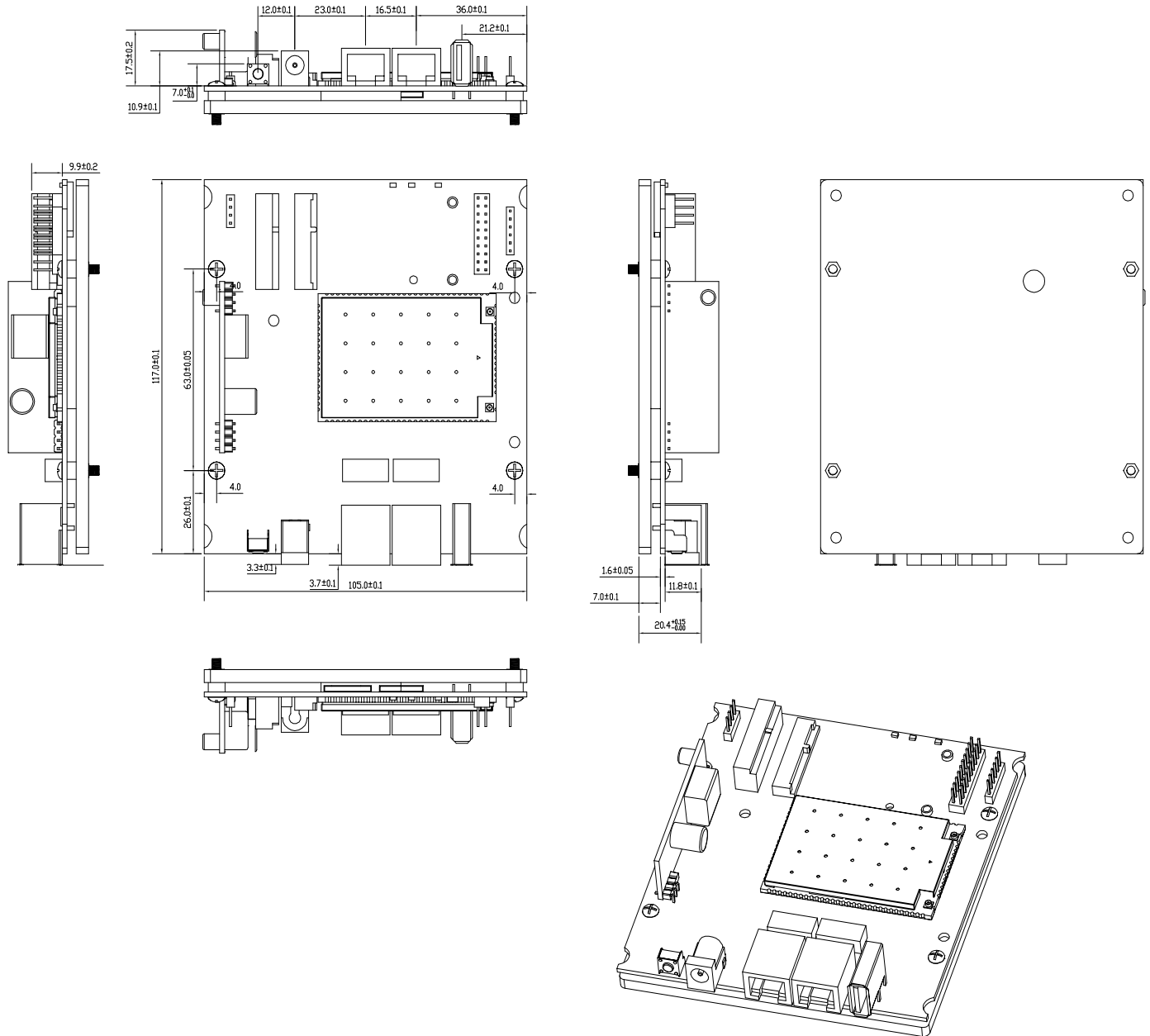
All dimensions are in mm.

