COMPEX

WiFi 6 (802.11ax) 4x4 MU-MIMO OFDMA 2.4/5GHz Dual Band Selectable Wireless Module

Model: WLE3000HX

KEY FEATURES

- Qualcomm QCN6024/9024 'Pine' series for Commercial grade
- Qualcomm QCN9074 'Pine' series for Industrial grade
- 2.4GHz, 4x4 MU-MIMO OFDMA Technology, up to 1376.4Mbps physical data rate
- 5GHz, 4x4 MU-MIMO OFDMA Technology, up to 4804Mbps physical data rate
- Dual band selectable 2.4/5GHz 4x4 WiFi 6 (802.11ax)
- Supports Dynamic Frequency Selection (DFS)
- Heat sink allows free air operation
- Supports IEEE 802.11d, e, h, i, j, k, r, u, v time stamp, w standard
- Designed for High Bandwidth Enterprise Wireless Access Points

Specifications

Chipset	Qualcomm QCN6024/9024 'Pine' series for Commercial grade Qualcomm QCN9074 'Pine' series for Industrial grade
System Memory	2Mbit serial I²C bus EEPROM
Reference Design	PN02.1
Host Interface	MiniPCIe interface with PCIe 3.0
Operating Voltage	3.3V
Power Consumption	9W (Max)
Wireless	2.4GHz 802.11b/g/n/ax, max 20dBm per chain 5GHz 802.11a/n/ac/ax, max 20dBm per chain 4x U.FL Connectors
Frequency Range	2.4GHz: 2.412~2.472GHz 5GHz (QCN6024/9024): 5.150~5.850GHz 5GHz (QCN9074): 4.920~5.850GHz
Modulation Techniques	OFDMA: BPSK, QPSK, DBPSK, DQPSK,16-QAM, 64-QAM, 256-QAM,1024-QAM
Channel Spectrum Widths for WLAN	Supports 20/40MHz at 2.4GHz Supports 20/40/80/160MHz at 5GHz
Operating Systems	Linux
Certification	FCC, CE & IC Certified, REACH & RoHS Compliance
Environmental Temperature	Operating (Commercial Grade): -20°C to 70°C, Storage: -40°C to 90°C Operating (Industrial Grade): -40°C to 85°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	50.8 X 30 X 12mm

Configurations are subject to change without notifications.

**Can be requested from respective sales executive.*

RF Performance Table at 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	19dBm	25dBm	±2dB
	48Mbps	18dBm	24dBm	±2dB
	54Mbps	18dBm	24dBm	±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	19dBm	25dBm	±2dB
	MCS 5	18dBm	24dBm	±2dB
	MCS 6	17dBm	23dBm	±2dB
	MCS 7	16dBm	22dBm	±2dB
2.4GHz 802.11n HT40	MCS 0	20dBm	26dBm	±2dB
	MCS 1	20dBm	26dBm	±2dB
	MCS 2	20dBm	26dBm	±2dB
	MCS 3	19dBm	25dBm	±2dB
	MCS 4	19dBm	25dBm	±2dB
	MCS 5	18dBm	24dBm	±2dB
	MCS 6	17dBm	23dBm	±2dB
	MCS 7	16dBm	22dBm	±2dB
2.4GHz 802.11ax HE20	MCS 0	20dBm	26dBm	±2dB
	MCS 1	20dBm	26dBm	±2dB
	MCS 2	20dBm	26dBm	±2dB
	MCS 3	19dBm	25dBm	±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
	MCS 9	14dBm	20dBm	±2dB
	MCS 10	13dBm	19dBm	±2dB
	MCS 11	13dBm	19dBm	±2dB

