

WiFi 7 (802.11BE) 2x2 MU-MIMO 2.4+5GHz Dual Band Dual Concurrent Wireless Module

Model: WLE7002E25D | WLE7002E25DF



KEY FEATURES

- Qualcomm QCN6224/6274 'Waikiki' series for Commercial Grade
- Qualcomm QCN9274-I 'Waikiki' series for Industrial Grade
- 2.4GHz, 2x2 MU-MIMO, up to 688 Mbps physical data rate
- 5GHz, 2x2 MU-MIMO, up to 4324 Mbps physical data rate
- Dual-Band Concurrent 2.4+5GHz WiFi 7 (802.11be)
- MiniPCIe Interface with PCIe 3.0
- Based on WK03.2 reference design
- Supports up to 4096-QAM
- -20°C to 70°C operating temperature for commercial grade
- -40°C to 85°C operating temperature for industrial grade

Specifications

Chipset	Qualcomm QCN6224/6274 'Waikiki' series for Commercial grade Qualcomm QCN9274-I 'Waikiki' series for Industrial grade
System Memory	2Mbit serial I ² C bus EEPROM
Reference Design	WK03.2
Host Interface	MiniPCIe Interface with PCIe 3.0
Operating Voltage	3.3V
Power Consumption	TBD
Wireless	2x2 2.4GHz 802.11b/g/n/ax/be, max 20dBm per chain 2x2 5GHz 802.11a/n/ax/be, max 18dBm per chain 2 x U.FL Connectors
Frequency Range	2.4 GHz: 2.412~2.472GHz 5 GHz: 5.150~5.825GHz
Modulation Techniques	OFDMA: BPSK, QPSK, DBPSK, DQPSK, 16-QAM, 64-QAM, 256-QAM, 1024QAM, 4096QAM
Channel Spectrum Widths for WLAN	Supports 20/40MHz at 2.4GHz Supports 20/40/80/160/240MHz at 5GHz
Operating Systems	Linux
Certification	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	30 X 50.8 X 13 mm

*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 (2 chains)	Tolerance
2.4GHz 802.11be EHT20	MCS 0	20dBm	23dBm	±2dB
	MCS 1	20dBm	23dBm	±2dB
	MCS 2	20dBm	23dBm	±2dB
	MCS 3	20dBm	23dBm	±2dB
	MCS 4	19dBm	22dBm	±2dB
	MCS 5	19dBm	22dBm	±2dB
	MCS 6	19dBm	22dBm	±2dB
	MCS 7	18dBm	21dBm	±2dB
	MCS 8	18dBm	21dBm	±2dB
	MCS 9	17dBm	20dBm	±2dB
	MCS 10	16dBm	19dBm	±2dB
	MCS 11	16dBm	19dBm	±2dB
	MCS 12	15dBm	18dBm	±2dB
	MCS 13	15dBm	18dBm	±2dB
2.4GHz 802.11be EHT40	MCS 0	20dBm	23dBm	±2dB
	MCS 1	20dBm	23dBm	±2dB
	MCS 2	20dBm	23dBm	±2dB
	MCS 3	20dBm	23dBm	±2dB
	MCS 4	19dBm	22dBm	±2dB
	MCS 5	19dBm	22dBm	±2dB
	MCS 6	19dBm	22dBm	±2dB
	MCS 7	18dBm	21dBm	±2dB
	MCS 8	18dBm	21dBm	±2dB
	MCS 9	17dBm	20dBm	±2dB
	MCS 10	16dBm	19dBm	±2dB
	MCS 11	16dBm	19dBm	±2dB
	MCS 12	15dBm	18dBm	±2dB
	MCS 13	15dBm	18dBm	±2dB

	Data Rate	RX Specifications Sensitivity	Tolerance
2.4GHz 802.11be EHT20	MCS 0	-92dBm	±2dB
	MCS 1	-90dBm	±2dB
	MCS 2	-88dBm	±2dB
	MCS 3	-85dBm	±2dB
	MCS 4	-81dBm	±2dB
	MCS 5	-77dBm	±2dB
	MCS 6	-76dBm	±2dB
	MCS 7	-74dBm	±2dB
	MCS 8	-70dBm	±2dB
	MCS 9	-69dBm	±2dB
	MCS 10	-65dBm	±2dB
	MCS 11	-63dBm	±2dB
	MCS 12	-59dBm	±2dB
	MCS 13	-57dBm	±2dB
2.4GHz 802.11be EHT40	MCS 0	-89dBm	±2dB
	MCS 1	-87dBm	±2dB
	MCS 2	-85dBm	±2dB
	MCS 3	-82dBm	±2dB
	MCS 4	-78dBm	±2dB
	MCS 5	-73dBm	±2dB
	MCS 6	-72dBm	±2dB
	MCS 7	-71dBm	±2dB
	MCS 8	-67dBm	±2dB
	MCS 9	-65dBm	±2dB
	MCS 10	-62dBm	±2dB
	MCS 11	-60dBm	±2dB
	MCS 12	-56dBm	±2dB
	MCS 13	-55dBm	±2dB

