2x2 2.4/5GHz 11ac miniPCIe Radio

Model: WLE600VX

Revision:1.04 IL
Date: 2015.03.30

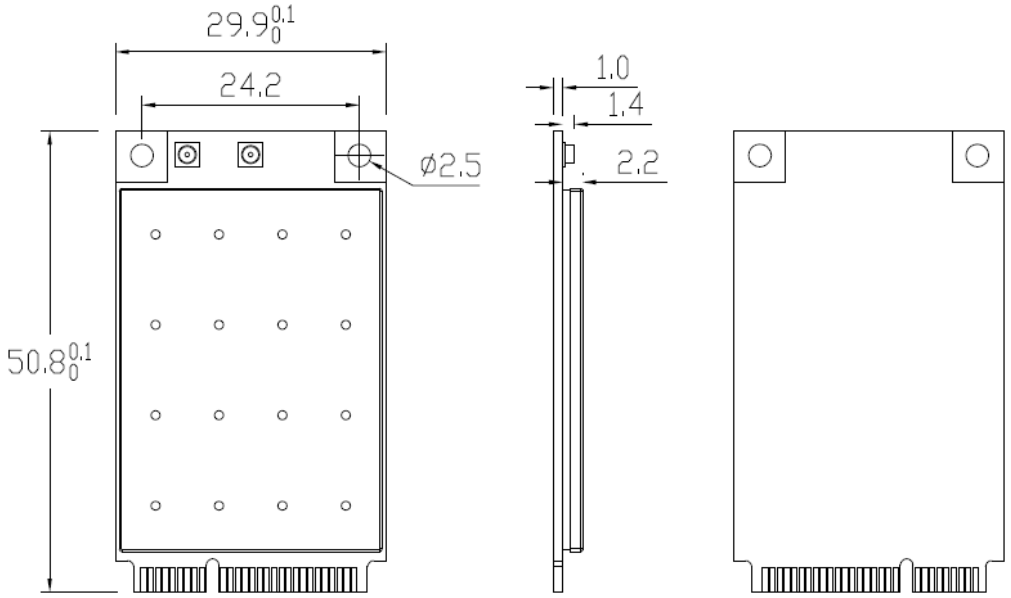
Features

- Qualcomm-Atheros QCA9892
- 2.4GHz max 21dBm & 5GHz max 21dBm output power (per chain)
- IEEE 802.11ac complaint & backward compatible with 802.11a/b/g/n
- 2X2 MIMO Technology & up to 867Mbps
- 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	QCA9892						
Host Interface	PCI-Express 1.1 Standard						
Operating Voltage	3.3 VDC						
Power Consumption	3.5W						
Antenna Connector	2 x U.F L						
Frequency Range	2.4G: 2.412 ~ 2.472 GHz 5G: 5.180 ~ 5.825 GHz						
Modulation Techniques	BPSK, QPSK, DBPSK,DQPSK,CCK,16-QAM, 64-QAM, 256-QAM						
RoHS Compliance	Yes						
Temperature Range	Operating: -20ºC to 70ºC; Storage: -40ºC to 90ºC						
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)						
Band	**TX Specifications**				**RX Specifications**		
	Data Rate	**TX Power** (per chain)	**TX Power** (2 chains)	**Tolerance**	**Data Rate**	**Sensitivity**	**Tolerance**
802.11bg	6-24Mbps	20dBm	--	±2dB	6Mbps	-94dBm	±2dB
	36Mbps	19dBm	--	±2dB	36Mbps	-86dBm	±2dB
	48Mbps	18dBm	--	±2dB	48Mbps	-82dBm	±2dB
	54Mbps	17dBm	--	±2dB	54Mbps	-80dBm	±2dB
2.4GHz 11n HT20	MCS 0	19dBm	23dBm	±2dB	MCS 0	-94dBm	±2dB
	MCS 1	18dBm	22dBm	±2dB	MCS1	-94dBm	±2dB
	MCS 2	18dBm	22dBm	±2dB	MCS2	-92dBm	±2dB
	MCS 3	17dBm	22dBm	±2dB	MCS 3	-88dBm	±2dB
	MCS 4	17dBm	22dBm	±2dB	MCS 4	-84dBm	±2dB
	MCS 5	17dBm	22dBm	±2dB	MCS 5	-81dBm	±2dB
	MCS 6	16dBm	21dBm	±2dB	MCS 6	-78dBm	±2dB
	MCS 7	15dBm	19dBm	±2dB	MCS 7	-77dBm	±2dB
2.4GHz 11n HT40	MCS 0	19dBm	23dBm	±2dB	MCS 0	-93dBm	±2dB
	MCS 1	18dBm	22dBm	±2dB	MCS1	-91dBm	±2dB
	MCS 2	18dBm	22dBm	±2dB	MCS2	-90dBm	±2dB
	MCS 3	17dBm	22dBm	±2dB	MCS 3	-85dBm	±2dB
	MCS 4	17dBm	22dBm	±2dB	MCS 4	-82dBm	±2dB
	MCS 5	17dBm	22dBm	±2dB	MCS 5	-78dBm	±2dB
	MCS 6	16dBm	21dBm	±2dB	MCS 6	-77dBm	±2dB
	MCS 7	15dBm	19dBm	±2dB	MCS 7	-75dBm	±2dB
802.11a	6-24Mbps	19dBm	--	±2dB	6Mbps	-94dBm	±2dB
	36Mbps	18dBm	--	±2dB	36Mbps	-86dBm	±2dB
	48Mbps	18dBm	--	±2dB	48Mbps	-82dBm	±2dB
	54Mbps	17dBm	--	±2dB	54Mbps	-80dBm	±2dB
5GHz 11an/ac HT20	MCS0	19dBm	21dBm	±2dB	MCS0	-93dBm	±2dB
	MCS1	19dBm	21dBm	±2dB	MCS1	-91dBm	±2dB
	MCS2	19dBm	21dBm	±2dB	MCS2	-90dBm	±2dB
	MCS3	18dBm	20dBm	±2dB	MCS3	-85dBm	±2dB
	MCS4	18dBm	20dBm	±2dB	MCS4	-82dBm	±2dB
	MCS5	17dBm	20dBm	±2dB	MCS5	-78dBm	±2dB
	MCS6	16dBm	19dBm	±2dB	MCS6	-77dBm	±2dB
	MCS7	16dBm	19dBm	±2dB	MCS7	-75dBm	±2dB
