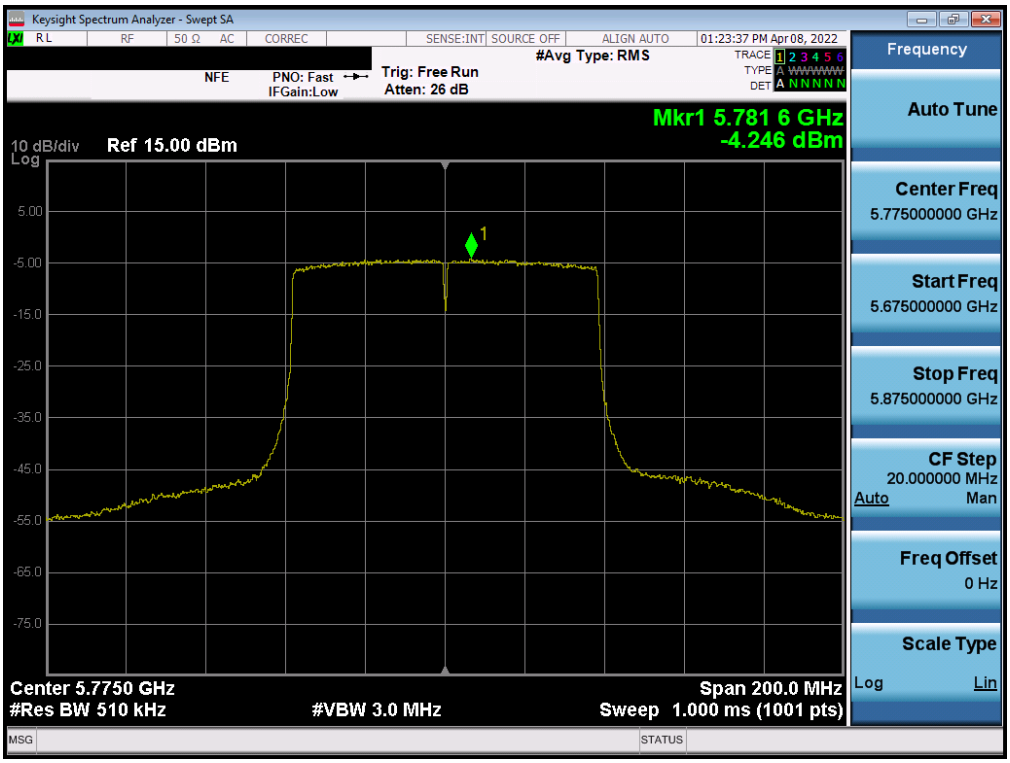
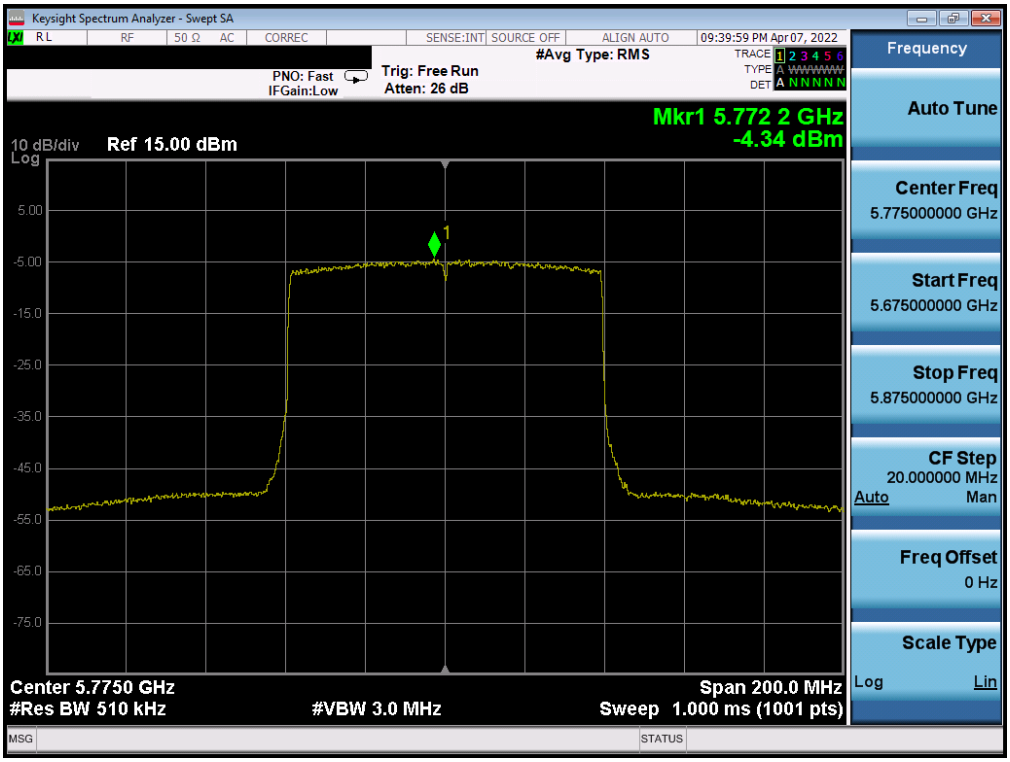


Plot 7-330. Power Spectral Density Plot MIMO ANT2 (80MHz BW 802.11ac (UNII Band 3) – Ch. 155)



Plot 7-331. Power Spectral Density Plot MIMO ANT2 (80MHz BW 802.11ax (UNII Band 3) – Ch. 155)

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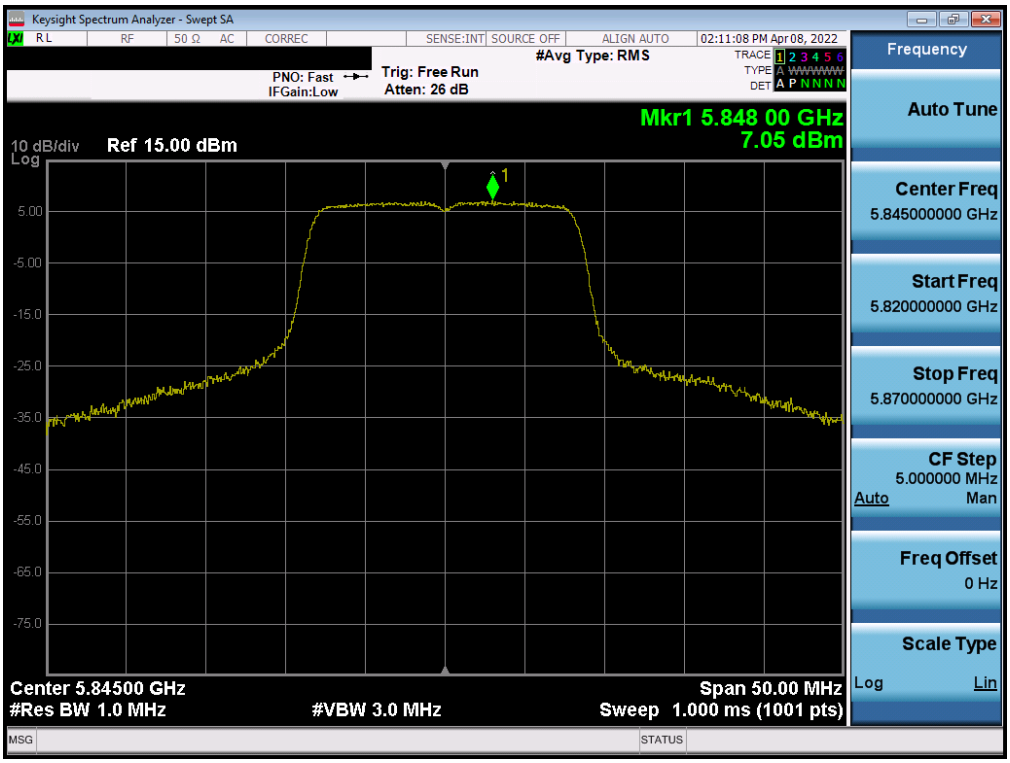
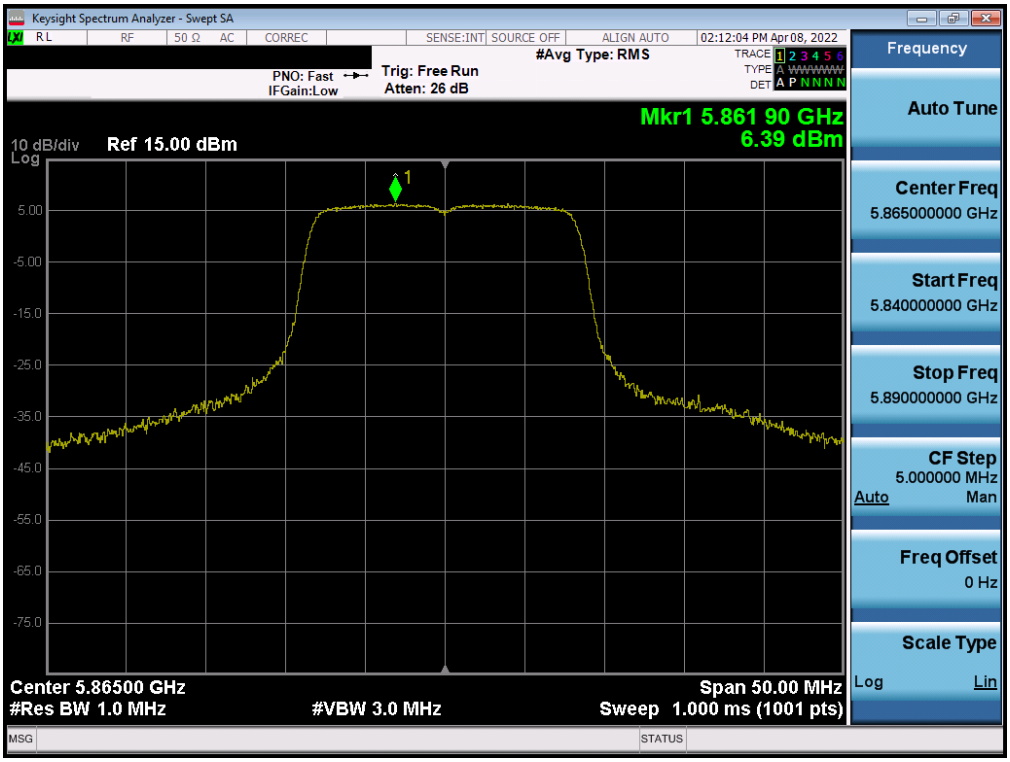