	Data Rate	RX Specifications Sensitivity	Tolerance
2.4GHz 802.11b	1Mbps	-100	±2dB
	2Mbps	-99	±2dB
	5.5Mbps	-96	±2dB
	11Mbps	-94	±2dB
2.4GHz 802.11g	6Mbps	-97	±2dB
	9Mbps	-95	±2dB
	12Mbps	-92	±2dB
	18Mbps	-90	±2dB
	24Mbps	-88	±2dB
	36Mbps	-85	±2dB
	48Mbps	-83	±2dB
	54Mbps	-82	±2dB
2.4GHz 802.11n HT20	MCS 0	-96	±2dB
	MCS 1	-94	±2dB
	MCS 2	-92	±2dB
	MCS 3	-90	±2dB
	MCS 4	-87	±2dB
	MCS 5	-84	±2dB
	MCS 6	-81	±2dB
	MCS 7	-80	±2dB
2.4GHz 802.11n HT40	MCS 0	-93	±2dB
	MCS 1	-92	±2dB
	MCS 2	-90	±2dB
	MCS 3	-87	±2dB
	MCS 4	-85	±2dB
	MCS 5	-82	±2dB
	MCS 6	-80	±2dB
	MCS 7	-77	±2dB
2.4GHz 802.11ax HE20	MCS 0	-96	±2dB
	MCS 1	-94	±2dB
	MCS 2	-92	±2dB
	MCS 3	-89	±2dB
	MCS 4	-86	±2dB
	MCS 5	-83	±2dB
	MCS 6	-81	±2dB
	MCS 7	-79	±2dB
	MCS 8	-75	±2dB
	MCS 9	-73	±2dB
	MCS 10	-69	±2dB
	MCS 11	-66	±2dB

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RF Performance Table at 2.4GHz

Data Rate		TX Power (per chain)	TX Power (4 chains)	Tolerance
2.4GHz 802.11ax HE40	MCS 0	20dBm	26dBm	±2dB
	MCS 1	20dBm	26dBm	±2dB
	MCS 2	20dBm	26dBm	±2dB
	MCS 3	19dBm	25dBm	±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
	MCS 9	14dBm	20dBm	±2dB
	MCS 10	13dBm	19dBm	±2dB
	MCS 11	13dBm	19dBm	±2dB

Data Rate		RX Specifications Sensitivity	Tolerance
2.4GHz 802.11ax HE40	MCS 0	-94	±2dB
	MCS 1	-92	±2dB
	MCS 2	-89	±2dB
	MCS 3	-87	±2dB
	MCS 4	-84	±2dB
	MCS 5	-81	±2dB
	MCS 6	-79	±2dB
	MCS 7	-76	±2dB
	MCS 8	-73	±2dB
	MCS 9	-70	±2dB
	MCS 10	-67	±2dB
	MCS 11	-64	±2dB

RF Performance Table at 5GHz

Data Rate		TX Power (per chain)	TX Power (4 chains)	Tolerance
5GHz 802.11a	6Mbps	20dBm	26dBm	±2dB
	9Mbps	20dBm	26dBm	±2dB
	12Mbps	20dBm	26dBm	±2dB
	18Mbps	20dBm	26dBm	±2dB
	24Mbps	19dBm	25dBm	±2dB
	36Mbps	19dBm	25dBm	±2dB
	48Mbps	18dBm	24dBm	±2dB
	54Mbps	18dBm	24dBm	±2dB
5GHz 802.11n/ac VHT20	MCS 0	20dBm	26dBm	±2dB
	MCS 1	20dBm	26dBm	±2dB
	MCS 2	20dBm	26dBm	±2dB
	MCS 3	19dBm	25dBm	±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	20dBm	26dBm	±2dB
	MCS 1	20dBm	26dBm	±2dB
	MCS 2	20dBm	26dBm	±2dB
	MCS 3	19dBm	25dBm	±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
	MCS 9	14dBm	20dBm	±2dB
5GHz 802.11ac VHT80	MCS 0	20dBm	26dBm	±2dB
	MCS 1	20dBm	26dBm	±2dB
	MCS 2	20dBm	26dBm	±2dB
	MCS 3	19dBm	25dBm	±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
	MCS 9	14dBm	20dBm	±2dB

