Dual Band 2.4 & 5 GHz 3x3 MIMO 802.11ac Mini PCIe WiFi Module
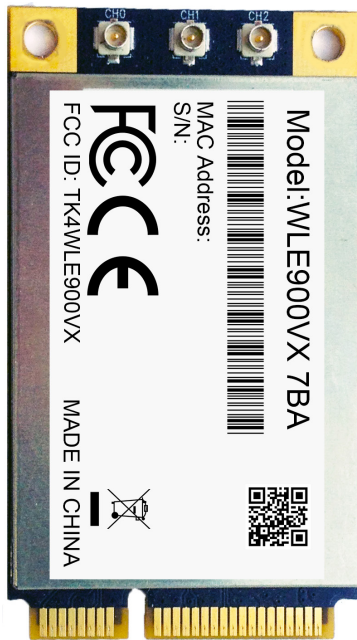## Designed for Dual Band High Speed Wireless Access Points

Model: WLE900VX-I

KEY FEATURES

- Qualcomm Atheros QCA9890
- XB140 Reference Design
- 2.4 GHz max 21 dBm & 5 GHz max 20 dBm output power (per chain)
- IEEE 802.11ac compliant & backward compatible with 802.11a/b/g/n
- 3x3 MIMO Technology, up to 1.3 Gbps
- Mini PCI Express edge connector
- Supports Spatial Multiplexing, Cyclic-Delay Diversity (CDD), Low-Density Parity Check (LDPC) Codes, Maximal Ratio Combining (MRC), Space Time Block Code (STBC)
- Supports IEEE 802.11d, e, h, i, k, r, v time stamp, and w standards
- Supports Dynamic Frequency Selection (DFS)
- Cards are individually calibrated for Quality Assurance
- Supports 4.9 GHz operation

Specifications

Chipset	QCA9890
Reference Design	XB140
Host Interface	Mini PCI Express 1.1 Standard
Operating Voltage	3.3 V DC
Antenna Connector	3x U.FL
Frequency Range	2.412 GHz to 2.472 GHz, or 4.920 GHz to 5.825 GHz, selectable dual band
Certification	FCC & CE Certified, RoHS Compliant
Power Consumption	5 W (Max)
Supported Operating System	Supported by CompexWRT with Qualcomm Atheros reference wireless drivers or OpenWRT/LEDE with ath10k wireless drivers, on WPJ344, WPJ558, WPJ563, WPJ564, WPQ864, and WPQ865.
Modulation Techniques	OFDM: BPSK, QPSK, DBPSK, DQPSK, 16-QAM, 64-QAM, 256-QAM
Environmental Temperature	Operating: -40°C to 70°C*, Storage: -40°C to 90°C *The wireless module can operate up to 90°C. For long term reliability, it is recommended that a 20°C safety margin be maintained.
Environmental Humidity, non-condensing	Operating: 5% to 95%, Storage: Max. 90%
ESD Sensitivity	Class 1C
Dimensions (W × H × D)	30.0 mm × 50.9 mm × 3.2 mm

RF Performance Table

	Data Rate	TX Power (per chain)	TX Power (3 chains)	Tolerance
2.4 GHz 802.11b	1 Mbps	20 dBm	25 dBm	± 2 dB
	2 Mbps	20 dBm	25 dBm	± 2 dB
	5.5 Mbps	20 dBm	25 dBm	± 2 dB
	11 Mbps	20 dBm	25 dBm	± 2 dB
2.4 GHz 802.11g	6 Mbps	21 dBm	26 dBm	± 2 dB
	9 Mbps	21 dBm	26 dBm	± 2 dB
	12 Mbps	21 dBm	26 dBm	± 2 dB
	18 Mbps	21 dBm	26 dBm	± 2 dB
	24 Mbps	21 dBm	26 dBm	± 2 dB
	36 Mbps	20 dBm	25 dBm	± 2 dB
	48 Mbps	19 dBm	24 dBm	± 2 dB
	54 Mbps	18 dBm	23 dBm	± 2 dB
2.4 GHz 802.11n HT20	MCS 0	21 dBm	26 dBm	± 2 dB
	MCS 1	21 dBm	26 dBm	± 2 dB
	MCS 2	21 dBm	26 dBm	± 2 dB
	MCS 3	20 dBm	25 dBm	± 2 dB
	MCS 4	20 dBm	25 dBm	± 2 dB
	MCS 5	20 dBm	25 dBm	± 2 dB
	MCS 6	18 dBm	23 dBm	± 2 dB
	MCS 7	16 dBm	21 dBm	± 2 dB
2.4 GHz 802.11n HT40	MCS 0	20 dBm	25 dBm	± 2 dB
	MCS 1	20 dBm	25 dBm	± 2 dB
	MCS 2	20 dBm	25 dBm	± 2 dB
	MCS 3	19 dBm	24 dBm	± 2 dB
	MCS 4	19 dBm	24 dBm	± 2 dB
	MCS 5	19 dBm	24 dBm	± 2 dB
	MCS 6	18 dBm	23 dBm	± 2 dB
	MCS 7	16 dBm	21 dBm	± 2 dB

