APPENDIX G: IEEE 802.11AX RU SAR EXCLUSION

G.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 and 996T.

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.

G.2 IEEE 802.11ax RU Target Powers

a. Maximum 802.11ax RU WLAN Output Power

IEEE 802.11ax RU (in dBm)				
MIMO				
Tones	6GHz 20MHz	6GHz 40MHz	6GHz 80MHz	6GHz 160MHz
	Maximum	Maximum	Maximum	Maximum
26T	2.0	2.0	2.0	2.0
52T	5.0	5.0	5.0	5.0
106T	8.0 Ch. 233: 7	8.0 Ch. 227: 7	8.0 Ch. 215: 7	8.0 Ch. 207: 7
242T	12.0 Ch. 233: 6.5	12.0	12.0	12.0 Ch. 207: 11.5
484T		12.0	12.0	12.0 Ch. 207: 11.5
996T			12.0	12.0 Ch. 207: 11.5

G.3 IEEE 802.11ax Measured Powers

Table G-1
Maximum 6 GHz 802.11ax RU Output Power – MIMO

	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)		
					RU Index: 0		
					ANT1	ANT2	MIMO
20MHz BW	5	5955	1	26T	-1.31	-1.45	1.63
		6175	45	26T	-1.17	-1.14	1.86
		6415	93	26T	-1.01	-1.32	1.85
	6	6435	97	26T	-1.12	-1.51	1.70
		6475	105	26T	-1.36	-1.13	1.77
		6515	113	26T	-1.68	-1.53	1.41
	7	6535	117	26T	-1.01	-1.07	1.97
		6695	149	26T	-1.14	-1.21	1.84
		6875	185	26T	-1.43	-1.27	1.66
	8	6895	189	26T	-1.04	-1.25	1.87
		6995	209	26T	-1.15	-1.06	1.91
		7115	233	26T	-1.05	-1.98	1.52
	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)		
					RU Index: 0		
					ANT1	ANT2	MIMO
20MHz BW	5	5955	1	52T	1.44	0.70	4.10
		6175	45	52T	1.95	1.12	4.57
		6415	93	52T	1.64	1.45	4.56
	6	6435	97	52T	1.94	1.77	4.87
		6475	105	52T	1.06	1.64	4.37
		6515	113	52T	1.37	1.01	4.20
	7	6535	117	52T	1.68	1.32	4.51
		6695	149	52T	1.35	1.70	4.54
		6875	185	52T	0.98	1.75	4.39
	8	6895	189	52T	1.50	1.97	4.75
		6995	209	52T	1.16	1.91	4.56
		7115	233	52T	1.65	1.31	4.49
	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)		
					RU Index: 53		
					ANT1	ANT2	MIMO
20MHz BW	5	5955	1	106T	4.65	4.09	7.39
		6175	45	106T	4.68	4.15	7.43
		6415	93	106T	4.75	4.87	7.82
	6	6435	97	106T	4.50	4.75	7.64
		6475	105	106T	3.70	4.61	7.19
		6515	113	106T	4.86	4.83	7.86
	7	6535	117	106T	4.67	4.74	7.72
		6695	149	106T	4.41	4.98	7.71
		6875	185	106T	4.05	4.99	7.56
	8	6895	189	106T	3.93	4.64	7.31
		6995	209	106T	4.12	4.71	7.44
		7115	233	106T	3.99	3.44	6.73
	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)		
					RU Index: 61		
					ANT1	ANT2	MIMO
20MHz BW	5	5955	1	242T	8.92	8.05	11.52
		6175	45	242T	8.63	8.41	11.53
		6415	93	242T	8.53	8.81	11.68
	6	6435	97	242T	8.29	8.75	11.54
		6475	105	242T	8.33	8.99	11.68
		6515	113	242T	8.84	8.89	11.88
	7	6535	117	242T	8.61	8.81	11.72
		6695	149	242T	8.56	8.99	11.79
		6875	185	242T	8.11	8.51	11.32
	8	6895	189	242T	8.71	8.99	11.86
		6995	209	242T	8.47	8.81	11.65
		7115	233	242T	3.38	2.91	6.16

40MHz BW	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm) RU Index: 0		
					ANT1	ANT2	MIMO
	5	5965	3	26T	-1.33	-1.60	1.55
		6165	43	26T	-1.01	-1.76	1.64
		6405	91	26T	-1.25	-1.87	1.46
	6	6445	99	26T	-1.19	-1.85	1.50
		6485	107	26T	-1.35	-1.54	1.57
		6525	115	26T	-1.02	-1.54	1.74
	7	6565	123	26T	-1.32	-1.36	1.67
		6725	155	26T	-1.28	-2.02	1.38
		6845	179	26T	-1.36	-1.91	1.38
	8	6885	187	26T	-1.31	-1.25	1.73
		7005	211	26T	-1.41	-1.12	1.75
		7085	227	26T	-1.08	-1.35	1.80