RF Performance Table at 2.4GHz with LTE Coexistence Filter

	Data Rate	TX Power (per chain)	TX Power (2 chains)	Tolerance		Data Rate	RX Specifications Sensitivity	Tolerance
2.4GHz 802.11be EHT20	MCS 0	20dBm	23dBm	±2dB	2.4GHz 802.11be EHT20	MCS 0	-92dBm	±2dB
	MCS 1	20dBm	23dBm	±2dB		MCS 1	-90dBm	±2dB
	MCS 2	20dBm	23dBm	±2dB		MCS 2	-88dBm	±2dB
	MCS 3	19dBm	22dBm	±2dB		MCS 3	-85dBm	±2dB
	MCS 4	18dBm	21dBm	±2dB		MCS 4	-81dBm	±2dB
	MCS 5	17dBm	20dBm	±2dB		MCS 5	-77dBm	±2dB
	MCS 6	16dBm	19dBm	±2dB		MCS 6	-76dBm	±2dB
	MCS 7	15dBm	18dBm	±2dB		MCS 7	-74dBm	±2dB
	MCS 8	14dBm	17dBm	±2dB		MCS 8	-70dBm	±2dB
	MCS 9	14dBm	17dBm	±2dB		MCS 9	-69dBm	±2dB
	MCS 10	13dBm	16dBm	±2dB		MCS 10	-65dBm	±2dB
	MCS 11	13dBm	16dBm	±2dB		MCS 11	-63dBm	±2dB
	MCS 12	12dBm	15dBm	±2dB		MCS 12	-59dBm	±2dB
	MCS 13	12dBm	15dBm	±2dB		MCS 13	-57dBm	±2dB
2.4GHz 802.11be EHT40	MCS 0	20dBm	23dBm	±2dB	2.4GHz 802.11be EHT40	MCS 0	-89dBm	±2dB
	MCS 1	20dBm	23dBm	±2dB		MCS 1	-87dBm	±2dB
	MCS 2	20dBm	23dBm	±2dB		MCS 2	-85dBm	±2dB
	MCS 3	19dBm	22dBm	±2dB		MCS 3	-82dBm	±2dB
	MCS 4	18dBm	21dBm	±2dB		MCS 4	-78dBm	±2dB
	MCS 5	17dBm	20dBm	±2dB		MCS 5	-73dBm	±2dB
	MCS 6	16dBm	19dBm	±2dB		MCS 6	-72dBm	±2dB
	MCS 7	15dBm	18dBm	±2dB		MCS 7	-71dBm	±2dB
	MCS 8	14dBm	17dBm	±2dB		MCS 8	-67dBm	±2dB
	MCS 9	14dBm	17dBm	±2dB		MCS 9	-65dBm	±2dB
	MCS 10	13dBm	16dBm	±2dB		MCS 10	-62dBm	±2dB
	MCS 11	13dBm	16dBm	±2dB		MCS 11	-60dBm	±2dB
	MCS 12	12dBm	15dBm	±2dB		MCS 12	-56dBm	±2dB
	MCS 13	12dBm	15dBm	±2dB		MCS 13	-55dBm	±2dB