Plot 7-332. Power Spectral Density Plot MIMO ANT2 (802.11a (UNII Band 3/4) – Ch. 169)



Plot 7-333. Power Spectral Density Plot MIMO ANT2 (802.11a (UNII Band 4) – Ch. 173)

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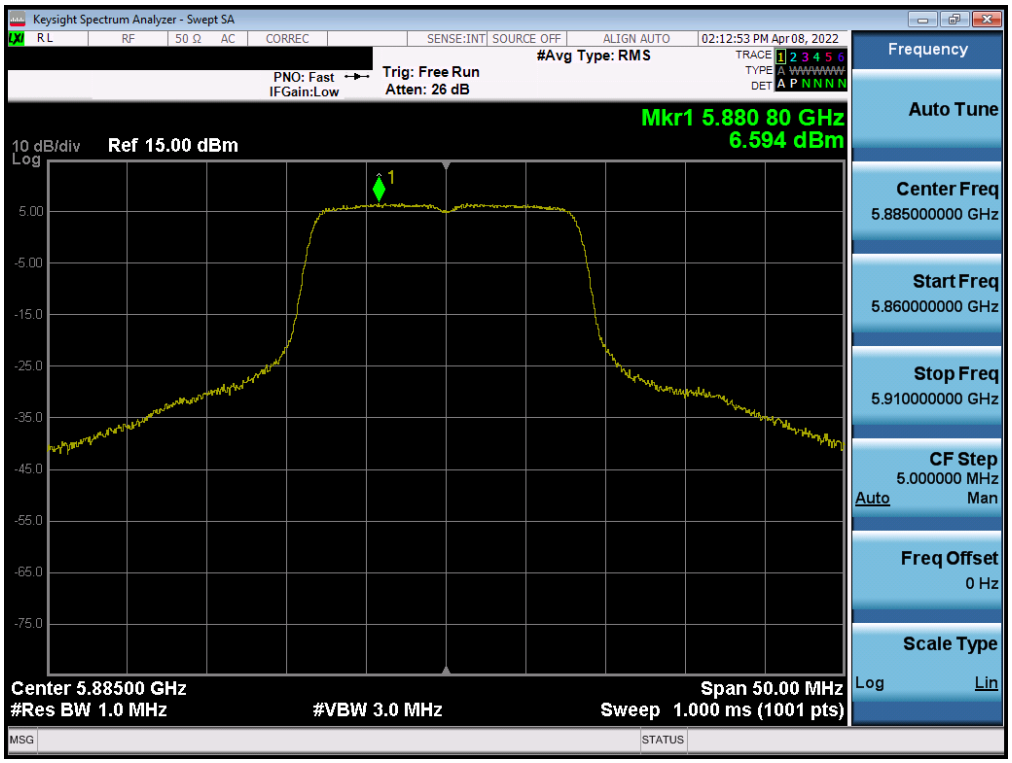
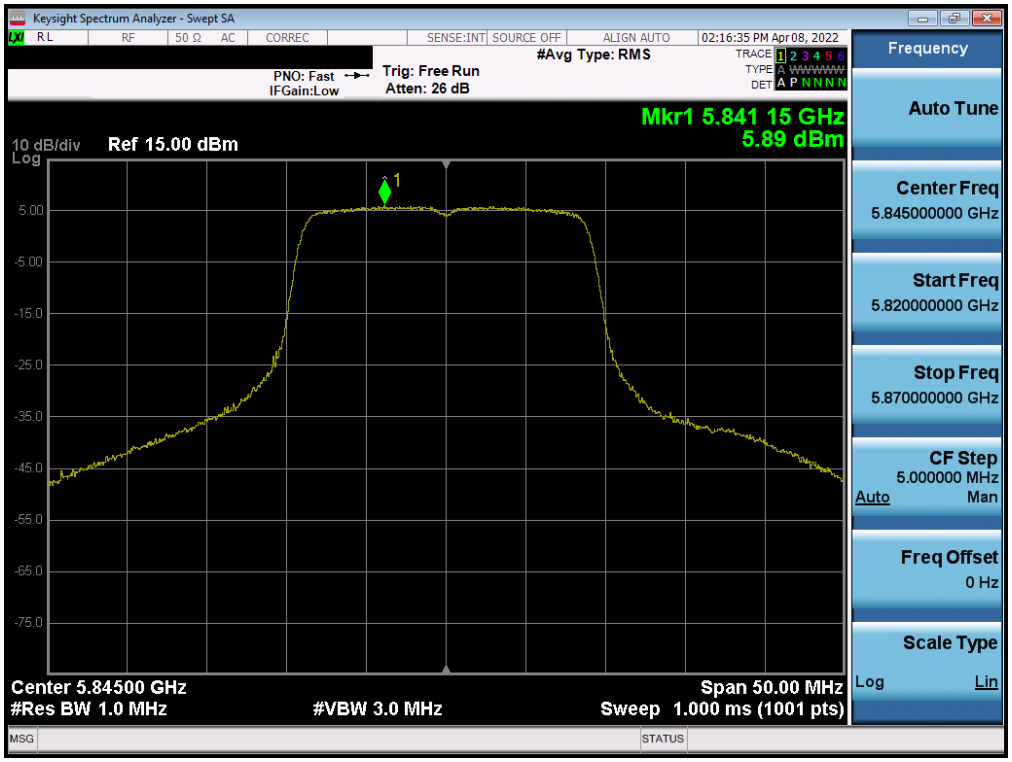


Plot 7-334. Power Spectral Density Plot MIMO ANT2 (802.11a (UNII Band 4) – Ch. 177)



Plot 7-335. Power Spectral Density Plot MIMO ANT2 (20MHz BW 802.11n (UNII Band 3/4) – Ch. 169)

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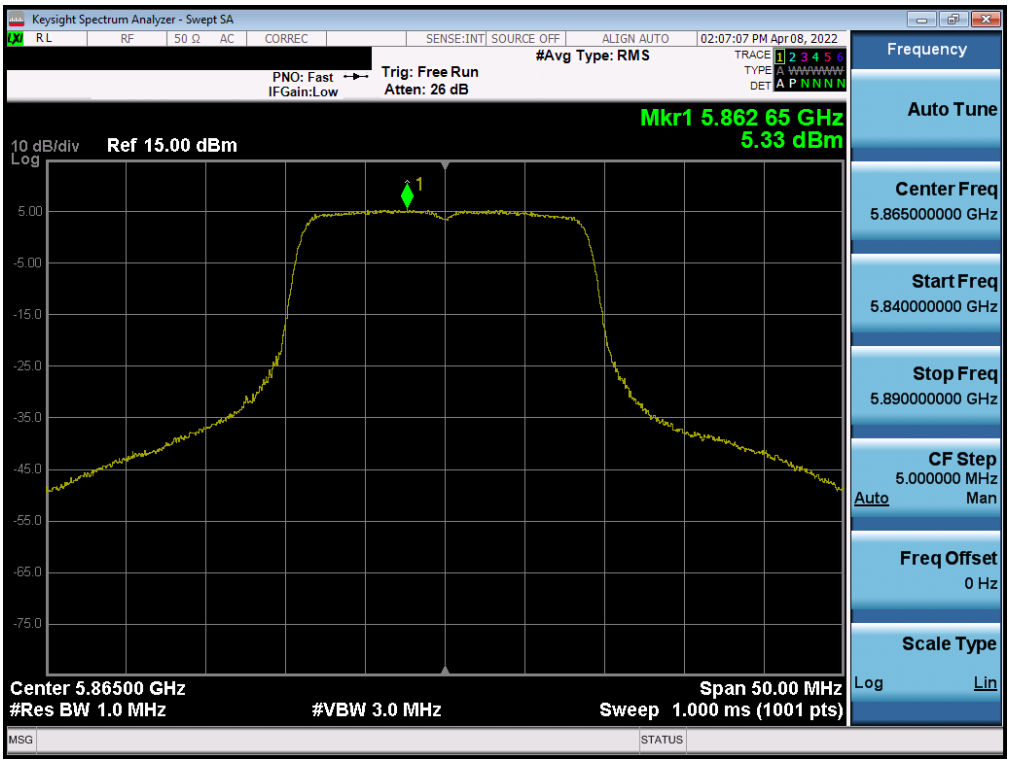
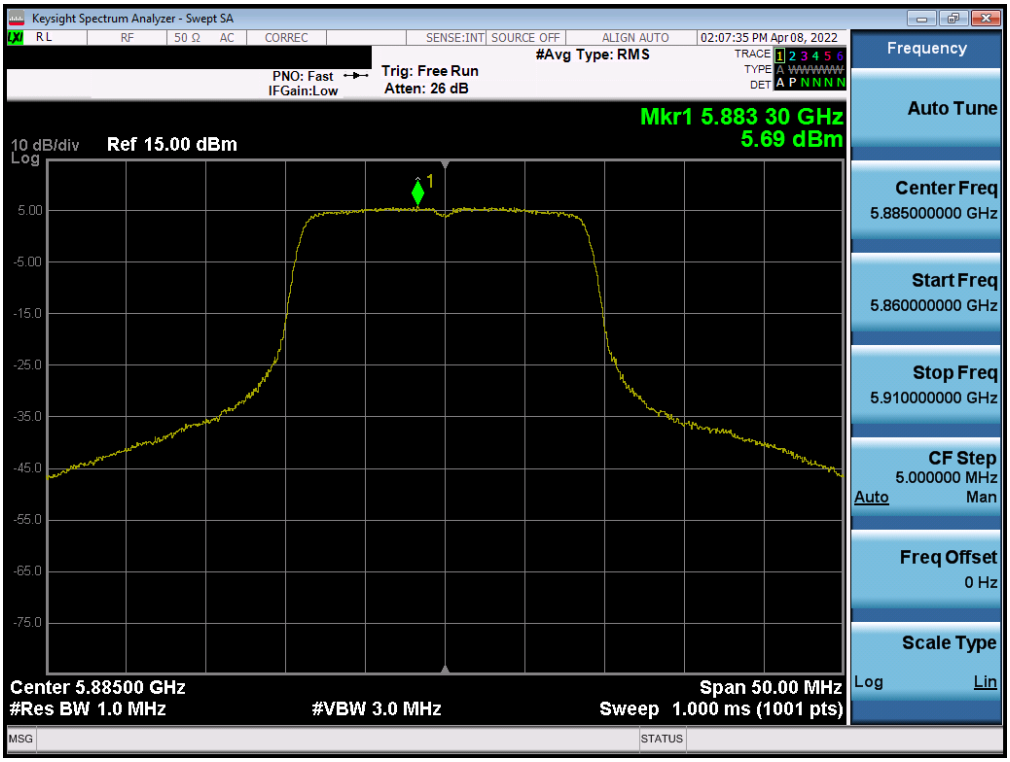