40MHz BW	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm) RU Index: 37		
					ANT1	ANT2	MIMO
	5	5965	3	52T	1.94	1.29	4.64
		6165	43	52T	1.80	1.11	4.48
		6405	91	52T	1.81	1.50	4.67
	6	6445	99	52T	1.95	1.97	4.97
		6485	107	52T	1.11	1.67	4.41
		6525	115	52T	1.92	1.46	4.71
	7	6565	123	52T	1.47	1.67	4.58
		6725	155	52T	1.78	1.80	4.80
		6845	179	52T	0.91	1.94	4.47
	8	6885	187	52T	1.16	1.67	4.43
		7005	211	52T	1.21	1.99	4.63
		7085	227	52T	1.99	1.45	4.74

40MHz BW	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm) RU Index: 53		
					ANT1	ANT2	MIMO
	5	5965	3	106T	4.54	4.11	7.34
		6165	43	106T	4.91	4.62	7.78
		6405	91	106T	4.85	4.91	7.89
	6	6445	99	106T	4.38	4.95	7.68
		6485	107	106T	4.09	4.99	7.57
		6525	115	106T	4.73	4.87	7.81
	7	6565	123	106T	4.23	4.99	7.64
		6725	155	106T	4.62	4.98	7.81
		6845	179	106T	3.24	4.66	7.02
	8	6885	187	106T	3.83	3.83	6.84
		7005	211	106T	4.01	4.01	7.02
		7085	227	106T	3.76	3.28	6.54

40MHz BW	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm) RU Index: 61		
					ANT1	ANT2	MIMO
	5	5965	3	242T	8.77	8.10	11.46
		6165	43	242T	8.87	8.06	11.49
		6405	91	242T	8.63	8.90	11.78
	6	6445	99	242T	8.50	8.91	11.72
		6485	107	242T	8.23	8.99	11.64
		6525	115	242T	8.73	8.97	11.86
	7	6565	123	242T	8.32	8.99	11.68
		6725	155	242T	8.13	8.69	11.43
		6845	179	242T	7.81	8.70	11.29
	8	6885	187	242T	8.06	8.87	11.49
		7005	211	242T	8.29	8.93	11.63
		7085	227	242T	8.99	8.41	11.72

40MHz BW	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm) RU Index: 65		
					ANT1	ANT2	MIMO
	5	5965	3	484T	8.93	8.22	11.60
		6165	43	484T	8.99	8.23	11.64
		6405	91	484T	8.55	8.92	11.75
	6	6445	99	484T	8.44	8.99	11.73
		6485	107	484T	8.21	8.99	11.63
		6525	115	484T	8.63	8.97	11.81
	7	6565	123	484T	8.30	8.99	11.67
		6725	155	484T	8.07	8.58	11.34
		6845	179	484T	7.73	8.66	11.23
	8	6885	187	484T	8.05	8.77	11.44
		7005	211	484T	8.27	8.78	11.54
		7085	227	484T	8.87	8.36	11.63

80MHz BW	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)		
					RU Index: 0		
					ANT1	ANT2	MIMO
	5	5985	7	26T	-1.19	-1.60	1.62
		6145	39	26T	-1.10	-2.24	1.38
		6385	87	26T	-1.15	-1.78	1.56
	6	6465	103	26T	-1.20	-1.37	1.73
	7	6545	119	26T	-1.33	-2.03	1.34
		6705	151	26T	-1.49	-1.25	1.64
		6865	183	26T	-1.38	-1.62	1.51
	8	6945	199	26T	-1.05	-1.36	1.81
		7025	215	26T	-1.18	-1.43	1.71

80MHz BW	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)		
					RU Index: 37		
					ANT1	ANT2	MIMO
	5	5985	7	52T	1.70	0.51	4.16
		6145	39	52T	1.76	0.62	4.24
		6385	87	52T	1.99	1.58	4.80
	6	6465	103	52T	1.52	1.63	4.59
	7	6545	119	52T	1.98	1.97	4.99
		6705	151	52T	1.51	1.58	4.56
		6865	183	52T	1.16	1.78	4.49
	8	6945	199	52T	1.69	1.78	4.75
		7025	215	52T	1.22	1.64	4.45

80MHz BW	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)		
					RU Index: 53		
					ANT1	ANT2	MIMO
	5	5985	7	106T	4.68	3.54	7.16
		6145	39	106T	4.82	4.24	7.55
		6385	87	106T	4.87	4.96	7.93
	6	6465	103	106T	4.43	4.96	7.71
	7	6545	119	106T	4.37	4.72	7.56
		6705	151	106T	4.40	4.81	7.62
		6865	183	106T	4.09	4.93	7.54
	8	6945	199	106T	4.64	4.70	7.68
		7025	215	106T	3.03	3.69	6.38