Mechanical Dimensions for LV Version
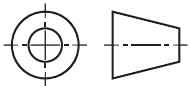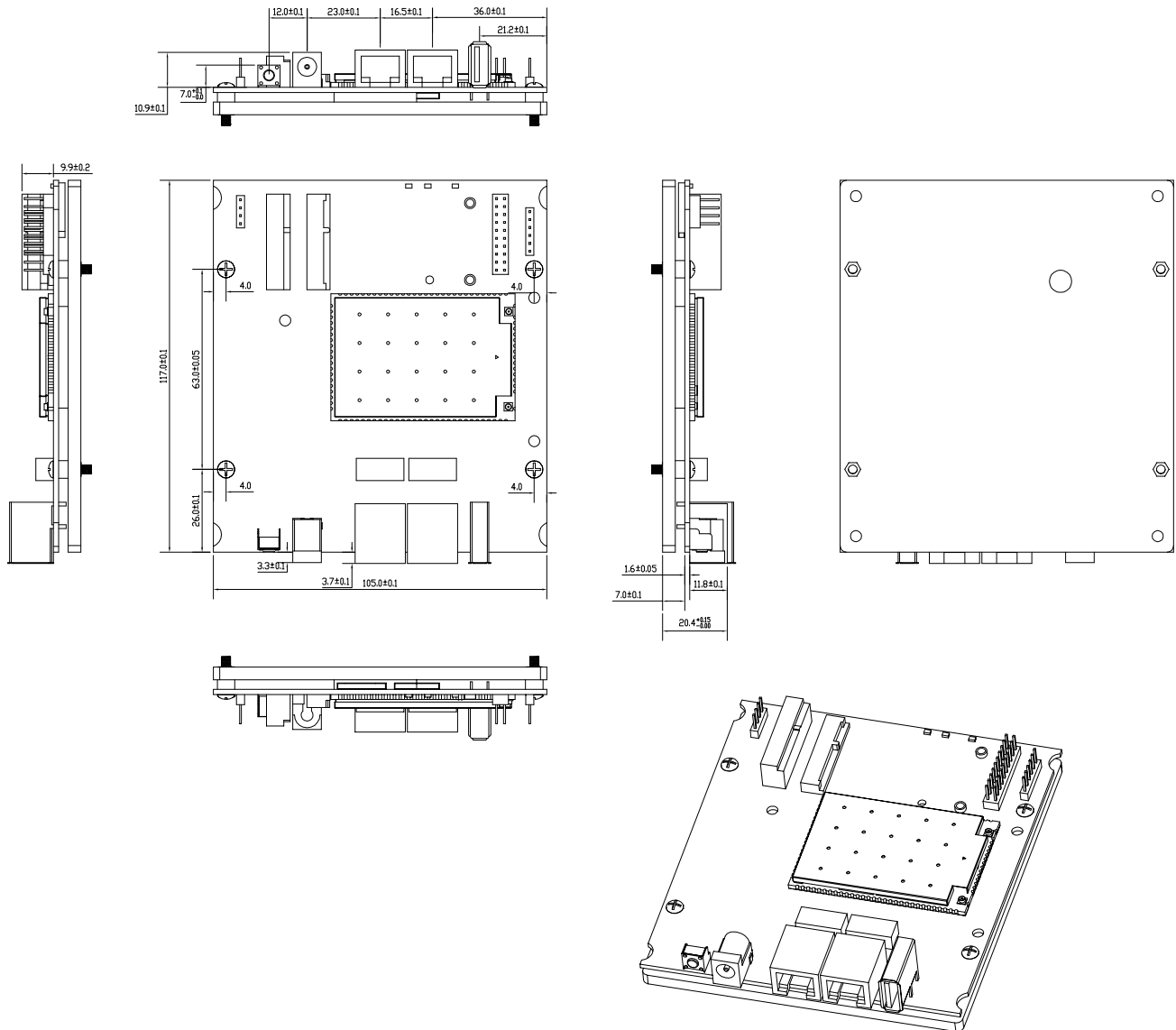
All dimensions are in mm.