Data Rate		RX Specifications Sensitivity	Tolerance
5GHz 802.11a	6Mbps	-94	±2dB
	9Mbps	-93	±2dB
	12Mbps	-91	±2dB
	18Mbps	-89	±2dB
	24Mbps	-87	±2dB
	36Mbps	-85	±2dB
	48Mbps	-82	±2dB
	54Mbps	-79	±2dB
5GHz 802.11n/ac VHT20	MCS 0	-94	±2dB
	MCS 1	-93	±2dB
	MCS 2	-91	±2dB
	MCS 3	-88	±2dB
	MCS 4	-86	±2dB
	MCS 5	-83	±2dB
	MCS 6	-81	±2dB
	MCS 7	-79	±2dB
	MCS 8	-76	±2dB
5GHz 802.11n/ac VHT40	MCS 0	-92	±2dB
	MCS 1	-90	±2dB
	MCS 2	-88	±2dB
	MCS 3	-85	±2dB
	MCS 4	-83	±2dB
	MCS 5	-81	±2dB
	MCS 6	-79	±2dB
	MCS 7	-77	±2dB
	MCS 8	-74	±2dB
	MCS 9	-71	±2dB
5GHz 802.11ac VHT80	MCS 0	-90	±2dB
	MCS 1	-88	±2dB
	MCS 2	-85	±2dB
	MCS 3	-82	±2dB
	MCS 4	-80	±2dB
	MCS 5	-77	±2dB
	MCS 6	-75	±2dB
	MCS 7	-72	±2dB
	MCS 8	-69	±2dB
	MCS 9	-67	±2dB

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RF Performance Table at 5GHz

	Data Rate	TX Power (per chain)	TX Power (4 chains)	Tolerance
5GHz 802.11n/ac VHT160	MCS 0	18dBm	23dBm	±2dB
	MCS 1	18dBm	23dBm	±2dB
	MCS 2	18dBm	23dBm	±2dB
	MCS 3	18dBm	23dBm	±2dB
	MCS 4	18dBm	23dBm	±2dB
	MCS 5	16dBm	21dBm	±2dB
	MCS 6	16dBm	21dBm	±2dB
	MCS 7	15dBm	20dBm	±2dB
	MCS 8	13dBm	18dBm	±2dB
	MCS 9	13dBm	18dBm	±2dB
5GHz 802.11ax HE20	MCS 0	20dBm	26dBm	±2dB
	MCS 1	20dBm	26dBm	±2dB
	MCS 2	20dBm	26dBm	±2dB
	MCS 3	19dBm	25dBm	±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
	MCS 9	14dBm	20dBm	±2dB
	MCS 10	13dBm	19dBm	±2dB
	MCS 11	13dBm	19dBm	±2dB
5GHz 802.11ax HE40	MCS 0	20dBm	26dBm	±2dB
	MCS 1	20dBm	26dBm	±2dB
	MCS 2	20dBm	26dBm	±2dB
	MCS 3	19dBm	25dBm	±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
	MCS 9	14dBm	20dBm	±2dB
	MCS 10	13dBm	19dBm	±2dB
	MCS 11	13dBm	19dBm	±2dB
5GHz 802.11ax HE80	MCS 0	20dBm	26dBm	±2dB
	MCS 1	20dBm	26dBm	±2dB
	MCS 2	20dBm	26dBm	±2dB
	MCS 3	19dBm	25dBm	±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
	MCS 9	14dBm	20dBm	±2dB
	MCS 10	13dBm	19dBm	±2dB
	MCS 11	13dBm	19dBm	±2dB

	Data Rate	RX Specifications Sensitivity	Tolerance
5GHz 802.11n/ac VHT160	MCS 0	-86	±2dB
	MCS 1	-84	±2dB
	MCS 2	-82	±2dB
	MCS 3	-80	±2dB
	MCS 4	-75	±2dB
	MCS 5	-74	±2dB
	MCS 6	-73	±2dB
	MCS 7	-70	±2dB
	MCS 8	-67	±2dB
	MCS 9	-64	±2dB
5GHz 802.11ax HE20	MCS 0	-94	±2dB
	MCS 1	-92	±2dB
	MCS 2	-89	±2dB
	MCS 3	-87	±2dB
	MCS 4	-85	±2dB
	MCS 5	-82	±2dB
	MCS 6	-79	±2dB
	MCS 7	-77	±2dB
	MCS 8	-74	±2dB
	MCS 9	-72	±2dB
	MCS 10	-70	±2dB
	MCS 11	-67	±2dB
5GHz 802.11ax HE40	MCS 0	-92	±2dB
	MCS 1	-90	±2dB
	MCS 2	-88	±2dB
	MCS 3	-86	±2dB
	MCS 4	-83	±2dB
	MCS 5	-81	±2dB
	MCS 6	-79	±2dB
	MCS 7	-76	±2dB
	MCS 8	-74	±2dB
	MCS 9	-71	±2dB
	MCS 10	-68	±2dB
	MCS 11	-65	±2dB
5GHz 802.11ax HE80	MCS 0	-88	±2dB
	MCS 1	-86	±2dB
	MCS 2	-84	±2dB
	MCS 3	-82	±2dB
	MCS 4	-79	±2dB
	MCS 5	-77	±2dB
	MCS 6	-74	±2dB
	MCS 7	-72	±2dB
	MCS 8	-69	±2dB
	MCS 9	-67	±2dB
	MCS 10	-64	±2dB
	MCS 11	-61	±2dB

