

WIRELESS 11Ac WAVE2 MODULES

Dual Band 2.4/5GHz 4x4 802.11ac Wave 2 MiniPCle WiFi Module Designed for High Bandwidth Enterprise Wireless Access Points

Model: WLE1216VX



KEY FEATURES

- Qualcomm Atheros QCA9984
- 2.4GHz, 4x4 MU-MIMO OFDM Technology, up to 800Mbps physical data rate
- 5GHz, 4x4 MU-MIMO OFDM Technology, up to 1733Mbps physical data rate
- Dual Band 2.4/5GHz 4x4 WiFi 5 (802.11ac Wave 2)
- MiniPCle interface with PCIe 2.0
- Heat sink allows free air operation
- Supports IEEE 802.11d, e, h, i, j, k, r, u, v time stamp, w, and z standards
- Supports Dynamic Frequency Selection (DFS)

Specifications

Chipset	Qualcomm Atheros QCA9984'Cascade' Series
System Memory	256Kbit serial I ² C bus EEPROM
Reference Design	Qualcomm Atheros CAS03
Host Interface	MiniPCle interface with PCIe 2.0
Operating Voltage	3.3V
Power Consumption (Board Only)	9W (Max)
Wireless	2.4GHz 802.11b/g/n/ac, max 20dBm per chain 5GHz 802.11a/n/ac, max 19dBm per chain 4x U.FL Connectors
Frequency Range	2.412~2.472GHz, 5.150~5.825GHz
Modulation Techniques	CCK, OFDM: BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM
Channel Spectrum Widths for WLAN	Supports 20/40MHz at 2.4GHz, Support 20/40/80/80+80MHz at 5GHz
Supported Operating System	CompexWRT or OpenWRT/ LEDE
Certification	FCC & IC Certified, 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 x H x D) in mm	29.9 x 50.8 x 12.9

*Configurations are subject to change without notifications.

WIRELESS 11AC WAVE2 MODULES

RF Performance Table for 2.4GHz

	Data Rate	TX Power (per chain)	TX Power (4 chains)	Tolerance
2.4GHz 802.11b	1Mbps	20dBm	26dBm	±2dB
	2Mbps	20dBm	26dBm	±2dB
	5.5Mbps	20dBm	26dBm	±2dB
	11Mbps	20dBm	26dBm	±2dB
2.4GHz 802.11g	6Mbps	20dBm	26dBm	±2dB
	9Mbps	20dBm	26dBm	±2dB
	12Mbps	20dBm	26dBm	±2dB
	18Mbps	20dBm	26dBm	±2dB
	24Mbps	19dBm	25dBm	±2dB
	36Mbps	18dBm	24dBm	±2dB
	48Mbps	17dBm	23dBm	±2dB
	54Mbps	16dBm	22dBm	±2dB
2.4GHz 802.11n HT20	MCS 0	20dBm	26dBm	±2dB
	MCS 1	20dBm	26dBm	±2dB
	MCS 2	20dBm	26dBm	±2dB
	MCS 3	19dBm	25dBm	±2dB
	MCS 4	18dBm	24dBm	±2dB
	MCS 5	17dBm	23dBm	±2dB
	MCS 6	16dBm	22dBm	±2dB
	MCS 7	15dBm	21dBm	±2dB
2.4GHz 802.11n/ac HT40	MCS 8	14dBm	20dBm	±2dB
	MCS 0	20dBm	26dBm	±2dB
	MCS 1	20dBm	26dBm	±2dB
	MCS 2	20dBm	26dBm	±2dB
	MCS 3	19dBm	25dBm	±2dB
	MCS 4	18dBm	24dBm	±2dB
	MCS 5	17dBm	23dBm	±2dB
	MCS 6	16dBm	22dBm	±2dB
	MCS 7	15dBm	21dBm	±2dB
	MCS 8	14dBm	20dBm	±2dB
MCS 9	13dBm	19dBm	±2dB	

