

USERS MANUAL

3X3 2.4/5GHz 11ac miniPCIe Radio

Revision:1.03 IL
Date: 2014,11,10



Model: WLE900VX-7S

7signal Revision: V2.1
Date: 2015,08,28

Features

- Qualcomm-Atheros QCA9880, Reference Design
- 2.4GHz max 19dBm & 5GHz max19dBm output power (per chain)
- IEEE 802.11ac complaint & backward compatible with 802.11a/b/g/n
- 3X3 MIMO Technology & up to 1.3Gbps
- MiniPCI Express 1.1 interface
- Supports Spatial Multiplexing, low-density parity check (LDPC), Maximal Ratio Combining (MRC), Space Time Block Code (STBC)
- Supports IEEE 802.11d, e, h, I, k, RO, v time stamp, and w standards
- Supported by either CompexWRT with Atheros Reference Wireless Driver, or OpenWRT with ath10k Wireless Driver on WPJ344
- Cards are individually calibrated for Quality Assurance

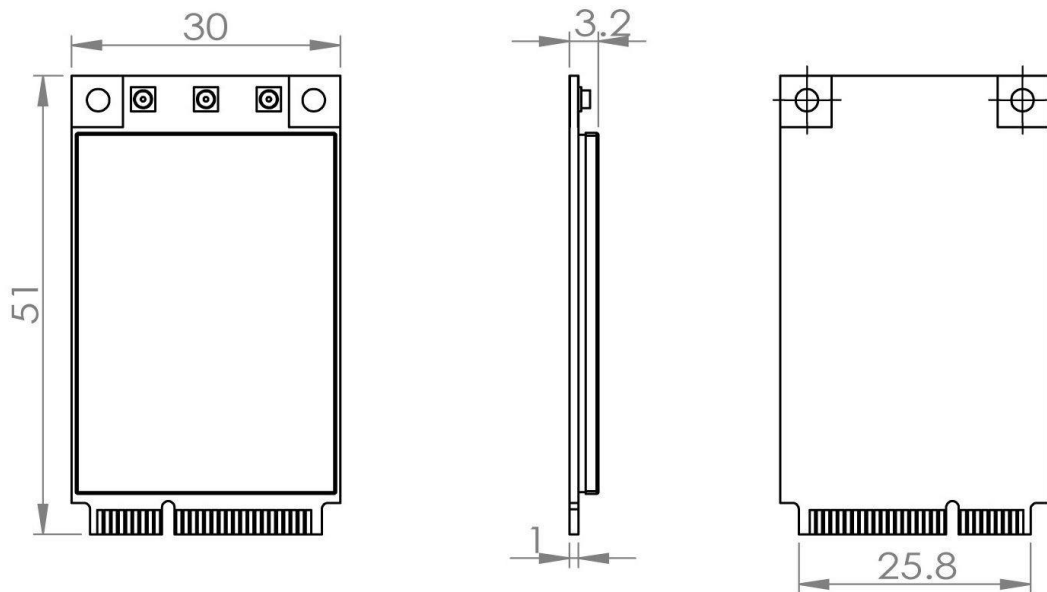
Technical Specifications

System Information									
Chipset		QCA9890							
Host Interface		PCI-Express 1.1 Standard							
Operating Voltage		3.3 VDC							
Power Consumption		5W							
Antenna Connector		3 x U.F L							
Frequency Range		5.180 ~ 5.825 GHz							
Modulation Techniques		OFDM: BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM							
RoHS Compliance		Yes							
Temperature Range		Operating: -20°C to 70°C; Storage: -40°C to 90°C							
Humidity		Operating:5% to 95% (non-condensing) Storage: Max.90% (non-condensing)							
Dimensions (mm)		50.95 x 30 x 3.2 (H x W x D)							
TX Specifications									
	Data Rate	TX Power (per chain)	TX Power (3 chains)	Tolerance		Data Rate	TX Power (per chain)	TX Power (3 chains)	Tolerance
802.11bg	6Mbps	19dBm	24dBm	±2dB	2.4G 11n HT20	MCS 0	19dBm	24dBm	±2dB
	54Mbps	15dBm	20dBm	±2dB		MCS 7	13dBm	18dBm	±2dB
2.4G 11n HT40	MCS 0	18dBm	23dBm	±2dB	802.11a	6Mbps	18dBm	22dBm	±2dB
	MCS 7	13dBm	18dBm	±2dB		54Mbps	15dBm	20dBm	±2dB
5G11n HT20	MCS 0	19dBm	22dBm	±2dB	5G11n HT40	MCS 0	18dBm	22dBm	±2dB
	MCS 7	13dBm	18dBm	±2dB		MCS 7	12dBm	17dBm	±2dB
5G11ac HT20	MCS 0	19dBm	22dBm	±2dB	5G11ac HT40	MCS 0	18dBm	21dBm	±2dB
	MCS 7	12dBm	17dBm	±2dB		MCS 9	11dBm	16dBm	±2dB
5G11ac HT80	MCS 0	18 dBm	22dBm	±2dB					
	MCS 9	10dBm	15dBm	±2dB					
RX Specifications									
	DataRate	Sensitivity	Tolerance			DataRate	Sensitivity	Tolerance	
802.11a	6Mbps	-96dBm	±2dB	5G11n HT40		MCS 0	-95dBm	±2dB	
	54Mbps	-84dBm	±2dB			MCS 7	-77dBm	±2dB	
5G11n HT40	MCS 0	-92dBm	±2dB	11ac HT20		MCS 0	-94dBm	±2dB	
	MCS 7	-77dBm	±2dB			MCS 9	-70dBm	±2dB	
11ac HT40	MCS 0	-91dBm	±2dB	11ac HT80		MCS 0	-90dBm	±2dB	
	MCS 9	-65dBm	±2dB			MCS 9	-61dBm	±2dB	
802.11bg	6Mbps	-94dBm	±2dB	2.4G 11n HT20		MCS 0	-94dBm	±2dB	
	54Mbps	-80dBm	±2dB			MCS 7	-77dBm	±2dB	
2.4G 11n HT40	MCS 0	-93dBm	±2dB						
	MCS 7	-75dBm	±2dB						