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RF Performance Table at 5GHz

Data Rate		TX Power (per chain)	TX Power (4 chains)	Tolerance
5GHz 802.11ax HE160	MCS 0	20dBm	26dBm	±2dB
	MCS 1	20dBm	26dBm	±2dB
	MCS 2	20dBm	26dBm	±2dB
	MCS 3	19dBm	25dBm	±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
	MCS 9	14dBm	20dBm	±2dB
	MCS 10	13dBm	19dBm	±2dB
	MCS 11	13dBm	19dBm	±2dB

Data Rate		RX Specifications Sensitivity	Tolerance
5GHz 802.11ax HE160	MCS 0	-87	±2dB
	MCS 1	-84	±2dB
	MCS 2	-82	±2dB
	MCS 3	-80	±2dB
	MCS 4	-77	±2dB
	MCS 5	-75	±2dB
	MCS 6	-73	±2dB
	MCS 7	-70	±2dB
	MCS 8	-68	±2dB
	MCS 9	-67	±2dB
	MCS 10	-62	±2dB
	MCS 11	-59	±2dB

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Component Map

U.FL Connector

CH3   CH2   CH1   CH0

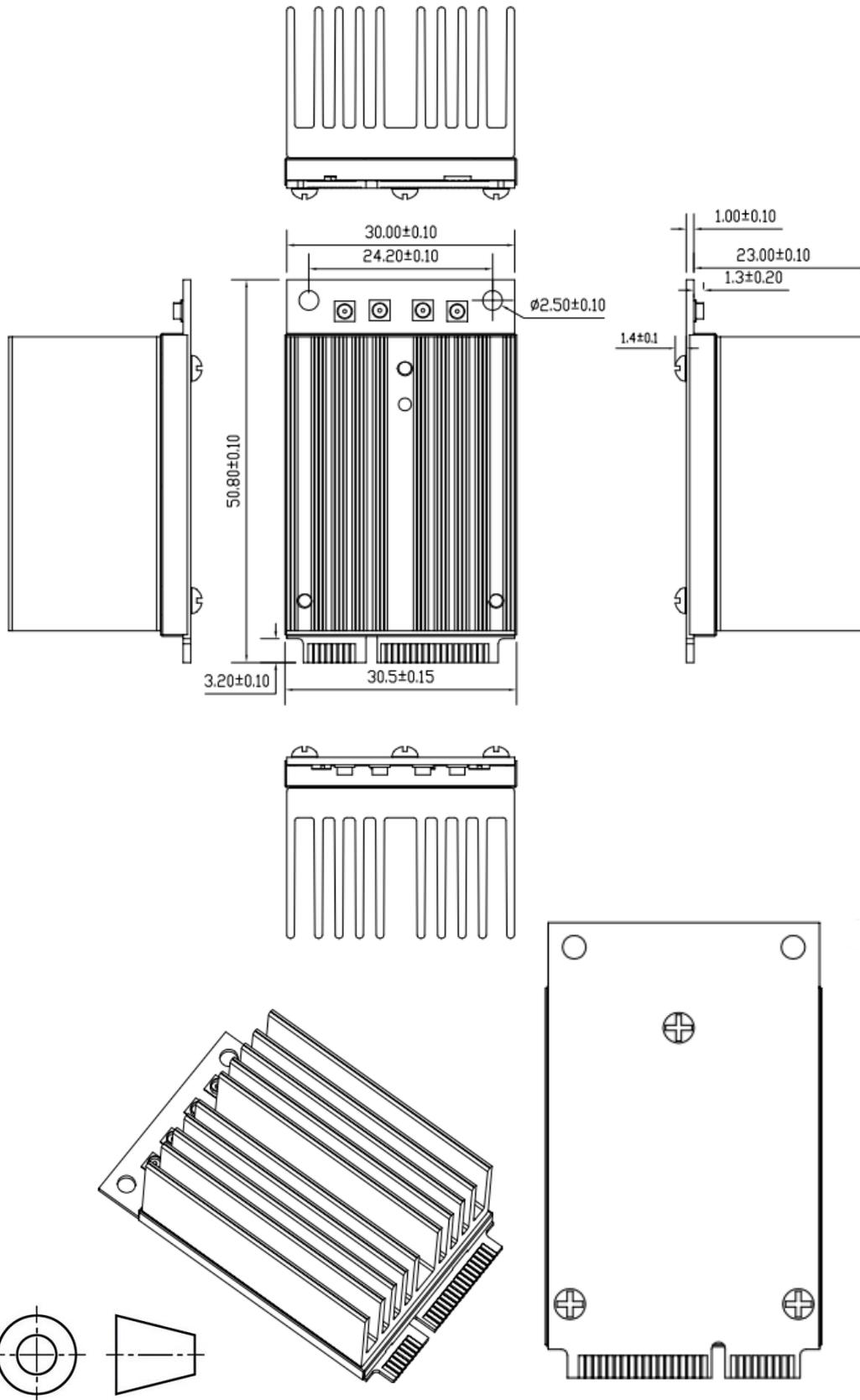MiniPCIe edge connector

Mechanical Dimensions for Commercial Grade
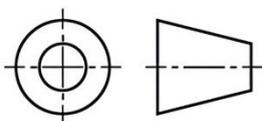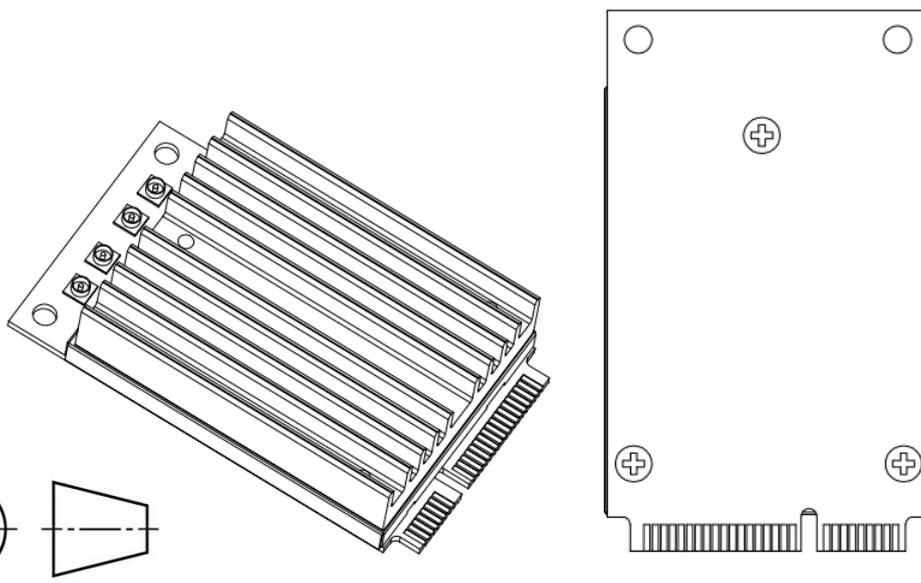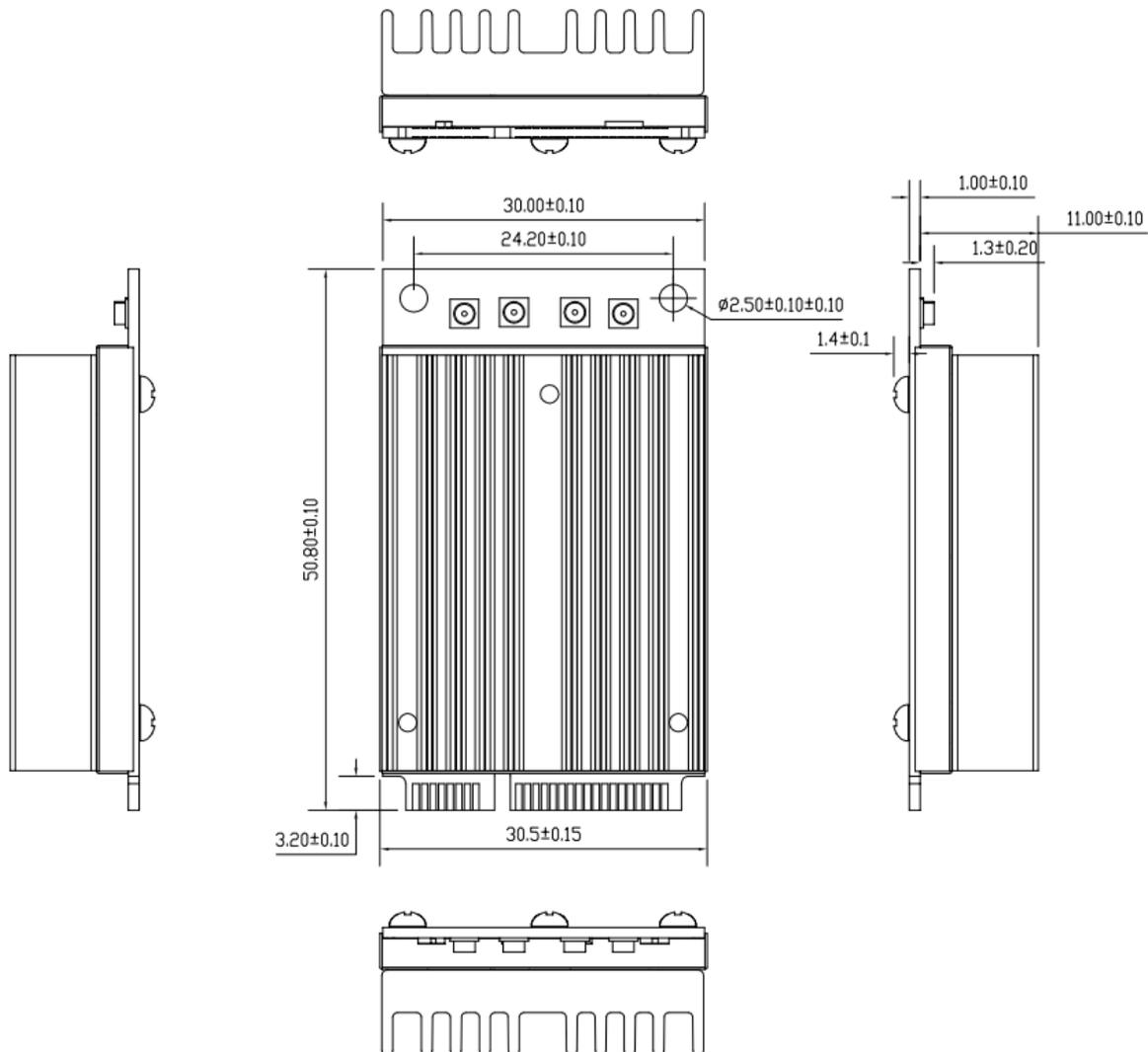
All dimensions are in mm