	MCS8	15dBm	18dBm	±2dB	MCS8	-73dBm	±2dB
	MCS9	15dBm	18dBm	±2dB	MCS9	-71dBm	±2dB
5GHz 11n/ac HT40	MCS0	19dBm	21dBm	±2dB	MCS0	-93dBm	±2dB
	MCS1	19dBm	21dBm	±2dB	MCS1	-91dBm	±2dB
	MCS2	19dBm	21dBm	±2dB	MCS2	-90dBm	±2dB
	MCS3	18dBm	20dBm	±2dB	MCS3	-85dBm	±2dB
	MCS4	18dBm	20dBm	±2dB	MCS4	-82dBm	±2dB
	MCS5	16dBm	19dBm	±2dB	MCS5	-78dBm	±2dB
	MCS6	15dBm	18dBm	±2dB	MCS6	-77dBm	±2dB
	MCS7	15dBm	18dBm	±2dB	MCS7	-75dBm	±2dB
	MCS8	14dBm	17dBm	±2dB	MCS8	-73dBm	±2dB
	MCS9	14dBm	17dBm	±2dB	MCS9	-71dBm	±2dB
5GHz11ac HT80	MCS0	19dBm	21dBm	±2dB	MCS0	-89dBm	±2dB
	MCS1	19dBm	21dBm	±2dB	MCS1	-88dBm	±2dB
	MCS2	19dBm	21dBm	±2dB	MCS2	-85dBm	±2dB
	MCS3	18dBm	20dBm	±2dB	MCS3	-81dBm	±2dB
	MCS4	18dBm	20dBm	±2dB	MCS4	-79dBm	±2dB
	MCS5	16dBm	19dBm	±2dB	MCS5	-75dBm	±2dB
	MCS6	15dBm	18dBm	±2dB	MCS6	-74dBm	±2dB
	MCS7	15dBm	18dBm	±2dB	MCS7	-72dBm	±2dB
	MCS8	14dBm	17dBm	±2dB	MCS8	-70dBm	±2dB
	MCS9	14dBm	17dBm	±2dB	MCS9	-68dBm	±2dB

Dimension Drawing



Ordering Information

Item Code	Chipset	Form factor	Card Information
WLE600VX	Atheros 9892	Full size	2x2 802.11ac 2.4G/5G PCIe mini card

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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	2	2.4GHz: 11.0
Panel Antenna 2#	Kenbotong Communication LTD	2	2.4GHz: 10.0, 5GHz: 10.0
Panel Antenna 3#	Smart Ant Inc	2	2.4GHz: 7.0, 5GHz: 7.0
Panel Antenna 4#	TAOGLAS Inc	2	2.4GHz: 4.5, 5GHz: 6.7
Panel Antenna 5#	Compex Systems Pte Ltd	2	2.4GHz: 5.0, 5GHz: 5.0
Panel Antenna 6#	Compex Systems Pte Ltd	2	2.4GHz: 5.0, 5GHz: 5.0
Dipole Antenna 1#	Kunshan Wavelink Electronic Co., Ltd.	2	2.4GHz: 2.0, 5GHz: 2.0

Note: 5.725~5.850GHz support the max antenna 10dBi,5.15~5.35,5.47~5.725GHz support the max antenna 7dBi.
This device is only a client equipment,the device is not radar detection and not 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 only limited to installation 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 transmit or antenna. The module shall be only used with the integral antenna(s) that has 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 and circumstance, 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 device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following:

"Contains Transmitter Module FCC ID: TK4WLE600VX or Contains FCC ID: TK4WLE600VX"

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 show in this manual.

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