

APPENDIX H: IEEE 802.11AX RU SAR EXCLUSION

1.1 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.

1.2 IEEE 802.11ax RU Target Powers

1.2.1 Maximum 802.11ax RU WLAN Output Power

Tones		SISO (Chain 0/Chain 1) /in dBm				MIMO (Chain 0/Chain 1) /in dBm			
		2.4GHz	5GHz/20MHz	5GHz/40MHz	5GHz/80MHz	2.4GHz	5GHz/20MHz	5GHz/40MHz	5GHz/80MHz
26T	Maximum	9.1	9	9	9	9.1	9	9	9
	Nominal	8.1	8	8	8	8.1	8	8	8
52T	Maximum	9.1	9	9	9	9.1	9	9	9
	Nominal	8.1	8	8	8	8.1	8	8	8
106T	Maximum	9.1	9	9	9	9.1	9	9	9
	Nominal	8.1	8	8	8	8.1	8	8	8
242T	Maximum	9.1	9	9	9	9.1	9	9	9
	Nominal	8.1	8	8	8	8.1	8	8	8
484T	Maximum			9	9			9	9
	Nominal			8	8			8	8
996T	Maximum				9				9
	Nominal				8				8

Note: In MIMO operations, each Chain 0 and Chain 1 transmits at maximum allowed powers as indicated above.

FCC ID: PY7-57441Y	 PCTEST Proud to be part of  element	SAR EVALUATION REPORT	SONY	Reviewed by: Quality Manager
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1.3 IEEE 802.11ax Measured Powers

Freq [MHz]	Channel	Tones	RU Index	Avg Conducted Powers (dBm)	Freq [MHz]	Channel	Tones	RU Index	Avg Conducted Powers (dBm)
2412	1	26T	0	8.80	2412	1	52T	37	8.98
			4	8.82				38	8.77
			8	8.78				40	8.76
2437	6	26T	0	9.09	2437	6	52T	37	8.74
			4	8.99				38	8.90
			8	9.08				40	8.70
2462	11	26T	0	8.84	2462	11	52T	37	8.94
			4	8.91				38	9.03
			8	8.92				40	9.05

Freq [MHz]	Channel	Tones	RU Index	Avg Conducted Powers (dBm)	Freq [MHz]	Channel	Tones	RU Index	Avg Conducted Powers (dBm)
2412	1	106T	53	9.09	2412	1	242T	61	8.83
			54	8.77					
2437	6	106T	53	8.88					
			54	8.89	2437	6	242T	61	8.71
2462	11	106T	53	8.96					
			54	8.83	2462	11	242T	61	8.79

Table 1
Maximum 2.4 GHz 802.11ax RU Output Power – Chain 0

FCC ID: PY7-57441Y	 PCTEST Proud to be part of the element	SAR EVALUATION REPORT	SONY	Reviewed by: Quality Manager
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Freq [MHz]	Channel	Tones	RU Index	Avg Conducted Powers (dBm)	Freq [MHz]	Channel	Tones	RU Index	Avg Conducted Powers (dBm)
2412	1	26T	0	9.04	2412	1	52T	37	9.09
			4	8.90				38	8.92
			8	9.09				40	9.09
2437	6	26T	0	8.53	2437	6	52T	37	8.68
			4	8.72				38	8.85
			8	9.04				40	8.56
2462	11	26T	0	9.05	2462	11	52T	37	8.77
			4	9.05				38	8.86
			8	8.91				40	8.71
Freq [MHz]	Channel	Tones	RU Index	Avg Conducted Powers (dBm)					
2412	1	106T	53	8.84	Freq [MHz]	Channel	Tones	RU Index	Avg Conducted Powers (dBm)
			54	8.77					
2437	6	106T	53	8.86	2412	1	242T	61	8.80
			54	8.79	2437	6	242T	61	8.85
2462	11	106T	53	8.89	2462	11	242T	61	8.84
			54	8.84					

Table 2
Maximum 2.4 GHz 802.11ax RU Output Power – Chain 1

FCC ID: PY7-57441Y	 PCTEST Proud to be part of 	SAR EVALUATION REPORT	SONY	Reviewed by: Quality Manager
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20MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)		
					RU Index		
					0	4	8
1		5180	36	26T	8.93	8.94	8.87
		5200	40	26T	8.99	8.63	8.99
		5240	48	26T	8.84	8.88	8.74
2A		5260	52	26T	8.83	8.92	8.82
		5280	56	26T	8.49	8.49	8.49
		5320	64	26T	8.63	8.73	8.64
2C		5500	100	26T	8.92	8.46	8.48
		5600	120	26T	8.86	8.81	8.81
		5720	144	26T	8.75	8.81	8.74
3		5745	149	26T	8.89	8.92	8.87
		5785	157	26T	8.77	8.80	8.66
		5825	165	26T	8.69	8.71	8.99

20MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)		
					RU Index		
					37	39	40
1		5180	36	52T	8.99	8.56	8.99
		5200	40	52T	8.79	8.97	8.81
		5240	48	52T	8.99	8.49	8.99
2A		5260	52	52T	8.98	8.47	8.99
		5280	56	52T	8.73	8.77	8.64
		5320	64	52T	8.88	8.95	8.88
2C		5500	100	52T	8.98	8.96	8.81
		5600	120	52T	8.87	8.99	8.84
		5720	144	52T	8.94	8.97	8.74
3		5745	149	52T	8.82	8.99	8.85
		5785	157	52T	8.58	8.72	8.99
		5825	165	52T	8.99	8.67	8.90

20MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)	
					RU Index	
					53	54
1		5180	36	106T	8.41	8.59
		5200	40	106T	8.89	8.97
		5240	48	106T	8.50	8.56
2A		5260	52	106T	8.57	8.51
		5280	56	106T	8.72	8.78
		5320	64	106T	8.99	8.98
2C		5500	100	106T	8.43	8.95
		5600	120	106T	8.48	8.52
		5720	144	106T	8.97	8.94
3		5745	149	106T	8.99	8.95
		5785	157	106T	8.74	8.71
		5825	165	106T	8.99	8.99

20MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)	
					RU Index	
					61	62
1		5180	36	242T	8.77	
		5200	40	242T	8.99	
		5240	48	242T	8.60	
2A		5260	52	242T	8.67	
		5280	56	242T	8.92	
		5320	64	242T	8.40	
2C		5500	100	242T	8.52	
		5600	120	242T	8.60	
		5720	144	242T	8.99	
3		5745	149	242T	8.98	
		5785	157	242T	8.86	
		5825	165	242T	8.84	

40MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)		
					RU Index		
					0	8	17
1		5190	38	26T	8.99	8.98	8.99
		5230	46	26T	8.93	8.78	8.98
2A		5270	54	26T	8.79	8.67	8.81
		5310	62	26T	8.57	8.52	8.57
2C		5510	102	26T	8.63	8.99	8.68
		5590	118	26T	8.80	8.65	8.87
		5710	142	26T	8.79	8.60	8.62
3		5755	151	26T	8.96	8.89	8.85
		5795	159	26T	8.75	8.72	8.99

40MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)		
					RU Index		
					53	54	56
1		5190	38	106T	8.80	8.85	8.99
		5230	46	106T	8.75	8.99	8.99
2A		5270	54	106T	8.91	8.90	8.88
		5310	62	106T	8.88	8.99	8.95
2C		5510	102	106T	8.99	8.85	8.72
		5590	118	106T	8.99	8.83	8.56
		5710	142	106T	8.63	8.92	8.54
3		5755	151	106T	8.99	8.90	8.92
		5795	159	106T	8.82	8.99	8.68

40MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)	
					RU Index	
					61	62
1		5190	38	242T	8.99	8.99
		5230	46	242T	8.94	8.86
2A		5270	54	242T	8.99	8.99
		5310	62	242T	8.98	8.96
2C		5510	102	242T	8.90	8.86
		5590	118	242T	8.62	8.70
		5710	142	242T	8.71	8.62
3		5755	151	242T	8.55	8.50
		5795	159	242T	8.82	8.73

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40MHz BW						80MHz BW								
	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)		Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)			
					RU Index						RU Index			
					65						0	18	36	
1		5190	38	484T	8.99		1	5210	42	26T	8.99	8.74	8.92	
		5230	46	484T	8.97		2A	5290	58	26T	8.94	8.86	8.93	
2A		5270	54	484T	8.99			5530	106	26T	8.73	8.39	8.70	
		5310	62	484T	8.99			2C	5610	122	26T	8.92	8.71	8.81
2C		5510	102	484T	8.91			5690	138	26T	8.99	8.82	8.84	
		5590	118	484T	8.71			3	5775	155	26T	8.79	8.99	8.99
		5710	142	484T	8.63									
3		5755	151	484T	8.61									
		5795	159	484T	8.82									

