

## Qualcomm's QCA6391 2.4GHz + 5GHz DBS Dual Band Dual Concurrent 802.11ax with Bluetooth Milan Designed for WLAN/BT and Low-Energy Communications

**Model: WLT639**



### KEY FEATURES

- Qualcomm Atheros QCA6391
- 2.4GHz, 2x2 MU-MIMO OFDMA Technology, up to 573.6Mbps physical data rate
- 5GHz, 2x2 MU-MIMO OFDMA Technology, up to 1201Mbps physical data rate
- Dual Band Dual Concurrent 2.4/5GHz 2x2 WiFi 6 (802.11ax)
- M.2 E Key interface with PCIe 2.0
- 2 spatial streams (4SS)
- Enables seamless integration of WLAN/Bluetooth and low energy technology.
- Provides a highly integrated System-on-Chip (SoC) for 802.11ax WiFi, Bluetooth (BT) Milan.
- Supports Bluetooth 5.1 + ANT+ IC and Bluetooth Milan ready and backward compatibility with BT 1.2 and BT 2.X + enhanced data rate.
- Supports BT-WLAN coexistence and 5G/ ISM coexistence

## Specifications

Chipset	Qualcomm Atheros QCA6391 'Hastings' Series
Host Interface	M.2 E Key interface with PCIe 2.0
Bluetooth Host Interface	HCI UART Interface
Operating Voltage	3.3V DC power supply and I/O supply of 1.8V or 3.3V
Power Consumption	TX: 798.12 mA, RX: 196.8 mA
Wireless	2.4GHz 802.11b/g/n/ax, max 16dBm per chain 5GHz 802.11ba/n/ac/ax, max 15dBm per chain 2x MHF4 Connectors Support WiFi/ Bluetooth coexistence
Frequency Range	2.412~2.483GHz, 5.150~5.850GHz, *Subject to local regulations
Modulation Techniques	802.11b: DSSS (DBPSK, DQPSK, CCK) 802.11a/g: OFDM (BPSK, QPSK, 16-QAM, 64-QAM) 802.11n: OFDM (BPSK, QPSK, 16-QAM, 64-QAM) 802.11ac: OFDM (BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM) 802.11ax: OFDMA (DPSK, QPSK, 16-QAM, 64-QAM, 256-QAM, 1024-QAM)
Standards for Bluetooth	Bluetooth 5.1
Channel Spectrum Widths for WLAN	Supports 20/40MHz at 2.4GHz Supports 20/40/80MHz at 5GHz
Data Rates for Bluetooth	2Mbps
Certification	REACH and RoHS Compliance

\*Configurations are subject to change without notifications.

## Specifications

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Driver Support	Linux, Windows 10
Security	64/128-bits WEP, WPA, WPA2, 802.1X
Environmental Temperature	Operating: TBD, Storage: -40°C to 85°C
Environmental Humidity, Non-Condensing	Operating: 5% to 95%, Storage: 5% to 90%
Dimensions (W x H x D) in mm	22 x 30 x 2.8

\*Configurations are subject to change without notifications.

## RF Performance Table for 2.4GHz

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

	Data Rate	RX Specifications Sensitivity	Tolerance
2.4GHz 802.11b	1 Mbps	TBD	±2dB
	2 Mbps	TBD	±2dB
	5.5 Mbps	TBD	±2dB
	11 Mbps	TBD	±2dB
2.4GHz 802.11g	6 Mbps	TBD	±2dB
	9 Mbps	TBD	±2dB
	12 Mbps	TBD	±2dB
	18 Mbps	TBD	±2dB
	24 Mbps	TBD	±2dB
	36 Mbps	TBD	±2dB
	48 Mbps	TBD	±2dB
	54 Mbps	TBD	±2dB
2.4GHz 802.11n HT20	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
2.4GHz 802.11n HT40	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