Component Map

Serial 6 Pin Connector (High Speed)

JTAG Interface

LED Array

MiniPCIe Slot with USB 3.0

MiniPCIe Slot with PCIe 2.0

Serial 4 Pin Connector

PoE Module
1/2 3/6 4/5 7/8 GND 12V NC NC
1/2 3/6 4/5 7/8 GND 12V NC NC

USB 2.0 Header

USB 2.0 Port

Ethernet Port 1 PoE Input

Ethernet Port 0

DC Jack: 12V

Reset Button (S/W Reset)

SIM Card Slot

MicroSD Card Slot
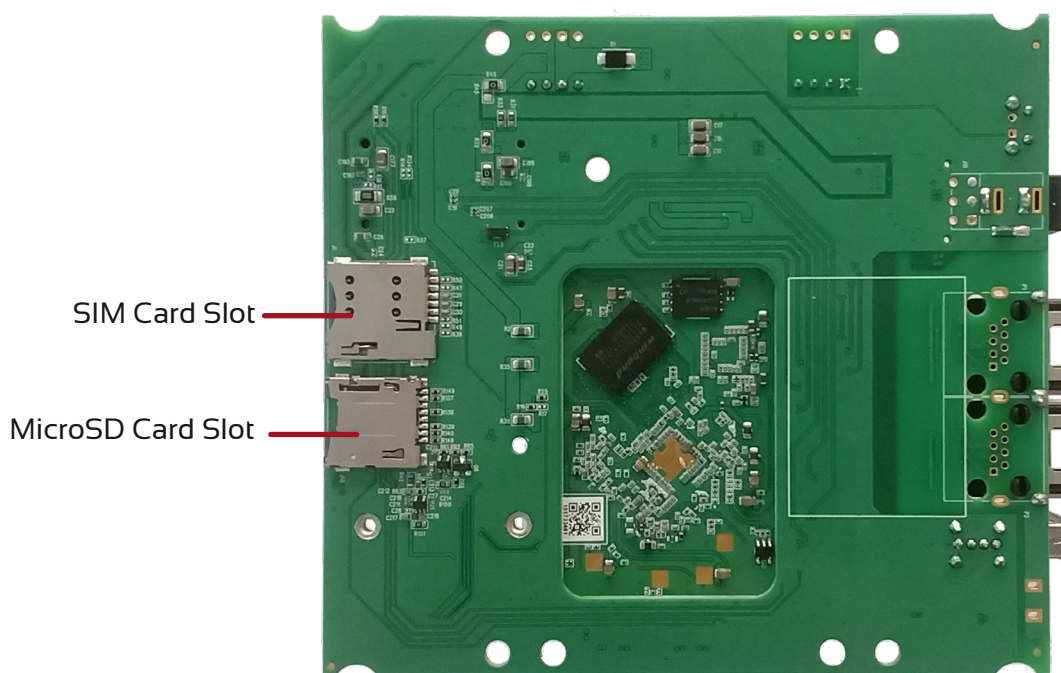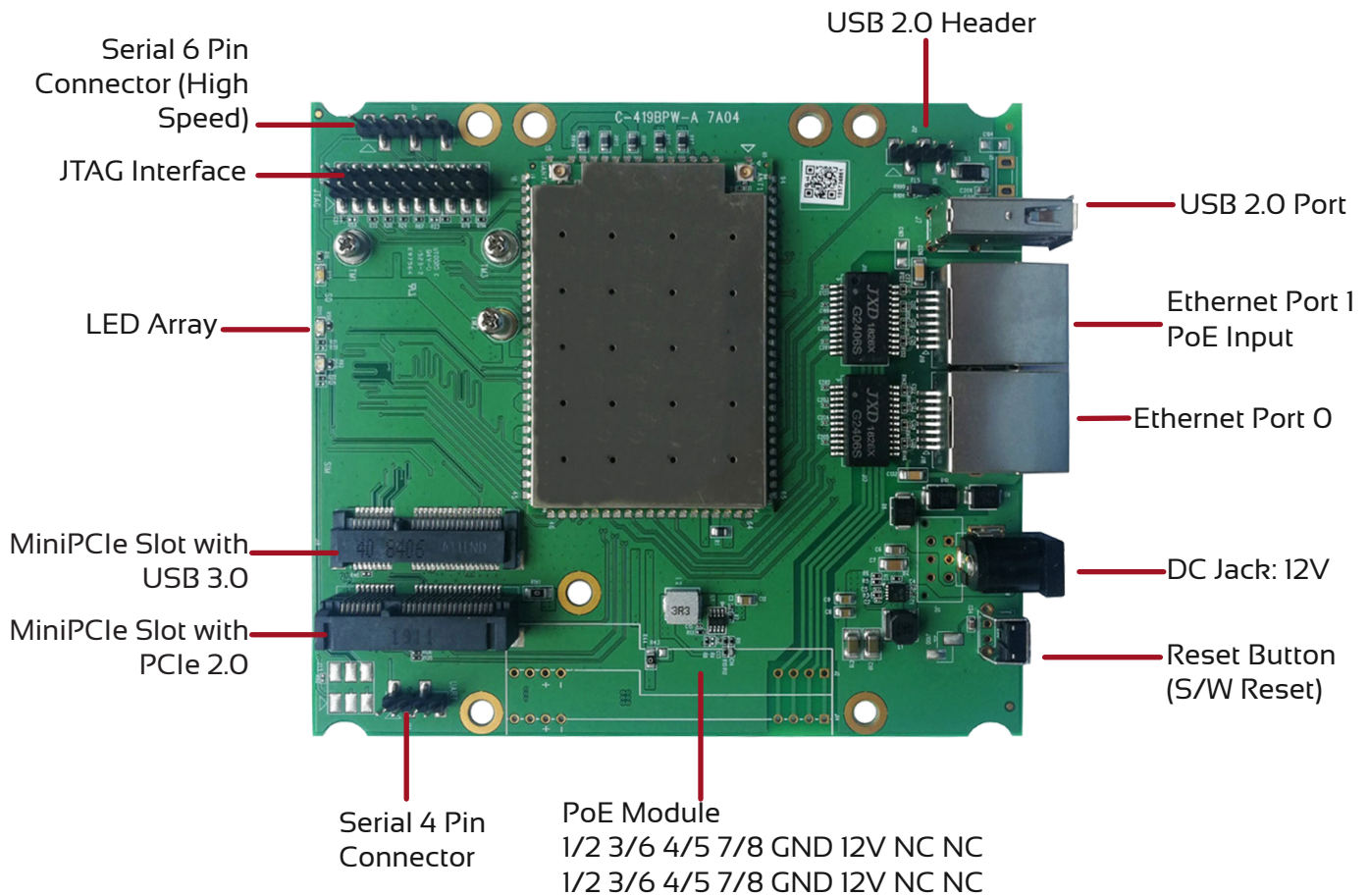
Firmware/Software

The WPJ419 is shipped with QCA reference firmware. SDKs with QCA wireless drivers are available for software developers.

SDK	• SDKs with QCA binary drivers are available for software developers.
Accessory	• JTAG Programmer, serial converter, power supply only if available

Ordering Options

Item Code	Processor	Power Solutions
WPJ419LV 7A04BO16256BR	IPQ4019	DC 12V
WPJ419HV 7A04BO16256BR	IPQ4019	DC 12V or 802.3af/at PoE, IEEE802.3af/IEEE802.3at (48-56V)

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