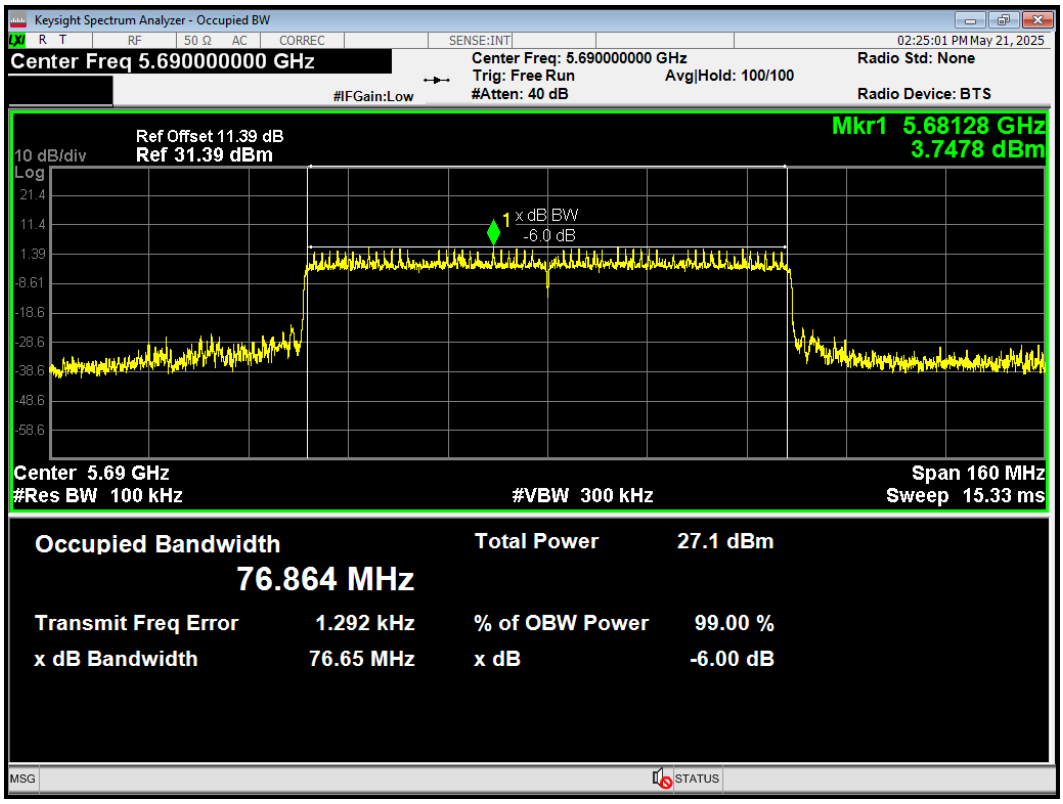
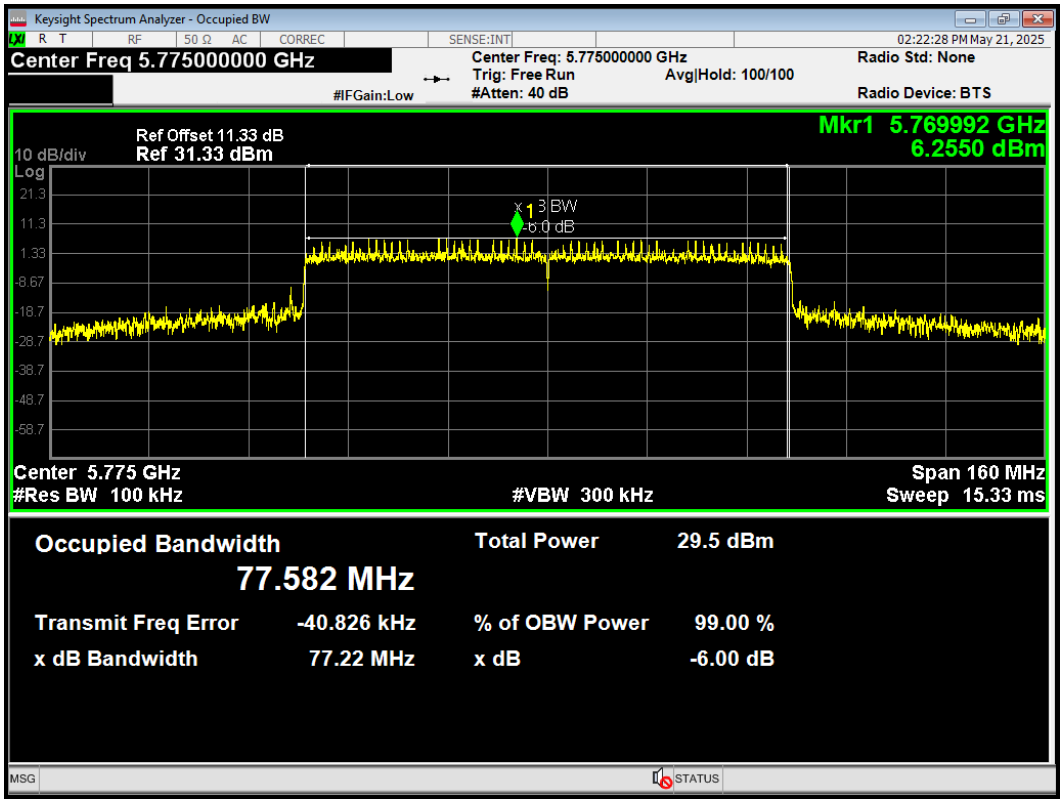
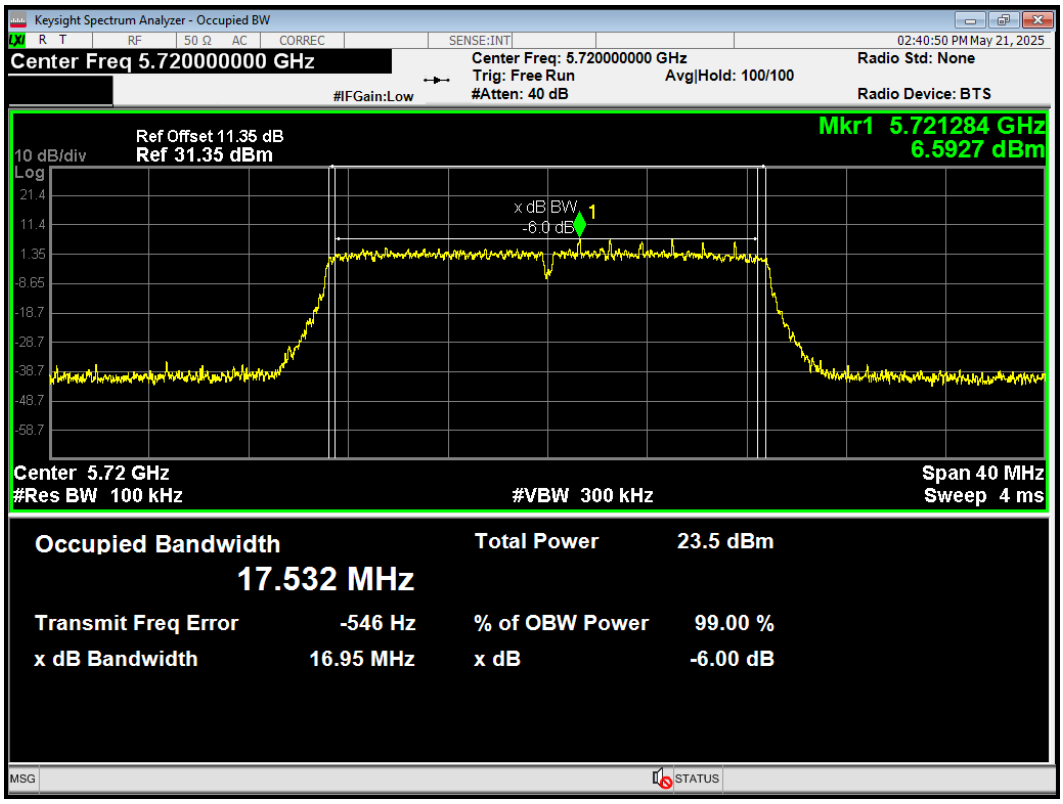
-6dB Bandwidth 802.11ax(HE80) 5690MHz