Plot 7-336. Power Spectral Density Plot MIMO ANT2 (20MHz BW 802.11n (UNII Band 4) – Ch. 173)



Plot 7-337. Power Spectral Density Plot MIMO ANT2 (20MHz BW 802.11n (UNII Band 4) – Ch. 177)

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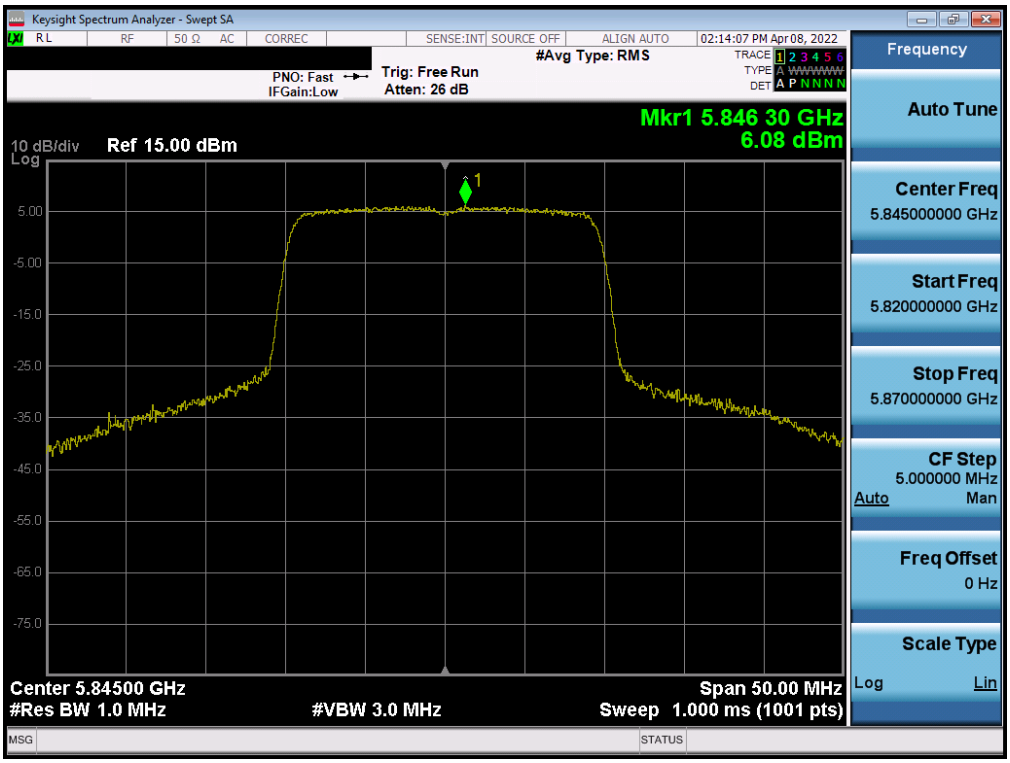
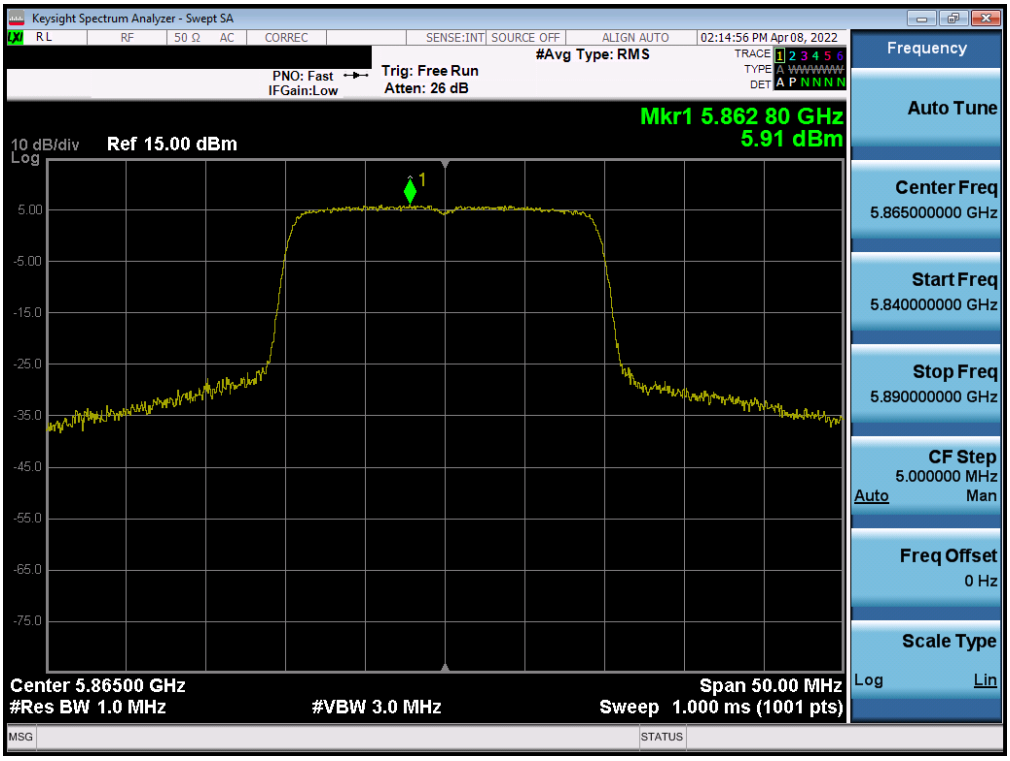


Plot 7-338. Power Spectral Density Plot MIMO ANT2 (20MHz BW 802.11ax (UNII Band 3/4) – Ch. 169)



Plot 7-339. Power Spectral Density Plot MIMO ANT2 (20MHz BW 802.11ax (UNII Band 4) – Ch. 173)

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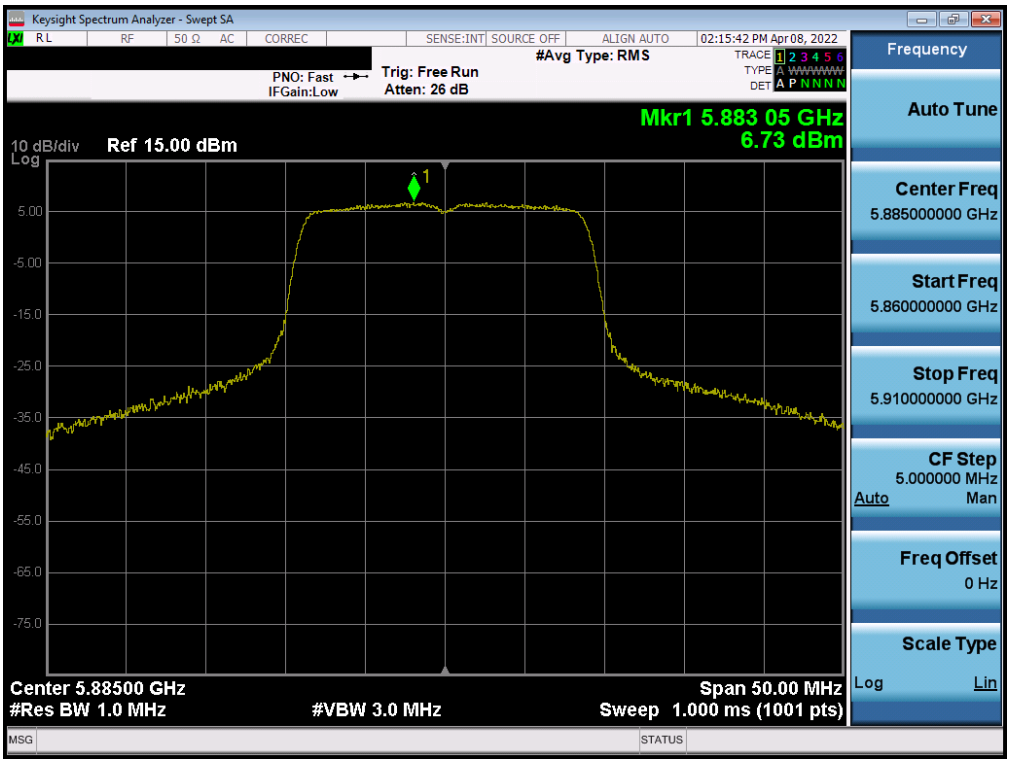
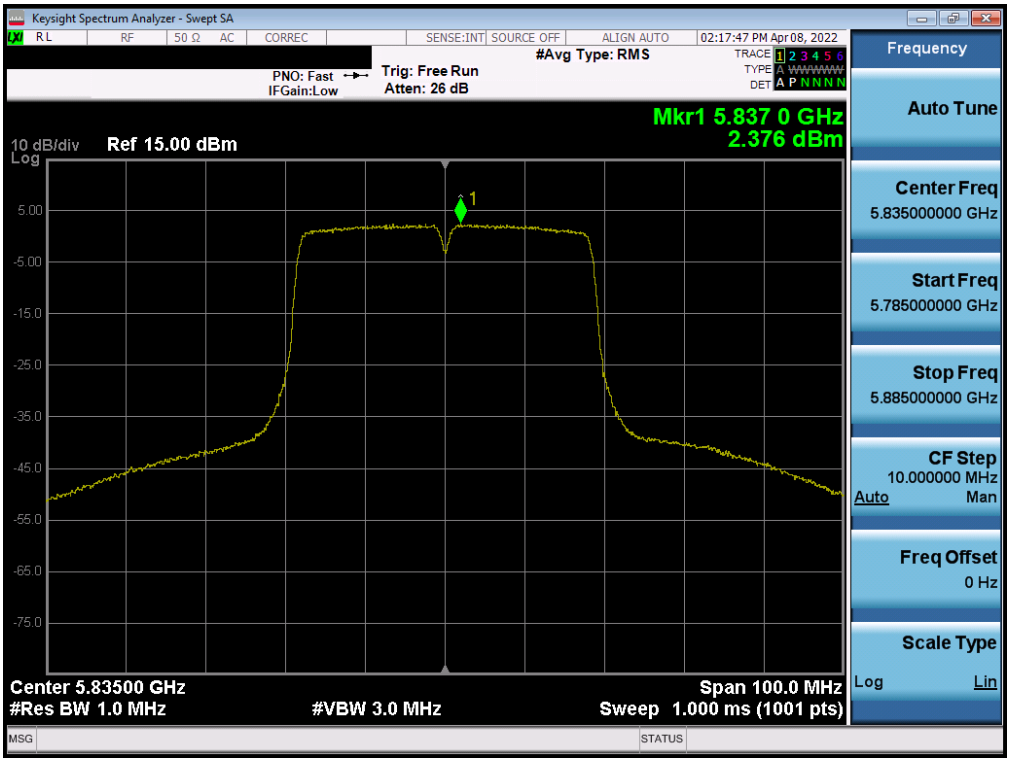


