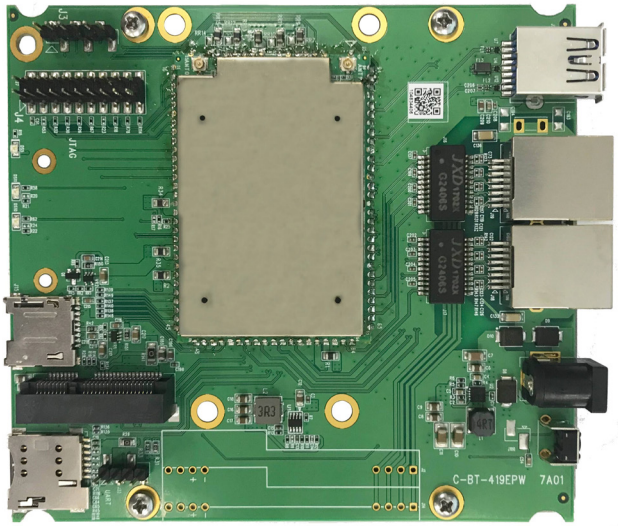
Multi-function IPQ4019 Embedded Board with on-board Wireless

710MHz CPU / 2x GE Port / Dual Band / 802.11ac Wave 2



Model: WPJ419 7A02

KEY FEATURES

- Qualcomm Atheros IPQ4019 710MHz CPU
- 2x2 MU-MIMO On-board WiFi 2.4GHz radio, up to 400Mbps physical data rate
- 2x2 MU-MIMO On-board WiFi 5GHz radio, up to 867Mbps physical data rate
- 3rd Mini PCI Express slot for 3rd WiFi radio or LTE module support

APPLICATIONS

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

Specifications

Chipset	CPU: Qualcomm Atheros IPQ4019 Quad-core ARM Cortex-A7 710MHz
Reference Design	DK04
System Memory	256MB (supports up to 1GB)
NAND Flash	128MB
NOR Flash	32MB
Wireless	On-board 2x2 2.4GHz 802.11b/g/n, max 23dBm per chain, and On-board 2x2 5GHz 802.11a/n/ac, max 23dBm per chain, 2x U.FL connectors, diplexer allows dual band concurrent operation
Frequency Range	2.412GHz to 2.472GHz and 5.180GHz to 5.825GHz, simultaneous dual band
Modulation Techniques	802.11b: DSSS (DBPSK / DQPSK / CCK) 802.11a/g: OFDM (BPSK / QPSK / 16-QAM / 64-QAM) 802.11ac/n: OFDM (BPSK / QPSK / 16-QAM / 64-QAM / 256-QAM)
Interface	2x Gigabit Ethernet LAN RJ45 Port with Auto MDI-X 1x Mini PCI Express v2.0 Slot at 9.2mm Height with PCIe and USB 2.0 signals 1x Serial Port 4 Pin Connector (UART)[1] 1x Serial Port 6 Pin Connector (High Speed UART) 1x JTAG 20 Pin Connector[2] 1x USB 3.0 Port
Reset Button	1x F/W Reset Button
LED	3x LED Indicators: 1x Power and 2x LAN Activity Indicators
Power over Ethernet, only for HV version	IEEE 802.3af (48V) / IEEE 802.3at (56V) and Passive PoE 36V to 56V DC, Supply PSE for pass-through (IEEE 802.3at)
DC Power	1x DC Jack Connector: 12V, 2A
Operating Voltage	3.3V, 5V (for PA), and 12V
Power Consumption	12W (Max)
Supported Operating System	QCA Reference Firmware, OpenWRT v18.x

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.

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Specifications

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Certification	RoHS Compliance
Environmental Temperature	Operating: -20ºC to 70ºC, Storage: -40ºC to 90ºC
Environmental Humidity, non-condensing	Operating: 5% to 95%, Storage: Max. 90%
Dimensions (W × H × D)	120mm × 105mm × 15mm
Extras	1x SIM Card Slot, 1x MicroSD Card Slot
Other Features	Supports Dynamic Frequency Selection (DFS)

**Configurations are subject to change without notifications.*

RF Performance Table for 2.4GHz

	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	19dBm	22dBm	±2dB
	MCS 7	18dBm	21dBm	±2dB