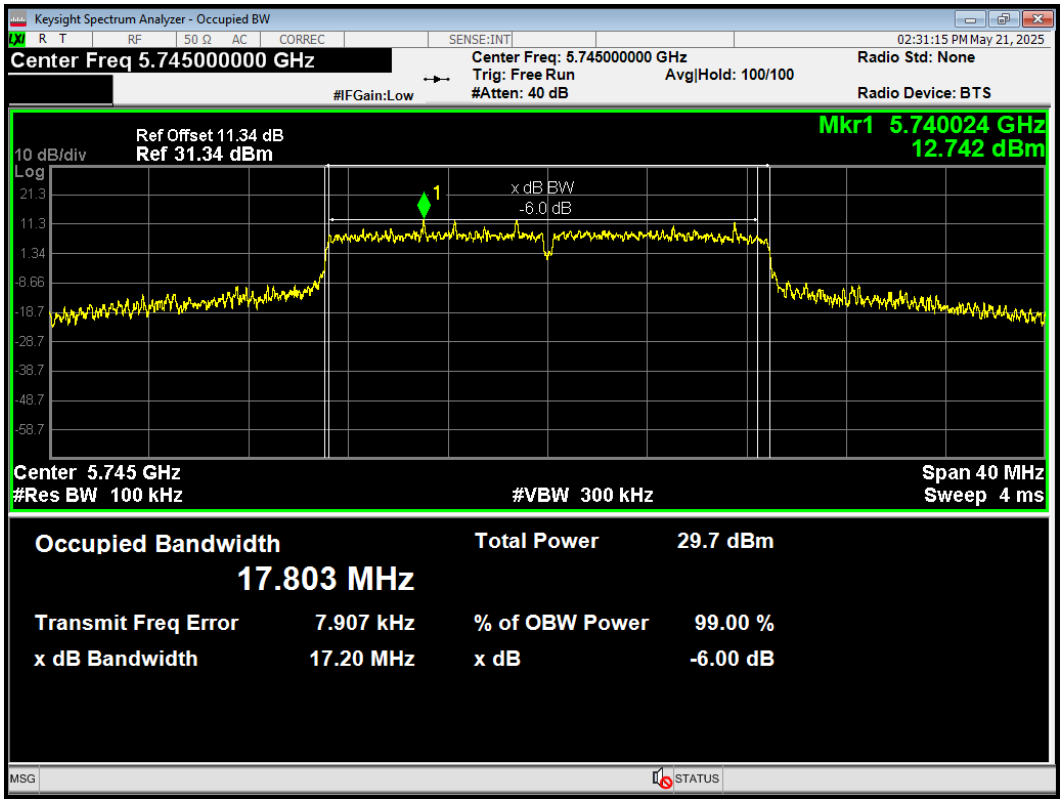
-6dB Bandwidth 802.11ax(HE80) 5775MHz



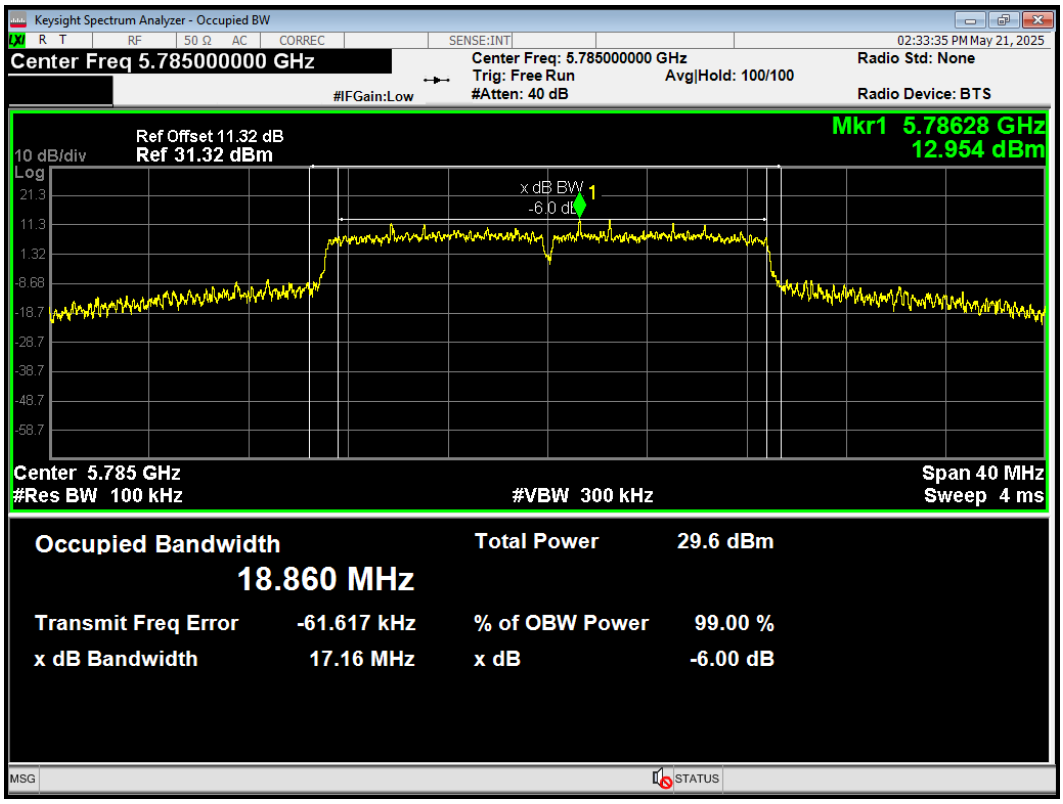
-6dB Bandwidth 802.11n(HT20) 5720MHz



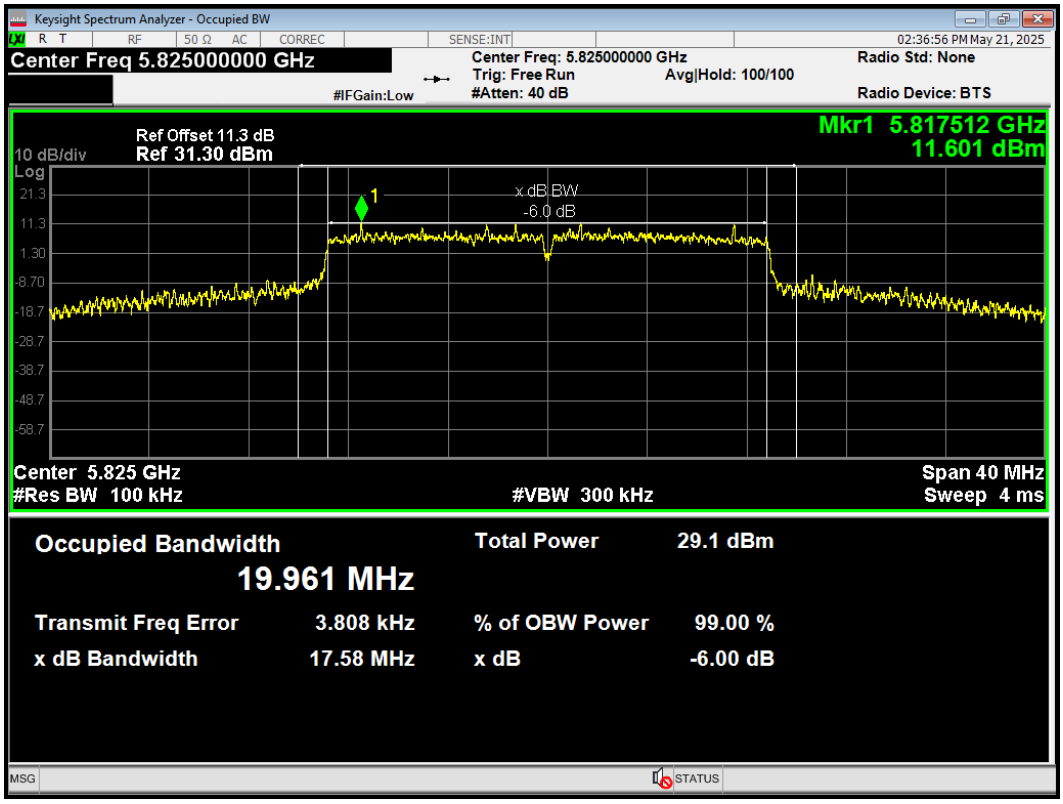
-6dB Bandwidth 802.11n(HT20) 5745MHz



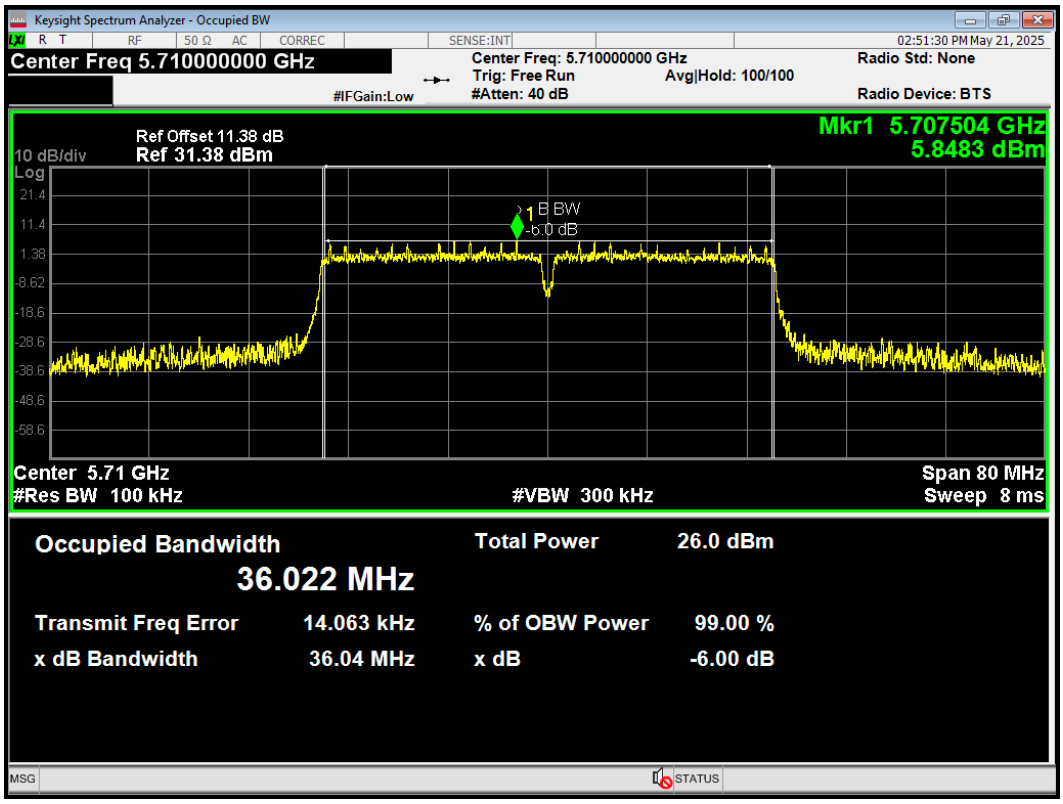
-6dB Bandwidth 802.11n(HT20) 5785MHz



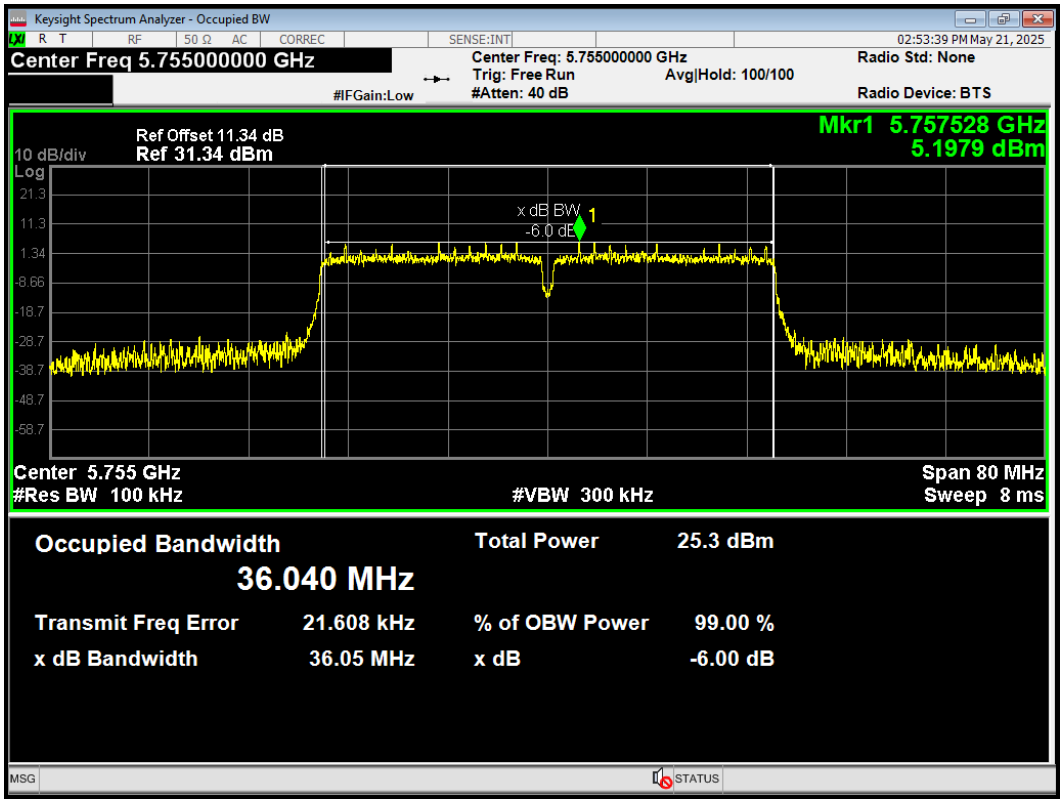
-6dB Bandwidth 802.11n(HT20) 5825MHz



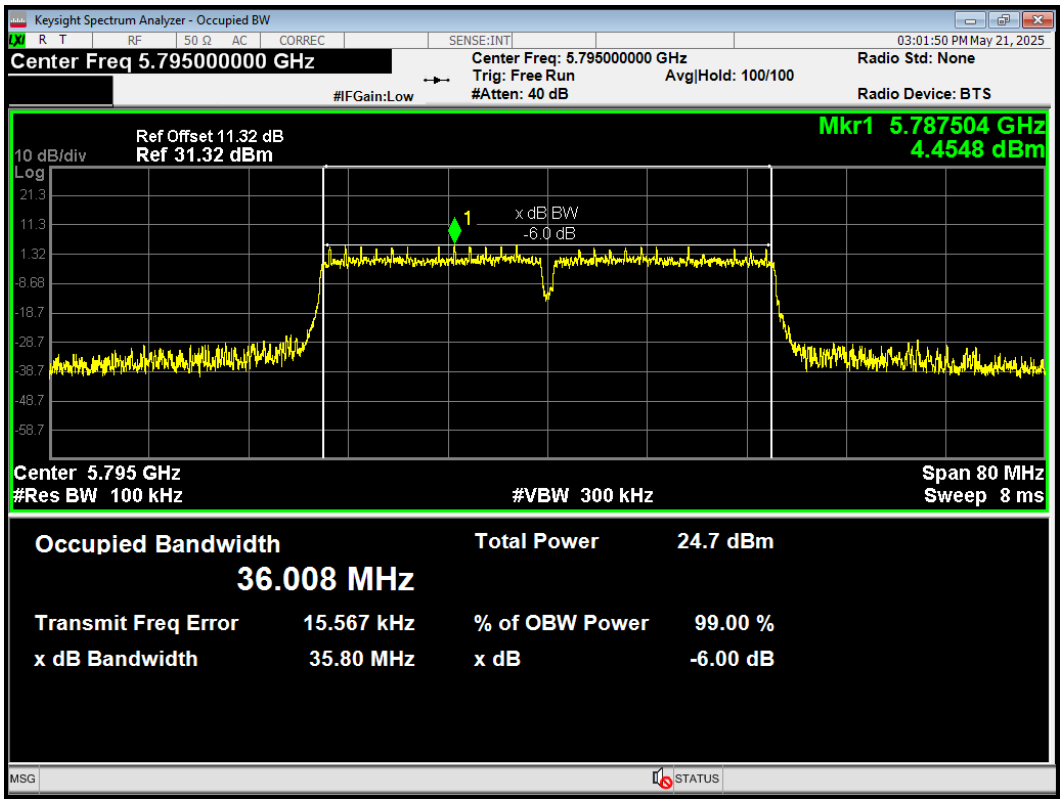
-6dB Bandwidth 802.11n(HT40) 5710MHz



-6dB Bandwidth 802.11n(HT40) 5755MHz



-6dB Bandwidth 802.11n(HT40) 5795MHz



5.2. Average Power Output

Ambient condition

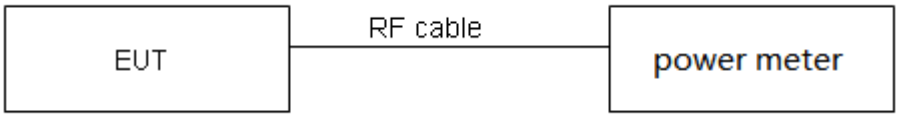
Temperature	Relative humidity	Pressure
15°C ~ 35°C	20% ~ 80%	86 kPa ~ 106 kPa

Methods of Measurement

During the process of the testing, The EUT was connected to the average power meter through an external attenuator and a known loss cable. The EUT is max power transmission with proper modulation. We use Maximum average Conducted Output Power Level Method in KDB789033 for this test

The conducted Power is measured at each antenna port. The measured results at the various antenna ports are then summed mathematically.

Test Setup



Limits

Rule FCC Part 15.407(a)(1) / FCC Part 15.407(a) (2) / FCC Part 15.407(a) (3)
(1) For the band 5.15-5.25 GHz.
(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).
(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23

dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.
(iv) For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
(2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
(3)For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 2, U= 0.44 dB.

Test Results

Mode	Duty cycle	Duty cycle correction Factor (dB)
802.11a	0.963	0.160
802.11n HT20	0.961	0.170
802.11n HT40	0.924	0.340
802.11ac VHT20	0.927	0.330
802.11ac VHT40	0.864	0.630
802.11ac VHT80	0.782	1.070
802.11ac VHT160	0.694	1.590
802.11ax HE20	0.910	0.410
802.11ax HE40	0.850	0.710
802.11ax HE80	0.767	1.150
802.11ax HE160	0.691	1.600
Note: when Duty cycle≥0.98, Duty cycle correction Factor not required.		

Test Mode		Channel/ Frequency (MHz)	B=26 dB bandwidth (MHz)	Limit 11 dBm + 10 log B (dBm)	Final Limit (dBm)
U-NII-2A	802.11a	52/5260	19.50	23.90	23.90
		60/5300	19.59	23.92	23.92
		64/5320	19.36	23.87	23.87
	802.11n HT20	52/5260	19.37	23.87	23.87
		60/5300	19.60	23.92	23.92
		64/5320	19.68	23.94	23.94
	802.11n HT40	54/5270	39.69	26.99	24.00
		62/5310	39.55	26.97	24.00
	802.11ac VHT20	52/5260	19.60	23.92	23.92
		60/5300	19.73	23.95	23.95
		64/5320	19.37	23.87	23.87
	802.11ac VHT40	54/5270	39.27	26.94	24.00
		62/5310	39.48	26.96	24.00
	802.11ac VHT80	58/5290	85.40	30.31	24.00
	802.11ac VHT160	50/5250	315.96	36.00	24.00
	802.11ax HE20	52/5260	19.62	23.93	23.93
		60/5300	19.54	23.91	23.91
		64/5320	19.36	23.87	23.87
	802.11ax HE40	54/5270	39.24	26.94	24.00
		62/5310	39.39	26.95	24.00
	802.11ax HE80	58/5290	85.18	30.30	24.00
	802.11ax HE160	50/5250	163.44	33.13	24.00
U-NII-2C	802.11a	100/5500	18.58	23.69	23.69
		120/5600	18.81	23.74	23.74
		140/5700	18.65	23.71	23.71
		144/5720	18.82	23.75	23.75
	802.11n HT20	100/5500	18.76	23.73	23.73
		120/5600	18.69	23.72	23.72
		140/5700	18.68	23.71	23.71
		144/5720	18.71	23.72	23.72
	802.11n HT40	102/5510	39.28	26.94	24.00
		118/5590	38.95	26.90	24.00
		134/5670	39.37	26.95	24.00
		142/5710	40.47	27.07	24.00
	802.11ac VHT20	100/5500	18.57	23.69	23.69
		120/5600	18.79	23.74	23.74
		140/5700	18.69	23.72	23.72
		144/5720	18.76	23.73	23.73
	802.11ac VHT40	102/5510	39.46	26.96	24.00

		118/5590	39.27	26.94	24.00
		134/5670	39.41	26.96	24.00
		142/5710	39.19	26.93	24.00
	802.11ac VHT80	106/5530	84.86	30.29	24.00
		122/5610	85.21	30.31	24.00
		138/5690	85.15	30.30	24.00
	802.11ac VHT160	114/5570	168.79	33.27	24.00
	802.11ax HE20	100/5500	18.51	23.67	23.67
		120/5600	18.71	23.72	23.72
		140/5700	18.72	23.72	23.72
		144/5720	18.72	23.72	23.72
	802.11ax HE40	102/5510	39.24	26.94	24.00
		118/5590	39.08	26.92	24.00
		134/5670	39.32	26.95	24.00
		142/5710	39.13	26.93	24.00
	802.11ax HE80	106/5530	85.34	30.31	24.00
		122/5610	84.70	30.28	24.00
		138/5690	85.13	30.30	24.00
	802.11ax HE160	114/5570	168.10	33.26	24.00
Note: 250mW=24dBm					

AOT
MIMO
U-NII-1

Test Mode	Channel/ Frequency (MHz)	MIMO Antenna 1		MIMO Antenna 2		Total Power (dBm)	Limit (dBm)	Conclusion
		Average Power Measured (dBm)	Average Power with duty factor (dBm)	Average Power Measured (dBm)	Average Power with duty factor (dBm)			
802.11a	36/5180	19.95	20.11	20.82	20.98	23.58	30.00	PASS
	40/5200	23.63	23.79	24.19	24.35	27.09	30.00	PASS
	48/5240	23.47	23.63	24.12	24.28	26.97	30.00	PASS
802.11n HT20	36/5180	20.76	20.93	21.76	21.93	24.47	30.00	PASS
	40/5200	23.76	23.93	24.44	24.61	27.29	30.00	PASS
	48/5240	23.71	23.88	24.45	24.62	27.28	30.00	PASS
802.11n HT40	38/5190	17.40	17.74	18.10	18.44	21.11	30.00	PASS
	46/5230	24.10	24.44	24.62	24.96	27.72	30.00	PASS
802.11ac VHT20	36/5180	20.61	20.94	21.51	21.84	24.42	30.00	PASS
	40/5200	23.66	23.99	24.43	24.76	27.40	30.00	PASS
	48/5240	23.64	23.97	24.47	24.80	27.41	30.00	PASS
802.11ac VHT40	38/5190	17.11	17.74	17.88	18.51	21.15	30.00	PASS
	46/5230	25.09	25.72	24.39	25.02	28.39	30.00	PASS
802.11ac VHT80	42/5210	16.72	17.79	17.67	18.74	21.30	30.00	PASS
802.11ax HE20	36/5180	20.13	20.54	20.81	21.22	23.90	30.00	PASS
	40/5200	24.12	24.53	24.65	25.06	27.81	30.00	PASS
	48/5240	24.11	24.52	24.61	25.02	27.79	30.00	PASS
802.11ax HE40	38/5190	17.01	17.72	17.91	18.62	21.21	30.00	PASS
	46/5230	25.06	25.77	24.40	25.11	28.46	30.00	PASS
802.11ax HE80	42/5210	16.69	17.84	17.57	18.72	21.31	30.00	PASS

Note: 1. For Total Power, according to KDB 662911 D01 Multiple Transmitter Output v02r01 1),

The Total Power =$10\log(10^{(\text{Power antenna1 in dBm}/10)}+10^{(\text{Power antenna2 in dBm}/10)})$.

2. According to KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f)(ii): If antenna gains are not equal, the user may use either of the following methods to calculate Directional gain, provided that each transmit antenna is driven by only one spatial stream: Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

Directional gain = $G_{ANT\ MAX}$ + Array Gain,

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};

Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less, for 20-MHz channel widths with $N_{ANT} \geq 5$.