Plot 7-340. Power Spectral Density Plot MIMO ANT2 (20MHz BW 802.11ax (UNII Band 4) – Ch. 177)



Plot 7-341. Power Spectral Density Plot MIMO ANT2 (40MHz BW 802.11n (UNII Band 3/4) – Ch. 167)

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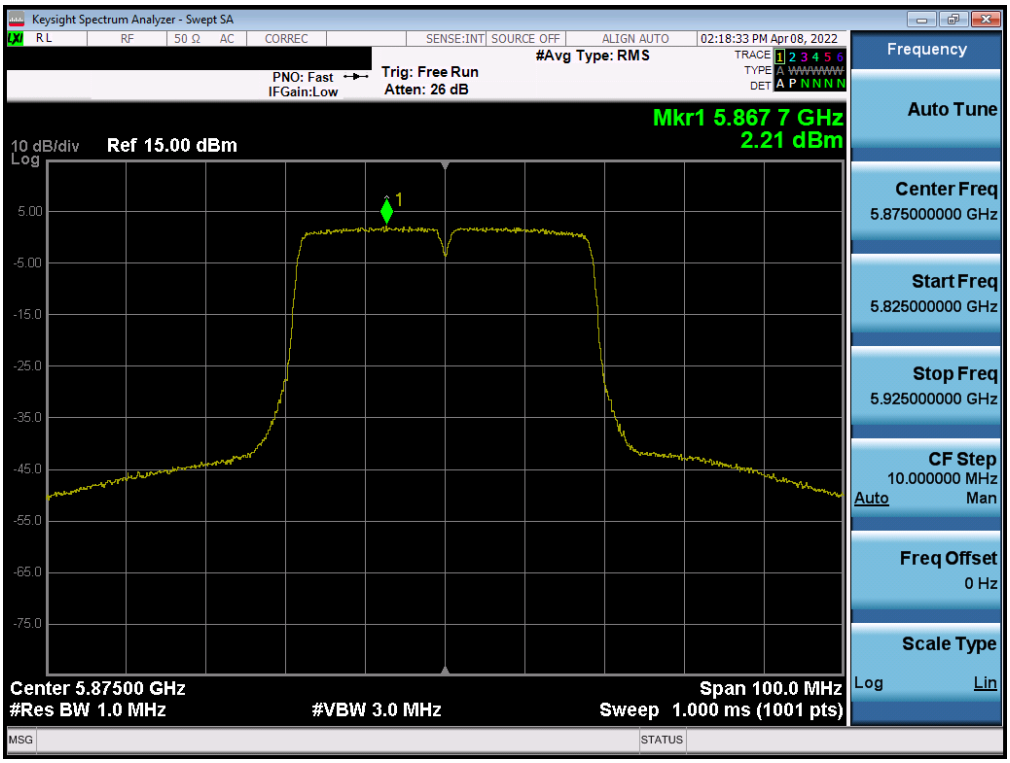
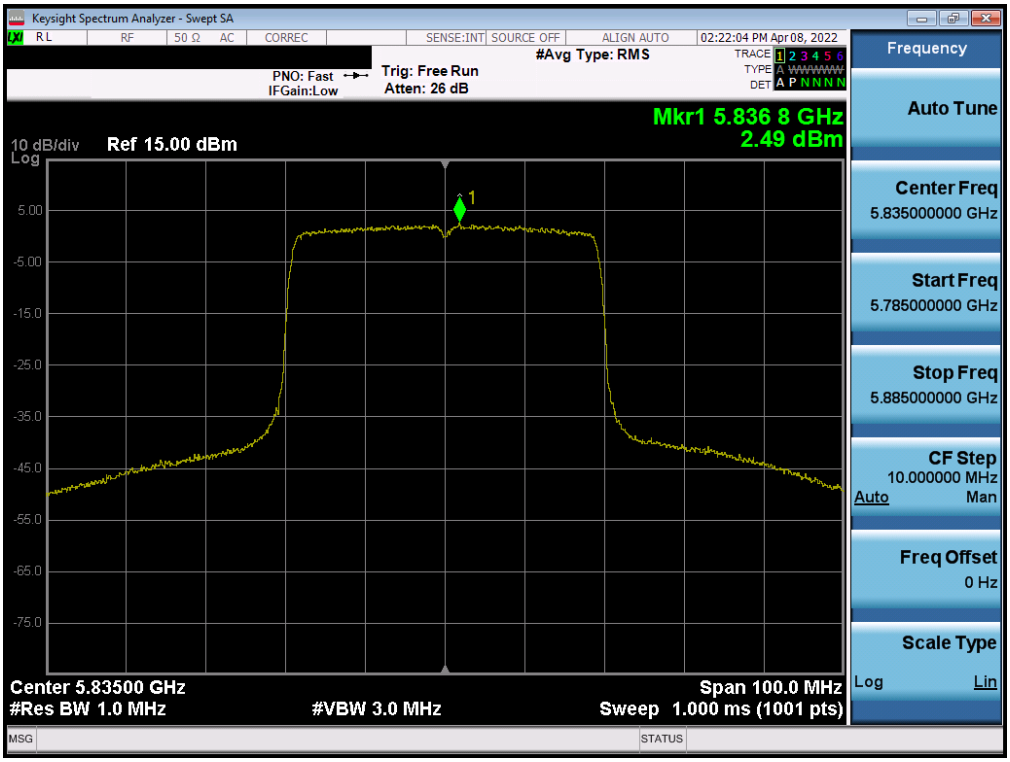


Plot 7-342. Power Spectral Density Plot MIMO ANT2 (40MHz BW 802.11n (UNII Band 4) – Ch. 175)



Plot 7-343. Power Spectral Density Plot MIMO ANT2 (40MHz BW 802.11ax (UNII Band 3/4) – Ch. 167)

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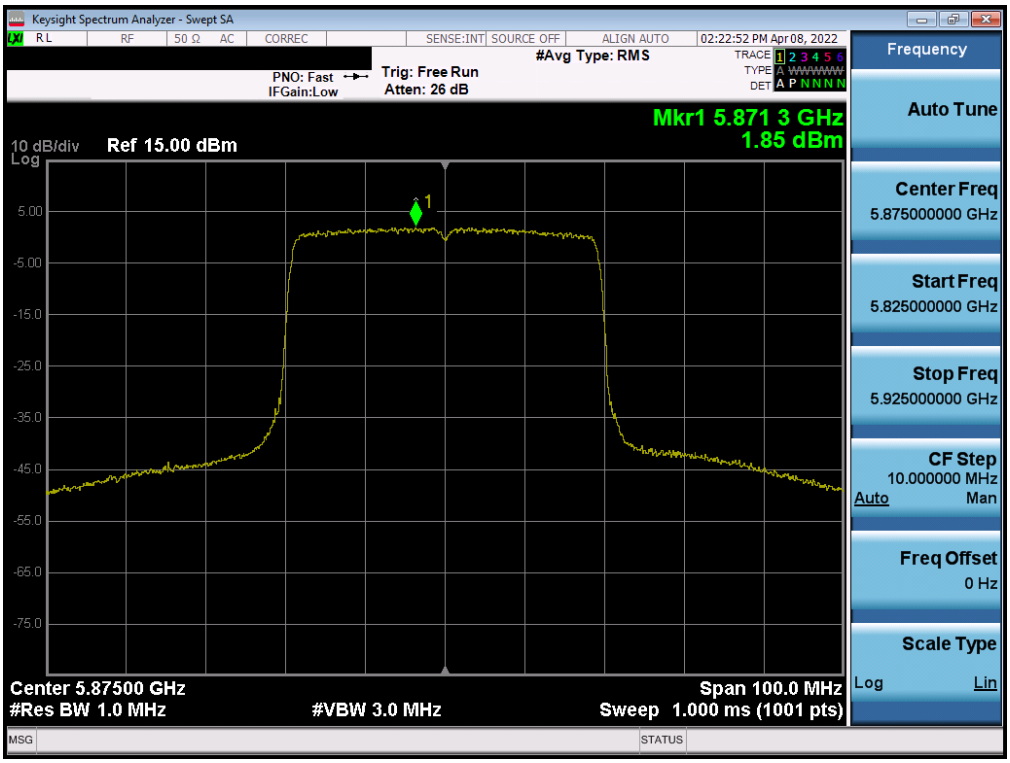
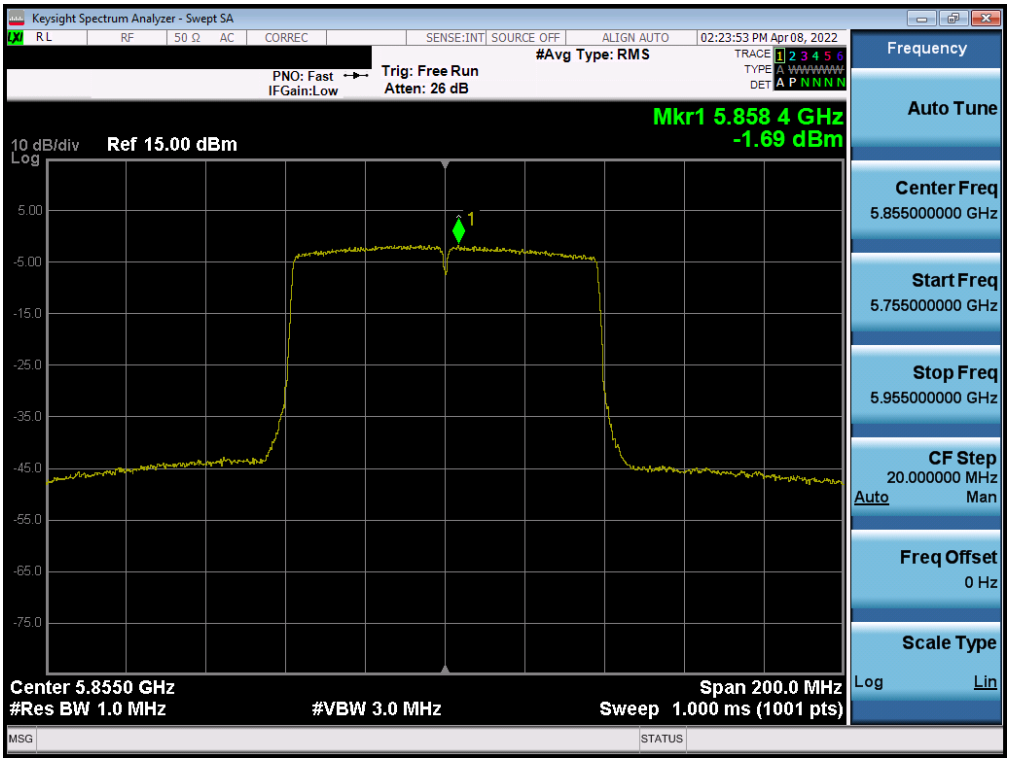