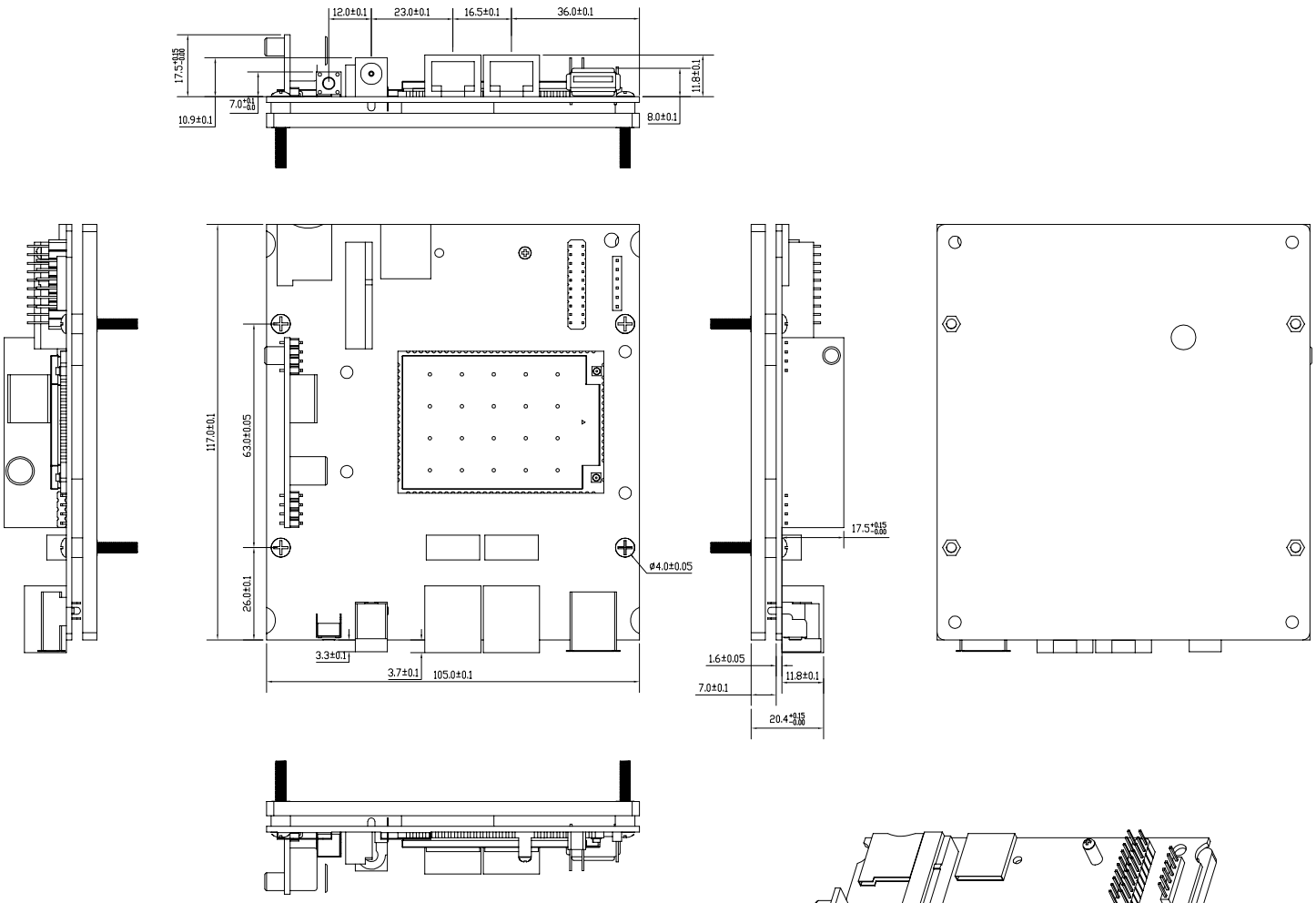
	Data Rate	RX Specifications Sensitivity	Tolerance
2.4GHz 802.11b	1Mbps	-96dBm	±2dB
	2Mbps	-94dBm	±2dB
	5.5Mbps	-92dBm	±2dB
	11Mbps	-90dBm	±2dB
2.4GHz 802.11g	6Mbps	-96dBm	±2dB
	9Mbps	-96dBm	±2dB
	12Mbps	-94dBm	±2dB
	18Mbps	-90dBm	±2dB
	24Mbps	-87dBm	±2dB
	36Mbps	-85dBm	±2dB
	48Mbps	-81dBm	±2dB
	54Mbps	-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 HT20	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 HT40	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 HT80	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