So Directional gain = $G_{ANT\ MAX}$ + Array Gain =3.59+0=3.59 dBi<6dBi. So the power limit is 30dBm

U-NII-2A

Test Mode	Channel/ Frequency (MHz)	MIMO Antenna 1		MIMO Antenna 2		Total Power (dBm)	Limit (dBm)	Conclusion
		Average Power Measured (dBm)	Average Power with duty factor (dBm)	Average Power Measured (dBm)	Average Power with duty factor (dBm)			
802.11a	52/5260	17.76	17.92	18.21	18.37	21.16	23.90	PASS
	60/5300	17.77	17.93	18.19	18.35	21.16	23.92	PASS
	64/5320	17.87	18.03	18.42	18.58	21.33	23.87	PASS
802.11n HT20	52/5260	18.17	18.34	18.73	18.90	21.64	23.87	PASS
	60/5300	18.22	18.39	18.55	18.72	21.57	23.92	PASS
	64/5320	18.14	18.31	18.72	18.89	21.62	23.94	PASS
802.11n HT40	54/5270	20.34	20.68	20.58	20.92	23.81	24.00	PASS
	62/5310	17.02	17.36	17.21	17.55	20.47	24.00	PASS
802.11ac VHT20	52/5260	18.12	18.45	18.62	18.95	21.72	23.92	PASS
	60/5300	18.09	18.42	18.47	18.80	21.62	23.95	PASS
	64/5320	17.64	17.97	18.15	18.48	21.24	23.87	PASS
802.11ac VHT40	54/5270	20.10	20.73	20.38	21.01	23.88	24.00	PASS
	62/5310	16.56	17.19	16.82	17.45	20.33	24.00	PASS
802.11ac VHT80	58/5290	17.65	18.72	18.33	19.40	22.09	24.00	PASS
802.11ac VHT160	50/5250	15.75	17.34	16.33	17.92	20.65	24.00	PASS
802.11ax HE20	52/5260	17.90	18.31	18.49	18.90	21.63	23.93	PASS
	60/5300	18.04	18.45	18.45	18.86	21.67	23.91	PASS
	64/5320	18.06	18.47	18.59	19.00	21.75	23.87	PASS
802.11ax HE40	54/5270	20.03	20.74	20.32	21.03	23.90	24.00	PASS
	62/5310	17.19	17.90	17.77	18.48	21.21	24.00	PASS
802.11ax HE80	58/5290	18.11	19.26	18.73	19.88	22.59	24.00	PASS
802.11ax HE160	50/5250	15.35	16.95	15.96	17.56	20.27	24.00	PASS

Note: 1. For Total Power, according to KDB 662911 D01 Multiple Transmitter Output v02r01 1),

The Total Power $=10\log(10^{(\text{Power antenna1 in dBm}/10)}+10^{(\text{Power antenna2 in dBm}/10)})$.

2. According to KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f)(ii): If antenna gains are not equal, the user may use either of the following methods to calculate Directional gain, provided that each transmit antenna is driven by only one spatial stream: Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

Directional gain = $G_{ANT\ MAX}$ + Array Gain,

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};

Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less, for 20-MHz channel widths with $N_{ANT} \geq 5$.

So Directional gain = $G_{ANT\ MAX}$ + Array Gain =3.59+0=3.59 dBi<6dBi. So the power limit is 24dBm

U-NII-2C

Test Mode	Channel/ Frequency (MHz)	MIMO Antenna 1		MIMO Antenna 2		Total Power (dBm)	Limit (dBm)	Conclusion
		Average Power Measured (dBm)	Average Power with duty factor (dBm)	Average Power Measured (dBm)	Average Power with duty factor (dBm)			
802.11a	100/5500	17.22	17.38	17.53	17.69	20.54	23.69	PASS
	120/5600	17.64	17.80	18.36	18.52	21.18	23.74	PASS
	140/5700	17.09	17.25	17.96	18.12	20.72	23.71	PASS
	144/5720	17.06	17.22	17.81	17.97	20.62	23.75	PASS
802.11n HT20	100/5500	17.10	17.27	17.41	17.58	20.44	23.73	PASS
	120/5600	17.47	17.64	18.20	18.37	21.03	23.72	PASS
	140/5700	17.91	18.08	18.82	18.99	21.57	23.71	PASS
	144/5720	16.74	16.91	17.57	17.74	20.36	23.72	PASS
802.11n HT40	102/5510	16.92	17.26	16.45	16.79	20.05	24.00	PASS
	118/5590	20.52	20.86	20.64	20.98	23.93	24.00	PASS
	134/5670	18.67	19.01	18.84	19.18	22.10	24.00	PASS
	142/5710	20.10	20.44	20.72	21.06	23.77	24.00	PASS
802.11ac VHT20	100/5500	16.93	17.26	17.20	17.53	20.41	23.69	PASS
	120/5600	17.81	18.14	18.31	18.64	21.41	23.74	PASS
	140/5700	17.78	18.11	18.57	18.90	21.53	23.72	PASS
	144/5720	16.66	16.99	17.31	17.64	20.34	23.73	PASS
802.11ac VHT40	102/5510	16.47	17.10	16.12	16.75	19.94	24.00	PASS
	118/5590	19.99	20.62	20.57	21.20	23.93	24.00	PASS
	134/5670	18.42	19.05	18.66	19.29	22.18	24.00	PASS
	142/5710	19.89	20.52	20.54	21.17	23.86	24.00	PASS
802.11ac VHT80	106/5530	17.15	18.22	17.06	18.13	21.19	24.00	PASS
	122/5610	19.58	20.65	20.09	21.16	23.92	24.00	PASS
	138/5690	19.62	20.69	19.90	20.97	23.84	24.00	PASS
802.11ac VHT160	114/5570	14.19	15.78	13.85	15.44	18.62	24.00	PASS
802.11ax HE20	100/5500	18.32	18.73	18.39	18.80	21.77	23.67	PASS
	120/5600	18.06	18.47	18.56	18.97	21.74	23.72	PASS
	140/5700	16.10	16.51	16.71	17.12	19.84	23.72	PASS
	144/5720	16.96	17.37	17.44	17.85	20.62	23.72	PASS
802.11ax HE40	102/5510	16.17	16.88	15.66	16.37	19.64	24.00	PASS
	118/5590	20.05	20.76	20.28	20.99	23.89	24.00	PASS
	134/5670	16.87	17.58	16.99	17.70	20.65	24.00	PASS
	142/5710	19.75	20.46	20.26	20.97	23.74	24.00	PASS
802.11ax HE80	106/5530	16.18	17.33	16.01	17.16	20.25	24.00	PASS
	122/5610	19.52	20.67	20.09	21.24	23.97	24.00	PASS
	138/5690	19.43	20.58	20.03	21.18	23.90	24.00	PASS
802.11ax HE160	114/5570	15.71	17.31	15.37	16.97	20.15	24.00	PASS

Note: 1. For Total Power, according to KDB 662911 D01 Multiple Transmitter Output v02r01 1),

The Total Power $=10\log(10^{(\text{Power antenna1 in dBm}/10)}+10^{(\text{Power antenna2 in dBm}/10)})$.

2. According to KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f)(ii): If antenna gains are not equal, the user may use either of the following methods to calculate Directional gain, provided that each transmit antenna is driven by only one spatial stream: Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

Directional gain = $G_{ANT\ MAX}$ + Array Gain,

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};

Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less, for 20-MHz channel widths with $N_{ANT} \geq 5$.

So Directional gain = $G_{ANT\ MAX}$ + Array Gain =3.19+0=3.19 dBi<6dBi. So the power limit is 24dBm

U-NII-3

Test Mode	Channel/ Frequency (MHz)	MIMO Antenna 1		MIMO Antenna 2		Total Power (dBm)	Limit (dBm)	Conclusion
		Average Power Measured (dBm)	Average Power with duty factor (dBm)	Average Power Measured (dBm)	Average Power with duty factor (dBm)			
802.11a	144/5720	11.78	11.94	12.41	12.57	15.27	30.00	PASS
	149/5745	25.30	25.46	25.70	25.86	28.67	30.00	PASS
	157/5785	23.91	24.07	25.02	25.18	27.67	30.00	PASS
	165/5825	24.34	24.50	24.38	24.54	27.53	30.00	PASS
802.11n HT20	144/5720	12.07	12.24	12.22	12.39	15.33	30.00	PASS
	149/5745	24.26	24.43	25.68	25.85	28.21	30.00	PASS
	157/5785	23.98	24.15	25.02	25.19	27.71	30.00	PASS
	165/5825	24.43	24.60	24.36	24.53	27.57	30.00	PASS
802.11n HT40	142/5710	9.98	10.32	10.45	10.79	13.57	30.00	PASS
	151/5755	24.04	24.38	25.34	25.68	28.09	30.00	PASS
	159/5795	24.32	24.66	24.66	25.00	27.84	30.00	PASS
802.11ac VHT20	144/5720	11.99	12.32	12.08	12.41	15.38	30.00	PASS
	149/5745	23.80	24.13	25.17	25.50	27.88	30.00	PASS
	157/5785	23.98	24.31	24.54	24.87	27.61	30.00	PASS
	165/5825	23.92	24.25	23.85	24.18	27.23	30.00	PASS
802.11ac VHT40	142/5710	9.59	10.22	10.32	10.95	13.61	30.00	PASS
	151/5755	23.87	24.50	25.16	25.79	28.20	30.00	PASS
	159/5795	23.66	24.29	24.40	25.03	27.69	30.00	PASS
802.11ac VHT80	138/5690	7.28	8.35	7.65	8.72	11.55	30.00	PASS
	155/5775	20.39	21.46	20.92	21.99	24.74	30.00	PASS
802.11ax HE20	144/5720	12.49	12.90	12.74	13.15	16.04	30.00	PASS
	149/5745	23.75	24.16	25.07	25.48	27.88	30.00	PASS
	157/5785	23.97	24.38	24.34	24.75	27.57	30.00	PASS
	165/5825	24.04	24.45	23.76	24.17	27.32	30.00	PASS
802.11ax HE40	142/5710	11.38	12.09	11.91	12.62	15.38	30.00	PASS
	151/5755	20.00	20.71	20.44	21.15	23.94	30.00	PASS
	159/5795	23.55	24.26	24.39	25.10	27.71	30.00	PASS
802.11ax HE80	138/5690	7.51	8.66	8.30	9.45	12.08	30.00	PASS
	155/5775	18.78	19.93	19.35	20.50	23.24	30.00	PASS

Note: 1. For Total Power, according to KDB 662911 D01 Multiple Transmitter Output v02r01 1),

The Total Power $=10\log(10^{(\text{Power antenna1 in dBm}/10)}+10^{(\text{Power antenna2 in dBm}/10)})$.

2. According to KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f)(ii): If antenna gains are not equal, the user may use either of the following methods to calculate Directional gain, provided that each transmit antenna is driven by only one spatial stream: Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

Directional gain = $G_{ANT\ MAX}$ + Array Gain,

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};

Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less, for 20-MHz channel widths with N_{ANT} ≥ 5.

So Directional gain = $G_{ANT\ MAX}$ + Array Gain =2.91+0=2.91 dBi<6dBi. So the power limit is 30dBm

Beamforming

U-NII-1

Test Mode	Channel/ Frequency (MHz)	Beamforming Antenna 1		Beamforming Antenna 2		Total Power (dBm)	Limit (dBm)	Conclusion
		Average Power Measured (dBm)	Average Power with duty factor (dBm)	Average Power Measured (dBm)	Average Power with duty factor (dBm)			
802.11n HT20	36/5180	20.46	20.63	21.61	21.78	24.25	30.00	PASS
	40/5200	23.49	23.66	24.22	24.39	27.05	30.00	PASS
	48/5240	23.45	23.62	24.17	24.34	27.01	30.00	PASS
802.11n HT40	38/5190	17.10	17.44	17.84	18.18	20.83	30.00	PASS
	46/5230	23.80	24.14	24.34	24.68	27.43	30.00	PASS
802.11ac VHT20	36/5180	20.31	20.64	21.38	21.71	24.22	30.00	PASS
	40/5200	23.48	23.81	24.28	24.61	27.24	30.00	PASS
	48/5240	23.52	23.85	24.28	24.61	27.26	30.00	PASS
802.11ac VHT40	38/5190	16.99	17.62	17.67	18.30	20.98	30.00	PASS
	46/5230	24.94	25.57	24.15	24.78	28.20	30.00	PASS
802.11ac VHT80	42/5210	16.57	17.64	17.51	18.58	21.14	30.00	PASS
802.11ax HE20	36/5180	20.00	20.41	20.65	21.06	23.75	30.00	PASS
	40/5200	23.93	24.34	24.47	24.88	27.63	30.00	PASS
	48/5240	23.83	24.24	24.40	24.81	27.54	30.00	PASS
802.11ax HE40	38/5190	16.88	17.59	17.76	18.47	21.07	30.00	PASS
	46/5230	24.78	25.49	24.10	24.81	28.17	30.00	PASS
802.11ax HE80	42/5210	16.46	17.61	17.35	18.50	21.09	30.00	PASS

Note: 1. For Total Power, according to KDB 662911 D01 Multiple Transmitter Output v02r01 1),

The Total Power $=10\log(10^{(\text{Power antenna1 in dBm}/10)}+10^{(\text{Power antenna2 in dBm}/10)})$.

2. According to KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f)(ii): If antenna gains are not equal, the user may use either of the following methods to calculate Directional gain, provided that each transmit antenna is driven by only one spatial stream: Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

Directional gain = $G_{ANT\ MAX}$ + Array Gain,

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};

Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less, for 20-MHz channel widths with $N_{ANT} \geq 5$.

So Directional gain = $G_{ANT\ MAX}$ + Array Gain =3.59+0=3.59 dBi<6dBi. So the power limit is 30dBm

U-NII-2A

Test Mode	Channel/ Frequency (MHz)	Beamforming Antenna 1		Beamforming Antenna 2		Total Power (dBm)	Limit (dBm)	Conclusion
		Average Power Measured (dBm)	Average Power with duty factor (dBm)	Average Power Measured (dBm)	Average Power with duty factor (dBm)			
802.11n HT20	52/5260	17.91	18.08	18.54	18.71	21.41	23.87	PASS
	60/5300	17.95	18.12	18.27	18.44	21.29	23.92	PASS
	64/5320	17.92	18.09	18.58	18.75	21.44	23.94	PASS
802.11n HT40	54/5270	20.15	20.49	20.39	20.73	23.62	24.00	PASS
	62/5310	16.92	17.26	16.94	17.28	20.28	24.00	PASS
802.11ac VHT20	52/5260	17.92	18.25	18.52	18.85	21.57	23.92	PASS
	60/5300	17.98	18.31	18.22	18.55	21.44	23.95	PASS
	64/5320	17.45	17.78	17.86	18.19	21.00	23.87	PASS
802.11ac VHT40	54/5270	19.97	20.60	20.27	20.90	23.76	24.00	PASS
	62/5310	16.31	16.94	16.65	17.28	20.12	24.00	PASS
802.11ac VHT80	58/5290	17.49	18.56	18.14	19.21	21.91	24.00	PASS
802.11ac VHT160	50/5250	15.55	17.14	16.06	17.65	20.41	24.00	PASS
802.11ax HE20	52/5260	17.70	18.11	18.26	18.67	21.41	23.93	PASS
	60/5300	17.80	18.21	18.16	18.57	21.41	23.91	PASS
	64/5320	17.94	18.35	18.41	18.82	21.60	23.87	PASS
802.11ax HE40	54/5270	19.89	20.60	20.02	20.73	23.68	24.00	PASS
	62/5310	16.91	17.62	17.48	18.19	20.92	24.00	PASS
802.11ax HE80	58/5290	17.88	19.03	18.49	19.64	22.36	24.00	PASS
802.11ax HE160	50/5250	15.22	16.82	15.73	17.33	20.09	24.00	PASS

Note: 1. For Total Power, according to KDB 662911 D01 Multiple Transmitter Output v02r01 1),

The Total Power $=10\log(10^{(\text{Power antenna1 in dBm}/10)}+10^{(\text{Power antenna2 in dBm}/10)})$.

