5GHz 2x2 MU-MIMO 802.11ac Mini PCIe WiFi Module

Designed for Next Generation 802.11ac Wave 2 Access Points



Model: WLE650V5-18A

KEY FEATURES

- Qualcomm Atheros QCA9888
- IEEE 802.11ac compliant & backward compatible with 802.11a/n
- Heat sink allows free air operation
- 2x2 MIMO Technology, up to 867Mbps
- 2 spatial streams (2SS) at 80MHz bandwidth
- 1 spatial stream (1SS) at 80+80MHz bandwidth
- MiniPCI 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)

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Specifications

Chipset	QCA9888[1]
Host Interface	PCI Express 1.2 Standard
Operating Voltage	DC 3.3V
Antenna Connector	2x U.FL
Frequency Range	5.180 ~ 5.825 GHz
Power Consumption	5.6W (Max)
Supported Operating System	CompexWRT ≥ v3.1.3 or OpenWRT/LEDE kernel ≥ v4.13.0 on WPJ558, WPJ563, WPQ864, and WPQ865
Modulation Techniques	BPSK, QPSK, DBPSK, DQPSK, 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 1C
Dimensions (W x H x D)	29.9 x 50.8 x 10.4 mm

[1] Older prototypes (WLE650V5-18) contain QCA9886.

RF Performance Table

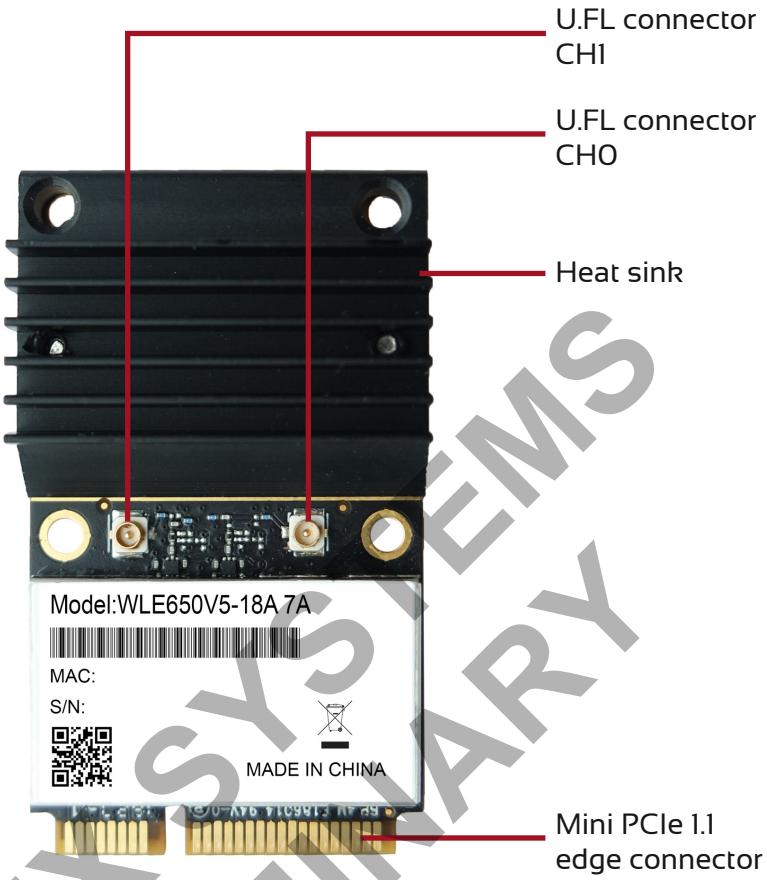
	Data Rate	TX Power (per chain)	TX Power (2 chains)	Tolerance
5GHz 802.11a	6Mbps	18dBm	21dBm	±2dB
	9Mbps	18dBm	21dBm	±2dB
	12Mbps	18dBm	21dBm	±2dB
	18Mbps	18dBm	21dBm	±2dB
	24Mbps	18dBm	21dBm	±2dB
	36Mbps	18dBm	21dBm	±2dB
	48Mbps	17dBm	20dBm	±2dB
	54Mbps	16dBm	19dBm	±2dB
5GHz 802.11n/ac VHT20	MCS 0	18dBm	21dBm	±2dB
	MCS 1	18dBm	21dBm	±2dB
	MCS 2	18dBm	21dBm	±2dB
	MCS 3	18dBm	21dBm	±2dB
	MCS 4	17dBm	20dBm	±2dB
	MCS 5	16dBm	19dBm	±2dB
	MCS 6	16dBm	19dBm	±2dB
	MCS 7	15dBm	18dBm	±2dB
	MCS 8	14dBm	17dBm	±2dB
5GHz 802.11n/ac VHT40	MCS 0	18dBm	21dBm	±2dB
	MCS 1	18dBm	21dBm	±2dB
	MCS 2	18dBm	21dBm	±2dB
	MCS 3	18dBm	21dBm	±2dB
	MCS 4	17dBm	20dBm	±2dB
	MCS 5	16dBm	19dBm	±2dB
	MCS 6	16dBm	19dBm	±2dB
	MCS 7	15dBm	18dBm	±2dB
	MCS 8	14dBm	17dBm	±2dB
	MCS 9	13dBm	16dBm	±2dB
5GHz 802.11ac VHT80	MCS 0	18dBm	21dBm	±2dB
	MCS 1	18dBm	21dBm	±2dB
	MCS 2	18dBm	21dBm	±2dB
	MCS 3	18dBm	21dBm	±2dB
	MCS 4	17dBm	20dBm	±2dB
	MCS 5	16dBm	19dBm	±2dB
	MCS 6	16dBm	19dBm	±2dB
	MCS 7	15dBm	18dBm	±2dB
	MCS 8	14dBm	17dBm	±2dB
	MCS 9	13dBm	16dBm	±2dB
5GHz 802.11ac VHT80+80	MCS 0	15dBm	18dBm	±2dB
	MCS 1	15dBm	18dBm	±2dB
	MCS 2	15dBm	18dBm	±2dB
	MCS 3	15dBm	18dBm	±2dB
	MCS 4	15dBm	18dBm	±2dB
	MCS 5	14dBm	17dBm	±2dB
	MCS 6	13dBm	16dBm	±2dB
	MCS 7	12dBm	15dBm	±2dB
	MCS 8	11dBm	14dBm	±2dB
	MCS 9	11dBm	14dBm	±2dB