	Data Rate	RX Specifications Sensitivity	Tolerance
2.4GHz 802.11b	1Mbps	-96dBm	±2dB
	2Mbps	-93dBm	±2dB
	5.5Mbps	-90dBm	±2dB
	11Mbps	-86dBm	±2dB
2.4GHz 802.11g	6Mbps	-90dBm	±2dB
	9Mbps	-88dBm	±2dB
	12Mbps	-86dBm	±2dB
	18Mbps	-84dBm	±2dB
	24Mbps	-81dBm	±2dB
	36Mbps	-78dBm	±2dB
	48Mbps	-76dBm	±2dB
	54Mbps	-73dBm	±2dB
2.4GHz 802.11n HT20	MCS 0	-89dBm	±2dB
	MCS 1	-87dBm	±2dB
	MCS 2	-84dBm	±2dB
	MCS 3	-81dBm	±2dB
	MCS 4	-78dBm	±2dB
	MCS 5	-75dBm	±2dB
	MCS 6	-72dBm	±2dB
	MCS 7	-69dBm	±2dB
2.4GHz 802.11n/ac HT40	MCS 8	-66dBm	±2dB
	MCS 0	-87dBm	±2dB
	MCS 1	-85dBm	±2dB
	MCS 2	-82dBm	±2dB
	MCS 3	-79dBm	±2dB
	MCS 4	-76dBm	±2dB
	MCS 5	-74dBm	±2dB
	MCS 6	-71dBm	±2dB
	MCS 7	-68dBm	±2dB
	MCS 8	-65dBm	±2dB
MCS 9	-62dBm	±2dB	

WIRELESS 11AC WAVE2 MODULES

RF Performance Table for 5GHz

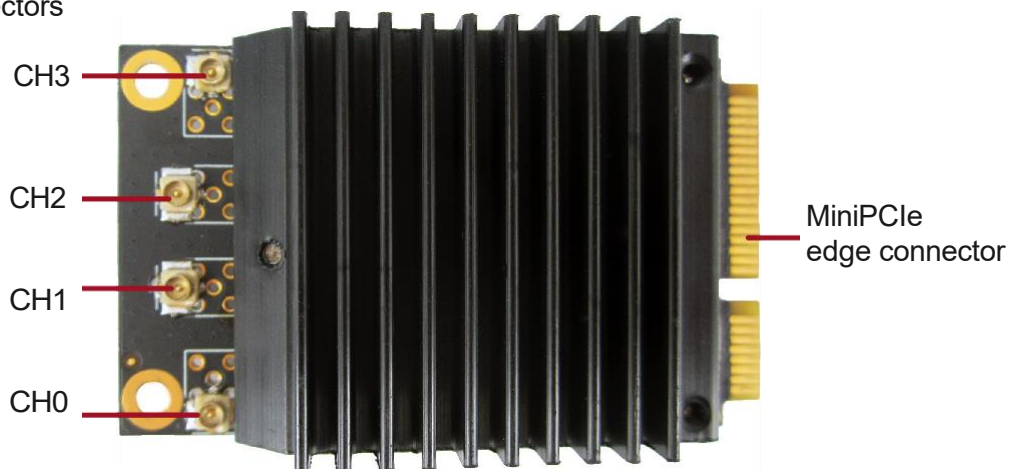
	Data Rate	TX Power (per chain)	TX Power (4 chains)	Tolerance
5GHz 802.11a	6Mbps	19dBm	25dBm	±2dB
	9Mbps	19dBm	25dBm	±2dB
	12Mbps	19dBm	25dBm	±2dB
	18Mbps	19dBm	25dBm	±2dB
	24Mbps	18dBm	24dBm	±2dB
	36Mbps	17dBm	23dBm	±2dB
	48Mbps	16dBm	22dBm	±2dB
	54Mbps	15dBm	21dBm	±2dB
5GHz 802.11n/ac VHT20	MCS 0	19dBm	25dBm	±2dB
	MCS 1	19dBm	25dBm	±2dB
	MCS 2	19dBm	25dBm	±2dB
	MCS 3	18dBm	24dBm	±2dB
	MCS 4	17dBm	23dBm	±2dB
	MCS 5	16dBm	22dBm	±2dB
	MCS 6	15dBm	21dBm	±2dB
	MCS 7	14dBm	20dBm	±2dB
5GHz 802.11n/ac VHT40	MCS 8	13dBm	19dBm	±2dB
	MCS 0	19dBm	25dBm	±2dB
	MCS 1	19dBm	25dBm	±2dB
	MCS 2	19dBm	25dBm	±2dB
	MCS 3	18dBm	24dBm	±2dB
	MCS 4	17dBm	23dBm	±2dB
	MCS 5	16dBm	22dBm	±2dB
	MCS 6	16dBm	22dBm	±2dB
	MCS 7	15dBm	21dBm	±2dB
	MCS 8	13dBm	19dBm	±2dB
5GHz 802.11ac VHT80	MCS 9	12dBm	18dBm	±2dB
	MCS 0	18dBm	24dBm	±2dB
	MCS 1	18dBm	24dBm	±2dB
	MCS 2	18dBm	24dBm	±2dB
	MCS 3	18dBm	24dBm	±2dB
	MCS 4	17dBm	23dBm	±2dB
	MCS 5	16dBm	22dBm	±2dB
	MCS 6	16dBm	22dBm	±2dB
	MCS 7	15dBm	21dBm	±2dB
	MCS 8	13dBm	19dBm	±2dB
5GHz 802.11ac VHT80+80	MCS 9	12dBm	18dBm	±2dB
	MCS 0	18dBm	24dBm	±2dB
	MCS 1	18dBm	24dBm	±2dB
	MCS 2	18dBm	24dBm	±2dB
	MCS 3	18dBm	24dBm	±2dB
	MCS 4	17dBm	23dBm	±2dB
	MCS 5	16dBm	22dBm	±2dB
	MCS 6	16dBm	22dBm	±2dB
	MCS 7	15dBm	21dBm	±2dB
	MCS 8	13dBm	19dBm	±2dB