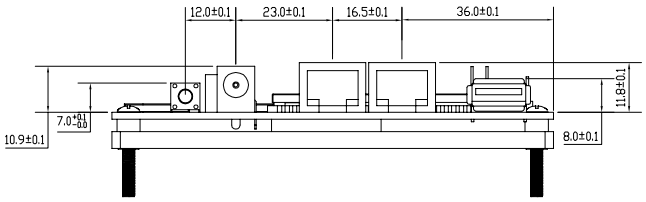
	Data Rate	RX Specifications Sensitivity	Tolerance
5GHz 802.11a	6Mbps	-93dBm	±2dB
	9Mbps	-92dBm	±2dB
	12Mbps	-91dBm	±2dB
	18Mbps	-88dBm	±2dB
	24Mbps	-87dBm	±2dB
	36Mbps	-84dBm	±2dB
	48Mbps	-81dBm	±2dB
	54Mbps	-79dBm	±2dB
5GHz 802.11n/ac HT20	MCS 0	-91dBm	±2dB
	MCS 1	-90dBm	±2dB
	MCS 2	-88dBm	±2dB
	MCS 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 HT40	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 HT80	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

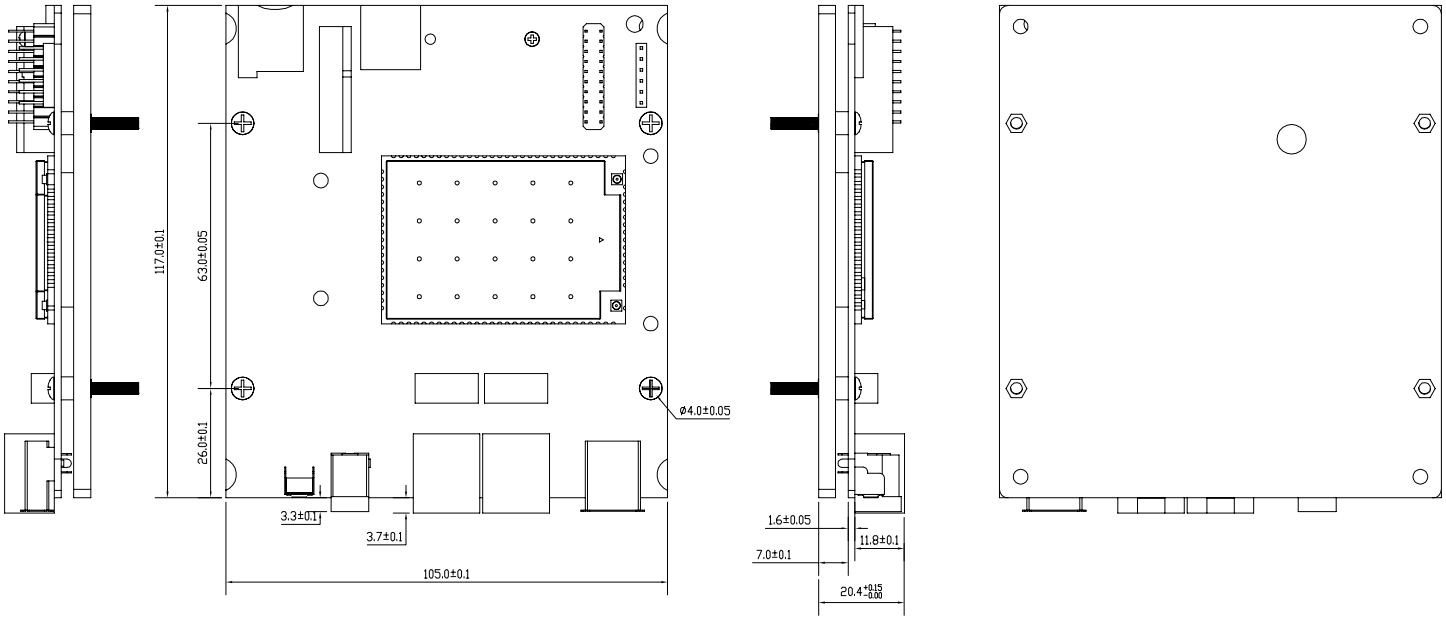
Mechanical Dimensions for HV Version

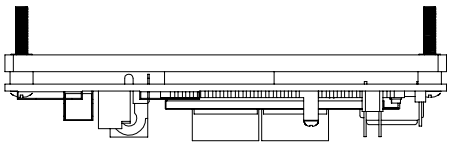


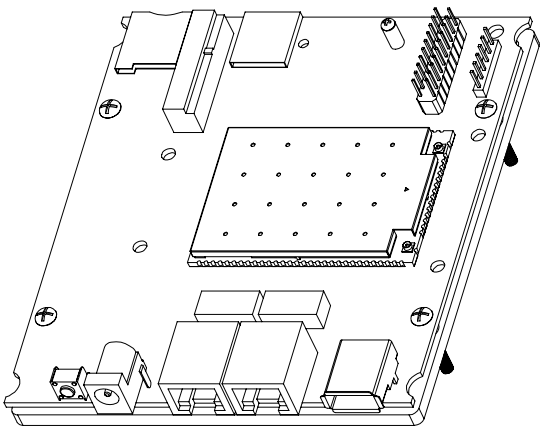
All dimensions are in mm.

