

APPENDIX J: IEEE 802.11AX RU SAR EXCLUSION

J.1 IEEE 802.11ax RU SAR Exclusion

To make the most efficient use of the additional available subcarriers (data tones), IEEE 802.11ax can utilize Orthogonal Frequency-Division Multiple Access (OFDMA) which divides the existing 802.11 channels into smaller subchannels called Resource Units (RUs). Possible RU sizes are: 26T, 52T, 106T, 242T, 484T, 996T and 996Tx2.

Per FCC Guidance, 802.11ax was considered a higher order 802.11 mode when compared to a/b/g/n/ac to apply KDB Publication 248227 D01v02r02 for OFDM mode selection. Therefore, SAR tests were not required for 802.11ax based on the maximum allowed output powers of OFDM modes and the reported SAR values. Per FCC Guidance, maximum conducted powers were performed for each RU size to demonstrate that the output powers would not be higher than the other OFDM 802.11 modes. Please refer to 1M2303100026-14,16,18 for IEEE 802.11ax RU powers.

J.2 IEEE 802.11ax RU Target Powers

J.2.1 Maximum 802.11ax RU WLAN Output Power – 2.4 GHz WLAN

Tones		SISO Ant 2 (in dBm)	MIMO (in dBm)
		2.4GHz	2.4GHz
26T	Maximum	14.0	17.0
	Nominal	13.0	16.0
52T	Maximum	15.0	18.0
	Nominal	14.0	17.0
106T	Maximum	16.0	19.0
	Nominal	15.0	18.0
242T	Maximum	17.0	20.0
	Nominal	16.0	19.0

J.2.2 Reduced 802.11ax RU WLAN Output Power – 2.4 GHz WLAN

The below table is applicable in the following conditions:

- RCV Active
- RCV Active during simultaneous conditions with 5G FR1/FR2 NR

Tones		SISO Ant 2 (in dBm)	MIMO (in dBm)
		2.4GHz	2.4GHz
26T	Maximum	13.0	16.0
	Nominal	12.0	15.0
52T	Maximum	13.0	16.0
	Nominal	12.0	15.0
106T	Maximum	13.0	16.0
	Nominal	12.0	15.0
242T	Maximum	13.0	16.0
	Nominal	12.0	15.0

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The below table is applicable in the following conditions:

- RCV Active during simultaneous conditions with 5/6 GHz WLAN
- RCV Active during simultaneous conditions with 5G FR1/FR2 NR and 5/6 GHz WLAN

Tones		SISO (ANT2) /in dBm	MIMO (ALL) /in dBm
		2.4GHz	2.4GHz
26T	Maximum	10	13
	Nominal	9	12
52T	Maximum	10	13
	Nominal	9	12
106T	Maximum	10	13
	Nominal	9	12
242T	Maximum	10	13
	Nominal	9	12

J.2.3 Maximum 802.11ax RU WLAN Output Power – 5 GHz WLAN

Tones		MIMO (in dBm)			
		5GHz/20MHz	5GHz/40MHz	5GHz/80MHz	5GHz/160MHz
26T	Maximum	14.0	14.0	14.0	14.0
	Nominal	13.0	13.0	13.0	13.0
52T	Maximum	16.5	16.5	16.5	16.5
	Nominal	15.5	15.5	15.5	15.5
106T	Maximum	19.0	19.0	19.0	19.0
			ch 38: 18.0 ch 62: 17.5 ch 102: 18.0	ch 42: 17.0 ch 58: 17.0 ch 106: 18.5	
	Nominal	18.0	18.0	18.0	18.0
			ch 38: 17.0 ch 62: 16.5 ch 102: 17.0	ch 42: 16.0 ch 58: 16.0 ch 106: 17.5	
242T	Maximum	20.0	20.0	20.0	20.0
			ch 38: 18.0 ch 62: 17.5 ch 102: 18.0	ch 42: 17.0 ch 58: 17.0 ch 106: 18.5	
	Nominal	19.0	19.0	19.0	19.0
			ch 38: 17.0 ch 62: 16.5 ch 102: 17.0	ch 42: 16.0 ch 58: 16.0 ch 106: 17.5	
484T	Maximum		19.0	19.0	19.0
			ch 38: 18.0 ch 62: 17.5 ch 102: 18.0	ch 42: 17.0 ch 58: 17.0 ch 106: 18.5	
	Nominal		18.0	18.0	18.0
			ch 38: 17.0 ch 62: 16.5 ch 102: 17.0	ch 42: 16.0 ch 58: 16.0 ch 106: 17.5	
996T	Maximum			18.0	18.0
	Nominal			17.0	17.0
996Tx2	Maximum				18.0
	Nominal				17.0

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J.2.4 Reduced 802.11ax RU WLAN Output Power – 5 GHz WLAN

The below table is applicable in the following conditions:

- Simultaneous conditions with 2.4 GHz WLAN
- Simultaneous conditions with 5G FR1/FR2 NR
- Simultaneous conditions with 5G FR1/FR2 NR and 2.4 GHz WLAN Active

Tones		MIMO (in dBm)			
		5GHz/20MHz	5GHz/40MHz	5GHz/80MHz	5GHz/160MHz
26T	Maximum	14	14	14	14
	Nominal	13	13	13	13
52T	Maximum	16.5	16.5	16.5	16.5
	Nominal	15.5	15.5	15.5	15.5
106T	Maximum	17	17	17	17
	Nominal	16	16	16	16
242T	Maximum	17	17	17	17
	Nominal	16	16	16	16
484T	Maximum		17	17	17
	Nominal		16	16	16
996T	Maximum			17	17
	Nominal			16	16
996Tx2	Maximum				17
	Nominal				16