Plot 7-344. Power Spectral Density Plot MIMO ANT2 (40MHz BW 802.11ax (UNII Band 4) – Ch. 175)



Plot 7-345. Power Spectral Density Plot MIMO ANT2 (80MHz BW 802.11ac (UNII Band 3/4) – Ch. 171)

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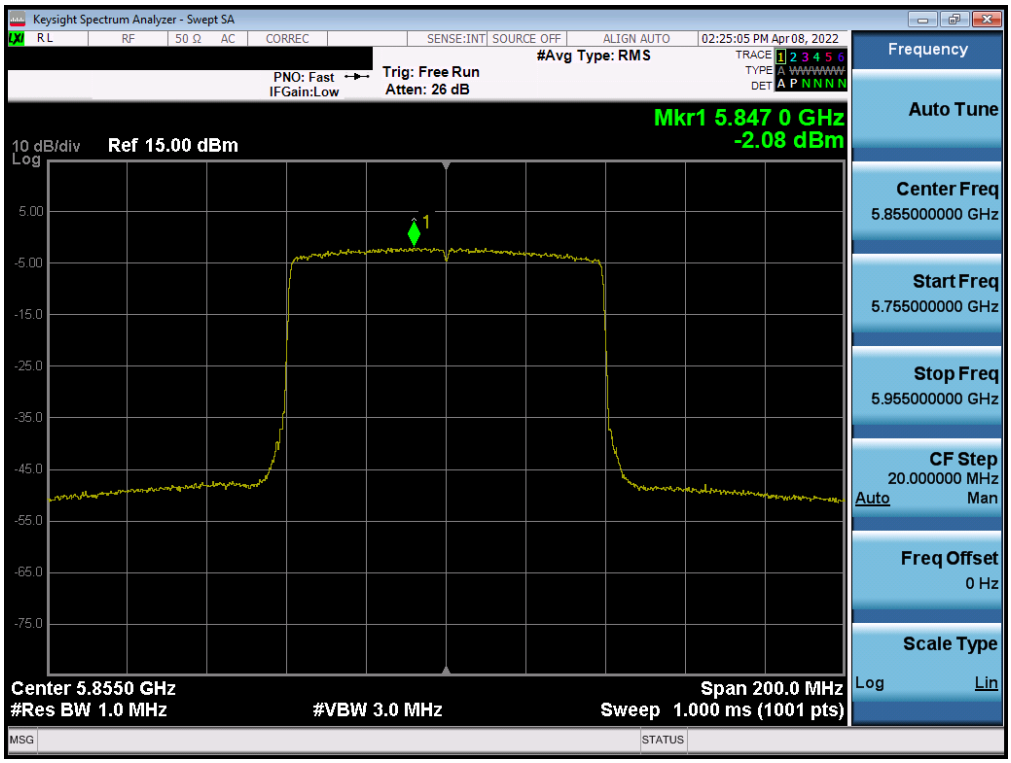
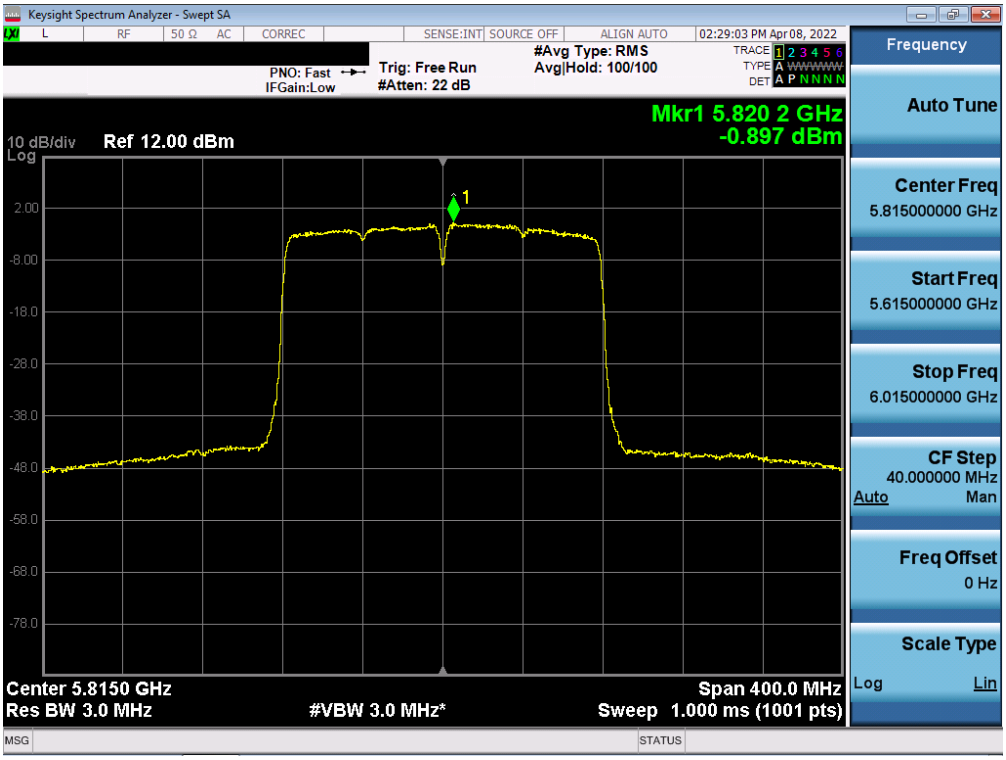


Plot 7-346. Power Spectral Density Plot MIMO ANT2 (80MHz BW 802.11ax (UNII Band 3/4) – Ch. 171)



Plot 7-347. Power Spectral Density Plot MIMO ANT2 (160MHz BW 802.11ac (UNII Band 3/4) – Ch. 163)

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Plot 7-348. Power Spectral Density Plot MIMO ANT2 (160MHz BW 802.11ax (UNII Band 3/4) – Ch. 163)

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Note:

Per ANSI C63.10-2013 Section 14.3.2.2 and KDB 662911 v02r01 Section E)2), the power spectral density at Antenna-1 and Antenna-2 were first measured separately as shown in the section above. The measured values were then summed in linear power units then converted back to dBm.

Sample MIMO Calculation:

At 5180MHz in 802.11n (20MHz BW) mode, the average conducted power spectral density was measured to be 6.71 dBm for Antenna 1 and 7.50 dBm for Antenna 2.

Antenna 1 + Antenna 2 = MIMO

(6.71 dBm + 7.50 dBm) = (4.688 mW + 5.623 mW) = 10.311 mW = 10.13 dBm

Sample e.i.r.p Power Spectral Density Calculation:

At 5180MHz in 802.11n (20MHz BW) mode, the average MIMO power density was calculated to be 10.13 dBm with directional gain of -1.96 dBi.

e.i.r.p. Power Spectral Density(dBm) = Power Spectral Density (dBm) + Ant gain (dBi)

10.13 dBm + -1.96 dBi = 8.17dBm

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7.6 Radiated Spurious Emission Measurements – Above 1GHz

§15.407(b) §15.205 §15.209

Test Overview and Limit

All out of band radiated spurious emissions are measured with a spectrum analyzer connected to a receive antenna while the EUT is operating at its maximum duty cycle, at its maximum power control level, as defined in ANSI C63.10-2013 and KDB 789033 D02 v02r01, and at the appropriate frequencies. All channels, modes (e.g. 802.11a, 802.11n (20MHz BW), 802.11n (40MHz BW), and 802.11ac (80MHz)), and modulations/data rates were investigated among all UNII bands. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

For transmitters operating in the 5.15-5.25 GHz and 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of −27 dBm/MHz.

For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of −27 dBm/MHz.

For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR and Table 6 of RSS-Gen (8.10) must not exceed the limits shown in Table 7-22 per Section 15.209 and RSS-Gen (8.9).