Mechanical Dimensions for Industrial Grade

All dimensions are in mm

Ordering Configuration

Item Code	Model	Description
WLE3000HX 7A0624S	WLE3000HX	QCN6024 4x4 802.11a/b/g/n/ac/ax support 2.4/5GHz Selectable MiniPCIe interface with PCIe 3.0 Module
WLE3000HX 7A0924S	WLE3000HX	QCN9024 4x4 802.11a/b/g/n/ac/ax support 2.4/5GHz Selectable MiniPCIe interface with PCIe 3.0 Module
WLE3000HX-7B0974S-I	WLE3000HX-I	QCN9074 4x4 802.11a/b/g/n/ac/ax support 2.4/5GHz Selectable MiniPCIe interface with PCIe 3.0 Module

Chipsets Comparisons

		QCN6024	QCN9024	QCN9074
Bands	4.9GHz	-	-	✓
	6GHz	-	✓	✓
	165MHz	-	-	✓
	4k QAM	-	✓	✓
Advanced 11ax Features	#clients	128	256	512
	#OFDMA users	8	16	37
	#MU-MIMO users	4	4	4
	UL/DL OFDMA	✓	✓	✓
	DL OFDMA w/ TxBF	-	✓	✓
	DL MU-MIMO	✓	✓	✓
	UL MU-MIMO (R2)	✓	✓	✓
Management	Spectrum Scan	-	✓	✓
	aDFS/aSA	aDFS	aDFS/aSA	aDFS/aSA
Others	RF Sensing	✓	✓	✓
	FIPS L2	-	-	-

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