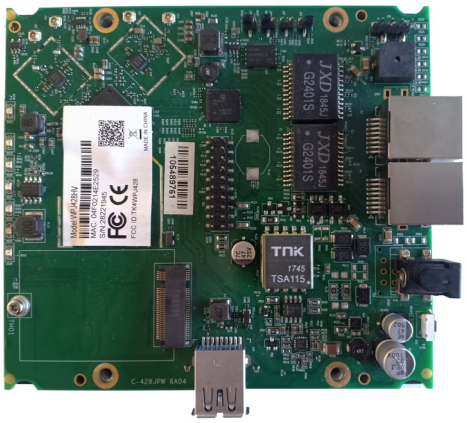
Multi-function IPQ4028 Embedded Board with on-board Wireless

710MHz CPU / 2x 1Gbps Ports / Dual Band 802.11ac Wave 2

Model: WPJ428 6A04



KEY FEATURES

- Qualcomm Atheros IPQ4028 Quad Core ARM cortex-A7 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 Access Point
- Point-to-MultiPoint High Capacity Wireless Bridge
- Wireless Customer-Premises Equipment (CPE)

Specifications

Chipset	Qualcomm Atheros IPQ4028 Quad Core ARM cortex-A7 710MHz processor 'Dakota' Series
Reference Design	Qualcomm Atheros DK03
System Memory	256MB DDR3
NAND Flash	128MB
NOR Flash	32MB
Wireless	On-board 2x2 2.4GHz MU-MIMO OFDM 802.11b/g/n, max 19dBm per chain On-board 2x2 5GHz MU-MIMO OFDM 802.11a/n/ac, max 18dBm per chain 4x U.FL Connectors
Frequency Range	2.412~2.472GHz, 5.150~5.825GHz
Modulation Techniques	OFDM: BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM
NGFF Slot	1x M.2 (NGFF) B Key Socket with USB 3.0
Interface	2x 1Gbps Ethernet Ports LAN RJ45 with Auto MDI-X 1x USB 3.0 Port 2x SIM Card Slots 1x JTAG 20 Pin Connector 1x Serial Port 4 Pin Connector 1x Buzzer
Reset Button	1x F/W Reset Button
LED	7x LED Indicators for MMZ/MMS/MPS
Power over Ethernet (PoE)	Passive PoE 24V, for network cable length < 20m (LV version), IEEE 802.3af/at or Passive PoE 36~56V (HV version)
DC Power	1x DC Jack Connector: 12~24V (LV version); 24~48V (HV version)
Power Consumption (Board Only)	19W
Certification	CE, FCC, 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	117 × 105 × 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.*

Last Updated: 29/01/2021

RF Performance Table for 2.4GHz

	Data Rate	TX Power (per chain)	TX Power (2 chains)	Tolerance
2.4GHz 802.11b	1Mbps	19dBm	22dBm	±2dB
	2Mbps	19dBm	22dBm	±2dB
	5.5Mbps	19dBm	22dBm	±2dB
	11Mbps	19dBm	22dBm	±2dB
2.4GHz 802.11g	6Mbps	19dBm	22dBm	±2dB
	9Mbps	19dBm	22dBm	±2dB
	12Mbps	19dBm	22dBm	±2dB
	18Mbps	19dBm	22dBm	±2dB
	24Mbps	18dBm	21dBm	±2dB
	36Mbps	18dBm	21dBm	±2dB
	48Mbps	17dBm	20dBm	±2dB
	54Mbps	16dBm	19dBm	±2dB
2.4GHz 802.11n HT20	MCS 0	19dBm	22dBm	±2dB
	MCS 1	19dBm	22dBm	±2dB
	MCS 2	19dBm	22dBm	±2dB
	MCS 3	18dBm	21dBm	±2dB
	MCS 4	18dBm	21dBm	±2dB
	MCS 5	17dBm	20dBm	±2dB
	MCS 6	16dBm	19dBm	±2dB
	MCS 7	15dBm	18dBm	±2dB
	MCS 8	14dBm	17dBm	±2dB
2.4GHz 802.11n HT40	MCS 0	19dBm	22dBm	±2dB
	MCS 1	19dBm	22dBm	±2dB
	MCS 2	19dBm	22dBm	±2dB
	MCS 3	18dBm	21dBm	±2dB
	MCS 4	18dBm	21dBm	±2dB
	MCS 5	17dBm	20dBm	±2dB
	MCS 6	16dBm	19dBm	±2dB
	MCS 7	15dBm	18dBm	±2dB
	MCS 8	14dBm	17dBm	±2dB
	MCS 9	13dBm	16dBm	±2dB