RF Performance Table at 5GHz

	Data Rate	TX Power (per chain)	TX Power (2 chains)	Tolerance		Data Rate	RX Specifications Sensitivity	Tolerance
5GHz 802.11be EHT20	MCS 0	18dBm	21dBm	±2dB	5GHz 802.11be EHT20	MCS 0	-91dBm	±2dB
	MCS 1	18dBm	21dBm	±2dB		MCS 1	-89dBm	±2dB
	MCS 2	18dBm	21dBm	±2dB		MCS 2	-86dBm	±2dB
	MCS 3	17dBm	20dBm	±2dB		MCS 3	-83dBm	±2dB
	MCS 4	17dBm	20dBm	±2dB		MCS 4	-80dBm	±2dB
	MCS 5	16dBm	19dBm	±2dB		MCS 5	-76dBm	±2dB
	MCS 6	16dBm	19dBm	±2dB		MCS 6	-74dBm	±2dB
	MCS 7	15dBm	18dBm	±2dB		MCS 7	-73dBm	±2dB
	MCS 8	15dBm	18dBm	±2dB		MCS 8	-69dBm	±2dB
	MCS 9	14dBm	17dBm	±2dB		MCS 9	-68dBm	±2dB
	MCS 10	14dBm	17dBm	±2dB		MCS 10	-64dBm	±2dB
	MCS 11	14dBm	17dBm	±2dB		MCS 11	-62dBm	±2dB
	MCS 12	13dBm	16dBm	±2dB		MCS 12	-58dBm	±2dB
	MCS 13	13dBm	16dBm	±2dB		MCS 13	-56dBm	±2dB
5GHz 802.11be EHT40	MCS 0	18dBm	21dBm	±2dB	5GHz 802.11be EHT40	MCS 0	-88dBm	±2dB
	MCS 1	18dBm	21dBm	±2dB		MCS 1	-86dBm	±2dB
	MCS 2	17dBm	20dBm	±2dB		MCS 2	-83dBm	±2dB
	MCS 3	16dBm	19dBm	±2dB		MCS 3	-80dBm	±2dB
	MCS 4	16dBm	19dBm	±2dB		MCS 4	-77dBm	±2dB
	MCS 5	15dBm	18dBm	±2dB		MCS 5	-73dBm	±2dB
	MCS 6	15dBm	18dBm	±2dB		MCS 6	-71dBm	±2dB
	MCS 7	14dBm	17dBm	±2dB		MCS 7	-70dBm	±2dB
	MCS 8	14dBm	17dBm	±2dB		MCS 8	-66dBm	±2dB
	MCS 9	14dBm	17dBm	±2dB		MCS 9	-65dBm	±2dB
	MCS 10	13dBm	16dBm	±2dB		MCS 10	-61dBm	±2dB
	MCS 11	13dBm	16dBm	±2dB		MCS 11	-58dBm	±2dB
	MCS 12	13dBm	16dBm	±2dB		MCS 12	-55dBm	±2dB
	MCS 13	13dBm	16dBm	±2dB		MCS 13	-54dBm	±2dB
5GHz 802.11be EHT80	MCS 0	18dBm	21dBm	±2dB	5GHz 802.11be EHT80	MCS 0	-85dBm	±2dB
	MCS 1	18dBm	21dBm	±2dB		MCS 1	-83dBm	±2dB
	MCS 2	17dBm	20dBm	±2dB		MCS 2	-80dBm	±2dB
	MCS 3	16dBm	19dBm	±2dB		MCS 3	-78dBm	±2dB
	MCS 4	16dBm	19dBm	±2dB		MCS 4	-75dBm	±2dB
	MCS 5	15dBm	18dBm	±2dB		MCS 5	-70dBm	±2dB
	MCS 6	14dBm	17dBm	±2dB		MCS 6	-69dBm	±2dB
	MCS 7	14dBm	17dBm	±2dB		MCS 7	-68dBm	±2dB
	MCS 8	14dBm	17dBm	±2dB		MCS 8	-64dBm	±2dB
	MCS 9	13dBm	16dBm	±2dB		MCS 9	-62dBm	±2dB
	MCS 10	13dBm	16dBm	±2dB		MCS 10	-59dBm	±2dB
	MCS 11	13dBm	16dBm	±2dB		MCS 11	-57dBm	±2dB
	MCS 12	12dBm	15dBm	±2dB		MCS 12	-54dBm	±2dB
	MCS 13	12dBm	15dBm	±2dB		MCS 13	-52dBm	±2dB

RF Performance Table at 5GHz

	Data Rate	TX Power (per chain)	TX Power (2 chains)	Tolerance
5GHz 802.11be EHT160	MCS 0	18dBm	21dBm	±2dB
	MCS 1	18dBm	21dBm	±2dB
	MCS 2	17dBm	20dBm	±2dB
	MCS 3	16dBm	19dBm	±2dB
	MCS 4	15dBm	18dBm	±2dB
	MCS 5	15dBm	18dBm	±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
	MCS 12	11dBm	14dBm	±2dB
	MCS 13	11dBm	14dBm	±2dB