2. According to KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f)(ii): If antenna gains are not equal, the user may use either of the following methods to calculate Directional gain, provided that each transmit antenna is driven by only one spatial stream: Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

Directional gain = $G_{ANT\ MAX}$ + Array Gain,

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};

Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less, for 20-MHz channel widths with $N_{ANT} \geq 5$.

So Directional gain = $G_{ANT\ MAX}$ + Array Gain =3.59+0=3.59 dBi<6dBi. So the power limit is 24dBm

U-NII-2C

Test Mode	Channel/ Frequency (MHz)	Beamforming Antenna 1		Beamforming Antenna 2		Total Power (dBm)	Limit (dBm)	Conclusion
		Average Power Measured (dBm)	Average Power with duty factor (dBm)	Average Power Measured (dBm)	Average Power with duty factor (dBm)			
802.11n HT20	100/5500	16.84	17.01	17.28	17.45	20.24	23.73	PASS
	120/5600	17.21	17.38	17.94	18.11	20.77	23.72	PASS
	140/5700	17.65	17.82	18.69	18.86	21.38	23.71	PASS
	144/5720	16.54	16.71	17.36	17.53	20.15	23.72	PASS
802.11n HT40	102/5510	16.78	17.12	16.27	16.61	19.89	24.00	PASS
	118/5590	20.35	20.69	20.42	20.76	23.74	24.00	PASS
	134/5670	18.37	18.71	18.62	18.96	21.85	24.00	PASS
	142/5710	19.99	20.33	20.54	20.88	23.62	24.00	PASS
802.11ac VHT20	100/5500	16.73	17.06	17.01	17.34	20.21	23.69	PASS
	120/5600	17.58	17.91	18.12	18.45	21.20	23.74	PASS
	140/5700	17.67	18.00	18.45	18.78	21.41	23.72	PASS
	144/5720	16.43	16.76	17.20	17.53	20.17	23.73	PASS
802.11ac VHT40	102/5510	16.24	16.87	15.97	16.60	19.74	24.00	PASS
	118/5590	19.70	20.33	20.41	21.04	23.71	24.00	PASS
	134/5670	18.19	18.82	18.37	19.00	21.92	24.00	PASS
	142/5710	19.74	20.37	20.31	20.94	23.67	24.00	PASS
802.11ac VHT80	106/5530	16.99	18.06	16.90	17.97	21.03	24.00	PASS
	122/5610	19.46	20.53	19.81	20.88	23.72	24.00	PASS
	138/5690	19.37	20.44	19.80	20.87	23.67	24.00	PASS
802.11ac VHT160	114/5570	14.05	15.64	13.65	15.24	18.46	24.00	PASS
802.11ax HE20	100/5500	18.07	18.48	18.17	18.58	21.54	23.67	PASS
	120/5600	17.82	18.23	18.37	18.78	21.52	23.72	PASS
	140/5700	15.94	16.35	16.42	16.83	19.61	23.72	PASS
	144/5720	16.72	17.13	17.31	17.72	20.44	23.72	PASS
802.11ax HE40	102/5510	16.00	16.71	15.56	16.27	19.51	24.00	PASS
	118/5590	19.91	20.62	19.98	20.69	23.67	24.00	PASS
	134/5670	16.62	17.33	16.88	17.59	20.47	24.00	PASS
	142/5710	19.64	20.35	20.12	20.83	23.61	24.00	PASS
802.11ax HE80	106/5530	15.90	17.05	15.90	17.05	20.06	24.00	PASS
	122/5610	19.38	20.53	19.81	20.96	23.76	24.00	PASS
	138/5690	19.24	20.39	19.80	20.95	23.69	24.00	PASS
802.11ax HE160	114/5570	15.47	17.07	15.22	16.82	19.96	24.00	PASS

Note: 1. For Total Power, according to KDB 662911 D01 Multiple Transmitter Output v02r01 1),

The Total Power $=10\log(10^{(\text{Power antenna1 in dBm}/10)}+10^{(\text{Power antenna2 in dBm}/10)})$.

2. According to KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f)(ii): If antenna gains are not equal, the user may use either of the following methods to calculate Directional gain, provided that each transmit antenna is driven by only one spatial stream: Directional

gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

Directional gain = $G_{ANT\ MAX}$ + Array Gain,

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};

Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less, for 20-MHz channel widths with $N_{ANT} \geq 5$.

So Directional gain = $G_{ANT\ MAX}$ + Array Gain =3.19+0=3.19 dBi<6dBi. So the power limit is 24dBm

U-NII-3

Test Mode	Channel/ Frequency (MHz)	Beamforming Antenna 1		Beamforming Antenna 2		Total Power (dBm)	Limit (dBm)	Conclusion
		Average Power Measured (dBm)	Average Power with duty factor (dBm)	Average Power Measured (dBm)	Average Power with duty factor (dBm)			
802.11n HT20	144/5720	11.80	11.97	11.95	12.12	15.06	30.00	PASS
	149/5745	24.01	24.18	25.44	25.61	27.96	30.00	PASS
	157/5785	23.88	24.05	24.89	25.06	27.59	30.00	PASS
	165/5825	24.16	24.33	24.21	24.38	27.36	30.00	PASS
802.11n HT40	142/5710	9.85	10.19	10.25	10.59	13.41	30.00	PASS
	151/5755	23.94	24.28	25.21	25.55	27.97	30.00	PASS
	159/5795	24.09	24.43	24.50	24.84	27.65	30.00	PASS
802.11ac VHT20	144/5720	11.79	12.12	11.79	12.12	15.13	30.00	PASS
	149/5745	23.58	23.91	25.04	25.37	27.71	30.00	PASS
	157/5785	23.88	24.21	24.27	24.60	27.42	30.00	PASS
	165/5825	23.68	24.01	23.69	24.02	27.03	30.00	PASS
802.11ac VHT40	142/5710	9.48	10.11	10.03	10.66	13.40	30.00	PASS
	151/5755	23.66	24.29	25.02	25.65	28.03	30.00	PASS
	159/5795	23.50	24.13	24.22	24.85	27.52	30.00	PASS
802.11ac VHT80	138/5690	6.98	8.05	7.36	8.43	11.25	30.00	PASS
	155/5775	20.22	21.29	20.69	21.76	24.54	30.00	PASS
802.11ax HE20	144/5720	12.27	12.68	12.48	12.89	15.80	30.00	PASS
	149/5745	23.48	23.89	24.93	25.34	27.69	30.00	PASS
	157/5785	23.85	24.26	24.13	24.54	27.41	30.00	PASS
	165/5825	23.90	24.31	23.60	24.01	27.17	30.00	PASS
802.11ax HE40	142/5710	11.15	11.86	11.78	12.49	15.20	30.00	PASS
	151/5755	19.86	20.57	20.27	20.98	23.79	30.00	PASS
	159/5795	23.30	24.01	24.21	24.92	27.50	30.00	PASS
802.11ax HE80	138/5690	7.21	8.36	8.05	9.20	11.81	30.00	PASS
	155/5775	18.49	19.64	19.22	20.37	23.03	30.00	PASS

Note: 1. For Total Power, according to KDB 662911 D01 Multiple Transmitter Output v02r01 1),

The Total Power $=10\log(10^{(\text{Power antenna1 in dBm}/10)}+10^{(\text{Power antenna2 in dBm}/10)})$.

2. According to KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f)(ii): If antenna gains are not equal, the user may use either of the following methods to calculate Directional gain, provided that each transmit antenna is driven by only one spatial stream: Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

Directional gain = $G_{ANT\ MAX}$ + Array Gain,

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};

Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less, for 20-MHz channel widths with $N_{ANT} \geq 5$.

So Directional gain = $G_{ANT\ MAX}$ + Array Gain =2.91+0=2.91 dBi<6dBi. So the power limit is 30dBm

INPAQ
MIMO
U-NII-1

Test Mode	Channel/ Frequency (MHz)	MIMO Antenna 1		MIMO Antenna 2		Total Power (dBm)	Limit (dBm)	Conclusion
		Average Power Measured (dBm)	Average Power with duty factor (dBm)	Average Power Measured (dBm)	Average Power with duty factor (dBm)			
802.11a	36/5180	20.43	20.59	21.10	21.26	23.95	30.00	PASS
	40/5200	23.63	23.79	24.19	24.35	27.09	30.00	PASS
	48/5240	23.47	23.63	24.12	24.28	26.97	30.00	PASS
802.11n HT20	36/5180	21.35	21.52	22.12	22.29	24.93	30.00	PASS
	40/5200	23.76	23.93	24.44	24.61	27.29	30.00	PASS
	48/5240	23.71	23.88	24.45	24.62	27.28	30.00	PASS
802.11n HT40	38/5190	16.65	16.99	17.08	17.42	20.22	30.00	PASS
	46/5230	24.10	24.44	24.62	24.96	27.72	30.00	PASS
802.11ac VHT20	36/5180	21.20	21.53	21.86	22.19	24.89	30.00	PASS
	40/5200	23.66	23.99	24.43	24.76	27.40	30.00	PASS
	48/5240	23.64	23.97	24.47	24.80	27.41	30.00	PASS
802.11ac VHT40	38/5190	16.32	16.95	16.85	17.48	20.23	30.00	PASS
	46/5230	25.09	25.72	24.39	25.02	28.39	30.00	PASS
802.11ac VHT80	42/5210	16.72	17.79	17.67	18.74	21.30	30.00	PASS
802.11ax HE20	36/5180	21.20	21.61	21.78	22.19	24.92	30.00	PASS
	40/5200	24.12	24.53	24.65	25.06	27.81	30.00	PASS
	48/5240	24.11	24.52	24.61	25.02	27.79	30.00	PASS
802.11ax HE40	38/5190	16.83	17.54	17.21	17.92	20.74	30.00	PASS
	46/5230	25.06	25.77	24.40	25.11	28.46	30.00	PASS
802.11ax HE80	42/5210	16.69	17.84	17.57	18.72	21.31	30.00	PASS

Note: 1. For Total Power, according to KDB 662911 D01 Multiple Transmitter Output v02r01 1),

The Total Power =$10\log(10^{(\text{Power antenna1 in dBm}/10)}+10^{(\text{Power antenna2 in dBm}/10)})$.

2. According to KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f)(ii): If antenna gains are not equal, the user may use either of the following methods to calculate Directional gain, provided that each transmit antenna is driven by only one spatial stream: Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

Directional gain = $G_{ANT\ MAX}$ + Array Gain,

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};

Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less, for 20-MHz channel widths with $N_{ANT} \geq 5$.

So Directional gain = $G_{ANT\ MAX}$ + Array Gain =3.86+0=3.86 dBi<6dBi. So the power limit is 24dBm

U-NII-2A

Test Mode	Channel/ Frequency (MHz)	MIMO Antenna 1		MIMO Antenna 2		Total Power (dBm)	Limit (dBm)	Conclusion
		Average Power Measured (dBm)	Average Power with duty factor (dBm)	Average Power Measured (dBm)	Average Power with duty factor (dBm)			
802.11a	52/5260	17.76	17.92	18.21	18.37	21.16	23.90	PASS
	60/5300	17.77	17.93	18.19	18.35	21.16	23.92	PASS
	64/5320	17.87	18.03	18.42	18.58	21.33	23.87	PASS
802.11n HT20	52/5260	18.17	18.34	18.73	18.90	21.64	23.87	PASS
	60/5300	18.22	18.39	18.55	18.72	21.57	23.92	PASS
	64/5320	18.14	18.31	18.72	18.89	21.62	23.94	PASS
802.11n HT40	54/5270	20.34	20.68	20.58	20.92	23.81	24.00	PASS
	62/5310	17.58	17.92	17.70	18.04	20.99	24.00	PASS
802.11ac VHT20	52/5260	18.12	18.45	18.62	18.95	21.72	23.92	PASS
	60/5300	18.09	18.42	18.47	18.80	21.62	23.95	PASS
	64/5320	17.64	17.97	18.15	18.48	21.24	23.87	PASS
802.11ac VHT40	54/5270	20.10	20.73	20.38	21.01	23.88	24.00	PASS
	62/5310	17.33	17.96	17.38	18.01	21.00	24.00	PASS
802.11ac VHT80	58/5290	19.24	20.31	19.64	20.71	23.52	24.00	PASS
802.11ac VHT160	50/5250	17.06	18.65	17.36	18.95	21.81	24.00	PASS
802.11ax HE20	52/5260	17.90	18.31	18.49	18.90	21.63	23.93	PASS
	60/5300	18.04	18.45	18.45	18.86	21.67	23.91	PASS
	64/5320	18.06	18.47	18.59	19.00	21.75	23.87	PASS
802.11ax HE40	54/5270	20.03	20.74	20.32	21.03	23.90	24.00	PASS
	62/5310	17.19	17.90	17.77	18.48	21.21	24.00	PASS
802.11ax HE80	58/5290	17.71	18.86	18.00	19.15	22.02	24.00	PASS
802.11ax HE160	50/5250	17.15	18.75	17.39	18.99	21.88	24.00	PASS

Note: 1. For Total Power, according to KDB 662911 D01 Multiple Transmitter Output v02r01 1),

The Total Power $=10\log(10^{(\text{Power antenna1 in dBm}/10)}+10^{(\text{Power antenna2 in dBm}/10)})$.

2. According to KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f)(ii): If antenna gains are not equal, the user may use either of the following methods to calculate Directional gain, provided that each transmit antenna is driven by only one spatial stream: Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

Directional gain = $G_{ANT\ MAX}$ + Array Gain,

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};

Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less, for 20-MHz channel widths with $N_{ANT} \geq 5$.

So Directional gain = $G_{ANT\ MAX}$ + Array Gain =3.86+0=3.86 dBi<6dBi. So the power limit is 24dBm

U-NII-2C

Test Mode	Channel/ Frequency (MHz)	MIMO Antenna 1		MIMO Antenna 2		Total Power (dBm)	Limit (dBm)	Conclusion
		Average Power Measured (dBm)	Average Power with duty factor (dBm)	Average Power Measured (dBm)	Average Power with duty factor (dBm)			
802.11a	100/5500	17.22	17.38	17.53	17.69	20.54	23.69	PASS
	120/5600	17.64	17.80	18.36	18.52	21.18	23.74	PASS
	140/5700	17.09	17.25	17.96	18.12	20.72	23.71	PASS
	144/5720	17.06	17.22	17.81	17.97	20.62	23.75	PASS
802.11n HT20	100/5500	17.10	17.27	17.41	17.58	20.44	23.73	PASS
	120/5600	17.47	17.64	18.20	18.37	21.03	23.72	PASS
	140/5700	17.91	18.08	18.82	18.99	21.57	23.71	PASS
	144/5720	16.74	16.91	17.57	17.74	20.36	23.72	PASS
802.11n HT40	102/5510	16.93	17.27	16.76	17.10	20.20	24.00	PASS
	118/5590	20.52	20.86	20.64	20.98	23.93	24.00	PASS
	134/5670	19.16	19.50	19.64	19.98	22.76	24.00	PASS
	142/5710	20.10	20.44	20.72	21.06	23.77	24.00	PASS
802.11ac VHT20	100/5500	16.93	17.26	17.20	17.53	20.41	23.69	PASS
	120/5600	17.81	18.14	18.31	18.64	21.41	23.74	PASS
	140/5700	17.78	18.11	18.57	18.90	21.53	23.72	PASS
	144/5720	16.66	16.99	17.31	17.64	20.34	23.73	PASS
802.11ac VHT40	102/5510	16.67	17.30	16.12	16.75	20.04	24.00	PASS
	118/5590	19.99	20.62	20.57	21.20	23.93	24.00	PASS
	134/5670	18.89	19.52	19.34	19.97	22.76	24.00	PASS
	142/5710	19.89	20.52	20.54	21.17	23.86	24.00	PASS
802.11ac VHT80	106/5530	16.54	17.61	16.89	17.96	20.79	24.00	PASS
	122/5610	19.58	20.65	20.09	21.16	23.92	24.00	PASS
	138/5690	19.62	20.69	19.90	20.97	23.84	24.00	PASS
802.11ac VHT160	114/5570	15.36	16.95	15.52	17.11	20.04	24.00	PASS
802.11ax HE20	100/5500	18.32	18.73	18.39	18.80	21.77	23.67	PASS
	120/5600	18.06	18.47	18.56	18.97	21.74	23.72	PASS
	140/5700	17.43	17.84	18.13	18.54	21.21	23.72	PASS
	144/5720	16.96	17.37	17.44	17.85	20.62	23.72	PASS
802.11ax HE40	102/5510	16.98	17.69	17.02	17.73	20.72	24.00	PASS
	118/5590	20.05	20.76	20.28	20.99	23.89	24.00	PASS
	134/5670	17.87	18.58	18.31	19.02	21.82	24.00	PASS
	142/5710	19.75	20.46	20.26	20.97	23.74	24.00	PASS
802.11ax HE80	106/5530	15.98	17.13	16.28	17.43	20.29	24.00	PASS
	122/5610	19.52	20.67	20.09	21.24	23.97	24.00	PASS
	138/5690	19.43	20.58	20.03	21.18	23.90	24.00	PASS
802.11ax HE160	114/5570	15.71	17.31	15.37	16.97	20.15	24.00	PASS

Note: 1. For Total Power, according to KDB 662911 D01 Multiple Transmitter Output v02r01 1),

The Total Power $=10\log(10^{(\text{Power antenna1 in dBm}/10)}+10^{(\text{Power antenna2 in dBm}/10)})$.