## RF Performance Table for 2.4GHz

	Data Rate	TX Power (per chain)	TX Power (2 chains)	Tolerance
2.4GHz 802.11ax HE20	MCS 0	15dBm	18dBm	±2dB
	MCS 1	15dBm	18dBm	±2dB
	MCS 2	15dBm	18dBm	±2dB
	MCS 3	15dBm	18dBm	±2dB
	MCS 4	14dBm	17dBm	±2dB
	MCS 5	14dBm	17dBm	±2dB
	MCS 6	14dBm	17dBm	±2dB
	MCS 7	14dBm	17dBm	±2dB
	MCS 8	13dBm	16dBm	±2dB
	MCS 9	13dBm	16dBm	±2dB
	MCS 10	12dBm	15dBm	±2dB
	MCS 11	12dBm	15dBm	±2dB
2.4GHz 802.11ax HE40	MCS 0	15dBm	18dBm	±2dB
	MCS 1	15dBm	18dBm	±2dB
	MCS 2	15dBm	18dBm	±2dB
	MCS 3	15dBm	18dBm	±2dB
	MCS 4	14dBm	17dBm	±2dB
	MCS 5	14dBm	17dBm	±2dB
	MCS 6	14dBm	17dBm	±2dB
	MCS 7	14dBm	17dBm	±2dB
	MCS 8	13dBm	16dBm	±2dB
	MCS 9	13dBm	16dBm	±2dB
	MCS 10	12dBm	15dBm	±2dB
	MCS 11	12dBm	15dBm	±2dB

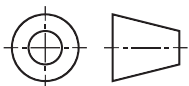
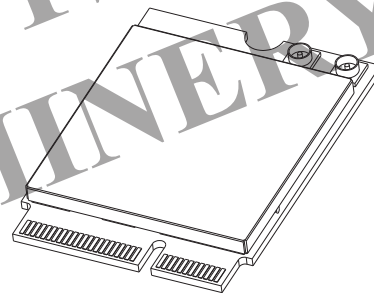
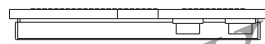
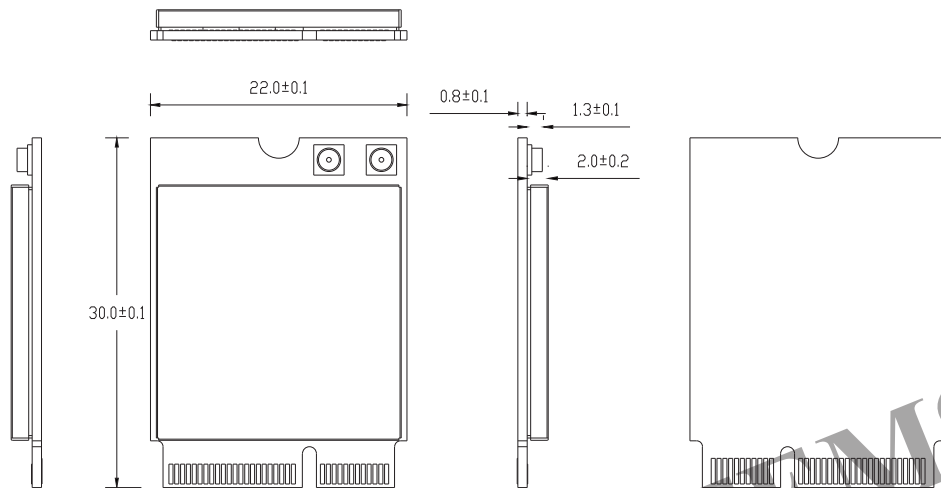
	Data Rate	RX Specifications Sensitivity	Tolerance
2.4GHz 802.11ax HE20	MCS 0	TBD	±2dB
	MCS 1	TBD	±2dB
	MCS 2	TBD	±2dB
	MCS 3	TBD	±2dB
	MCS 4	TBD	±2dB
	MCS 5	TBD	±2dB
	MCS 6	TBD	±2dB
	MCS 7	TBD	±2dB
	MCS 8	TBD	±2dB
	MCS 9	TBD	±2dB
	MCS 10	TBD	±2dB
	MCS 11	TBD	±2dB
2.4GHz 802.11ax HE40	MCS 0	TBD	±2dB
	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
	MCS 10	TBD	±2dB
	MCS 11	TBD	±2dB