	Data Rate	RX Specifications Sensitivity	Tolerance
5GHz 802.11a	6Mbps	-94dBm	±2dB
	9Mbps	-93dBm	±2dB
	12Mbps	-92dBm	±2dB
	18Mbps	-90dBm	±2dB
	24Mbps	-87dBm	±2dB
	36Mbps	-83dBm	±2dB
	48Mbps	-78dBm	±2dB
	54Mbps	-76dBm	±2dB
5GHz 802.11n/ac VHT20	MCS 0	-92dBm	±2dB
	MCS 1	-88dBm	±2dB
	MCS 2	-85dBm	±2dB
	MCS 3	-83dBm	±2dB
	MCS 4	-79dBm	±2dB
	MCS 5	-73dBm	±2dB
	MCS 6	-71dBm	±2dB
	MCS 7	-71dBm	±2dB
	MCS 8	-67dBm	±2dB
5GHz 802.11n/ac VHT40	MCS 0	-87dBm	±2dB
	MCS 1	-84dBm	±2dB
	MCS 2	-81dBm	±2dB
	MCS 3	-79dBm	±2dB
	MCS 4	-75dBm	±2dB
	MCS 5	-71dBm	±2dB
	MCS 6	-70dBm	±2dB
	MCS 7	-68dBm	±2dB
	MCS 8	-64dBm	±2dB
	MCS 9	-62dBm	±2dB
5GHz 802.11ac VHT80	MCS 0	-84dBm	±2dB
	MCS 1	-81dBm	±2dB
	MCS 2	-78dBm	±2dB
	MCS 3	-76dBm	±2dB
	MCS 4	-71dBm	±2dB
	MCS 5	-67dBm	±2dB
	MCS 6	-66dBm	±2dB
	MCS 7	-64dBm	±2dB
	MCS 8	-60dBm	±2dB
	MCS 9	-58dBm	±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