80MHz BW						80MHz BW								
	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)			Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)		
					RU Index							RU Index		
					37	44	52					53	56	60
1	5210	42	52T	8.72	8.99	8.76	1	5210	42	106T	8.75	8.99	8.86	
2A	5290	58	52T	8.84	8.99	8.72	2A	5290	58	106T	8.74	8.98	8.89	
2C	5530	106	52T	8.84	8.98	8.66		5530	106	106T	8.82	8.99	8.80	
	5610	122	52T	8.99	8.90	8.99		2C	5610	122	106T	8.65	8.58	8.95
	5690	138	52T	8.75	8.99	8.77			5690	138	106T	8.86	8.73	8.84
3	5775	155	52T	8.99	8.80	8.72	3	5775	155	106T	8.99	8.87	8.92	

80MHz BW						80MHz BW								
	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)			Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)		
					RU Index							RU Index		
					61	62	64					65	66	
1	5210	42	242T	8.90	8.99	8.95	1	5210	42	484T	8.99	8.99		
2A	5290	58	242T	8.78	8.98	8.85	2A	5290	58	484T	8.93	8.94		
2C	5530	106	242T	8.94	8.99	8.93		5530	106	484T	8.58	8.55		
	5610	122	242T	8.67	8.94	8.78		2C	5610	122	484T	8.85	8.88	
	5690	138	242T	8.55	8.73	8.52			5690	138	484T	8.99	8.99	
3	5775	155	242T	8.66	8.91	8.58	3	5775	155	484T	8.80	8.69		

80MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)
					RU Index
					67
					1
2A	5290	58	996T	8.75	
2C	5530	106	996T	8.52	
	5610	122	996T	8.73	
	5690	138	996T	8.98	
3	5775	155	996T	8.65	

Table 3
Maximum 5 GHz 802.11ax RU Output Power – Chain 0

FCC ID: PY7-57441Y	 SAR EVALUATION REPORT		Reviewed by: Quality Manager
Test Dates: 08/23/20 - 09/16/20	DUT Type: Portable Handset		APPENDIX H: Page 5 of 7

20MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)		
					RU Index		
					0	4	8
	1	5180	36	26T	8.62	8.62	8.62
		5200	40	26T	8.99	8.98	8.95
		5240	48	26T	8.92	8.99	8.99
	2A	5260	52	26T	8.95	8.99	8.94
		5280	56	26T	8.95	8.88	8.66
		5320	64	26T	8.75	8.95	8.90
	2C	5500	100	26T	8.99	8.75	8.94
		5600	120	26T	8.54	8.75	8.55
		5720	144	26T	8.99	8.99	8.97
	3	5745	149	26T	8.62	8.69	8.99
		5785	157	26T	8.80	8.87	8.75
		5825	165	26T	8.81	8.79	8.65

20MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)		
					RU Index		
					37	39	40
	1	5180	36	52T	8.89	8.99	8.99
		5200	40	52T	8.92	8.99	8.99
		5240	48	52T	8.64	8.77	8.74
		5260	52	52T	8.84	8.99	8.91
	2A	5280	56	52T	8.62	8.76	8.53
		5320	64	52T	8.53	8.65	8.53
	2C	5500	100	52T	8.53	8.68	8.64
		5600	120	52T	8.51	8.64	8.53
		5720	144	52T	8.82	8.78	8.83
	3	5745	149	52T	8.72	8.85	8.70
		5785	157	52T	8.90	8.95	8.74
		5825	165	52T	8.68	8.78	8.72

20MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)	
					RU Index	
					53	54
	1	5180	36	106T	8.99	8.59
		5200	40	106T	8.88	8.99
		5240	48	106T	8.82	8.90
	2A	5260	52	106T	8.73	8.65
		5280	56	106T	8.73	8.72
		5320	64	106T	8.65	8.71
	2C	5500	100	106T	8.99	8.82
		5600	120	106T	8.67	8.71
		5720	144	106T	8.94	8.94
	3	5745	149	106T	8.79	8.84
		5785	157	106T	8.81	8.94
		5825	165	106T	8.67	8.81

20MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)
					RU Index
					61
	1	5180	36	242T	8.62
		5200	40	242T	8.72
		5240	48	242T	8.56
	2A	5260	52	242T	8.85
		5280	56	242T	8.53
		5320	64	242T	8.83
	2C	5500	100	242T	8.87
		5600	120	242T	8.83
		5720	144	242T	8.99
	3	5745	149	242T	8.99
		5785	157	242T	8.99
		5825	165	242T	8.97

40MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)		
					RU Index		
					0	8	17
	1	5190	38	26T	8.99	8.99	8.99
		5230	46	26T	8.69	8.65	8.69
	2A	5270	54	26T	8.99	8.99	8.85
		5310	62	26T	8.99	8.92	8.89
		5510	102	26T	8.99	8.81	8.75
	2C	5590	118	26T	8.58	8.67	8.63
		5710	142	26T	8.46	8.95	8.89
	3	5755	151	26T	8.79	8.74	8.70
		5795	159	26T	8.50	8.49	8.61

40MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)		
					RU Index		
					37	40	44
	1	5190	38	52T	8.87	8.86	8.54
		5230	46	52T	8.59	8.99	8.68
	2A	5270	54	52T	8.63	8.99	8.54
		5310	62	52T	8.63	8.71	8.71
		5510	102	52T	8.98	8.89	8.63
	2C	5590	118	52T	8.76	8.49	8.72
		5710	142	52T	8.84	8.83	8.82
	3	5755	151	52T	8.92	8.91	8.99
		5795	159	52T	8.60	8.99	8.64

40MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)		
					RU Index		
					53	54	56
	1	5190	38	106T	8.99	8.81	8.71
		5230	46	106T	8.87	8.55	8.86
	2A	5270	54	106T	8.84	8.72	8.76
		5310	62	106T	8.86	8.84	8.89
	2C	5510	102	106T	8.99	8.91	8.72
		5590	118	106T	8.99	8.50	8.94
		5710	142	106T	8.98	8.81	8.99
	3	5755	151	106T	8.74	8.99	8.72
		5795	159	106T	8.92	8.97	8.86

40MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)	
					RU Index	
					61	62
	1	5190	38	242T	8.72	8.82
		5230	46	242T	8.96	8.99
	2A	5270	54	242T	8.56	8.53
		5310	62	242T	8.61	8.57
	2C	5510	102	242T	8.71	8.75
		5590	118	242T	8.99	8.99
		5710	142	242T	8.62	8.65
	3	5755	151	242T	8.85	8.72
		5795	159	242T	8.92	8.88

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40MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)
					RU Index
					65
	1	5190	38	484T	8.77
		5230	46	484T	8.99
	2A	5270	54	484T	8.53
		5310	62	484T	8.65
	2C	5510	102	484T	8.84
		5590	118	484T	8.99
		5710	142	484T	8.61
	3	5755	151	484T	8.94
		5795	159	484T	8.80

80MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)		
					RU Index		
					0	18	36
	1	5210	42	26T	8.50	8.60	8.97
	2A	5290	58	26T	8.70	8.67	8.90
		5530	106	26T	8.49	8.46	8.62
	2C	5610	122	26T	8.99	8.84	8.34
		5690	138	26T	8.68	8.85	8.99
		5775	155	26T	8.58	8.99	8.70

80MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)		
					RU Index		
					37	44	52
	1	5210	42	52T	8.81	8.77	8.54
	2A	5290	58	52T	8.84	8.62	8.70
		5530	106	52T	8.92	8.90	8.59
	2C	5610	122	52T	8.99	8.83	8.56
		5690	138	52T	8.86	8.71	8.95
		5775	155	52T	8.69	8.99	8.74

80MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)		
					RU Index		
					53	56	60
	1	5210	42	106T	8.98	8.94	8.61
	2A	5290	58	106T	8.91	8.64	8.73
		5530	106	106T	8.99	8.92	8.63
	2C	5610	122	106T	8.63	8.99	8.61
		5690	138	106T	8.96	8.77	8.99
		5775	155	106T	8.86	8.51	8.81

80MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)		
					RU Index		
					61	62	64
	1	5210	42	242T	8.99	8.81	8.76
	2A	5290	58	242T	8.99	8.75	8.94
		5530	106	242T	8.53	8.76	8.88
	2C	5610	122	242T	8.62	8.91	8.83
		5690	138	242T	8.99	8.68	8.55
		5775	155	242T	8.98	8.49	8.99

80MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)
					RU Index
					65
	1	5210	42	996T	8.65
	2A	5290	58	996T	8.99
		5530	106	996T	8.69
	2C	5610	122	996T	8.74
		5690	138	996T	8.55
		5775	155	996T	8.99

Table 4
Maximum 5 GHz 802.11ax RU Output Power – Chain 1

FCC ID: PY7-57441Y	 SAR EVALUATION REPORT		Reviewed by: Quality Manager
Test Dates: 08/23/20 - 09/16/20	DUT Type: Portable Handset		APPENDIX H: Page 7 of 7