

## 4x4 Wave-2 802.11ac/a/n Mini PCIe WiFi Module

Full size form factor with 80+80MHz bandwidth support

Model: **WLE1216V5-20**



### KEY FEATURES

- Qualcomm Atheros 'Cascade' QCA9984
- 5GHz max 20dBm output power (per chain)
- Heat sink allows free air operation
- IEEE 802.11ac compliant & backward compatible with 802.11a/n, up to 1733Mbps data rate
- Multi-user MIMO (MU-MIMO) beamformer
- 4 spatial streams (4SS) at 80MHz
- 2 spatial streams (2SS) at 80+80MHz
- Mini PCI Express 2.0 interface
- 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, j, k, r, u, v time stamp, w, and z standards
- Supports Dynamic Frequency Selection (DFS)
- Designed for High Bandwidth Enterprise Wireless Access Points

## Specifications

Chipset	QCA9984
System Memory	256Kbit serial I <sup>2</sup> C bus EEPROM
Host Interface	Mini PCI Express 2.0 Standard
Operating Voltage	3.3V
Antenna Connector	4x U.FL
Frequency Range	5.180 ~ 5.825 GHz
Certification	FCC and CE Certified
Power Consumption	8.5W (Max)
Supported Operating System	Supported by CompexWRT (v3.x and above) with Qualcomm Atheros reference wireless drivers; on WPJ558, WPJ563, and WPJ564: throughput up to 800Mbps; on WPQ864 and WPQ865: throughput up to 1300Mbps; or OpenWRT/LEDE with ath10k wireless drivers.
Modulation Techniques	OFDM: BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM
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)
ESD Sensitivity	Class 1B
Dimensions (W x H x D)	29.9 x 50.8 x 12.9 mm

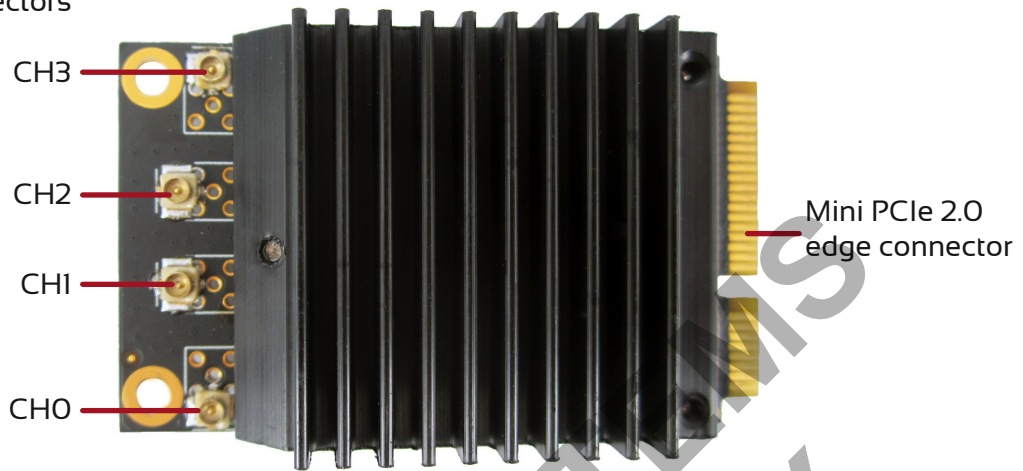
## RF Performance Table

	Data Rate	TX Power (per chain)	TX Power (4 chains)	Tolerance
5GHz 802.11a	6Mbps	21dBm	27dBm	±2dB
	9Mbps	21dBm	27dBm	±2dB
	12Mbps	21dBm	27dBm	±2dB
	18Mbps	21dBm	27dBm	±2dB
	24Mbps	20dBm	26dBm	±2dB
	36Mbps	19dBm	25dBm	±2dB
	48Mbps	18dBm	24dBm	±2dB
	54Mbps	17dBm	23dBm	±2dB
5GHz 802.11n/ac VHT20	MCS 0	21dBm	27dBm	±2dB
	MCS 1	21dBm	27dBm	±2dB
	MCS 2	21dBm	27dBm	±2dB
	MCS 3	20dBm	26dBm	±2dB
	MCS 4	19dBm	25dBm	±2dB
	MCS 5	18dBm	24dBm	±2dB
	MCS 6	17dBm	23dBm	±2dB
	MCS 7	16dBm	22dBm	±2dB
	MCS 8	15dBm	21dBm	±2dB
5GHz 802.11n/ac VHT40	MCS 0	21dBm	27dBm	±2dB
	MCS 1	21dBm	27dBm	±2dB
	MCS 2	21dBm	27dBm	±2dB
	MCS 3	20dBm	26dBm	±2dB
	MCS 4	19dBm	25dBm	±2dB
	MCS 5	18dBm	24dBm	±2dB
	MCS 6	18dBm	24dBm	±2dB
	MCS 7	17dBm	23dBm	±2dB
	MCS 8	16dBm	22dBm	±2dB
	MCS 9	15dBm	21dBm	±2dB
5GHz 802.11ac VHT80	MCS 0	20dBm	26dBm	±2dB
	MCS 1	20dBm	26dBm	±2dB
	MCS 2	20dBm	26dBm	±2dB
	MCS 3	20dBm	26dBm	±2dB
	MCS 4	19dBm	25dBm	±2dB
	MCS 5	18dBm	24dBm	±2dB
	MCS 6	18dBm	24dBm	±2dB
	MCS 7	17dBm	23dBm	±2dB
	MCS 8	16dBm	22dBm	±2dB
	MCS 9	15dBm	21dBm	±2dB
5GHz 802.11ac VHT80+80	MCS 0	20dBm	26dBm	±2dB
	MCS 1	20dBm	26dBm	±2dB
	MCS 2	20dBm	26dBm	±2dB
	MCS 3	20dBm	26dBm	±2dB
	MCS 4	19dBm	25dBm	±2dB
	MCS 5	18dBm	24dBm	±2dB
	MCS 6	18dBm	24dBm	±2dB
	MCS 7	17dBm	23dBm	±2dB
	MCS 8	16dBm	22dBm	±2dB
	MCS 9	15dBm	21dBm	±2dB