	Data Rate	RX Specifications Sensitivity	Tolerance
2.4GHz 802.11b	1Mbps	-94dBm	±2dB
	2Mbps	-93dBm	±2dB
	5.5Mbps	-92dBm	±2dB
	11Mbps	-90dBm	±2dB
2.4GHz 802.11g	6Mbps	-94dBm	±2dB
	9Mbps	-93dBm	±2dB
	12Mbps	-92dBm	±2dB
	18Mbps	-90dBm	±2dB
	24Mbps	-88dBm	±2dB
	36Mbps	-86dBm	±2dB
	48Mbps	-80dBm	±2dB
	54Mbps	-76dBm	±2dB
2.4GHz 802.11n HT20	MCS 0	-94dBm	±2dB
	MCS 1	-92dBm	±2dB
	MCS 2	-89dBm	±2dB
	MCS 3	-86dBm	±2dB
	MCS 4	-83dBm	±2dB
	MCS 5	-79dBm	±2dB
	MCS 6	-77dBm	±2dB
	MCS 7	-75dBm	±2dB
	MCS 8	-72dBm	±2dB
2.4GHz 802.11n HT40	MCS 0	-92dBm	±2dB
	MCS 1	-89dBm	±2dB
	MCS 2	-85dBm	±2dB
	MCS 3	-83dBm	±2dB
	MCS 4	-80dBm	±2dB
	MCS 5	-77dBm	±2dB
	MCS 6	-74dBm	±2dB
	MCS 7	-72dBm	±2dB
	MCS 8	-69dBm	±2dB
	MCS 9	-67dBm	±2dB

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RF Performance Table for 5GHz

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

	Data Rate	RX Specifications Sensitivity	Tolerance
5GHz 802.11a	6Mbps	-93dBm	±2dB
	9Mbps	-92dBm	±2dB
	12Mbps	-91dBm	±2dB
	18Mbps	-89dBm	±2dB
	24Mbps	-87dBm	±2dB
	36Mbps	-84dBm	±2dB
	48Mbps	-80dBm	±2dB
	54Mbps	-79dBm	±2dB
5GHz 802.11n/ac VHT20	MCS 0	-90dBm	±2dB
	MCS 1	-87dBm	±2dB
	MCS 2	-85dBm	±2dB
	MCS 3	-82dBm	±2dB
	MCS 4	-79dBm	±2dB
	MCS 5	-75dBm	±2dB
	MCS 6	-72dBm	±2dB
	MCS 7	-71dBm	±2dB
	MCS 8	-67dBm	±2dB
5GHz 802.11n/ac VHT40	MCS 0	-88dBm	±2dB
	MCS 1	-84dBm	±2dB
	MCS 2	-82dBm	±2dB
	MCS 3	-80dBm	±2dB
	MCS 4	-76dBm	±2dB
	MCS 5	-71dBm	±2dB
	MCS 6	-69dBm	±2dB
	MCS 7	-68dBm	±2dB
	MCS 8	-64dBm	±2dB
	MCS 9	-63dBm	±2dB
5GHz 802.11ac VHT80	MCS 0	-84dBm	±2dB
	MCS 1	-81dBm	±2dB
	MCS 2	-78dBm	±2dB
	MCS 3	-76dBm	±2dB
	MCS 4	-72dBm	±2dB
	MCS 5	-66dBm	±2dB
	MCS 6	-65dBm	±2dB
	MCS 7	-62dBm	±2dB
	MCS 8	-60dBm	±2dB
	MCS 9	-60dBm	±2dB