Notes:

- Only the 20MHz and 40MHz bandwidth channels are available in the UNII-2C band. The 80MHz channels number 106, 122, 138 cannot be programmed to operate.
- The newer 20MHz channel number 144 is not available and cannot be programmed to operate.

Dimension Drawing



Ordering Information

Item Code	Chipset	Form factor	Card Information
WLE900VX-7S	Atheros 9890	Full size	3x3 802.11ac 2.4G/5G PCIe mini card

Compliance Information

FCC Compliance Statement:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

This device must accept any interference received, including interference that may cause undesired operation. Product that is a radio transmitter is labeled with FCC ID.

FCC Caution:

- (1) Exposure to Radio Frequency Radiation. This equipment must be installed and operated in accordance with provided instructions and the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be collocated or operating in conjunction with any other antenna or transmitter. End-users and installers must be provided with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.
- (2) Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.
- (3) This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
- (4) Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user authority to operate the equipment.

RF exposure warning

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. The equipment must not be co-located or operating in conjunction with any other antenna or transmitter.

IMPORTANT NOTE: In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

The antenna gain which being use as below:

Antenna Type	Manufacturer	Tx Paths	Max Directional Gain (dBi)
Panel Antenna 1#	Compex Systems Pte Ltd	3	2.4GHz: 11.0
Panel Antenna 2#	Kenbotong Communication LTD	3	2.4GHz: 10.0, 5GHz: 10.0
Panel Antenna 3#	Smart Ant Inc	3	2.4GHz: 7.0, 5GHz: 7.0
Panel Antenna 4#	TAOGLAS Inc	3	2.4GHz: 4.5, 5GHz: 6.7
Panel Antenna 5#	Compex Systems Pte Ltd	3	2.4GHz: 5.0, 5GHz: 5.0
Panel Antenna 6#	Compex Systems Pte Ltd	3	2.4GHz: 5.0, 5GHz: 5.0
Dipole Antenna 1#	Kunshan Wavelink Electronic Co., Ltd.	3	2.4GHz: 2.0, 5GHz: 2.0
Vivaldi PCB + Metal Slot Antennas	7signal Solutions Inc custom PCB and sheet metal slot design	3 simultaneous	2.4GHz: 6.0, 5GHz: 6.0

Note: 5.725~5.850GHz supports a max antenna gain of 10dBi, 5.15~5.35, 5.47~5.725GHz supports a max antenna gain of 7dBi. This device is only a client module, the device does not perform radar detection and does not support ad-hoc operation in the DFS band.

OEM integration instructions:

This device is intended only for OEM integrators under the following conditions:

The module is limited to only installations in mobile applications. The antenna must be installed such that 20 cm is maintained between the antenna and users, and the transmitter module may not be co-located with any other transmitter antenna. The module shall be only used with the integral antenna(s) that have been originally tested and certified with this module.

As long as 3 conditions above are met, further transmitter test will not be required.

However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirement with this module installed (for example, digital device emission, PC peripheral requirements, etc.)

OEM integration instructions:

In the event that these conditions cannot be met (for example certain laptop configuration or co-location with another transmitter), then the FCC authorization for this module in combination with the host equipment is no longer considered valid and the FCC ID of the module cannot be used on the final product. In these circumstances the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

End product labeling:

This transmitter module is authorization only for use in devices where the antenna may be installed such that 20 cm will be maintained between the antenna and user. The final end product must be labeled in a visible area with the following:

"Contains Transmitter Module FCC ID: YLFSE2100WL" or "Contains FCC ID: YLFSE2100WL"

Information that must be placed in the end user manual:

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module. The end user manual shall include all required regulatory information/warning as shown in this manual.