	Data Rate	Tx Power (per chain)	Tx Power (2 chains)	Tolerance
5GHz 802.11a	6Mbps	15dBm	18dBm	±2dB
	9Mbps	15dBm	18dBm	±2dB
	12Mbps	15dBm	18dBm	±2dB
	18Mbps	15dBm	18dBm	±2dB
	24Mbps	14dBm	17dBm	±2dB
	36Mbps	14dBm	17dBm	±2dB
	48Mbps	14dBm	17dBm	±2dB
	54Mbps	14dBm	17dBm	±2dB
5GHz 802.11n/ac VHT20	MCS 0	15dBm	18dBm	±2dB
	MCS 1	15dBm	18dBm	±2dB
	MCS 2	15dBm	18dBm	±2dB
	MCS 3	15dBm	18dBm	±2dB
	MCS 4	14dBm	17dBm	±2dB
	MCS 5	14dBm	17dBm	±2dB
	MCS 6	14dBm	17dBm	±2dB
	MCS 7	14dBm	17dBm	±2dB
5GHz 802.11n/ac VHT40	MCS 8	13dBm	16dBm	±2dB
	MCS 0	15dBm	18dBm	±2dB
	MCS 1	15dBm	18dBm	±2dB
	MCS 2	15dBm	18dBm	±2dB
	MCS 3	15dBm	18dBm	±2dB
	MCS 4	14dBm	17dBm	±2dB
	MCS 5	14dBm	17dBm	±2dB
	MCS 6	14dBm	17dBm	±2dB
5GHz 802.11ac HT80	MCS 7	14dBm	17dBm	±2dB
	MCS 8	13dBm	16dBm	±2dB
	MCS 9	13dBm	16dBm	±2dB
	MCS 0	15dBm	18dBm	±2dB
	MCS 1	15dBm	18dBm	±2dB
	MCS 2	15dBm	18dBm	±2dB
	MCS 3	15dBm	18dBm	±2dB
	MCS 4	14dBm	17dBm	±2dB
5GHz 802.11ac HT80	MCS 5	14dBm	17dBm	±2dB
	MCS 6	14dBm	17dBm	±2dB
	MCS 7	14dBm	17dBm	±2dB
	MCS 8	13dBm	16dBm	±2dB
	MCS 9	13dBm	16dBm	±2dB
	Data Rate	RX Specifications Sensitivity		Tolerance
5GHz 802.11a	6Mbps	TBD		±2dB
	9Mbps	TBD		±2dB
	12Mbps	TBD		±2dB
	18Mbps	TBD		±2dB
	24Mbps	TBD		±2dB
	36Mbps	TBD		±2dB
	48Mbps	TBD		±2dB
	54Mbps	TBD		±2dB
5GHz 802.11n/ac VHT20	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
5GHz 802.11n/ac VHT40	MCS 8	TBD		±2dB
	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
5GHz 802.11ac HT80	MCS 7	TBD		±2dB
	MCS 8	TBD		±2dB
	MCS 9	TBD		±2dB
	MCS 0	TBD		±2dB
	MCS 1	TBD		±2dB
	MCS 2	TBD		±2dB
	MCS 3	TBD		±2dB
	MCS 4	TBD		±2dB
5GHz 802.11ac HT80	MCS 5	TBD		±2dB
	MCS 6	TBD		±2dB
	MCS 7	TBD		±2dB
	MCS 8	TBD		±2dB
	MCS 9	TBD		±2dB