The below table is applicable in the following conditions:

- RCV Active
- RCV Active during simultaneous conditions with 5G FR1/FR2 NR

Tones		MIMO (in dBm)			
		5GHz/20MHz	5GHz/40MHz	5GHz/80MHz	5GHz/160MHz
26T	Maximum	13	13	13	13
	Nominal	12	12	12	12
52T	Maximum	13	13	13	13
	Nominal	12	12	12	12
106T	Maximum	13	13	13	13
	Nominal	12	12	12	12
242T	Maximum	13	13	13	13
	Nominal	12	12	12	12
484T	Maximum		13	13	13
	Nominal		12	12	12
996T	Maximum			13	13
	Nominal			12	12
996Tx2	Maximum				13
	Nominal				12

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The below table is applicable in the following conditions:

- RCV Active during simultaneous conditions with 2.4 GHz WLAN
- RCV Active during simultaneous conditions with 5G FR1/FR2 NR and 2.4 GHz WLAN Active

Tones		MIMO (ALL) /in dBm			
		5GHz/20MHz	5GHz/40MHz	5GHz/80MHz	5GHz/160MHz
26T	Maximum	10	10	10	10
	Nominal	9	9	9	9
52T	Maximum	10	10	10	10
	Nominal	9	9	9	9
106T	Maximum	10	10	10	10
	Nominal	9	9	9	9
242T	Maximum	10	10	10	10
	Nominal	9	9	9	9
484T	Maximum		10	10	10
	Nominal		9	9	9
996T	Maximum			10	10
	Nominal			9	9
996Tx2	Maximum				10
	Nominal				9

J.2.5 Maximum 802.11ax RU WLAN Output Power – 6 GHz WLAN

Tones		MIMO (in dBm)						
		6GHz/20MHz LPI	6GHz/40MHz LPI	6GHz/80MHz LPI	6GHz/160MHz LPI	6GHz/20MHz SP	6GHz/40MHz SP	6GHz/80MHz SP
26T	Maximum	4	4	4	4	13	13	13
	Nominal	3	3	3	3	12	12	12
52T	Maximum	4.5	4.5	4.5	4.5	13	13	13
	Nominal	3.5	3.5	3.5	3.5	12	12	12
106T	Maximum	5	5	5	5	13	13	13
	Nominal	4	4	4	4	12	12	12
242T	Maximum	13	13	13	13	13	13	13
	Nominal	12	12	12	12	12	12	12
484T	Maximum		14	14	14		14	14
	Nominal		13	13	13		13	13
996T	Maximum			14	14			14
	Nominal			13	13			13
996Tx2	Maximum				14			14
	Nominal				13			13

J.2.6 Reduced 802.11ax RU WLAN Output Power – 6 GHz WLAN

The below table is applicable in the following conditions:

- RCV Active
- RCV Active during simultaneous conditions with 5G FR1/FR2 NR

Tones		MIMO (in dBm)						
		6GHz/20MHz LPI	6GHz/40MHz LPI	6GHz/80MHz LPI	6GHz/160MHz LPI	6GHz/20MHz SP	6GHz/40MHz SP	6GHz/80MHz SP
26T	Maximum	4	4	4	4	13	13	13
	Nominal	3	3	3	3	12	12	12
52T	Maximum	4.5	4.5	4.5	4.5	13	13	13
	Nominal	3.5	3.5	3.5	3.5	12	12	12
106T	Maximum	5	5	5	5	13	13	13
	Nominal	4	4	4	4	12	12	12
242T	Maximum	13	13	13	13	13	13	13
	Nominal	12	12	12	12	12	12	12
484T	Maximum		13	13	13		13	13
	Nominal		12	12	12		12	12
996T	Maximum			13	13			13
	Nominal			12	12			12
996Tx2	Maximum				13			13
	Nominal				12			12

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The below table is applicable in the following conditions:

- RCV Active during simultaneous conditions with 2.4 GHz WLAN
- RCV Active during simultaneous conditions with 5G FR1/FR2 NR and 2.4 GHz WLAN Active

Tones		MIMO (in dBm)							
		6GHz/20MHz LPI	6GHz/40MHz LPI	6GHz/80MHz LPI	6GHz/160MHz LPI	6GHz/20MHz SP	6GHz/40MHz SP	6GHz/80MHz SP	6GHz/160MHz SP
26T	Maximum	4	4	4	4	10	10	10	10
	Nominal	3	3	3	3	9	9	9	9
52T	Maximum	4.5	4.5	4.5	4.5	10	10	10	10
	Nominal	3.5	3.5	3.5	3.5	9	9	9	9
106T	Maximum	5	5	5	5	10	10	10	10
	Nominal	4	4	4	4	9	9	9	9
242T	Maximum	10	10	10	10	10	10	10	10
	Nominal	9	9	9	9	9	9	9	9
484T	Maximum		10	10	10		10	10	10
	Nominal		9	9	9		9	9	9
996T	Maximum			10	10			10	10
	Nominal			9	9			9	9
996Tx2	Maximum				10				10
	Nominal				9				9

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