2. According to KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f)(ii): If antenna gains are not equal, the user may use either of the following methods to calculate Directional gain, provided that each transmit antenna is driven by only one spatial stream: Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

Directional gain = $G_{ANT\ MAX}$ + Array Gain,

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};

Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less, for 20-MHz channel widths with $N_{ANT} \geq 5$.

So Directional gain = $G_{ANT\ MAX}$ + Array Gain =4.48+0=4.48 dBi<6dBi. So the power limit is 24dBm

U-NII-3

Test Mode	Channel/ Frequency (MHz)	MIMO Antenna 1		MIMO Antenna 2		Total Power (dBm)	Limit (dBm)	Conclusion
		Average Power Measured (dBm)	Average Power with duty factor (dBm)	Average Power Measured (dBm)	Average Power with duty factor (dBm)			
802.11a	144/5720	11.78	11.94	12.41	12.57	15.27	30.00	PASS
	149/5745	25.30	25.46	25.70	25.86	28.67	30.00	PASS
	157/5785	23.91	24.07	25.02	25.18	27.67	30.00	PASS
	165/5825	24.34	24.50	24.38	24.54	27.53	30.00	PASS
802.11n HT20	144/5720	12.07	12.24	12.22	12.39	15.33	30.00	PASS
	149/5745	24.26	24.43	25.68	25.85	28.21	30.00	PASS
	157/5785	23.98	24.15	25.02	25.19	27.71	30.00	PASS
	165/5825	24.43	24.60	24.36	24.53	27.57	30.00	PASS
802.11n HT40	142/5710	9.98	10.32	10.45	10.79	13.57	30.00	PASS
	151/5755	24.04	24.38	25.34	25.68	28.09	30.00	PASS
	159/5795	24.32	24.66	24.66	25.00	27.84	30.00	PASS
802.11ac VHT20	144/5720	11.99	12.32	12.08	12.41	15.38	30.00	PASS
	149/5745	23.80	24.13	25.17	25.50	27.88	30.00	PASS
	157/5785	23.98	24.31	24.54	24.87	27.61	30.00	PASS
	165/5825	23.92	24.25	23.85	24.18	27.23	30.00	PASS
802.11ac VHT40	142/5710	9.59	10.22	10.32	10.95	13.61	30.00	PASS
	151/5755	23.87	24.50	25.16	25.79	28.20	30.00	PASS
	159/5795	23.66	24.29	24.40	25.03	27.69	30.00	PASS
802.11ac VHT80	138/5690	7.28	8.35	7.65	8.72	11.55	30.00	PASS
	155/5775	19.19	20.26	20.00	21.07	23.69	30.00	PASS
802.11ax HE20	144/5720	12.49	12.90	12.74	13.15	16.04	30.00	PASS
	149/5745	23.75	24.16	25.07	25.48	27.88	30.00	PASS
	157/5785	23.97	24.38	24.34	24.75	27.57	30.00	PASS
	165/5825	24.04	24.45	23.76	24.17	27.32	30.00	PASS
802.11ax HE40	142/5710	11.38	12.09	11.91	12.62	15.38	30.00	PASS
	151/5755	20.62	21.33	21.42	22.13	24.76	30.00	PASS
	159/5795	23.55	24.26	24.39	25.10	27.71	30.00	PASS
802.11ax HE80	138/5690	7.51	8.66	8.30	9.45	12.08	30.00	PASS
	155/5775	18.70	19.85	19.59	20.74	23.33	30.00	PASS

Note: 1. For Total Power, according to KDB 662911 D01 Multiple Transmitter Output v02r01 1),

The Total Power $=10\log(10^{(\text{Power antenna1 in dBm}/10)}+10^{(\text{Power antenna2 in dBm}/10)})$.

2. According to KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f)(ii): If antenna gains are not equal, the user may use either of the following methods to calculate Directional gain, provided that each transmit antenna is driven by only one spatial stream: Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

Directional gain = $G_{ANT\ MAX}$ + Array Gain,

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};

Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less, for 20-MHz channel widths with N_{ANT} ≥ 5.

So Directional gain = $G_{ANT\ MAX}$ + Array Gain =3.92+0=3.92 dBi<6dBi. So the power limit is 30dBm

Beamforming

U-NII-1

Test Mode	Channel/ Frequency (MHz)	Beamforming Antenna 1		Beamforming Antenna 2		Total Power (dBm)	Limit (dBm)	Conclusion
		Average Power Measured (dBm)	Average Power with duty factor (dBm)	Average Power Measured (dBm)	Average Power with duty factor (dBm)			
802.11n HT20	36/5180	21.17	21.34	21.90	22.07	24.73	30.00	PASS
	40/5200	23.49	23.66	24.22	24.39	27.05	30.00	PASS
	48/5240	23.45	23.62	24.17	24.34	27.01	30.00	PASS
802.11n HT40	38/5190	16.35	16.69	16.86	17.20	19.96	30.00	PASS
	46/5230	23.80	24.14	24.34	24.68	27.43	30.00	PASS
802.11ac VHT20	36/5180	20.97	21.30	21.64	21.97	24.66	30.00	PASS
	40/5200	23.48	23.81	24.28	24.61	27.24	30.00	PASS
	48/5240	23.52	23.85	24.28	24.61	27.26	30.00	PASS
802.11ac VHT40	38/5190	16.14	16.77	16.56	17.19	19.99	30.00	PASS
	46/5230	24.94	25.57	24.15	24.78	28.20	30.00	PASS
802.11ac VHT80	42/5210	16.57	17.64	17.51	18.58	21.14	30.00	PASS
802.11ax HE20	36/5180	21.05	21.46	21.48	21.89	24.69	30.00	PASS
	40/5200	23.93	24.34	24.47	24.88	27.63	30.00	PASS
	48/5240	23.83	24.24	24.40	24.81	27.54	30.00	PASS
802.11ax HE40	38/5190	16.56	17.27	17.09	17.80	20.55	30.00	PASS
	46/5230	24.78	25.49	24.10	24.81	28.17	30.00	PASS
802.11ax HE80	42/5210	16.46	17.61	17.35	18.50	21.09	30.00	PASS

Note: 1. For Total Power, according to KDB 662911 D01 Multiple Transmitter Output v02r01 1),

The Total Power $=10\log(10^{(\text{Power antenna1 in dBm}/10)}+10^{(\text{Power antenna2 in dBm}/10)})$.

2. According to KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f)(ii): If antenna gains are not equal, the user may use either of the following methods to calculate Directional gain, provided that each transmit antenna is driven by only one spatial stream: Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

Directional gain = $G_{ANT\ MAX}$ + Array Gain,

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};

Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less, for 20-MHz channel widths with $N_{ANT} \geq 5$.

So Directional gain = $G_{ANT\ MAX}$ + Array Gain =3.86+0=3.86 dBi<6dBi. So the power limit is 24dBm

U-NII-2A

Test Mode	Channel/ Frequency (MHz)	Beamforming Antenna 1		Beamforming Antenna 2		Total Power (dBm)	Limit (dBm)	Conclusion
		Average Power Measured (dBm)	Average Power with duty factor (dBm)	Average Power Measured (dBm)	Average Power with duty factor (dBm)			
802.11n HT20	52/5260	17.91	18.08	18.54	18.71	21.41	23.87	PASS
	60/5300	17.95	18.12	18.27	18.44	21.29	23.92	PASS
	64/5320	17.92	18.09	18.58	18.75	21.44	23.94	PASS
802.11n HT40	54/5270	20.15	20.49	20.39	20.73	23.62	24.00	PASS
	62/5310	17.39	17.73	17.51	17.85	20.80	24.00	PASS
802.11ac VHT20	52/5260	17.92	18.25	18.52	18.85	21.57	23.92	PASS
	60/5300	17.98	18.31	18.22	18.55	21.44	23.95	PASS
	64/5320	17.45	17.78	17.86	18.19	21.00	23.87	PASS
802.11ac VHT40	54/5270	19.97	20.60	20.27	20.90	23.76	24.00	PASS
	62/5310	17.16	17.79	17.10	17.73	20.77	24.00	PASS
802.11ac VHT80	58/5290	19.12	20.19	19.54	20.61	23.42	24.00	PASS
802.11ac VHT160	50/5250	16.88	18.47	17.20	18.79	21.64	24.00	PASS
802.11ax HE20	52/5260	17.70	18.11	18.26	18.67	21.41	23.93	PASS
	60/5300	17.80	18.21	18.16	18.57	21.41	23.91	PASS
	64/5320	17.94	18.35	18.41	18.82	21.60	23.87	PASS
802.11ax HE40	54/5270	19.89	20.60	20.02	20.73	23.68	24.00	PASS
	62/5310	16.91	17.62	17.48	18.19	20.92	24.00	PASS
802.11ax HE80	58/5290	17.55	18.70	17.72	18.87	21.79	24.00	PASS
802.11ax HE160	50/5250	16.91	18.51	17.17	18.77	21.65	24.00	PASS

Note: 1. For Total Power, according to KDB 662911 D01 Multiple Transmitter Output v02r01 1),

The Total Power $=10\log(10^{(\text{Power antenna1 in dBm}/10)}+10^{(\text{Power antenna2 in dBm}/10)})$.

2. According to KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f)(ii): If antenna gains are not equal, the user may use either of the following methods to calculate Directional gain, provided that each transmit antenna is driven by only one spatial stream: Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

Directional gain = $G_{ANT\ MAX}$ + Array Gain,

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};

Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less, for 20-MHz channel widths with $N_{ANT} \geq 5$.

So Directional gain = $G_{ANT\ MAX}$ + Array Gain =3.86+0=3.86 dBi<6dBi. So the power limit is 24dBm

U-NII-2C

Test Mode	Channel/ Frequency (MHz)	Beamforming Antenna 1		Beamforming Antenna 2		Total Power (dBm)	Limit (dBm)	Conclusion
		Average Power Measured (dBm)	Average Power with duty factor (dBm)	Average Power Measured (dBm)	Average Power with duty factor (dBm)			
802.11n HT20	100/5500	16.84	17.01	17.28	17.45	20.24	23.73	PASS
	120/5600	17.21	17.38	17.94	18.11	20.77	23.72	PASS
	140/5700	17.65	17.82	18.69	18.86	21.38	23.71	PASS
	144/5720	16.54	16.71	17.36	17.53	20.15	23.72	PASS
802.11n HT40	102/5510	16.64	16.98	16.63	16.97	19.99	24.00	PASS
	118/5590	20.35	20.69	20.42	20.76	23.74	24.00	PASS
	134/5670	18.99	19.33	19.53	19.87	22.62	24.00	PASS
	142/5710	19.99	20.33	20.54	20.88	23.62	24.00	PASS
802.11ac VHT20	100/5500	16.73	17.06	17.01	17.34	20.21	23.69	PASS
	120/5600	17.58	17.91	18.12	18.45	21.20	23.74	PASS
	140/5700	17.67	18.00	18.45	18.78	21.41	23.72	PASS
	144/5720	16.43	16.76	17.20	17.53	20.17	23.73	PASS
802.11ac VHT40	102/5510	16.48	17.11	15.89	16.52	19.83	24.00	PASS
	118/5590	19.70	20.33	20.41	21.04	23.71	24.00	PASS
	134/5670	18.71	19.34	19.17	19.80	22.59	24.00	PASS
	142/5710	19.74	20.37	20.31	20.94	23.67	24.00	PASS
802.11ac VHT80	106/5530	16.34	17.41	16.74	17.81	20.62	24.00	PASS
	122/5610	19.46	20.53	19.81	20.88	23.72	24.00	PASS
	138/5690	19.37	20.44	19.80	20.87	23.67	24.00	PASS
802.11ac VHT160	114/5570	15.06	16.65	15.25	16.84	19.76	24.00	PASS
802.11ax HE20	100/5500	18.07	18.48	18.17	18.58	21.54	23.67	PASS
	120/5600	17.82	18.23	18.37	18.78	21.52	23.72	PASS
	140/5700	17.33	17.74	17.84	18.25	21.01	23.72	PASS
	144/5720	16.72	17.13	17.31	17.72	20.44	23.72	PASS
802.11ax HE40	102/5510	16.69	17.40	16.77	17.48	20.45	24.00	PASS
	118/5590	19.91	20.62	19.98	20.69	23.67	24.00	PASS
	134/5670	17.69	18.40	18.13	18.84	21.64	24.00	PASS
	142/5710	19.64	20.35	20.12	20.83	23.61	24.00	PASS
802.11ax HE80	106/5530	15.73	16.88	16.06	17.21	20.06	24.00	PASS
	122/5610	19.38	20.53	19.81	20.96	23.76	24.00	PASS
	138/5690	19.24	20.39	19.80	20.95	23.69	24.00	PASS
802.11ax HE160	114/5570	15.47	17.07	15.22	16.82	19.96	24.00	PASS

Note: 1. For Total Power, according to KDB 662911 D01 Multiple Transmitter Output v02r01 1),

The Total Power $=10\log(10^{(\text{Power antenna1 in dBm}/10)}+10^{(\text{Power antenna2 in dBm}/10)})$.

2. According to KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f)(ii): If antenna gains are not equal, the user may use either of the following methods to calculate Directional gain, provided that each transmit antenna is driven by only one spatial stream: Directional

gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

Directional gain = $G_{ANT\ MAX}$ + Array Gain,

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};

Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less, for 20-MHz channel widths with $N_{ANT} \geq 5$.

So Directional gain = $G_{ANT\ MAX}$ + Array Gain =4.48+0=4.48 dBi<6dBi. So the power limit is 24dBm

U-NII-3

Test Mode	Channel/ Frequency (MHz)	Beamforming Antenna 1		Beamforming Antenna 2		Total Power (dBm)	Limit (dBm)	Conclusion
		Average Power Measured (dBm)	Average Power with duty factor (dBm)	Average Power Measured (dBm)	Average Power with duty factor (dBm)			
802.11n HT20	144/5720	11.80	11.97	11.95	12.12	15.06	30.00	PASS
	149/5745	24.01	24.18	25.44	25.61	27.96	30.00	PASS
	157/5785	23.88	24.05	24.89	25.06	27.59	30.00	PASS
	165/5825	24.16	24.33	24.21	24.38	27.36	30.00	PASS
802.11n HT40	142/5710	9.85	10.19	10.25	10.59	13.41	30.00	PASS
	151/5755	23.94	24.28	25.21	25.55	27.97	30.00	PASS
	159/5795	24.09	24.43	24.50	24.84	27.65	30.00	PASS
802.11ac VHT20	144/5720	11.79	12.12	11.79	12.12	15.13	30.00	PASS
	149/5745	23.58	23.91	25.04	25.37	27.71	30.00	PASS
	157/5785	23.88	24.21	24.27	24.60	27.42	30.00	PASS
	165/5825	23.68	24.01	23.69	24.02	27.03	30.00	PASS
802.11ac VHT40	142/5710	9.48	10.11	10.03	10.66	13.40	30.00	PASS
	151/5755	23.66	24.29	25.02	25.65	28.03	30.00	PASS
	159/5795	23.50	24.13	24.22	24.85	27.52	30.00	PASS
802.11ac VHT80	138/5690	6.98	8.05	7.36	8.43	11.25	30.00	PASS
	155/5775	18.96	20.03	19.80	20.87	23.48	30.00	PASS
802.11ax HE20	144/5720	12.27	12.68	12.48	12.89	15.80	30.00	PASS
	149/5745	23.48	23.89	24.93	25.34	27.69	30.00	PASS
	157/5785	23.85	24.26	24.13	24.54	27.41	30.00	PASS
	165/5825	23.90	24.31	23.60	24.01	27.17	30.00	PASS
802.11ax HE40	142/5710	11.15	11.86	11.78	12.49	15.20	30.00	PASS
	151/5755	20.32	21.03	21.15	21.86	24.48	30.00	PASS
	159/5795	23.30	24.01	24.21	24.92	27.50	30.00	PASS
802.11ax HE80	138/5690	7.21	8.36	8.05	9.20	11.81	30.00	PASS
	155/5775	18.42	19.57	19.35	20.50	23.07	30.00	PASS

Note: 1. For Total Power, according to KDB 662911 D01 Multiple Transmitter Output v02r01 1),

The Total Power $=10\log(10^{(\text{Power antenna1 in dBm}/10)}+10^{(\text{Power antenna2 in dBm}/10)})$.