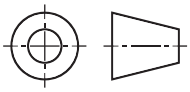
Mechanical Dimensions for LV Version





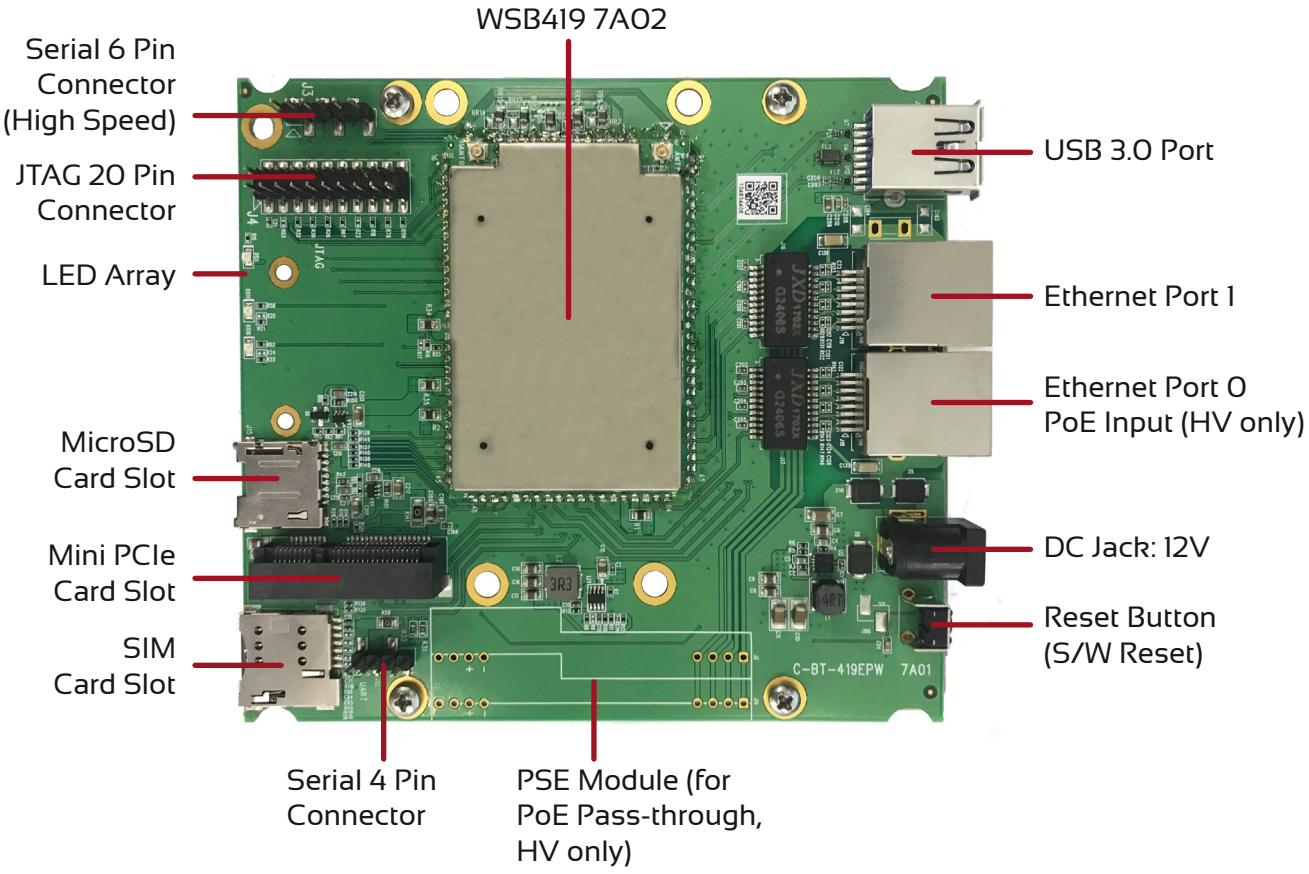






All dimensions are in mm.

Component Map



Firmware / Software

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

Supported Operating System	• **QCA Reference Firmware** • **OpenWRT v18.x**

Ordering Options

Item Code	Model	Description
WPJ419HV 7A02BO32256BR	WPJ419HV 7A02	Board using DC Jack and PoE
WPJ419LV 7A02BO32256BR	WPJ419LV 7A02	Board using DC Jack, no PoE