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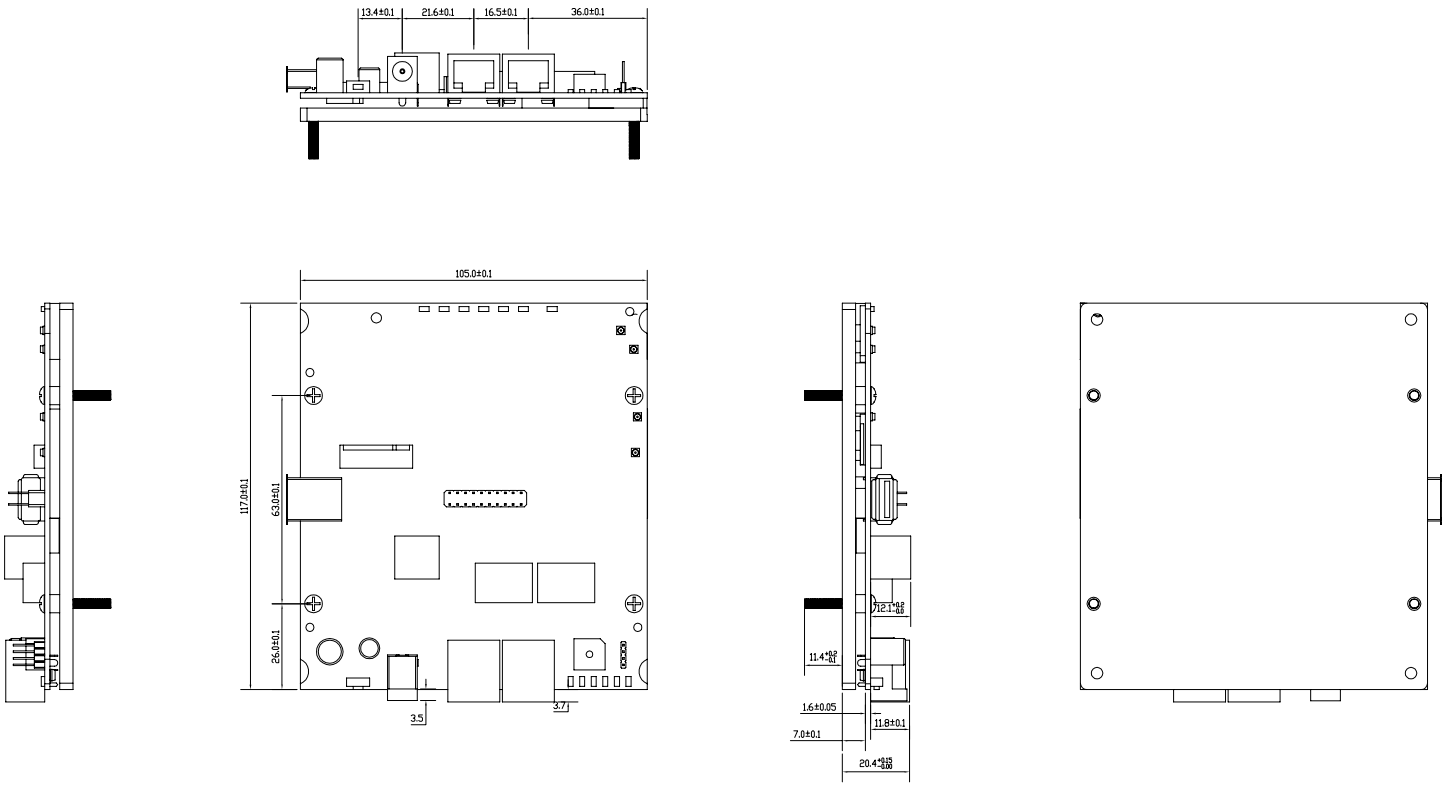
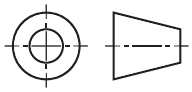
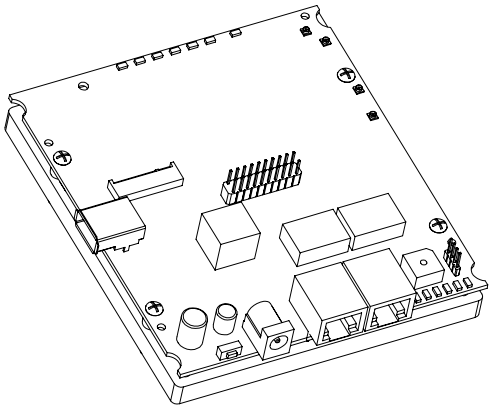
Mechanical Dimensions