2. According to KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f)(ii): If antenna gains are not equal, the user may use either of the following methods to calculate Directional gain, provided that each transmit antenna is driven by only one spatial stream: Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

Directional gain = $G_{ANT\ MAX}$ + Array Gain,

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};

Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less, for 20-MHz channel widths with $N_{ANT} \geq 5$.

So Directional gain = $G_{ANT\ MAX}$ + Array Gain =3.92+0=3.92 dBi<6dBi. So the power limit is 30dBm

5.3. Frequency Stability

Ambient condition

Temperature	Relative humidity	Pressure
15°C ~ 35°C	20% ~ 80%	86 kPa ~ 106 kPa

Method of Measurement

1. Frequency stability with respect to ambient temperature

a) Supply the EUT with a nominal ac voltage or install a new or fully charged battery in the EUT. If possible, a dummy load shall be connected to the EUT because an antenna near the metallic walls of an environmental test chamber could affect the output frequency of the EUT. If the EUT is equipped with a permanently attached, adjustable-length antenna, then the EUT shall be placed in the center of the chamber with the antenna adjusted to the shortest length possible. Turn ON the EUT and tune it to one of the number of frequencies shown in 5.6.

b) Couple the unlicensed wireless device output to the measuring instrument by connecting an antenna to the measuring instrument with a suitable length of coaxial cable and placing the measuring antenna near the EUT (e.g., 15 cm away), or by connecting a dummy load to the measuring instrument, through an attenuator if necessary.

c) Adjust the location of the measurement antenna and the controls on the measurement instrument to obtain a suitable signal level (i.e., a level that will not overload the measurement instrument but is strong enough to allow measurement of the operating or fundamental frequency of the EUT).

d) Turn the EUT OFF and place it inside the environmental temperature chamber. For devices that have oscillator heaters, energize only the heater circuit.

e) Set the temperature control on the chamber to the highest specified in the regulatory requirements for the type of device and allow the oscillator heater and the chamber temperature to stabilize.

f) While maintaining a constant temperature inside the environmental chamber, turn the EUT ON and record the operating frequency at startup, and at 2 minutes, 5 minutes, and 10 minutes after the EUT is energized. Four measurements in total are made.

g) Measure the frequency at each of frequencies specified in 5.6.

h) Switch OFF the EUT but do not switch OFF the oscillator heater.

i) Lower the chamber temperature by not more that 10°C, and allow the temperature inside the chamber to stabilize.

j) Repeat step f) through step i) down to the lowest specified temperature.

2. Frequency stability when varying supply voltage

Unless otherwise specified, these tests shall be made at ambient room temperature (+15°C to +25 °C). An antenna shall be connected to the antenna output terminals of the EUT if possible. If the EUT is equipped with or uses an adjustable-length antenna, then it shall be fully extended.

a) Supply the EUT with nominal voltage or install a new or fully charged battery in the EUT. Turn ON the EUT and couple its output to a frequency counter or other frequency-measuring instrument.

b) Tune the EUT to one of the number of frequencies required in 5.6. Adjust the location of the

measurement antenna and the controls on the measurement instrument to obtain a suitable signal level (i.e., a level that will not overload the measurement instrument but is strong enough to allow measurement of the operating or fundamental frequency of the EUT).
c) Measure the frequency at each of the frequencies specified in 5.6.
d) Repeat the above procedure at 85% and 115% of the nominal supply voltage.

Limit

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual.

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 2, U= 936Hz

Test Results

Voltage (V)	Temperature (°C)	U-NII-1 Test Results			
		5200MHz			
		1min	2min	5min	10min
12	-30	5200.006598	5200.002806	5199.998446	5199.996794
12	-20	5200.014374	5199.992998	5199.991044	5199.993921
12	-10	5200.024030	5199.990084	5199.989493	5199.990938
12	0	5200.004613	5199.991818	5199.990140	5199.986658
12	10	5199.997672	5199.990440	5199.984982	5199.982701
12	20	5199.989176	5199.988433	5199.983919	5199.979655
12	30	5199.988183	5199.986556	5199.982918	5199.977371
12	40	5199.984988	5199.984924	5199.973677	5199.972209
12	50	5199.976653	5199.977170	5199.967155	5199.967188
10	20	5199.972842	5199.970796	5199.959025	5199.965918
14	20	5199.968977	5199.961056	5199.954614	5199.965373
Max. ΔMHz		-0.031023	-0.038944	-0.045386	-0.034627
PPM		-5.965962	-7.489231	-8.728077	-6.659038

Voltage (V)	Temperature (°C)	U-NII-2A Test Results			
		5300MHz			
		1min	2min	5min	10min
12	-30	5299.990333	5299.983359	5299.978720	5299.978435
12	-20	5299.982060	5299.975906	5299.972563	5299.976228
12	-10	5299.977361	5299.966643	5299.969015	5299.969801
12	0	5299.973503	5299.965988	5299.970078	5299.966754
12	10	5299.964632	5299.957082	5299.960595	5299.964973
12	20	5299.962837	5299.949383	5299.954874	5299.956953
12	30	5299.961851	5299.939624	5299.945722	5299.949138
12	40	5299.957101	5299.933785	5299.938919	5299.940055
12	50	5299.954138	5299.931383	5299.932781	5299.931161
10	20	5299.944644	5299.926390	5299.923625	5299.929241
14	20	5299.940530	5299.923311	5299.917967	5299.928389
Max. ΔMHz		-0.059470	-0.076689	-0.082033	-0.071611
PPM		-11.220755	-14.469623	-15.477925	-13.511509

Voltage (V)	Temperature (°C)	U-NII-2C Test Results			
		5580MHz			
		1min	2min	5min	10min
12	-30	5580.000557	5579.999013	5579.990747	5579.987452
12	-20	5579.992154	5579.989202	5579.986704	5579.981392
12	-10	5579.990831	5579.986983	5579.979749	5579.974223
12	0	5579.984434	5579.984433	5579.979309	5579.975826
12	10	5579.981937	5579.983518	5579.972916	5579.968232
12	20	5579.981715	5579.976380	5579.969288	5579.959999
12	30	5579.976890	5579.971157	5579.960251	5579.955502
12	40	5579.969217	5579.970593	5579.959450	5579.948206
12	50	5579.963338	5579.965205	5579.951303	5579.938877
10	20	5579.957201	5579.964821	5579.949897	5579.929506
14	20	5579.950393	5579.957183	5579.947835	5579.927743
Max. ΔMHz		-0.049607	-0.042817	-0.052165	-0.072257
PPM		-8.890143	-7.673297	-9.348566	-12.949283

Voltage (V)	Temperature (°C)	U-NII-3 Test Results			
		5785MHz			
		1min	2min	5min	10min
12	-30	5784.993972	5784.987091	5784.986063	5784.982990
12	-20	5784.991361	5784.979828	5784.980511	5784.981902
12	-10	5784.986598	5784.978447	5784.977939	5784.975387
12	0	5784.990399	5784.978619	5784.971360	5784.981725
12	10	5784.985494	5784.977920	5784.965890	5784.979423
12	20	5784.978819	5784.972929	5784.964000	5784.979117
12	30	5784.969803	5784.970745	5784.962474	5784.977122
12	40	5784.963411	5784.966068	5784.958476	5784.971422
12	50	5784.963167	5784.962096	5784.950169	5784.963428
10	20	5784.960716	5784.959819	5784.941160	5784.955626
14	20	5784.954748	5784.958732	5784.934879	5784.952677
Max. ΔMHz		-0.045252	-0.041268	-0.065121	-0.047323
PPM		-7.822299	-7.133621	-11.256871	-8.180294

5.4. Power Spectral Density

Ambient condition

Temperature	Relative humidity	Pressure
15°C ~ 35°C	20% ~ 80%	86 kPa ~ 106 kPa

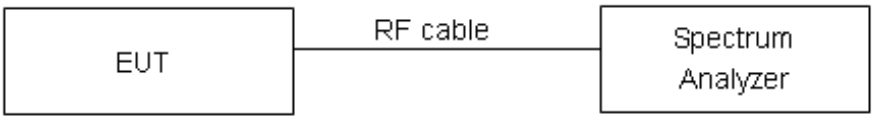
Method of Measurement

The EUT was connected to the spectrum analyzer through an external attenuator (20dB) and a known loss cable.

Set RBW = 1MHz, VBW =3MHz for the band 5.150-5.250GHz, 5.250-5.350GHz, 5.470-5.725GHz.
Set RBW = 470kHz, VBW =1.5MHz for the band 5.725-5.850GHz

The conducted PSD is measured at each antenna port. The measured results at the various antenna ports are then summed mathematically.

Test setup



Limits

Rule FCC Part 15.407(a)(1)/ FCC Part 15.407(a)(2) / FCC Part 15.407(a)(3)
For an indoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500kHz band. If transmittingantennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the

amount in dB that the directional gain of the antenna exceeds 6 dBi.

Frequency Bands/GHz	Limits
5.15-5.25	17/MHz
5.25-5.35 and 5.47-5.725	11dBm/MHz
5.725-5.85	30dBm/500kHz

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 2, U= 0.75dB.

Test Results:

AOT

MIMO

U-NII-1

Mode	Channel/ Frequency (MHz)	Power Spectral Density					Limit (dBm /MHz)	Conclusion
		Antenna 1		Antenna 2		Total PSD (dBm/MHz)		
		Read Value (dBm/MHz)	PSD (dBm/MHz)	Read Value (dBm/MHz)	PSD (dBm/MHz)			
802.11a	36/5180	9.47	9.63	10.36	10.52	13.11	17.00	PASS
	40/5200	12.94	13.10	13.84	14.00	16.58	17.00	PASS
	48/5240	12.99	13.15	13.77	13.93	16.57	17.00	PASS
802.11n HT20	36/5180	10.06	10.23	11.14	11.31	13.81	17.00	PASS
	40/5200	13.11	13.28	13.96	14.13	16.74	17.00	PASS
	48/5240	13.26	13.43	13.76	13.93	16.69	17.00	PASS
802.11n HT40	38/5190	3.62	3.96	4.21	4.55	7.28	17.00	PASS
	46/5230	10.32	10.66	10.98	11.32	14.01	17.00	PASS
802.11ac VHT20	36/5180	10.04	10.37	10.79	11.12	13.77	17.00	PASS
	40/5200	13.02	13.35	13.81	14.14	16.77	17.00	PASS
	48/5240	12.94	13.27	13.74	14.07	16.70	17.00	PASS
802.11ac VHT40	38/5190	3.67	4.30	4.62	5.25	7.81	17.00	PASS
	46/5230	11.32	11.95	10.96	11.59	14.78	17.00	PASS
802.11ac VHT80	42/5210	0.16	1.23	1.29	2.36	4.84	17.00	PASS
802.11ax HE20	36/5180	9.86	10.27	10.69	11.10	13.72	17.00	PASS
	40/5200	13.47	13.88	13.67	14.08	16.99	17.00	PASS
	48/5240	13.29	13.70	13.79	14.20	16.97	17.00	PASS
802.11ax HE40	38/5190	3.41	4.12	4.32	5.03	7.61	17.00	PASS
	46/5230	11.26	11.97	10.59	11.30	14.66	17.00	PASS
802.11ax HE80	42/5210	0.08	1.23	0.68	1.83	4.55	17.00	PASS

Note: 1. Power Spectral Density =Read Value+Duty cycle correction factor

2. According to KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f)(ii): If antenna gains are not equal, the user may use either of the following methods to calculate Directional gain, provided that each transmit antenna is driven by only one spatial stream: Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

Directional gain = $G_{ANT\ MAX}$ + Array Gain, For PSD measurements on all devices, Array Gain=10log(Nant/Nss)dB,

So Directional gain = $G_{ANT\ MAX}$ + Array Gain =5.35+0=5.35 dBi<6dBi. So the PSD limit is 17dBm

U-NII-2A

Mode	Channel /Frequency (MHz)	Power Spectral Density					Limit (dBm /MHz)	Conclusion
		Antenna 1		Antenna 2		Total PSD (dBm/MHz)		
		Read Value (dBm/MHz)	PSD (dBm/MHz)	Read Value (dBm/MHz)	PSD (dBm/MHz)			
802.11a	52/5260	7.54	7.70	7.96	8.12	10.93	11.00	PASS
	60/5300	7.56	7.72	7.83	7.99	10.87	11.00	PASS
	64/5320	7.53	7.69	8.02	8.18	10.95	11.00	PASS
802.11n HT20	52/5260	7.51	7.68	7.99	8.16	10.94	11.00	PASS
	60/5300	7.43	7.60	8.01	8.18	10.91	11.00	PASS
	64/5320	7.27	7.44	7.84	8.01	10.74	11.00	PASS
802.11n HT40	54/5270	6.75	7.09	6.97	7.31	10.21	11.00	PASS
	62/5310	3.38	3.72	3.85	4.19	6.97	11.00	PASS
802.11ac VHT20	52/5260	7.36	7.69	7.82	8.15	10.93	11.00	PASS
	60/5300	7.41	7.74	7.87	8.20	10.98	11.00	PASS
	64/5320	7.05	7.38	7.67	8.00	10.71	11.00	PASS
802.11ac VHT40	54/5270	6.51	7.14	6.83	7.46	10.31	11.00	PASS
	62/5310	3.10	3.73	3.66	4.29	7.03	11.00	PASS
802.11ac VHT80	58/5290	1.36	2.43	1.89	2.96	5.71	11.00	PASS
802.11ac VHT160	50/5250	-3.45	-1.86	-2.87	-1.28	1.45	11.00	PASS
802.11ax HE20	52/5260	7.07	7.48	7.91	8.32	10.93	11.00	PASS
	60/5300	7.34	7.75	7.62	8.03	10.90	11.00	PASS
	64/5320	7.11	7.52	7.75	8.16	10.86	11.00	PASS
802.11ax HE40	54/5270	6.35	7.06	6.37	7.08	10.08	11.00	PASS
	62/5310	3.72	4.43	4.08	4.79	7.62	11.00	PASS
802.11ax HE80	58/5290	1.40	2.55	1.95	3.10	5.84	11.00	PASS
802.11ax HE160	50/5250	-4.11	-2.51	-3.45	-1.85	0.84	11.00	PASS

Note: 1. Power Spectral Density =Read Value+Duty cycle correction factor

2. According to KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f)(ii): If antenna gains are not equal, the user may use either of the following methods to calculate Directional gain, provided that each transmit antenna is driven by only one spatial stream: Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

Directional gain = $G_{ANT\ MAX}$ + Array Gain, For PSD measurements on all devices, Array Gain=10log(Nant/Nss)dB,

So Directional gain = $G_{ANT\ MAX}$ + Array Gain =5.35+0=5.35 dBi<6dBi. So the PSD limit is 11dBm