	Data Rate	RX Specifications Sensitivity	Tolerance
5GHz 802.11a	6Mbps	-91dBm	±2dB
	9Mbps	-89dBm	±2dB
	12Mbps	-87dBm	±2dB
	18Mbps	-85dBm	±2dB
	24Mbps	-83dBm	±2dB
	36Mbps	-80dBm	±2dB
	48Mbps	-77dBm	±2dB
	54Mbps	-74dBm	±2dB
5GHz 802.11n/ac VHT20	MCS 0	-90dBm	±2dB
	MCS 1	-88dBm	±2dB
	MCS 2	-86dBm	±2dB
	MCS 3	-84dBm	±2dB
	MCS 4	-81dBm	±2dB
	MCS 5	-79dBm	±2dB
	MCS 6	-77dBm	±2dB
	MCS 7	-74dBm	±2dB
5GHz 802.11n/ac VHT40	MCS 8	-71dBm	±2dB
	MCS 0	-89dBm	±2dB
	MCS 1	-87dBm	±2dB
	MCS 2	-85dBm	±2dB
	MCS 3	-82dBm	±2dB
	MCS 4	-80dBm	±2dB
	MCS 5	-77dBm	±2dB
	MCS 6	-74dBm	±2dB
	MCS 7	-71dBm	±2dB
	MCS 8	-68dBm	±2dB
5GHz 802.11ac VHT80	MCS 9	-65dBm	±2dB
	MCS 0	-85dBm	±2dB
	MCS 1	-83dBm	±2dB
	MCS 2	-81dBm	±2dB
	MCS 3	-78dBm	±2dB
	MCS 4	-75dBm	±2dB
	MCS 5	-73dBm	±2dB
	MCS 6	-70dBm	±2dB
	MCS 7	-67dBm	±2dB
	MCS 8	-64dBm	±2dB
5GHz 802.11ac VHT80+80	MCS 9	-61dBm	±2dB