## RF Performance Table for 5GHz

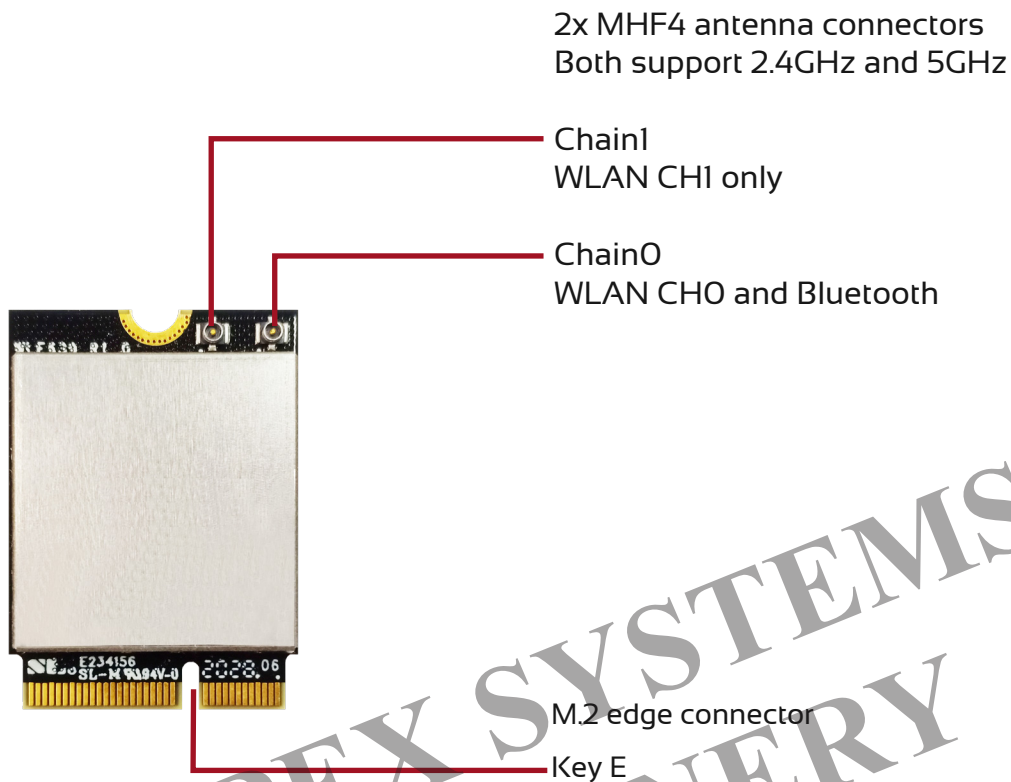
	Data Rate	TX Power (per chain)	TX Power (2 chains)	Tolerance
5GHz 802.11ax HE20	MCS 0	15dBm	18dBm	±2dB
	MCS 1	15dBm	18dBm	±2dB
	MCS 2	15dBm	18dBm	±2dB
	MCS 3	15dBm	18dBm	±2dB
	MCS 4	14dBm	17dBm	±2dB
	MCS 5	14dBm	17dBm	±2dB
	MCS 6	14dBm	17dBm	±2dB
	MCS 7	14dBm	17dBm	±2dB
	MCS 8	13dBm	16dBm	±2dB
	MCS 9	13dBm	16dBm	±2dB
	MCS 10	12dBm	15dBm	±2dB
	MCS 11	12dBm	15dBm	±2dB
5GHz 802.11ax HE40	MCS 0	15dBm	18dBm	±2dB
	MCS 1	15dBm	18dBm	±2dB
	MCS 2	15dBm	18dBm	±2dB
	MCS 3	15dBm	18dBm	±2dB
	MCS 4	14dBm	17dBm	±2dB
	MCS 5	14dBm	17dBm	±2dB
	MCS 6	14dBm	17dBm	±2dB
	MCS 7	14dBm	17dBm	±2dB
	MCS 8	13dBm	16dBm	±2dB
	MCS 9	13dBm	16dBm	±2dB
	MCS 10	12dBm	15dBm	±2dB
	MCS 11	12dBm	15dBm	±2dB
5GHz 802.11ax HE80	MCS 0	15dBm	18dBm	±2dB
	MCS 1	15dBm	18dBm	±2dB
	MCS 2	15dBm	18dBm	±2dB
	MCS 3	15dBm	18dBm	±2dB
	MCS 4	14dBm	17dBm	±2dB
	MCS 5	14dBm	17dBm	±2dB
	MCS 6	14dBm	17dBm	±2dB
	MCS 7	14dBm	17dBm	±2dB
	MCS 8	13dBm	16dBm	±2dB
	MCS 9	13dBm	16dBm	±2dB
	MCS 10	12dBm	15dBm	±2dB
	MCS 11	12dBm	15dBm	±2dB
	Data Rate	RX Specifications Sensitivity		Tolerance
5GHz 802.11ax HE20	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
	MCS 10	TBD		±2dB
	MCS 11	TBD		±2dB
5GHz 802.11ax HE40	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
	MCS 10	TBD		±2dB
	MCS 11	TBD		±2dB
5GHz 802.11ax HE80	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
	MCS 10	TBD		±2dB
	MCS 11	TBD		±2dB

## Mechanical Dimensions



All dimensions are in mm.

## Component Map



## Ordering Configuration

Item Code	Model	Description
WLT639 6A0000 1.0-TE	WLT639	2x2 802.11a/b/g/n/ac/ax support dual band dual concurrent PCIe M.2 module