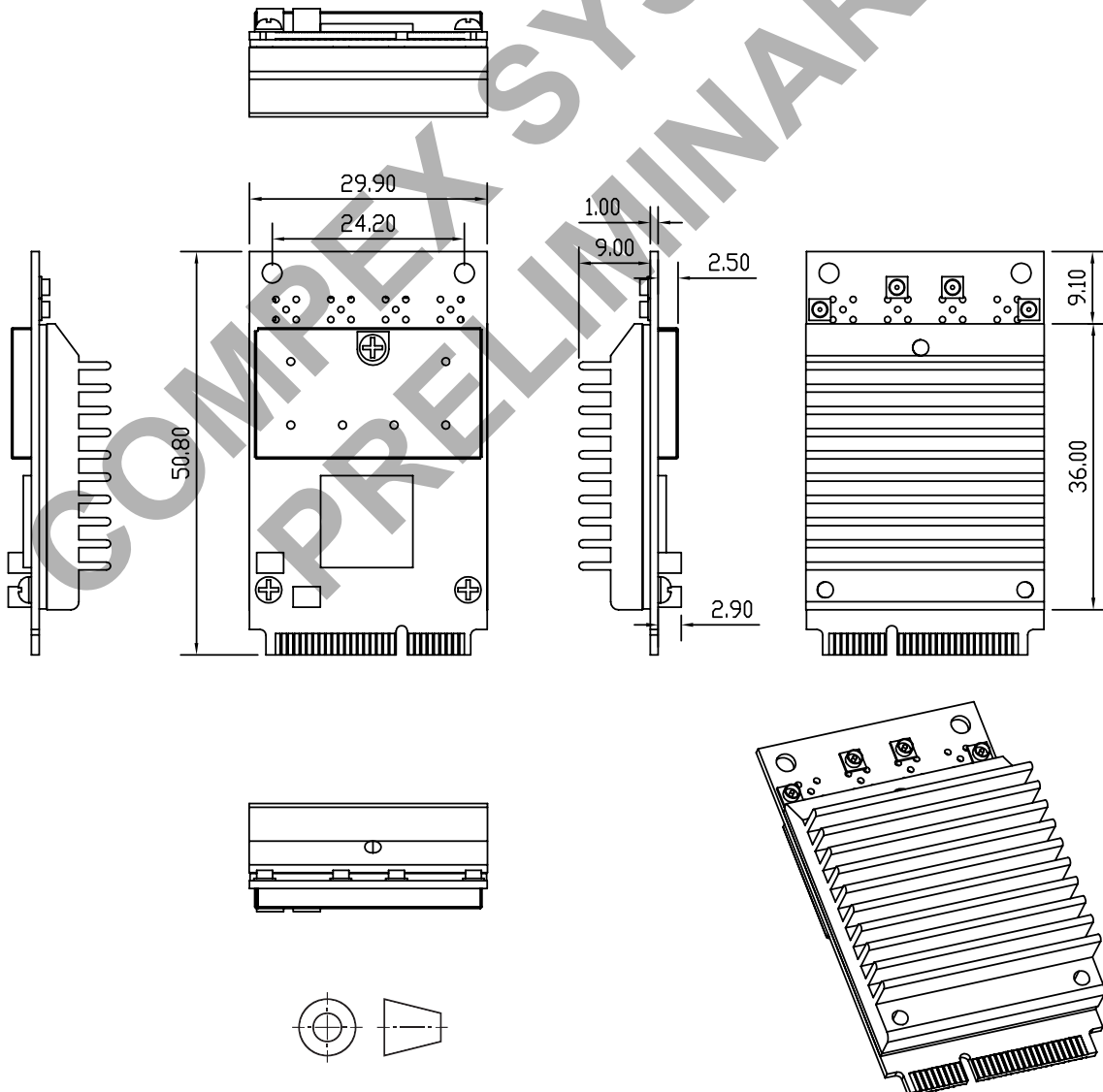
	Data Rate	RX Specifications Sensitivity	Tolerance
5GHz 802.11a	6Mbps	-94dBm	±2dB
	9Mbps	-93dBm	±2dB
	12Mbps	-92dBm	±2dB
	18Mbps	-89dBm	±2dB
	24Mbps	-86dBm	±2dB
	36Mbps	-84dBm	±2dB
	48Mbps	-79dBm	±2dB
	54Mbps	-77dBm	±2dB
5GHz 802.11n/ac VHT20	MCS 0	-94dBm	±2dB
	MCS 1	-91dBm	±2dB
	MCS 2	-90dBm	±2dB
	MCS 3	-86dBm	±2dB
	MCS 4	-83dBm	±2dB
	MCS 5	-80dBm	±2dB
	MCS 6	-77dBm	±2dB
	MCS 7	-75dBm	±2dB
	MCS 8	-71dBm	±2dB
5GHz 802.11n/ac VHT40	MCS 0	-91dBm	±2dB
	MCS 1	-88dBm	±2dB
	MCS 2	-85dBm	±2dB
	MCS 3	-82dBm	±2dB
	MCS 4	-79dBm	±2dB
	MCS 5	-75dBm	±2dB
	MCS 6	-73dBm	±2dB
	MCS 7	-72dBm	±2dB
	MCS 8	-69dBm	±2dB
	MCS 9	-66dBm	±2dB
5GHz 802.11ac VHT80	MCS 0	-88dBm	±2dB
	MCS 1	-85dBm	±2dB
	MCS 2	-83dBm	±2dB
	MCS 3	-79dBm	±2dB
	MCS 4	-76dBm	±2dB
	MCS 5	-71dBm	±2dB
	MCS 6	-69dBm	±2dB
	MCS 7	-69dBm	±2dB
	MCS 8	-65dBm	±2dB
	MCS 9	-62dBm	±2dB
5GHz 802.11ac VHT80+80	MCS 0	TBD	±2dB
	MCS 1	TBD	±2dB
	MCS 2	TBD	±2dB
	MCS 3	TBD	±2dB
	MCS 4	TBD	±2dB
	MCS 5	TBD	±2dB
	MCS 6	TBD	±2dB
	MCS 7	TBD	±2dB
	MCS 8	TBD	±2dB
	MCS 9	TBD	±2dB