Frequency	Field Strength [μV/m]	Measured Distance [Meters]
Above 960.0 MHz	500	3

Table 7-22. Radiated Limits

Test Procedures Used

ANSI C63.10-2013 – Sections 12.7.7.2, 12.7.6, 12.7.5
KDB 789033 D02 v02r01 – Section G

Test Settings

Average Measurements above 1GHz (Method AD)

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = power average (RMS)
5. Number of measurement points = 1001 (Number of points must be ≥ 2 x span/RBW)
6. Averaging type = power (RMS)
7. Sweep time = auto couple
8. Trace was averaged over 100 sweeps

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Peak Measurements above 1GHz

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

Peak Measurements below 1GHz

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. Span was set greater than 1MHz
3. RBW = 120kHz
4. Detector = CISPR quasi-peak
5. Sweep time = auto couple
6. Trace was allowed to stabilize

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

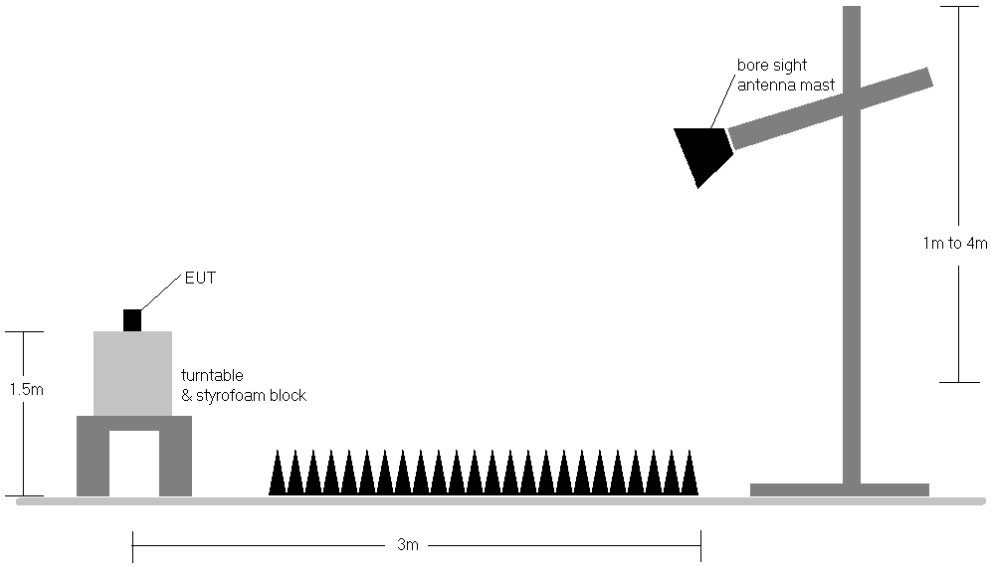

Figure 7-5. Test Instrument & Measurement Setup

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Test Notes

1. All emissions that lie in the restricted bands (denoted by a * next to the frequency) specified in §15.205 and Section 8.10 of RSS-Gen are below the limit shown in Table 7-22.
2. All spurious emissions lying in restricted bands specified in §15.205 and Section 8.10 of RSS-Gen are below the limit shown in Table 7-22. All spurious emissions that do not lie in a restricted band are subject to a peak limit of -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a "conversion" factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions of 68.2dBμV/m.
3. The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
4. This unit was tested with its standard battery.
5. The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter using CISPR quasi peak detector below 1GHz. Above 1 GHz, average and peak measurements were taken using linearly polarized horn antennas. The worst-case emissions are reported however emissions whose levels were not within 20dB of the respective limits were not reported.
6. Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.
7. Radiated spurious emissions were investigated while operating in MIMO mode, however, it was determined that single antenna operation produced the worst case emissions. Since the emissions produced from MIMO operation were found to be more than 20dB below the limit, the MIMO emissions are not reported.
8. The wide spectrum spurious emissions plots shown on the following pages are used only for the purpose of emission identification. Any emissions found to be within 20dB of the limit are fully investigated and the results are shown in this section.
9. The "-" shown in the following RSE tables are used to denote a noise floor measurement.

Sample Calculations

Determining Spurious Emissions Levels

- Field Strength Level [dBμV/m] = Analyzer Level [dBm] + 107 + AFCL [dB/m]
- AFCL [dB/m] = Antenna Factor [dB/m] + Cable Loss [dB]
- Margin [dB] = Field Strength Level [dBμV/m] – Limit [dBμV/m]

Radiated Band Edge Measurement Offset

- The amplitude offset shown in the radiated restricted band edge plots was calculated using the formula:

  Offset (dB) = (Antenna Factor + Cable Loss + Attenuator) – Preamplifier Gain

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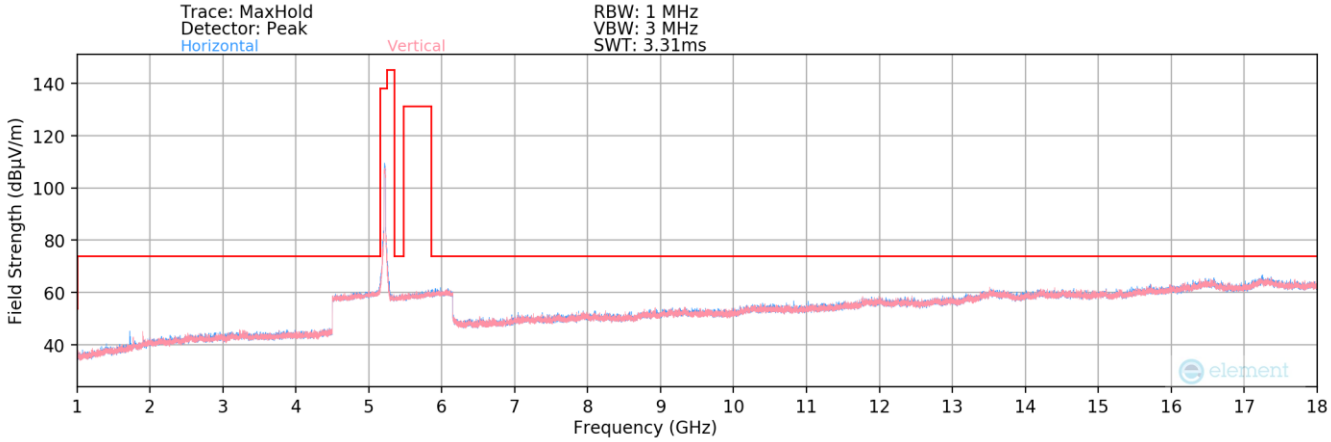
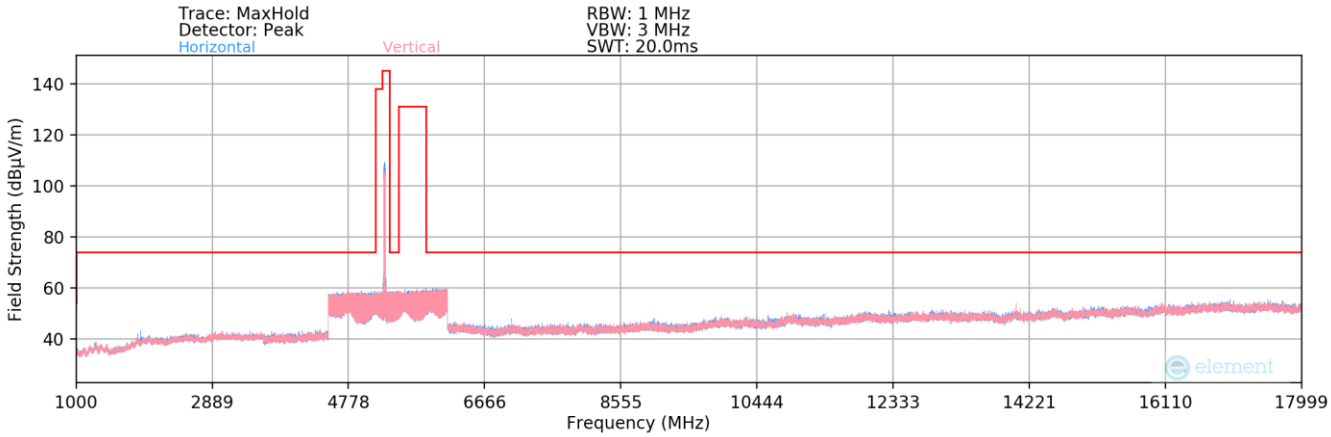
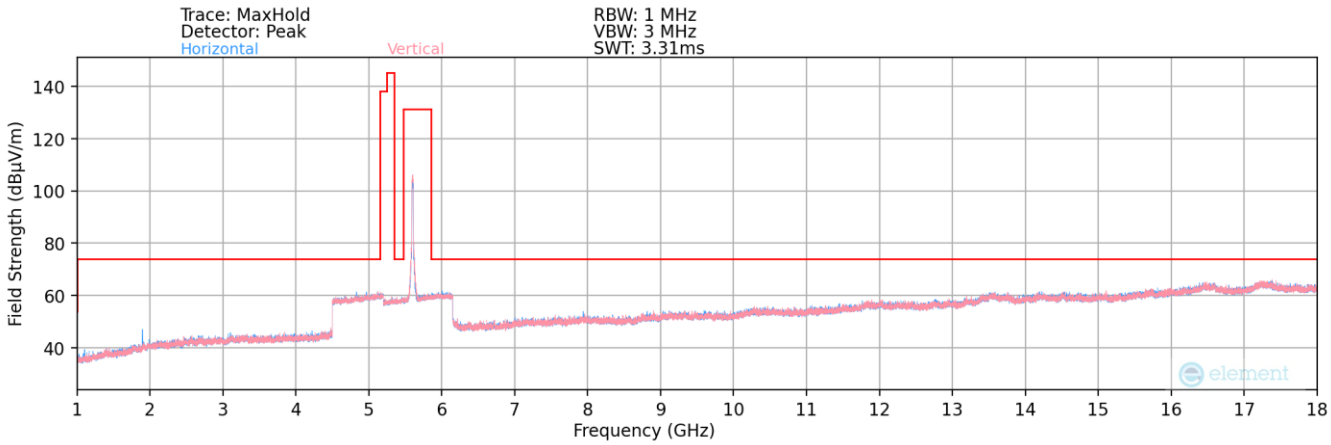
7.6.1 MIMO Radiated Spurious Emission Measurements