U-NII-2C

Mode	Channel /Frequency (MHz)	Power Spectral Density					Limit (dBm /MHz)	Conclusion
		Antenna 1		Antenna 2		Total PSD (dBm/MHz)		
		Read Value (dBm/MHz)	PSD (dBm/MHz)	Read Value (dBm/MHz)	PSD (dBm/MHz)			
802.11a	100/5500	6.67	6.83	7.18	7.34	10.10	11.00	PASS
	120/5600	7.35	7.51	7.97	8.13	10.84	11.00	PASS
	140/5700	6.76	6.92	7.66	7.82	10.40	11.00	PASS
	144/5720	7.35	7.51	8.15	8.31	10.94	11.00	PASS
802.11n HT20	100/5500	7.52	7.69	7.91	8.08	10.90	11.00	PASS
	120/5600	7.04	7.21	7.86	8.03	10.65	11.00	PASS
	140/5700	7.39	7.56	8.18	8.35	10.98	11.00	PASS
	144/5720	7.08	7.25	7.98	8.15	10.73	11.00	PASS
802.11n HT40	102/5510	3.11	3.45	2.67	3.01	6.25	11.00	PASS
	118/5590	6.78	7.12	7.14	7.48	10.31	11.00	PASS
	134/5670	5.01	5.35	5.23	5.57	8.47	11.00	PASS
	142/5710	6.73	7.07	7.48	7.82	10.47	11.00	PASS
802.11ac VHT20	100/5500	7.39	7.72	7.60	7.93	10.84	11.00	PASS
	120/5600	6.94	7.27	7.89	8.22	10.78	11.00	PASS
	140/5700	7.25	7.58	7.99	8.32	10.98	11.00	PASS
	144/5720	6.93	7.26	7.85	8.18	10.75	11.00	PASS
802.11ac VHT40	102/5510	3.07	3.70	2.62	3.25	6.49	11.00	PASS
	118/5590	6.56	7.19	6.91	7.54	10.38	11.00	PASS
	134/5670	4.86	5.49	4.99	5.62	8.57	11.00	PASS
	142/5710	6.60	7.23	7.31	7.94	10.61	11.00	PASS
802.11ac VHT80	106/5530	0.65	1.72	0.44	1.51	4.63	11.00	PASS
	122/5610	3.23	4.30	3.29	4.36	7.34	11.00	PASS
	138/5690	2.91	3.98	3.63	4.70	7.36	11.00	PASS
802.11ac VHT160	114/5570	-5.27	-3.68	-5.46	-3.87	-0.76	11.00	PASS
802.11ax HE20	100/5500	7.33	7.74	7.70	8.11	10.94	11.00	PASS
	120/5600	7.31	7.72	7.82	8.23	10.99	11.00	PASS
	140/5700	5.17	5.58	5.91	6.32	8.98	11.00	PASS
	144/5720	7.26	7.67	7.66	8.07	10.88	11.00	PASS
802.11ax HE40	102/5510	2.51	3.22	2.16	2.87	6.06	11.00	PASS
	118/5590	6.50	7.21	6.49	7.20	10.22	11.00	PASS
	134/5670	3.41	4.12	3.24	3.95	7.05	11.00	PASS
	142/5710	6.30	7.01	6.93	7.64	10.35	11.00	PASS
802.11ax HE80	106/5530	-0.72	0.43	-0.85	0.30	3.38	11.00	PASS
	122/5610	2.84	3.99	3.35	4.50	7.26	11.00	PASS

	138/5690	2.70	3.85	3.50	4.65	7.28	11.00	PASS
802.11ax HE160	114/5570	-3.53	-1.93	-3.65	-2.05	1.02	11.00	PASS

Note: 1. Power Spectral Density =Read Value+Duty cycle correction factor

2. According to KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f)(ii): If antenna gains are not equal, the user may use either of the following methods to calculate Directional gain, provided that each transmit antenna is driven by only one spatial stream: Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

Directional gain = $G_{ANT\ MAX}$ + Array Gain, For PSD measurements on all devices, Array Gain=10log(Nant/Nss)dB,

So Directional gain = $G_{ANT\ MAX}$ + Array Gain =5.94+0=5.94 dBi<6dBi. So the PSD limit is 11dBm

U-NII-3

Mode	Channel/ Frequency (MHz)	Power Spectral Density					Limit (dBm/ 500kHz)	Conclusion
		Antenna 1		Antenna 2		Total Power (dBm/500kHz)		
		Read Value (dBm/470kHz)	PSD (dBm/500kHz)	Read Value (dBm470kHz)	PSD (dBm/500kHz)			
802.11a	144/5720	5.08	5.51	5.54	5.97	8.76	30.00	PASS
	149/5745	10.77	11.20	11.64	12.07	14.67	30.00	PASS
	157/5785	10.26	10.69	10.91	11.34	14.04	30.00	PASS
	165/5825	10.50	10.93	10.55	10.98	13.96	30.00	PASS
802.11n HT20	144/5720	4.36	4.80	4.53	4.97	7.89	30.00	PASS
	149/5745	10.36	10.80	11.77	12.21	14.57	30.00	PASS
	157/5785	10.18	10.62	11.65	12.09	14.43	30.00	PASS
	165/5825	10.18	10.62	10.37	10.81	13.73	30.00	PASS
802.11n HT40	142/5710	3.04	3.65	3.58	4.19	6.94	30.00	PASS
	151/5755	7.04	7.65	8.49	9.10	11.44	30.00	PASS
	159/5795	7.22	7.83	7.54	8.15	11.00	30.00	PASS
802.11ac VHT20	144/5720	4.66	5.26	4.63	5.23	8.25	30.00	PASS
	149/5745	9.81	10.41	10.95	11.55	14.03	30.00	PASS
	157/5785	9.89	10.49	10.60	11.20	13.87	30.00	PASS
	165/5825	10.42	11.02	10.37	10.97	14.00	30.00	PASS
802.11ac VHT40	142/5710	2.96	3.86	3.41	4.31	7.10	30.00	PASS
	151/5755	7.05	7.95	7.99	8.89	11.45	30.00	PASS
	159/5795	6.76	7.66	7.42	8.32	11.01	30.00	PASS
802.11ac VHT80	138/5690	0.42	1.76	0.92	2.26	5.03	30.00	PASS
	155/5775	0.25	1.59	1.33	2.67	5.17	30.00	PASS
802.11ax HE20	144/5720	4.48	5.16	4.43	5.11	8.14	30.00	PASS
	149/5745	9.54	10.22	10.78	11.46	13.89	30.00	PASS
	157/5785	9.64	10.32	10.09	10.77	13.56	30.00	PASS
	165/5825	9.82	10.50	9.62	10.30	13.41	30.00	PASS
802.11ax HE40	142/5710	3.76	4.74	3.99	4.97	7.87	30.00	PASS
	151/5755	3.21	4.19	4.00	4.98	7.61	30.00	PASS
	159/5795	6.99	7.97	7.52	8.50	11.25	30.00	PASS
802.11ax HE80	138/5690	-0.10	1.32	0.58	2.00	4.68	30.00	PASS
	155/5775	-1.30	0.12	-0.39	1.03	3.61	30.00	PASS

Note: 1. Power Spectral Density =Read Value+Duty cycle correction factor +10*log (500/510).

2. According to KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f)(ii): If antenna gains are not equal, the user may use either of the following methods to calculate Directional gain, provided that each transmit antenna is driven by only one spatial stream: Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

Directional gain = $G_{ANT\ MAX}$ + Array Gain, For PSD measurements on all devices, Array Gain=10log(Nant/Nss)dB,

So Directional gain = $G_{ANT\ MAX}$ + Array Gain =5.83+0=5.83 dBi<6dBi. So the PSD limit is 30dBm

Beamforming

U-NII-1

Mode	Channel/ Frequency (MHz)	Power Spectral Density					Limit (dBm /MHz)	Conclusion
		Antenna 1		Antenna 2		Total PSD (dBm/MHz)		
		Read Value (dBm/MHz)	PSD (dBm/MHz)	Read Value (dBm/MHz)	PSD (dBm/MHz)			
802.11n HT20	36/5180	10.07	10.24	10.69	10.86	13.57	17.00	PASS
	40/5200	12.64	12.81	13.40	13.57	16.22	17.00	PASS
	48/5240	12.96	13.13	13.85	14.02	16.61	17.00	PASS
802.11n HT40	38/5190	3.54	3.88	4.16	4.50	7.21	17.00	PASS
	46/5230	10.63	10.97	10.49	10.83	13.91	17.00	PASS
802.11ac VHT20	36/5180	9.94	10.27	10.46	10.79	13.55	17.00	PASS
	40/5200	12.69	13.02	13.29	13.62	16.34	17.00	PASS
	48/5240	12.77	13.10	13.47	13.80	16.47	17.00	PASS
802.11ac VHT40	38/5190	3.43	4.06	4.02	4.65	7.38	17.00	PASS
	46/5230	10.42	11.05	10.49	11.12	14.10	17.00	PASS
802.11ac VHT80	42/5210	-0.06	1.01	0.65	1.72	4.39	17.00	PASS
802.11ax HE20	36/5180	9.80	10.21	10.71	11.12	13.70	17.00	PASS
	40/5200	13.16	13.57	13.77	14.18	16.90	17.00	PASS
	48/5240	13.00	13.41	13.84	14.25	16.86	17.00	PASS
802.11ax HE40	38/5190	3.51	4.22	3.78	4.49	7.37	17.00	PASS
	46/5230	10.47	11.18	10.43	11.14	14.17	17.00	PASS
802.11ax HE80	42/5210	0.24	1.39	0.73	1.88	4.65	17.00	PASS

Note: 1. Power Spectral Density =Read Value+Duty cycle correction factor

2. According to KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f)(ii): If antenna gains are not equal, the user may use either of the following methods to calculate Directional gain, provided that each transmit antenna is driven by only one spatial stream: Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

Directional gain = $G_{ANT\ MAX}$ + Array Gain, For PSD measurements on all devices, Array Gain=10log(Nant/Nss)dB,

So Directional gain = $G_{ANT\ MAX}$ + Array Gain =5.35+0=5.35 dBi<6dBi. So the PSD limit is 17dBm

U-NII-2A

Mode	Channel /Frequency (MHz)	Power Spectral Density					Limit (dBm /MHz)	Conclusion
		Antenna 1		Antenna 2		Total PSD (dBm/MHz)		
		Read Value (dBm/MHz)	PSD (dBm/MHz)	Read Value (dBm/MHz)	PSD (dBm/MHz)			
802.11n HT20	52/5260	7.21	7.38	7.34	7.51	10.46	11.00	PASS
	60/5300	7.45	7.62	7.56	7.73	10.69	11.00	PASS
	64/5320	7.36	7.53	8.08	8.25	10.92	11.00	PASS
802.11n HT40	54/5270	6.06	6.40	6.03	6.37	9.40	11.00	PASS
	62/5310	2.40	2.74	2.69	3.03	5.90	11.00	PASS
802.11ac VHT20	52/5260	6.84	7.17	7.70	8.03	10.63	11.00	PASS
	60/5300	7.04	7.37	7.56	7.89	10.65	11.00	PASS
	64/5320	6.66	6.99	7.48	7.81	10.43	11.00	PASS
802.11ac VHT40	54/5270	6.12	6.75	6.19	6.82	9.80	11.00	PASS
	62/5310	2.39	3.02	2.84	3.47	6.26	11.00	PASS
802.11ac VHT80	58/5290	1.17	2.24	1.16	2.23	5.25	11.00	PASS
802.11ac VHT160	50/5250	-3.75	-2.16	-3.65	-2.06	0.90	11.00	PASS
802.11ax HE20	52/5260	6.82	7.23	7.13	7.54	10.40	11.00	PASS
	60/5300	7.12	7.53	7.25	7.66	10.61	11.00	PASS
	64/5320	7.06	7.47	7.39	7.80	10.65	11.00	PASS
802.11ax HE40	54/5270	5.77	6.48	6.23	6.94	9.73	11.00	PASS
	62/5310	3.35	4.06	3.78	4.49	7.29	11.00	PASS
802.11ax HE80	58/5290	1.46	2.61	1.80	2.95	5.79	11.00	PASS
802.11ax HE160	50/5250	-4.28	-2.68	-4.13	-2.53	0.41	11.00	PASS

Note: 1. Power Spectral Density =Read Value+Duty cycle correction factor

2. According to KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f)(ii): If antenna gains are not equal, the user may use either of the following methods to calculate Directional gain, provided that each transmit antenna is driven by only one spatial stream: Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

Directional gain = $G_{ANT\ MAX}$ + Array Gain, For PSD measurements on all devices, Array Gain=10log(Nant/Nss)dB,

So Directional gain = $G_{ANT\ MAX}$ + Array Gain =5.35+0=5.35 dBi<6dBi. So the PSD limit is 11dBm

U-NII-2C

Mode	Channel /Frequency (MHz)	Power Spectral Density					Limit (dBm /MHz)	Conclusion
		Antenna 1		Antenna 2		Total PSD (dBm/MHz)		
		Read Value (dBm/MHz)	PSD (dBm/MHz)	Read Value (dBm/MHz)	PSD (dBm/MHz)			
802.11n HT20	100/5500	5.96	6.13	6.24	6.41	9.28	11.00	PASS
	120/5600	6.48	6.65	7.20	7.37	10.04	11.00	PASS
	140/5700	6.54	6.71	7.61	7.78	10.29	11.00	PASS
	144/5720	6.14	6.31	7.22	7.39	9.89	11.00	PASS
802.11n HT40	102/5510	1.89	2.23	2.12	2.46	5.36	11.00	PASS
	118/5590	6.63	6.97	6.96	7.30	10.15	11.00	PASS
	134/5670	4.98	5.32	5.35	5.69	8.52	11.00	PASS
	142/5710	5.53	5.87	6.65	6.99	9.48	11.00	PASS
802.11ac VHT20	100/5500	5.89	6.22	6.18	6.51	9.38	11.00	PASS
	120/5600	6.40	6.73	6.90	7.23	10.00	11.00	PASS
	140/5700	6.28	6.61	7.35	7.68	10.19	11.00	PASS
	144/5720	6.18	6.51	7.30	7.63	10.12	11.00	PASS
802.11ac VHT40	102/5510	2.80	3.43	3.08	3.71	6.58	11.00	PASS
	118/5590	6.36	6.99	6.39	7.02	10.02	11.00	PASS
	134/5670	5.18	5.81	5.91	6.54	9.20	11.00	PASS
	142/5710	5.66	6.29	6.65	7.28	9.82	11.00	PASS
802.11ac VHT80	106/5530	0.04	1.11	1.14	2.21	4.71	11.00	PASS
	122/5610	2.36	3.43	3.21	4.28	6.89	11.00	PASS
	138/5690	2.37	3.44	3.23	4.30	6.90	11.00	PASS
802.11ac VHT160	114/5570	-5.81	-4.22	-5.40	-3.81	-1.00	11.00	PASS
802.11ax HE20	100/5500	6.95	7.36	7.08	7.49	10.44	11.00	PASS
	120/5600	7.31	7.72	7.82	8.23	10.99	11.00	PASS
	140/5700	5.14	5.55	6.10	6.51	9.07	11.00	PASS
	144/5720	6.30	6.71	7.54	7.95	10.38	11.00	PASS
802.11ax HE40	102/5510	1.88	2.59	2.11	2.82	5.72	11.00	PASS
	118/5590	6.50	7.21	6.49	7.20	10.22	11.00	PASS
	134/5670	2.89	3.60	3.30	4.01	6.82	11.00	PASS
	142/5710	5.52	6.23	6.55	7.26	9.79	11.00	PASS
802.11ax HE80	106/5530	-1.46	-0.31	-1.56	-0.41	2.65	11.00	PASS
	122/5610	2.27	3.42	2.53	3.68	6.56	11.00	PASS
	138/5690	2.59	3.74	3.19	4.34	7.06	11.00	PASS
802.11ax HE160	114/5570	-5.60	-4.00	-5.85	-4.25	-1.11	11.00	PASS

Note: 1. Power Spectral Density =Read Value+Duty cycle correction factor

2. According to KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f)(ii): If antenna gains are not equal, the user

may use either of the following methods to calculate Directional gain, provided that each transmit antenna is driven by only one spatial stream: Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

Directional gain = $G_{ANT\ MAX}$ + Array Gain, For PSD measurements on all devices, Array Gain=10log(Nant/Nss)dB,

So Directional gain = $G_{ANT\ MAX}$ + Array Gain =5.94+0=5.94 dBi<6dBi. So the PSD limit is 11dBm