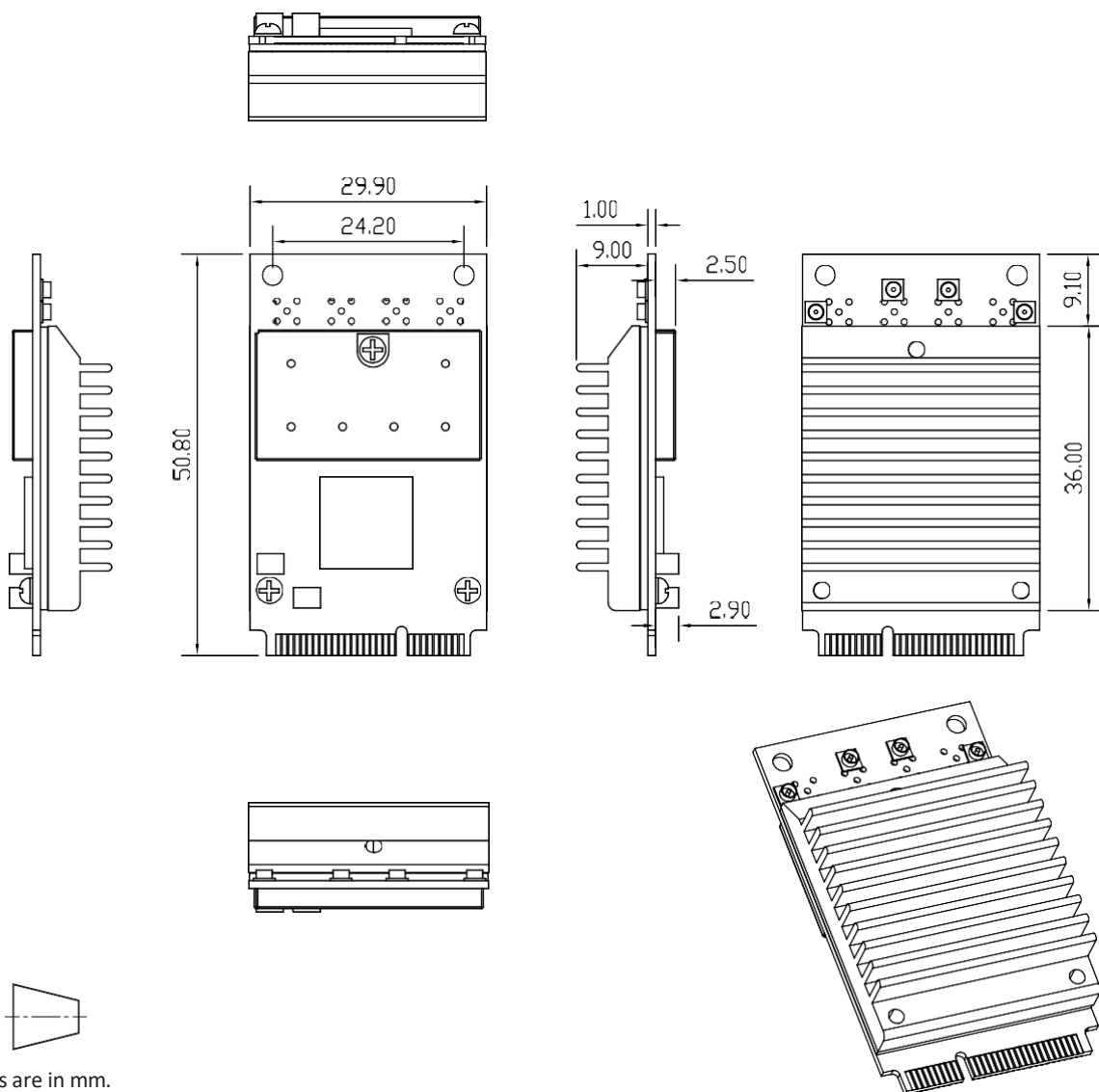
WIRELESS 11AC WAVE2 MODULES

Component Map

U.FL connectors



Mechanical Dimensions



WIRELESS 11AC WAVE2 MODULES

Ordering Configuration

Item Code	Model	Description
WLE1216VX 7A0001.01-2	WLE1216VX	4x4 802.11 a/b/g/n/ac Dual Band Wave 2 miniPCIe Card