	Data Rate	RX Specifications Sensitivity	Tolerance
5GHz 802.11be EHT160	MCS 0	-83dBm	±2dB
	MCS 1	-80dBm	±2dB
	MCS 2	-78dBm	±2dB
	MCS 3	-75dBm	±2dB
	MCS 4	-72dBm	±2dB
	MCS 5	-68dBm	±2dB
	MCS 6	-67dBm	±2dB
	MCS 7	-66dBm	±2dB
	MCS 8	-62dBm	±2dB
	MCS 9	-61dBm	±2dB
	MCS 10	-56dBm	±2dB
	MCS 11	-54dBm	±2dB
	MCS 12	-53dBm	±2dB
	MCS 13	-50dBm	±2dB

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RF Performance Table at 5GHz with BAW Filter

	Data Rate	TX Power (per chain)	TX Power (2 chains)	Tolerance		Data Rate	RX Specifications Sensitivity	Tolerance
5GHz 802.11be EHT20	MCS 0	17dBm	20dBm	±2dB	5GHz 802.11be EHT20	MCS 0	-91dBm	±2dB
	MCS 1	17dBm	20dBm	±2dB		MCS 1	-89dBm	±2dB
	MCS 2	17dBm	20dBm	±2dB		MCS 2	-86dBm	±2dB
	MCS 3	17dBm	20dBm	±2dB		MCS 3	-83dBm	±2dB
	MCS 4	16dBm	19dBm	±2dB		MCS 4	-80dBm	±2dB
	MCS 5	15dBm	18dBm	±2dB		MCS 5	-76dBm	±2dB
	MCS 6	14dBm	17dBm	±2dB		MCS 6	-74dBm	±2dB
	MCS 7	14dBm	17dBm	±2dB		MCS 7	-73dBm	±2dB
	MCS 8	13dBm	16dBm	±2dB		MCS 8	-69dBm	±2dB
	MCS 9	13dBm	16dBm	±2dB		MCS 9	-68dBm	±2dB
	MCS 10	12dBm	15dBm	±2dB		MCS 10	-64dBm	±2dB
	MCS 11	12dBm	15dBm	±2dB		MCS 11	-62dBm	±2dB
	MCS 12	12dBm	15dBm	±2dB		MCS 12	-58dBm	±2dB
	MCS 13	12dBm	15dBm	±2dB		MCS 13	-56dBm	±2dB
5GHz 802.11be EHT40	MCS 0	17dBm	20dBm	±2dB	5GHz 802.11be EHT40	MCS 0	-88dBm	±2dB
	MCS 1	17dBm	20dBm	±2dB		MCS 1	-86dBm	±2dB
	MCS 2	16dBm	19dBm	±2dB		MCS 2	-83dBm	±2dB
	MCS 3	16dBm	19dBm	±2dB		MCS 3	-80dBm	±2dB
	MCS 4	16dBm	19dBm	±2dB		MCS 4	-77dBm	±2dB
	MCS 5	15dBm	18dBm	±2dB		MCS 5	-73dBm	±2dB
	MCS 6	14dBm	17dBm	±2dB		MCS 6	-71dBm	±2dB
	MCS 7	14dBm	17dBm	±2dB		MCS 7	-70dBm	±2dB
	MCS 8	13dBm	16dBm	±2dB		MCS 8	-66dBm	±2dB
	MCS 9	13dBm	16dBm	±2dB		MCS 9	-65dBm	±2dB
	MCS 10	12dBm	15dBm	±2dB		MCS 10	-61dBm	±2dB
	MCS 11	12dBm	15dBm	±2dB		MCS 11	-58dBm	±2dB
	MCS 12	12dBm	15dBm	±2dB		MCS 12	-55dBm	±2dB
	MCS 13	12dBm	15dBm	±2dB		MCS 13	-54dBm	±2dB
5GHz 802.11be EHT80	MCS 0	17dBm	20dBm	±2dB	5GHz 802.11be EHT80	MCS 0	-85dBm	±2dB
	MCS 1	17dBm	20dBm	±2dB		MCS 1	-83dBm	±2dB
	MCS 2	16dBm	19dBm	±2dB		MCS 2	-80dBm	±2dB
	MCS 3	16dBm	19dBm	±2dB		MCS 3	-78dBm	±2dB
	MCS 4	16dBm	19dBm	±2dB		MCS 4	-75dBm	±2dB
	MCS 5	15dBm	18dBm	±2dB		MCS 5	-70dBm	±2dB
	MCS 6	14dBm	17dBm	±2dB		MCS 6	-69dBm	±2dB
	MCS 7	14dBm	17dBm	±2dB		MCS 7	-68dBm	±2dB
	MCS 8	13dBm	16dBm	±2dB		MCS 8	-64dBm	±2dB
	MCS 9	13dBm	16dBm	±2dB		MCS 9	-62dBm	±2dB
	MCS 10	12dBm	15dBm	±2dB		MCS 10	-59dBm	±2dB
	MCS 11	12dBm	15dBm	±2dB		MCS 11	-57dBm	±2dB
	MCS 12	12dBm	15dBm	±2dB		MCS 12	-54dBm	±2dB
	MCS 13	12dBm	15dBm	±2dB		MCS 13	-52dBm	±2dB