	Data Rate	RX Specifications Sensitivity	Tolerance
2.4 GHz 802.11b	1 Mbps	-95 dBm	± 2 dB
	2 Mbps	-94 dBm	± 2 dB
	5.5 Mbps	-92 dBm	± 2 dB
	11 Mbps	-90 dBm	± 2 dB
2.4 GHz 802.11g	6 Mbps	-94 dBm	± 2 dB
	9 Mbps	-93 dBm	± 2 dB
	12 Mbps	-92 dBm	± 2 dB
	18 Mbps	-90 dBm	± 2 dB
	24 Mbps	-88 dBm	± 2 dB
	36 Mbps	-85 dBm	± 2 dB
	48 Mbps	-81 dBm	± 2 dB
	54 Mbps	-80 dBm	± 2 dB
2.4 GHz 802.11n HT20	MCS 0	-94 dBm	± 2 dB
	MCS 1	-91 dBm	± 2 dB
	MCS 2	-89 dBm	± 2 dB
	MCS 3	-84 dBm	± 2 dB
	MCS 4	-83 dBm	± 2 dB
	MCS 5	-78 dBm	± 2 dB
	MCS 6	-78 dBm	± 2 dB
	MCS 7	-76 dBm	± 2 dB
2.4 GHz 802.11n HT40	MCS 0	-92 dBm	± 2 dB
	MCS 1	-88 dBm	± 2 dB
	MCS 2	-85 dBm	± 2 dB
	MCS 3	-82 dBm	± 2 dB
	MCS 4	-79 dBm	± 2 dB
	MCS 5	-75 dBm	± 2 dB
	MCS 6	-75 dBm	± 2 dB
	MCS 7	-73 dBm	± 2 dB

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RF Performance Table

	Data Rate	TX Power (per chain)	TX Power (3 chains)	Tolerance
5 GHz 802.11a	6 Mbps	20 dBm	25 dBm	± 2 dB
	9 Mbps	20 dBm	25 dBm	± 2 dB
	12 Mbps	20 dBm	25 dBm	± 2 dB
	18 Mbps	20 dBm	25 dBm	± 2 dB
	24 Mbps	20 dBm	25 dBm	± 2 dB
	36 Mbps	18 dBm	23 dBm	± 2 dB
	48 Mbps	16 dBm	21 dBm	± 2 dB
	54 Mbps	15 dBm	20 dBm	± 2 dB
5 GHz 802.11n/ac HT20	MCS 0	19 dBm	24 dBm	± 2 dB
	MCS 1	19 dBm	24 dBm	± 2 dB
	MCS 2	19 dBm	24 dBm	± 2 dB
	MCS 3	18 dBm	23 dBm	± 2 dB
	MCS 4	18 dBm	23 dBm	± 2 dB
	MCS 5	17 dBm	22 dBm	± 2 dB
	MCS 6	16 dBm	21 dBm	± 2 dB
	MCS 7	14 dBm	19 dBm	± 2 dB
	MCS 8	13 dBm	18 dBm	± 2 dB
5 GHz 802.11n/ac HT40	MCS 0	18 dBm	23 dBm	± 2 dB
	MCS 1	18 dBm	23 dBm	± 2 dB
	MCS 2	18 dBm	23 dBm	± 2 dB
	MCS 3	17 dBm	22 dBm	± 2 dB
	MCS 4	17 dBm	22 dBm	± 2 dB
	MCS 5	16 dBm	21 dBm	± 2 dB
	MCS 6	15 dBm	20 dBm	± 2 dB
	MCS 7	14 dBm	19 dBm	± 2 dB
	MCS 8	13 dBm	18 dBm	± 2 dB
	MCS 9	13 dBm	18 dBm	± 2 dB
5 GHz 802.11ac HT80	MCS 0	18 dBm	23 dBm	± 2 dB
	MCS 1	18 dBm	23 dBm	± 2 dB
	MCS 2	18 dBm	23 dBm	± 2 dB
	MCS 3	17 dBm	22 dBm	± 2 dB
	MCS 4	17 dBm	22 dBm	± 2 dB
	MCS 5	16 dBm	21 dBm	± 2 dB
	MCS 6	15 dBm	20 dBm	± 2 dB
	MCS 7	14 dBm	19 dBm	± 2 dB
	MCS 8	13 dBm	18 dBm	± 2 dB
	MCS 9	13 dBm	18 dBm	± 2 dB