## Feature Guide

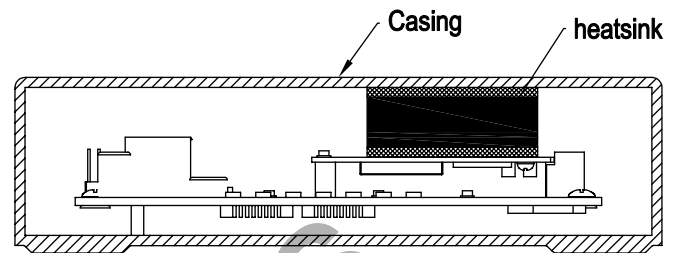
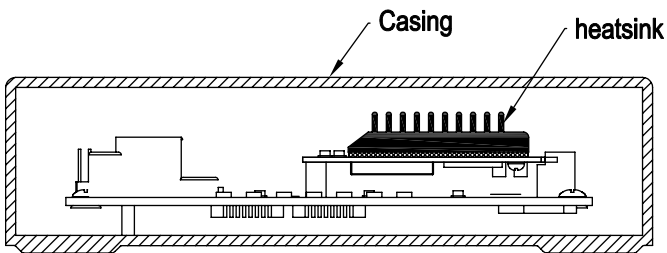
U.FL connectors



## Mechanical Dimensions



## Heatsink Options



## Packaging Content

Item	Quantity
WLE1216V5-20 Wireless Module	1

## Ordering Configuration

Item Code	Chipset	Form Factor	Card Information
WLE1216V5-20 7A00001.01	QCA9984	Standard size card	4x4 802.11 ac/a/n 5GHz Wave 2

## Packaging Information

Packaging Type	Dimensions	Weight	Dimensional Weight
Packing Box (50 units)	385 x 207 x 76 mm	1.514 kg	1.5 kg
Carton Box (5 packing boxes / 250 units)	422 x 410 x 240 mm	8.3 kg	9 kg