80MHz BW	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)		
					RU Index: 61		
					ANT1	ANT2	MIMO
	5	5985	7	242T	8.84	8.09	11.49
		6145	39	242T	8.69	7.81	11.28
		6385	87	242T	8.32	8.75	11.55
	6	6465	103	242T	8.04	8.53	11.30
	7	6545	119	242T	8.46	8.98	11.74
		6705	151	242T	8.01	8.81	11.44
		6865	183	242T	8.23	8.48	11.37
	8	6945	199	242T	8.61	8.70	11.67
		7025	215	242T	8.26	8.61	11.45

80MHz BW	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)		
					RU Index: 65		
					ANT1	ANT2	MIMO
	5	5985	7	484T	8.99	8.13	11.59
		6145	39	484T	8.85	7.86	11.39
		6385	87	484T	8.35	8.75	11.56
	6	6465	103	484T	8.00	8.62	11.33
	7	6545	119	484T	8.35	8.92	11.65
		6705	151	484T	8.03	8.63	11.35
		6865	183	484T	8.70	8.99	11.86
	8	6945	199	484T	8.55	8.57	11.57
		7025	215	484T	8.68	8.99	11.85

80MHz BW	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)		
					RU Index: 67		
					ANT1	ANT2	MIMO
	5	5985	7	996T	8.70	7.72	11.25
		6145	39	996T	8.99	8.03	11.55
		6385	87	996T	8.76	8.99	11.89
	6	6465	103	996T	8.38	8.99	11.71
	7	6545	119	996T	8.10	8.73	11.44
		6705	151	996T	8.38	8.77	11.59
		6865	183	996T	8.53	8.84	11.70
	8	6945	199	996T	8.98	8.91	11.96
		7025	215	996T	8.57	8.72	11.66

160MHz BW	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)		
					RU Index: 0 (L)		
					ANT1	ANT2	MIMO
	5	6025	15	26T	-2.31	-2.42	0.65
		6185	47	26T	-1.01	-2.02	1.52
		6345	79	26T	-1.26	-2.74	1.07
	6	6505	111	26T	-1.03	-1.38	1.81
	7	6665	143	26T	-2.28	-1.39	1.20
		6825	175	26T	-1.02	-1.67	1.68
	8	6985	207	26T	-1.13	-1.76	1.58

160MHz BW	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)		
					RU Index: 37 (L)		
					ANT1	ANT2	MIMO
	5	6025	15	52T	1.64	1.11	4.39
		6185	47	52T	1.82	0.81	4.35
		6345	79	52T	1.89	0.95	4.46
	6	6505	111	52T	1.92	1.18	4.58
	7	6665	143	52T	1.07	1.86	4.49
		6825	175	52T	1.62	1.14	4.40
	8	6985	207	52T	1.64	1.34	4.50

160MHz BW	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)		
					RU Index: 53 (L)		
					ANT1	ANT2	MIMO
	5	6025	15	106T	4.46	4.35	7.42
		6185	47	106T	4.74	4.02	7.41
		6345	79	106T	4.89	4.01	7.48
	6	6505	111	106T	4.59	4.30	7.46
	7	6665	143	106T	3.94	4.92	7.47
		6825	175	106T	4.55	4.13	7.36
	8	6985	207	106T	3.61	3.11	6.38

160MHz BW	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)		
					RU Index: 61(L)		
					ANT1	ANT2	MIMO
	5	6025	15	242T	8.75	8.89	11.83
		6185	47	242T	8.82	7.53	11.23
		6345	79	242T	8.54	7.91	11.25
	6	6505	111	242T	8.80	8.58	11.70
	7	6665	143	242T	7.83	8.84	11.37
		6825	175	242T	8.68	8.43	11.57
	8	6985	207	242T	8.35	8.45	11.41

160MHz BW	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)		
					RU Index: 65 (L)		
					ANT1	ANT2	MIMO
	5	6025	15	484T	8.91	8.96	11.95
		6185	47	484T	8.88	7.60	11.30
		6345	79	484T	8.61	7.99	11.32
	6	6505	111	484T	8.70	8.63	11.68
	7	6665	143	484T	7.75	8.76	11.29
		6825	175	484T	8.64	8.23	11.45
	8	6985	207	484T	8.30	8.37	11.35

160MHz BW	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)		
					RU Index: 67(L)		
					ANT1	ANT2	MIMO
	5	6025	15	996T	8.98	8.37	11.70
		6185	47	996T	8.63	7.27	11.01
		6345	79	996T	8.60	8.14	11.39
	6	6505	111	996T	8.57	8.57	11.58
	7	6665	143	996T	7.54	8.54	11.08
		6825	175	996T	8.50	7.87	11.21
	8	6985	207	996T	8.49	8.30	11.41

160MHz BW	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)		
					RU Index: 68		
					ANT1	ANT2	MIMO
	5	6025	15	996T X 2	8.79	8.36	11.59
		6185	47	996T X 2	8.86	8.12	11.52
		6345	79	996T X 2	8.95	8.55	11.76
	6	6505	111	996T X 2	8.60	8.49	11.56
	7	6665	143	996T X 2	8.32	8.98	11.67
		6825	175	996T X 2	8.55	7.56	11.09
	8	6985	207	996T X 2	8.18	8.21	11.21