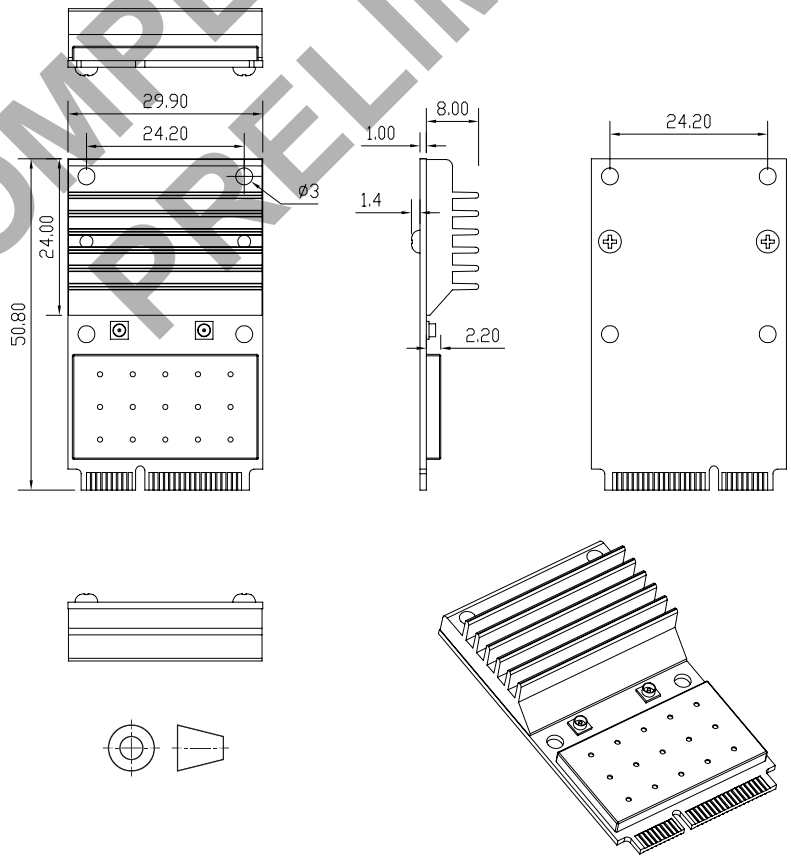
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Connector Map



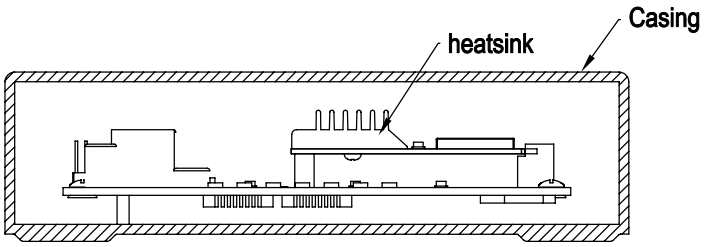
Mechanical Dimensions

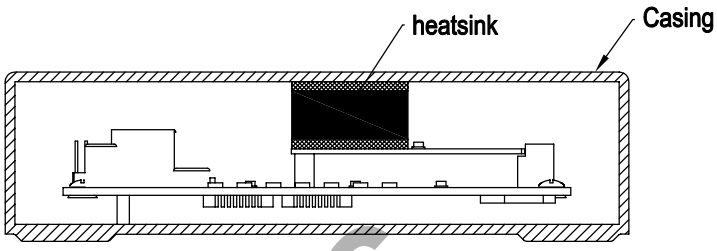


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Heatsink Options





Packaging Content

Item	Quantity
WLE650V5-18A Wireless Module	1

Ordering Configuration

Item Code	Chipset	Form Factor	Card Information
WLE650V5-18A 7A0000	QCA9888	Standard size card	2x2 802.11ac/a/n 5GHz

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Packaging Information

Packaging Type	Dimensions	Weight	Dimensional Weight
Packing Box (50 units)	385 x 207 x 76 mm	1.1 kg	1.5 kg
Carton Box (5 packing boxes / 250 units)	422 x 410 x 240 mm	6.5 kg	9 kg

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