RF Performance Table at 5GHz with BAW Filter

	Data Rate	TX Power (per chain)	TX Power (2 chains)	Tolerance		Data Rate	RX Specifications Sensitivity	Tolerance
5GHz 802.11be EHT160	MCS 0	17dBm	20dBm	±2dB	5GHz 802.11be EHT160	MCS 0	-83dBm	±2dB
	MCS 1	17dBm	20dBm	±2dB		MCS 1	-80dBm	±2dB
	MCS 2	16dBm	19dBm	±2dB		MCS 2	-78dBm	±2dB
	MCS 3	16dBm	19dBm	±2dB		MCS 3	-75dBm	±2dB
	MCS 4	16dBm	19dBm	±2dB		MCS 4	-72dBm	±2dB
	MCS 5	15dBm	18dBm	±2dB		MCS 5	-68dBm	±2dB
	MCS 6	14dBm	17dBm	±2dB		MCS 6	-67dBm	±2dB
	MCS 7	14dBm	17dBm	±2dB		MCS 7	-66dBm	±2dB
	MCS 8	13dBm	16dBm	±2dB		MCS 8	-62dBm	±2dB
	MCS 9	13dBm	16dBm	±2dB		MCS 9	-61dBm	±2dB
	MCS 10	12dBm	15dBm	±2dB		MCS 10	-56dBm	±2dB
	MCS 11	12dBm	15dBm	±2dB		MCS 11	-54dBm	±2dB
	MCS 12	11dBm	14dBm	±2dB		MCS 12	-53dBm	±2dB
	MCS 13	11dBm	14dBm	±2dB		MCS 13	-50dBm	±2dB