	Data Rate	RX Specifications Sensitivity	Tolerance
5 GHz 802.11a	6 Mbps	-94 dBm	± 2 dB
	9 Mbps	-94 dBm	± 2 dB
	12 Mbps	-92 dBm	± 2 dB
	18 Mbps	-90 dBm	± 2 dB
	24 Mbps	-86 dBm	± 2 dB
	36 Mbps	-84 dBm	± 2 dB
	48 Mbps	-81 dBm	± 2 dB
	54 Mbps	-80 dBm	± 2 dB
5 GHz 802.11n/ac HT20	MCS 0	-93 dBm	± 2 dB
	MCS 1	-90 dBm	± 2 dB
	MCS 2	-87 dBm	± 2 dB
	MCS 3	-83 dBm	± 2 dB
	MCS 4	-80 dBm	± 2 dB
	MCS 5	-77 dBm	± 2 dB
	MCS 6	-74 dBm	± 2 dB
	MCS 7	-73 dBm	± 2 dB
	MCS 8	-71 dBm	± 2 dB
5 GHz 802.11n/ac HT40	MCS 0	-90 dBm	± 2 dB
	MCS 1	-88 dBm	± 2 dB
	MCS 2	-85 dBm	± 2 dB
	MCS 3	-82 dBm	± 2 dB
	MCS 4	-79 dBm	± 2 dB
	MCS 5	-75 dBm	± 2 dB
	MCS 6	-73 dBm	± 2 dB
	MCS 7	-73 dBm	± 2 dB
	MCS 8	-69 dBm	± 2 dB
	MCS 9	-67 dBm	± 2 dB
5 GHz 802.11ac HT80	MCS 0	-88 dBm	± 2 dB
	MCS 1	-86 dBm	± 2 dB
	MCS 2	-84 dBm	± 2 dB
	MCS 3	-81 dBm	± 2 dB
	MCS 4	-77 dBm	± 2 dB
	MCS 5	-74 dBm	± 2 dB
	MCS 6	-73 dBm	± 2 dB
	MCS 7	-70 dBm	± 2 dB
	MCS 8	-67 dBm	± 2 dB
	MCS 9	-66 dBm	± 2 dB

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Connector Map

U.FL connectors

CH2

CH1

CH0

Model:WLE900VX 7BA

MAC Address:
S/N:

FCC ID: TK4WLE900VX   MADE IN CHINA

Mini PCIe
edge connector

Mechanical Dimensions

$29.9^{0.1}_{0}$

24.2 ± 0.1

1.0 ± 0.1

1.4 ± 0.1

$2.2^{0.1}_{0}$

$\varnothing2.5\pm0.1$

$50.8^{0.1}_{0}$

25.8 ± 0.1

All dimensions are in mm.
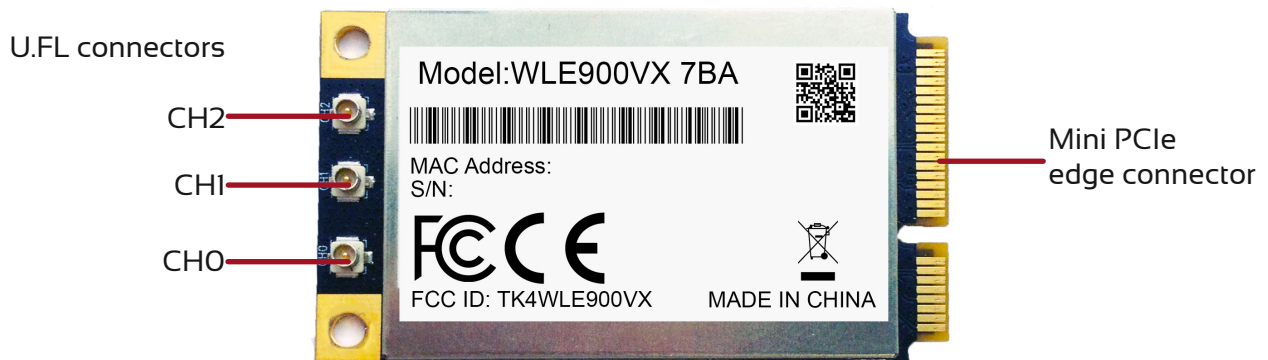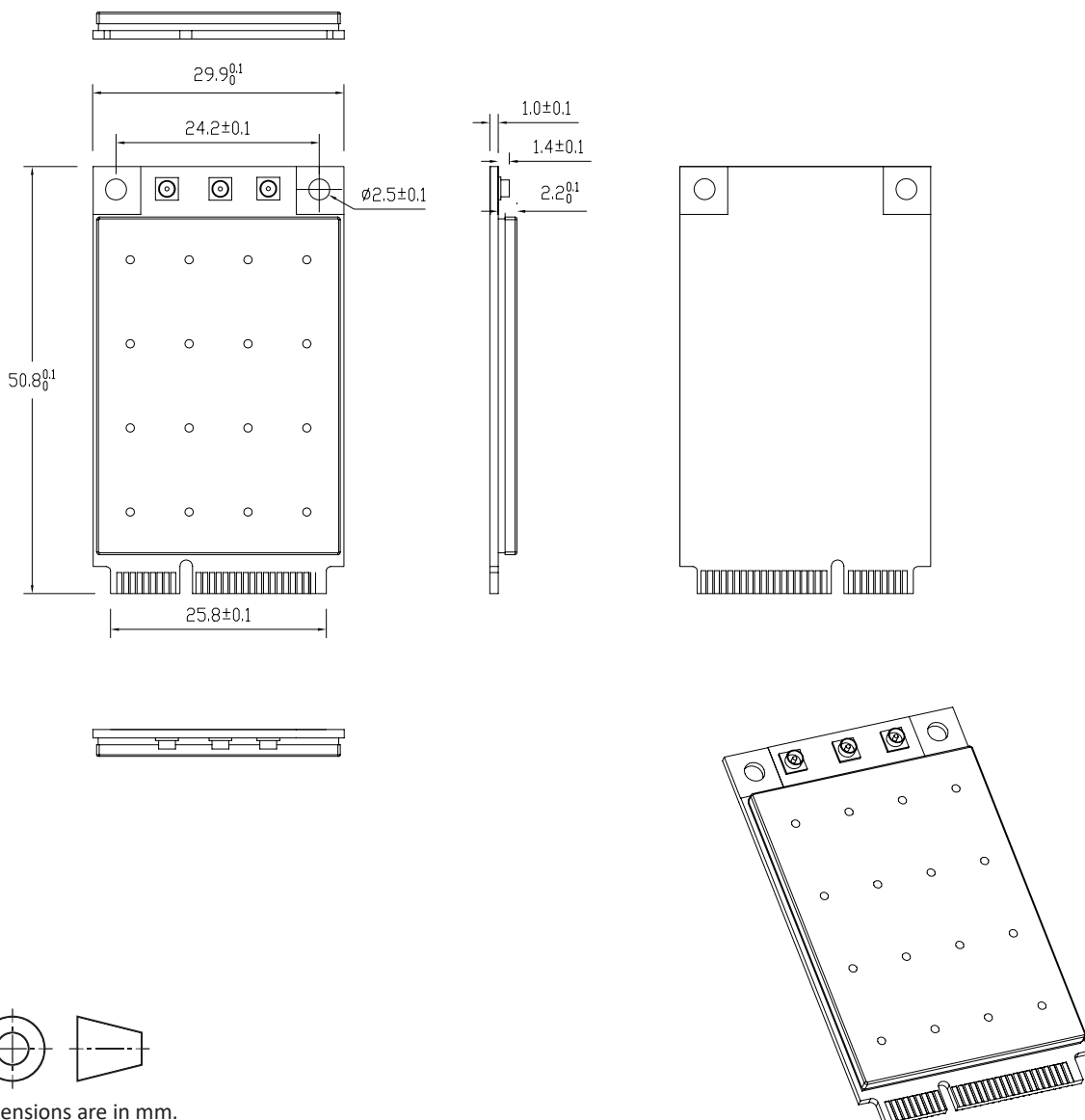
Ordering Configuration

Item Code	Model	Description
WLE900VX 7BA000S-I	WLE900VX-I	Industrial Grade 3x3 802.11a/b/g/n/ac 2.4 GHz / 5 GHz miniPCIe card

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