Plot 7-349. Radiated Spurious Plot above 1GHz MIMO (802.11a – U1 Ch. 40)



Plot 7-350. Radiated Spurious Plot above 1GHz MIMO (802.11a – U2A Ch. 56)



Plot 7-351. Radiated Spurious Plot above 1GHz MIMO (802.11a – U2C Ch. 120)

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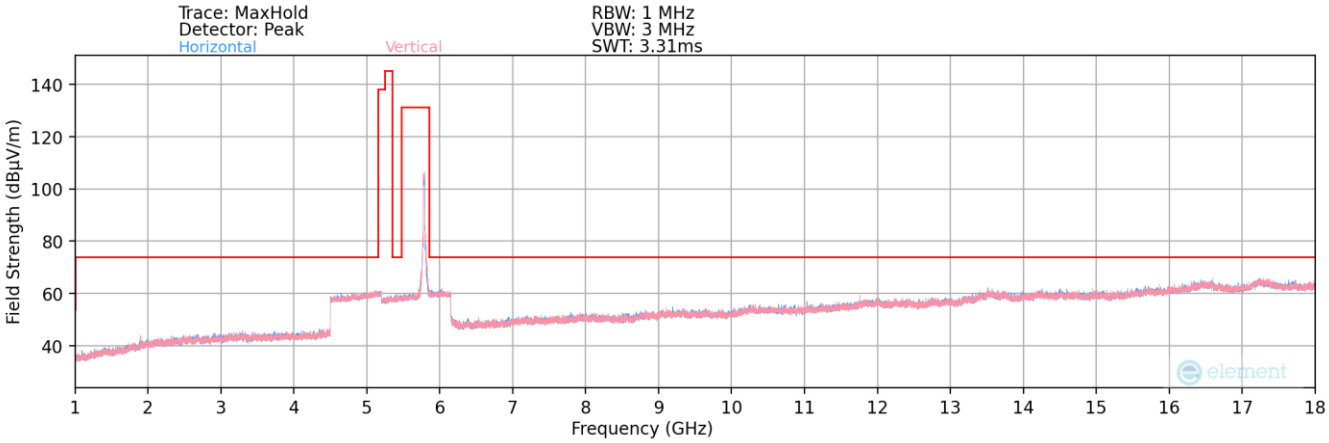
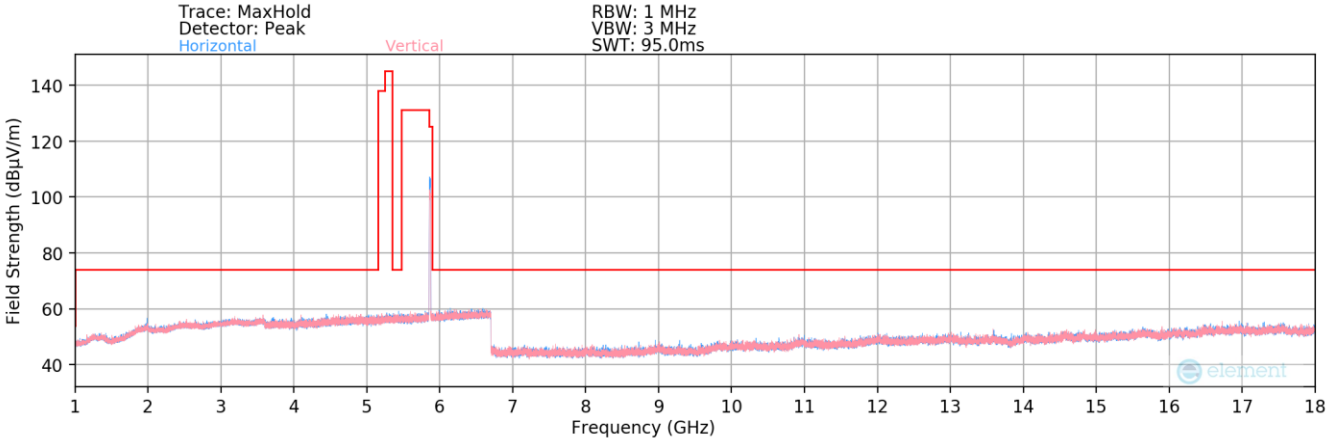


Plot 7-352. Radiated Spurious Plot above 1GHz MIMO (802.11a – U3 Ch. 157)



Plot 7-353. Radiated Spurious Plot above 1GHz MIMO (802.11a – U4 Ch. 173)

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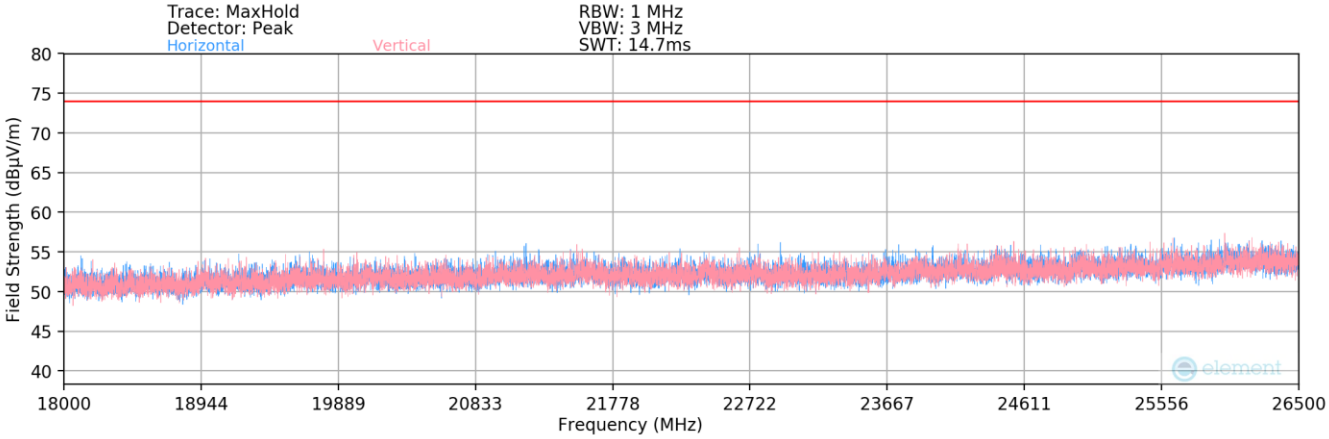
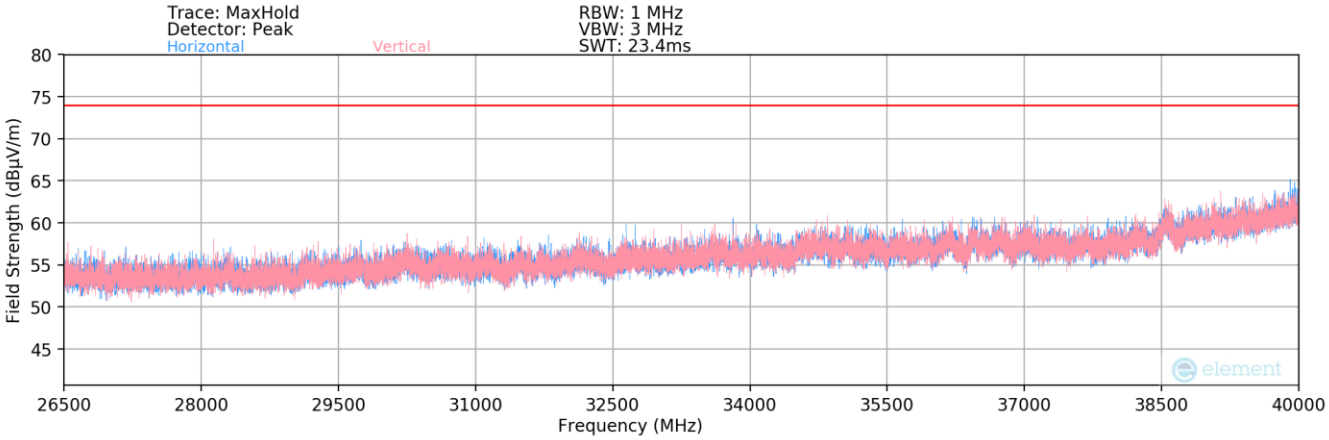
MIMO Radiated Spurious Emissions Measurements (Above 18GHz)



Plot 7-354. Radiated Spurious Plot 18GHz - 26.5GHz MIMO (802.11a)



Plot 7-355. Radiated Spurious Plot 26.5GHz - 40GHz MIMO (802.11a)

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MIMO Radiated Spurious Emission Measurements

§15.407(b) §15.205 & §15.209

Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5180MHz
Channel: 36

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10360.00	Peak	V	-	-	-73.04	20.16	0.00	54.12	68.20	-14.08
*	15540.00	Average	V	-	-	-88.42	29.71	0.00	48.29	53.98	-5.69
*	15540.00	Peak	V	-	-	-73.08	29.71	0.00	63.63	73.98	-10.35
*	20720.00	Average	V	-	-	-66.79	3.15	-9.54	33.82	53.98	-20.16
*	20720.00	Peak	V	-	-	-58.75	3.15	-9.54	41.86	73.98	-32.12
	25900.00	Peak	V	-	-	-58.04	4.77	-9.54	44.19	68.20	-24.01

Table 7-23. Radiated Measurements MIMO

Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5200MHz
Channel: 40

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10400.00	Peak	V	-	-	-73.00	20.83	0.00	54.83	68.20	-13.37
*	15600.00	Average	V	-	-	-87.66	28.68	0.00	48.02	53.98	-5.96
*	15600.00	Peak	V	-	-	-73.82	28.68	0.00	61.86	73.98	-12.12
*	20800.00	Average	V	-	-	-67.63	3.48	-9.54	33.31	53.98	-20.67
*	20800.00	Peak	V	-	-	-57.50	3.48	-9.54	43.44	73.98	-30.54
	26000.00	Peak	V	-	-	-57.14	5.15	-9.54	45.47	68.20	-22.73