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Component Map

U.FL Connectors

CH0

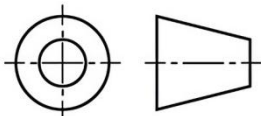
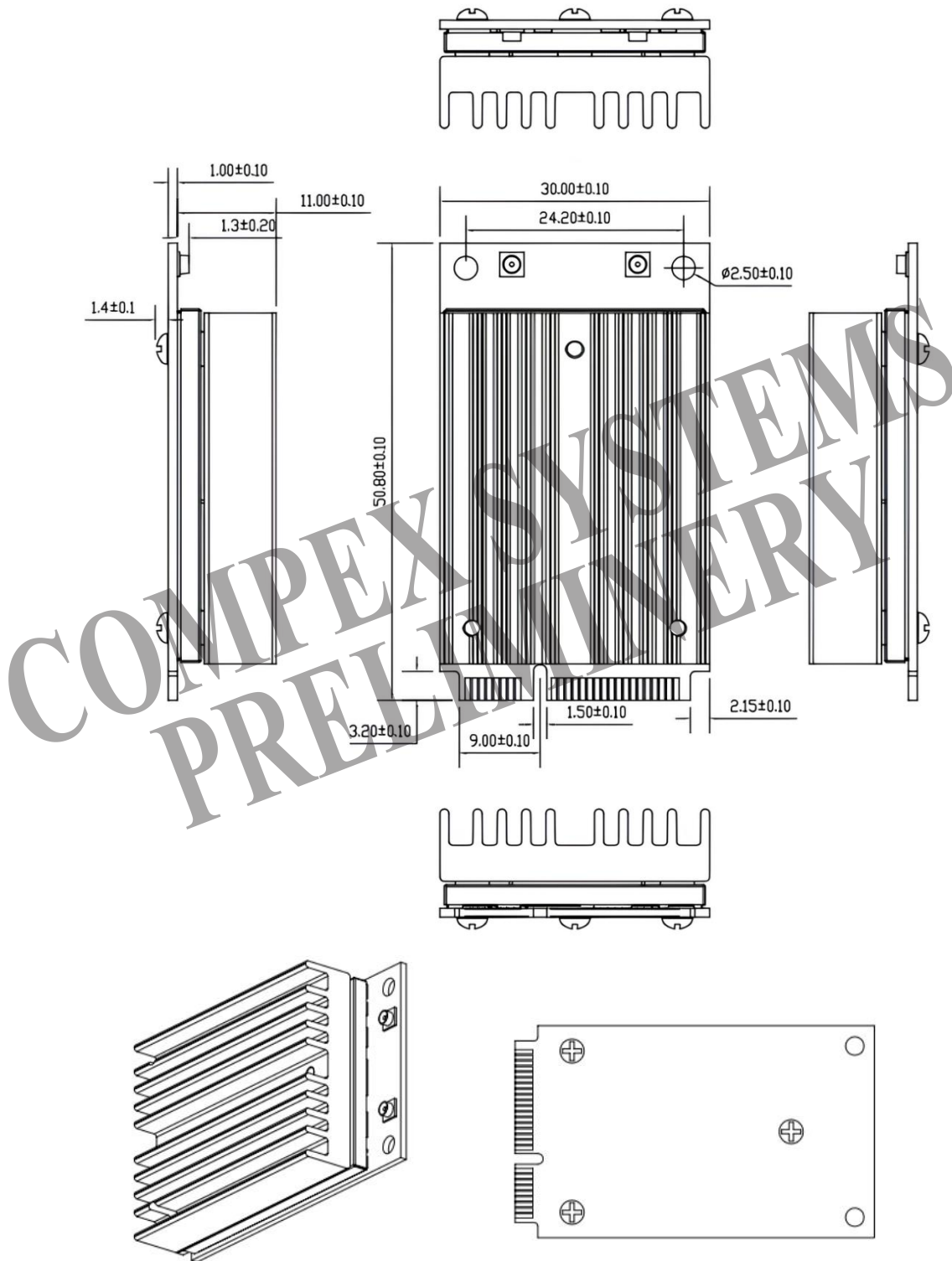
CH1



Mini PCI Express 3.0 Standard

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Mechanical Dimensions



All dimensions are in mm

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Ordering Configuration

Item Code	Model	Description
WLE7002E25D 7A0624XN-TE	WLE7002E25D	QCN6224 2x2 802.11a/b/g/n/ac/ax/be support 2.4+5GHz Dual-Band Concurrent MiniPCIe interface with PCIe 3.0 Module
WLE7002E25D 7B0974XN-I-TE	WLE7002E25D-I	QCN9274-I 2x2 802.11a/b/g/n/ac/ax/be support 2.4+5GHz Dual-Band Concurrent MiniPCIe interface with PCIe 3.0 Module
WLE7002E25D 7A0674XA-TE	WLE7002E25DF	QCN6274 2x2 802.11a/b/g/n/ac/ax/be support 2.4+5GHz Dual-Band Concurrent MiniPCIe interface with PCIe 3.0 Module with LTE Coexistence Filter
WLE7002E25D 7B0974XA-I-TE	WLE7002E25DF-I	QCN9274-I 2x2 802.11a/b/g/n/ac/ax/be support 2.4+5GHz Dual-Band Concurrent MiniPCIe interface with PCIe 3.0 Module with LTE Coexistence Filter

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Chipsets Comparisons

		QCN6224	QCN6274	QCN9274
Band Operation	4 Single Band	✓	✓	✓
	2+2 Dual Band	✓	✓	✓
	2.4GHz	✓	✓	✓
	4.9GHz	-	-	✓
	5GHz	✓	✓	✓
	6GHz	-	✓	✓
	Channel Support	Up to 160MHz at 5GHz	Up to 320MHz at 6GHz	Up to 320MHz at 6GHz
Performance	4K QAM	✓	✓	✓
	#clients	128	256	512
	#OFDMA users	8	16	37
	DL OFDMA + TxBF	-	✓	✓
	DL/UL MU-MIMO	✓	✓	✓
Advanced 11be Features	WFA certified MLO	✓	✓	✓
	Puncture	Static	Static	Static & Dynamic
Others	DPD	✓	✓	✓
	FIPS	-	-	✓
Software Packages	Provisioned Multi Link	✓	✓	✓
	Dense Deployment	✓	✓	✓
	Location & RF Sensing	✓	✓	✓