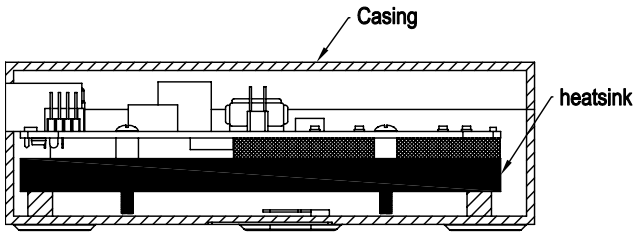


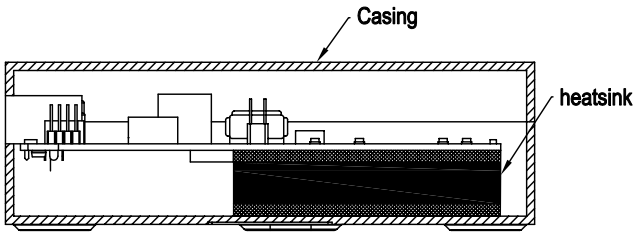


All dimensions are in mm.



Heatsink Options





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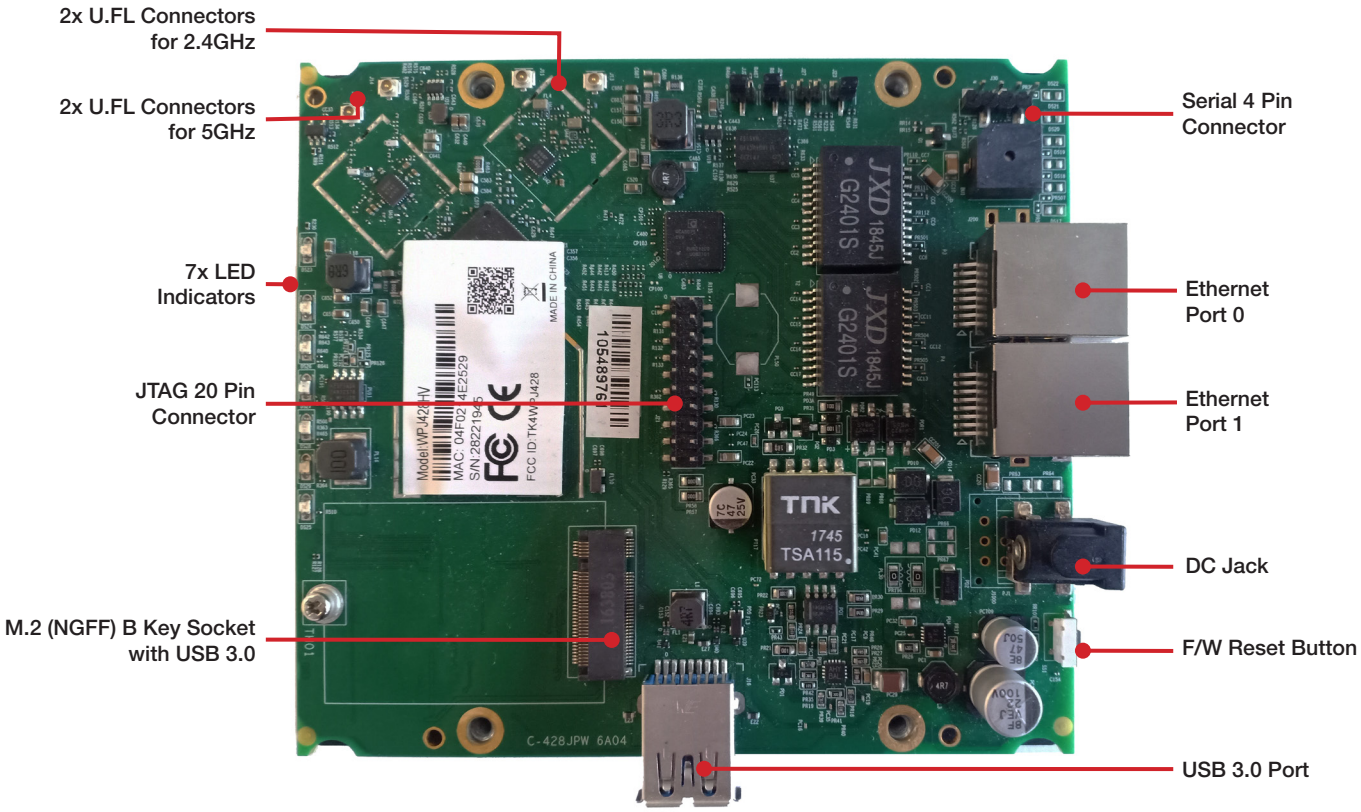
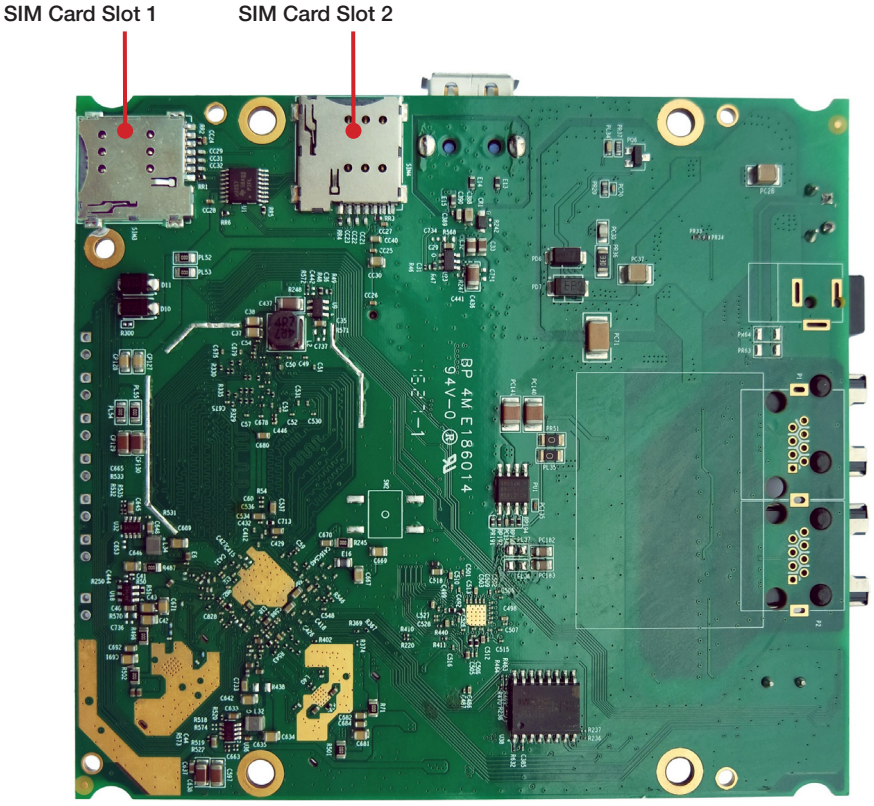
Component Map





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Firmware / Software

The WPJ428 is shipped with CompexWRT firmware. SDKs with QCA binary drivers are available for software developers.

Supported Operating System	• CompexWRT • OpenWRT Barrier Breaker • LEDE

Ordering Options

Item Code	Model	Description
WPJ428HV 6A04PO32256BR	WPJ428HV 6A04	IEEE 802.3af/at or Passive PoE 36~56V DC Jack: 24~48V
WPJ428LV 6A04PO32256BR	WPJ428LV 6A04	Passive PoE 24V, for network cable length less than 20m DC Jack: 12~24V

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