U-NII-3

Mode	Channel/ Frequency (MHz)	Power Spectral Density					Limit (dBm/ 500kHz)	Conclusion
		Antenna 1		Antenna 2		Total Power (dBm/500kHz)		
		Read Value (dBm/470kHz)	PSD (dBm/500kHz)	Read Value (dBm470kHz)	PSD (dBm/500kHz)			
802.11n HT20	144/5720	2.82	3.26	3.38	3.82	6.56	30.00	PASS
	149/5745	8.70	9.14	10.18	10.62	12.95	30.00	PASS
	157/5785	9.08	9.52	9.40	9.84	12.69	30.00	PASS
	165/5825	9.31	9.75	9.20	9.64	12.70	30.00	PASS
802.11n HT40	142/5710	0.74	1.35	2.42	3.03	5.28	30.00	PASS
	151/5755	5.36	5.97	6.75	7.36	9.73	30.00	PASS
	159/5795	5.59	6.20	6.66	7.27	9.78	30.00	PASS
802.11ac VHT20	144/5720	2.76	3.36	3.48	4.08	6.74	30.00	PASS
	149/5745	8.60	9.20	10.15	10.75	13.05	30.00	PASS
	157/5785	8.78	9.38	9.52	10.12	12.77	30.00	PASS
	165/5825	8.97	9.57	8.97	9.57	12.58	30.00	PASS
802.11ac VHT40	142/5710	1.77	2.67	2.22	3.12	5.91	30.00	PASS
	151/5755	5.64	6.54	6.63	7.53	10.07	30.00	PASS
	159/5795	5.92	6.82	6.16	7.06	9.95	30.00	PASS
802.11ac VHT80	138/5690	-1.62	-0.28	-0.19	1.15	3.50	30.00	PASS
	155/5775	0.20	1.54	1.72	3.06	5.38	30.00	PASS
802.11ax HE20	144/5720	2.65	3.33	3.73	4.41	6.91	30.00	PASS
	149/5745	8.04	8.72	10.23	10.91	12.96	30.00	PASS
	157/5785	8.75	9.43	9.45	10.13	12.80	30.00	PASS
	165/5825	8.57	9.25	8.77	9.45	12.36	30.00	PASS
802.11ax HE40	142/5710	1.90	2.88	2.78	3.76	6.35	30.00	PASS
	151/5755	2.99	3.97	4.06	5.04	7.55	30.00	PASS
	159/5795	5.75	6.73	6.08	7.06	9.91	30.00	PASS
802.11ax HE80	138/5690	-1.91	-0.49	-0.22	1.20	3.45	30.00	PASS
	155/5775	-1.35	0.07	-0.36	1.06	3.60	30.00	PASS

Note: 1. Power Spectral Density =Read Value+Duty cycle correction factor +10*log(500/470).

2. According to KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f)(ii): If antenna gains are not equal, the user may use either of the following methods to calculate Directional gain, provided that each transmit antenna is driven by only one spatial stream: Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

Directional gain = $G_{ANT\ MAX}$ + Array Gain, For PSD measurements on all devices, Array Gain=10log(Nant/Nss)dB,

So Directional gain = $G_{ANT\ MAX}$ + Array Gain =5.83+0=5.83 dBi<6dBi. So the PSD limit is 30dBm

INPAQ

MIMO

U-NII-1

Mode	Channel/ Frequency (MHz)	Power Spectral Density					Limit (dBm /MHz)	Conclusion
		Antenna 1		Antenna 2		Total PSD (dBm/MHz)		
		Read Value (dBm/MHz)	PSD (dBm/MHz)	Read Value (dBm/MHz)	PSD (dBm/MHz)			
802.11a	36/5180	10.20	10.36	10.86	11.02	13.71	17.00	PASS
	40/5200	12.94	13.10	13.84	14.00	16.58	17.00	PASS
	48/5240	12.99	13.15	13.77	13.93	16.57	17.00	PASS
802.11n HT20	36/5180	10.48	10.65	11.55	11.72	14.23	17.00	PASS
	40/5200	13.11	13.28	13.96	14.13	16.74	17.00	PASS
	48/5240	13.26	13.43	13.76	13.93	16.69	17.00	PASS
802.11n HT40	38/5190	2.86	3.20	3.27	3.61	6.42	17.00	PASS
	46/5230	10.32	10.66	10.98	11.32	14.01	17.00	PASS
802.11ac VHT20	36/5180	10.51	10.84	11.21	11.54	14.21	17.00	PASS
	40/5200	13.02	13.35	13.81	14.14	16.77	17.00	PASS
	48/5240	12.94	13.27	13.74	14.07	16.70	17.00	PASS
802.11ac VHT40	38/5190	2.69	3.32	3.44	4.07	6.72	17.00	PASS
	46/5230	11.32	11.95	10.96	11.59	14.78	17.00	PASS
802.11ac VHT80	42/5210	0.16	1.23	1.29	2.36	4.84	17.00	PASS
802.11ax HE20	36/5180	10.12	10.53	11.02	11.43	14.01	17.00	PASS
	40/5200	13.47	13.88	13.67	14.08	16.99	17.00	PASS
	48/5240	13.29	13.70	13.79	14.20	16.97	17.00	PASS
802.11ax HE40	38/5190	3.15	3.86	4.01	4.72	7.32	17.00	PASS
	46/5230	11.26	11.97	10.59	11.30	14.66	17.00	PASS
802.11ax HE80	42/5210	0.08	1.23	0.68	1.83	4.55	17.00	PASS

Note: 1. Power Spectral Density =Read Value+Duty cycle correction factor

2. According to KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f)(ii): If antenna gains are not equal, the user may use either of the following methods to calculate Directional gain, provided that each transmit antenna is driven by only one spatial stream: Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

Directional gain = $G_{ANT\ MAX}$ + Array Gain, For PSD measurements on all devices, Array Gain=10log(Nant/Nss)dB,

So Directional gain = $G_{ANT\ MAX}$ + Array Gain =4.69+0=4.69 dBi<6dBi. So the PSD limit is 17dBm

U-NII-2A

Mode	Channel /Frequency (MHz)	Power Spectral Density					Limit (dBm /MHz)	Conclusion
		Antenna 1		Antenna 2		Total PSD (dBm/MHz)		
		Read Value (dBm/MHz)	PSD (dBm/MHz)	Read Value (dBm/MHz)	PSD (dBm/MHz)			
802.11a	52/5260	7.54	7.70	7.96	8.12	10.93	11.00	PASS
	60/5300	7.56	7.72	7.83	7.99	10.87	11.00	PASS
	64/5320	7.53	7.69	8.02	8.18	10.95	11.00	PASS
802.11n HT20	52/5260	7.51	7.68	7.99	8.16	10.94	11.00	PASS
	60/5300	7.43	7.60	8.01	8.18	10.91	11.00	PASS
	64/5320	7.27	7.44	7.84	8.01	10.74	11.00	PASS
802.11n HT40	54/5270	6.75	7.09	6.97	7.31	10.21	11.00	PASS
	62/5310	3.98	4.32	3.88	4.22	7.28	11.00	PASS
802.11ac VHT20	52/5260	7.36	7.69	7.82	8.15	10.93	11.00	PASS
	60/5300	7.41	7.74	7.87	8.20	10.98	11.00	PASS
	64/5320	7.05	7.38	7.67	8.00	10.71	11.00	PASS
802.11ac VHT40	54/5270	6.51	7.14	6.83	7.46	10.31	11.00	PASS
	62/5310	3.81	4.44	4.27	4.90	7.69	11.00	PASS
802.11ac VHT80	58/5290	2.54	3.61	3.18	4.25	6.95	11.00	PASS
802.11ac VHT160	50/5250	-1.97	-0.38	-2.15	-0.56	2.54	11.00	PASS
802.11ax HE20	52/5260	7.07	7.48	7.91	8.32	10.93	11.00	PASS
	60/5300	7.34	7.75	7.62	8.03	10.90	11.00	PASS
	64/5320	7.11	7.52	7.75	8.16	10.86	11.00	PASS
802.11ax HE40	54/5270	6.35	7.06	6.37	7.08	10.08	11.00	PASS
	62/5310	3.72	4.43	4.08	4.79	7.62	11.00	PASS
802.11ax HE80	58/5290	1.26	2.41	1.26	2.41	5.42	11.00	PASS
802.11ax HE160	50/5250	-2.17	-0.57	-1.82	-0.22	2.62	11.00	PASS

Note: 1. Power Spectral Density =Read Value+Duty cycle correction factor

2. According to KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f)(ii): If antenna gains are not equal, the user may use either of the following methods to calculate Directional gain, provided that each transmit antenna is driven by only one spatial stream: Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

Directional gain = $G_{ANT\ MAX}$ + Array Gain, For PSD measurements on all devices, Array Gain=10log(Nant/Nss)dB,

So Directional gain = $G_{ANT\ MAX}$ + Array Gain =4.69+0=4.69 dBi<6dBi. So the PSD limit is 11dBm

U-NII-2C

Mode	Channel /Frequency (MHz)	Power Spectral Density					Limit (dBm /MHz)	Conclusion
		Antenna 1		Antenna 2		Total PSD (dBm/MHz)		
		Read Value (dBm/MHz)	PSD (dBm/MHz)	Read Value (dBm/MHz)	PSD (dBm/MHz)			
802.11a	100/5500	6.67	6.83	7.18	7.34	10.10	11.00	PASS
	120/5600	7.35	7.51	7.97	8.13	10.84	11.00	PASS
	140/5700	6.76	6.92	7.66	7.82	10.40	11.00	PASS
	144/5720	7.35	7.51	8.15	8.31	10.94	11.00	PASS
802.11n HT20	100/5500	7.52	7.69	7.91	8.08	10.90	11.00	PASS
	120/5600	7.04	7.21	7.86	8.03	10.65	11.00	PASS
	140/5700	7.39	7.56	8.18	8.35	10.98	11.00	PASS
	144/5720	7.08	7.25	7.98	8.15	10.73	11.00	PASS
802.11n HT40	102/5510	3.54	3.88	3.10	3.44	6.68	11.00	PASS
	118/5590	6.78	7.12	7.14	7.48	10.31	11.00	PASS
	134/5670	5.43	5.77	6.08	6.42	9.12	11.00	PASS
	142/5710	6.73	7.07	7.48	7.82	10.47	11.00	PASS
802.11ac VHT20	100/5500	7.39	7.72	7.60	7.93	10.84	11.00	PASS
	120/5600	6.94	7.27	7.89	8.22	10.78	11.00	PASS
	140/5700	7.25	7.58	7.99	8.32	10.98	11.00	PASS
	144/5720	6.93	7.26	7.85	8.18	10.75	11.00	PASS
802.11ac VHT40	102/5510	3.07	3.70	2.62	3.25	6.49	11.00	PASS
	118/5590	6.56	7.19	6.91	7.54	10.38	11.00	PASS
	134/5670	5.06	5.69	5.82	6.45	9.10	11.00	PASS
	142/5710	6.60	7.23	7.31	7.94	10.61	11.00	PASS
802.11ac VHT80	106/5530	-0.01	1.06	0.45	1.52	4.31	11.00	PASS
	122/5610	3.23	4.30	3.29	4.36	7.34	11.00	PASS
	138/5690	2.91	3.98	3.63	4.70	7.36	11.00	PASS
802.11ac VHT160	114/5570	-3.96	-2.37	-3.76	-2.17	0.74	11.00	PASS
802.11ax HE20	100/5500	7.33	7.74	7.70	8.11	10.94	11.00	PASS
	120/5600	7.31	7.72	7.82	8.23	10.99	11.00	PASS
	140/5700	6.66	7.07	7.56	7.97	10.55	11.00	PASS
	144/5720	7.26	7.67	7.66	8.07	10.88	11.00	PASS
802.11ax HE40	102/5510	3.40	4.11	3.36	4.07	7.10	11.00	PASS
	118/5590	6.50	7.21	6.49	7.20	10.22	11.00	PASS
	134/5670	4.05	4.76	4.74	5.45	8.13	11.00	PASS
	142/5710	6.30	7.01	6.93	7.64	10.35	11.00	PASS
802.11ax HE80	106/5530	-0.51	0.64	-0.39	0.76	3.71	11.00	PASS
	122/5610	2.84	3.99	3.35	4.50	7.26	11.00	PASS

	138/5690	2.70	3.85	3.50	4.65	7.28	11.00	PASS
802.11ax HE160	114/5570	-3.53	-1.93	-3.65	-2.05	1.02	11.00	PASS

Note: 1. Power Spectral Density =Read Value+Duty cycle correction factor

2. According to KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f)(ii): If antenna gains are not equal, the user may use either of the following methods to calculate Directional gain, provided that each transmit antenna is driven by only one spatial stream: Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

Directional gain = $G_{ANT\ MAX}$ + Array Gain, For PSD measurements on all devices, Array Gain=10log(Nant/Nss)dB,

So Directional gain = $G_{ANT\ MAX}$ + Array Gain =4.78+0=4.78 dBi<6dBi. So the PSD limit is 11dBm

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Mode	Channel/ Frequency (MHz)	Power Spectral Density					Limit (dBm/ 500kHz)	Conclusion
		Antenna 1		Antenna 2		Total Power (dBm/500kHz)		
		Read Value (dBm/470kHz)	PSD (dBm/500kHz)	Read Value (dBm470kHz)	PSD (dBm/500kHz)			
802.11a	144/5720	5.08	5.51	5.54	5.97	8.76	30.00	PASS
	149/5745	10.77	11.20	11.64	12.07	14.67	30.00	PASS
	157/5785	10.26	10.69	10.91	11.34	14.04	30.00	PASS
	165/5825	10.50	10.93	10.55	10.98	13.96	30.00	PASS
802.11n HT20	144/5720	4.36	4.80	4.53	4.97	7.89	30.00	PASS
	149/5745	10.36	10.80	11.77	12.21	14.57	30.00	PASS
	157/5785	10.18	10.62	11.65	12.09	14.43	30.00	PASS
	165/5825	10.18	10.62	10.37	10.81	13.73	30.00	PASS
802.11n HT40	142/5710	3.04	3.65	3.58	4.19	6.94	30.00	PASS
	151/5755	7.04	7.65	8.49	9.10	11.44	30.00	PASS
	159/5795	7.22	7.83	7.54	8.15	11.00	30.00	PASS
802.11ac VHT20	144/5720	4.66	5.26	4.63	5.23	8.25	30.00	PASS
	149/5745	9.81	10.41	10.95	11.55	14.03	30.00	PASS
	157/5785	9.89	10.49	10.60	11.20	13.87	30.00	PASS
	165/5825	10.42	11.02	10.37	10.97	14.00	30.00	PASS
802.11ac VHT40	142/5710	2.96	3.86	3.41	4.31	7.10	30.00	PASS
	151/5755	7.05	7.95	7.99	8.89	11.45	30.00	PASS
	159/5795	6.76	7.66	7.42	8.32	11.01	30.00	PASS
802.11ac VHT80	138/5690	0.42	1.76	0.92	2.26	5.03	30.00	PASS
	155/5775	-0.81	0.53	1.03	2.37	4.56	30.00	PASS
802.11ax HE20	144/5720	4.48	5.16	4.43	5.11	8.14	30.00	PASS
	149/5745	9.54	10.22	10.78	11.46	13.89	30.00	PASS
	157/5785	9.64	10.32	10.09	10.77	13.56	30.00	PASS
	165/5825	9.82	10.50	9.62	10.30	13.41	30.00	PASS
802.11ax HE40	142/5710	3.76	4.74	3.99	4.97	7.87	30.00	PASS
	151/5755	4.01	4.99	4.29	5.27	8.14	30.00	PASS
	159/5795	6.99	7.97	7.52	8.50	11.25	30.00	PASS
802.11ax HE80	138/5690	-0.10	1.32	0.58	2.00	4.68	30.00	PASS
	155/5775	-1.52	-0.10	-0.53	0.89	3.43	30.00	PASS

Note: 1. Power Spectral Density =Read Value+Duty cycle correction factor +10*log (500/510).

2. According to KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f)(ii): If antenna gains are not equal, the user may use either of the following methods to calculate Directional gain, provided that each transmit antenna is driven by only one spatial stream: Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

Directional gain = $G_{ANT\ MAX}$ + Array Gain, For PSD measurements on all devices, Array Gain=10log(Nant/Nss)dB,

So Directional gain = $G_{ANT\ MAX}$ + Array Gain =4.82+0=4.82 dBi<6dBi. So the PSD limit is 30dBm