Table 7-24. Radiated Measurements MIMO

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Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5240MHz
Channel: 48

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10480.00	Peak	V	-	-	-72.89	20.81	0.00	54.92	68.20	-13.28
*	15720.00	Average	V	-	-	-86.98	29.48	0.00	49.50	53.98	-4.48
*	15720.00	Peak	V	-	-	-74.01	29.48	0.00	62.47	73.98	-11.51
*	20960.00	Average	V	-	-	-67.45	3.48	-9.54	33.49	53.98	-20.49
*	20960.00	Peak	V	-	-	-58.52	3.48	-9.54	42.41	73.98	-31.57
	26200.00	Peak	V	-	-	-58.89	4.78	-9.54	43.35	68.20	-24.85

Table 7-25. Radiated Measurements MIMO

Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5260MHz
Channel: 52

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10520.00	Peak	V	-	-	-72.65	20.70	0.00	55.05	68.20	-13.15
*	15780.00	Average	V	-	-	-86.11	28.85	0.00	49.74	53.98	-4.24
*	15780.00	Peak	V	-	-	-74.16	28.85	0.00	61.69	73.98	-12.29
*	21040.00	Average	V	-	-	-68.20	3.53	-9.54	32.79	53.98	-21.19
*	21040.00	Peak	V	-	-	-58.88	3.53	-9.54	42.11	73.98	-31.87
	26300.00	Peak	V	-	-	-57.74	4.64	-9.54	44.36	68.20	-23.84

Table 7-26. Radiated Measurements MIMO

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Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5280MHz
Channel: 56

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10560.00	Peak	V	-	-	-72.20	20.89	0.00	55.69	68.20	-12.51
	10560.00	Peak	V	-	-	-72.20	20.89	0.00	55.69	68.20	-12.51
*	15840.00	Average	V	-	-	-86.32	29.33	0.00	50.01	53.98	-3.97
*	15840.00	Peak	V	-	-	-73.95	29.33	0.00	62.38	73.98	-11.60
*	21120.00	Average	V	-	-	-67.41	3.68	-9.54	33.73	53.98	-20.25
*	21120.00	Peak	V	-	-	-57.79	3.68	-9.54	43.35	73.98	-30.63
	26400.00	Peak	V	-	-	-58.43	4.78	-9.54	43.81	68.20	-24.39

Table 7-27. Radiated Measurements MIMO

Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5320MHz
Channel: 64

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	10640.00	Average	V	-	-	-84.13	20.73	0.00	43.60	53.98	-10.38
*	10640.00	Peak	V	-	-	-71.01	20.73	0.00	56.72	73.98	-17.26
*	15960.00	Average	V	-	-	-86.36	29.29	0.00	49.93	53.98	-4.04
*	15960.00	Peak	V	-	-	-73.30	29.29	0.00	62.99	73.98	-10.98
*	21280.00	Average	V	-	-	-67.87	3.72	-9.54	33.31	53.98	-20.67
*	21280.00	Peak	V	-	-	-58.39	3.72	-9.54	42.79	73.98	-31.19
	26600.00	Peak	V	-	-	-58.07	4.72	-9.54	44.11	68.20	-24.09

Table 7-28. Radiated Measurements MIMO

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Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5500MHz
Channel: 100

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11000.00	Average	V	-	-	-84.11	21.48	0.00	44.37	53.98	-9.61
*	11000.00	Peak	V	-	-	-84.03	21.48	0.00	44.45	73.98	-29.53
	16500.00	Peak	V	-	-	-84.61	30.98	0.00	53.37	68.20	-14.83
	22000.00	Peak	V	-	-	-58.63	3.83	-9.54	42.67	68.20	-25.53
	27500.00	Peak	V	-	-	-56.39	4.97	-9.54	46.04	68.20	-22.16

Table 7-29. Radiated Measurements MIMO

Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5600MHz
Channel: 120

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11200.00	Average	V	-	-	-86.33	21.36	0.00	42.03	53.98	-11.95
*	11200.00	Peak	V	-	-	-69.77	21.36	0.00	58.59	73.98	-15.39
	16800.00	Peak	V	-	-	-75.11	30.54	0.00	62.43	68.20	-5.77
*	22400.00	Average	V	-	-	-67.25	3.79	-9.54	34.00	53.98	-19.98
*	22400.00	Peak	V	-	-	-58.43	3.79	-9.54	42.82	73.98	-31.16
	28000.00	Peak	V	-	-	-58.34	4.94	-9.54	44.06	68.20	-24.14

Table 7-30. Radiated Measurements MIMO

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Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5720MHz
Channel: 144

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11440.00	Average	V	-	-	-84.41	22.14	0.00	44.73	53.98	-9.25
*	11440.00	Peak	V	-	-	-73.73	22.14	0.00	55.41	73.98	-18.57
	17160.00	Peak	V	-	-	-84.27	31.03	0.00	53.76	68.20	-14.44
*	22880.00	Average	V	-	-	-67.84	3.79	-9.54	33.41	53.98	-20.57
*	22880.00	Peak	V	-	-	-57.87	3.79	-9.54	43.38	73.98	-30.60
	28600.00	Peak	V	-	-	-57.49	5.27	-9.54	45.24	68.20	-22.96

Table 7-31. Radiated Measurements MIMO

Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5745MHz
Channel: 149

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11490.00	Average	V	-	-	-84.57	22.12	0.00	44.55	53.98	-9.43
*	11490.00	Peak	V	-	-	-71.52	22.12	0.00	57.60	73.98	-16.38
	17235.00	Peak	V	-	-	-73.22	31.14	0.00	64.92	68.20	-3.28
*	22980.00	Average	V	-	-	-67.84	3.79	-9.54	33.41	53.98	-20.57
*	22980.00	Peak	V	-	-	-57.21	3.79	-9.54	44.04	73.98	-29.94
	28725.00	Peak	V	-	-	-57.42	5.41	-9.54	45.45	69.20	-23.75

Table 7-32. Radiated Measurements MIMO

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Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5785MHz
Channel: 157

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11570.00	Average	V	-	-	-84.77	22.50	0.00	44.73	53.98	-9.24
*	11570.00	Peak	V	-	-	-72.11	22.50	0.00	57.39	73.98	-16.58
	17355.00	Peak	V	-	-	-73.62	31.16	0.00	64.54	68.20	-3.66
	23140.00	Peak	V	-	-	-57.88	3.75	-9.54	43.33	68.20	-24.87
	28925.00	Peak	V	-	-	-57.92	5.46	-9.54	44.99	68.20	-23.21

Table 7-33. Radiated Measurements MIMO

Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5825MHz
Channel: 165

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11650.00	Average	V	-	-	-84.88	22.36	0.00	44.48	53.98	-9.50
*	11650.00	Peak	V	-	-	-72.89	22.36	0.00	56.47	73.98	-17.51
	17475.00	Peak	V	-	-	-73.24	30.92	0.00	64.68	68.20	-3.52
	23300.00	Peak	V	-	-	-58.44	3.76	-9.54	42.78	68.20	-25.42
	29125.00	Peak	V	-	-	-58.21	5.54	-9.54	44.78	68.20	-23.42

Table 7-34. Radiated Measurements MIMO

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Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5845MHz
Channel: 169

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11690.00	Average	V	-	-	-85.46	18.45	0.00	39.99	53.98	-13.99
*	11690.00	Peak	V	-	-	-70.86	18.45	0.00	54.59	73.98	-19.39
	17535.00	Peak	V	-	-	-74.48	26.24	0.00	58.76	68.20	-9.44
	23380.00	Peak	V	-	-	-59.86	3.85	-9.54	50.99	68.20	-17.21
	29225.00	Peak	V	-	-	-58.55	5.60	-9.54	54.05	68.20	-14.15
	35070.00	Peak	V	-	-	-59.41	8.11	-9.54	55.70	68.20	-12.50

Table 7-35. Radiated Measurements MIMO

Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5865MHz
Channel: 173

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11730.00	Average	V	-	-	-86.22	18.22	0.00	39.00	53.98	-14.97
*	11730.00	Peak	V	-	-	-70.11	18.22	0.00	55.11	73.98	-18.86
	17595.00	Peak	V	-	-	-73.29	26.24	0.00	59.95	68.20	-8.25
	23460.00	Peak	V	-	-	-58.44	3.85	-9.54	52.41	68.20	-15.79
	29325.00	Peak	V	-	-	-58.72	5.60	-9.54	53.88	68.20	-14.32
	35190.00	Peak	V	-	-	-59.41	8.11	-9.54	55.70	68.20	-12.50

Table 7-36. Radiated Measurements MIMO

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Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5885MHz
Channel: 177

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11770.00	Average	V	-	-	-87.41	18.30	0.00	37.89	53.98	-16.09
*	11770.00	Peak	V	-	-	-72.22	18.30	0.00	53.08	73.98	-20.90
	17655.00	Peak	V	-	-	-74.01	26.11	0.00	59.10	68.20	-9.10
	23540.00	Peak	V	-	-	-59.11	3.84	-9.54	51.73	68.20	-16.47
	29425.00	Peak	V	-	-	-59.24	5.87	-9.54	53.63	68.20	-14.57
	35310.00	Peak	V	-	-	-58.66	8.04	-9.54	56.38	68.20	-11.82

Table 7-37. Radiated Measurements MIMO

Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5280MHz
Channel: 56

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	7039.88	Peak	V	-	-	-65.01	7.75	0.00	49.74	68.20	-18.46
	10560.00	Peak	V	-	-	-69.11	12.39	0.00	50.28	68.20	-17.92
*	15840.00	Average	V	-	-	-80.55	16.71	0.00	43.16	53.98	-10.82
*	15840.00	Peak	V	-	-	-68.88	16.71	0.00	54.83	73.98	-19.15
*	21120.00	Average	V	-	-	-67.21	3.68	-9.54	33.93	53.98	-20.05
*	21120.00	Peak	V	-	-	-57.45	3.68	-9.54	43.69	73.98	-30.29
	26400.00	Peak	V	-	-	-58.23	4.78	-9.54	44.01	68.20	-24.19

Table 7-38. Radiated Measurements MIMO with WCP

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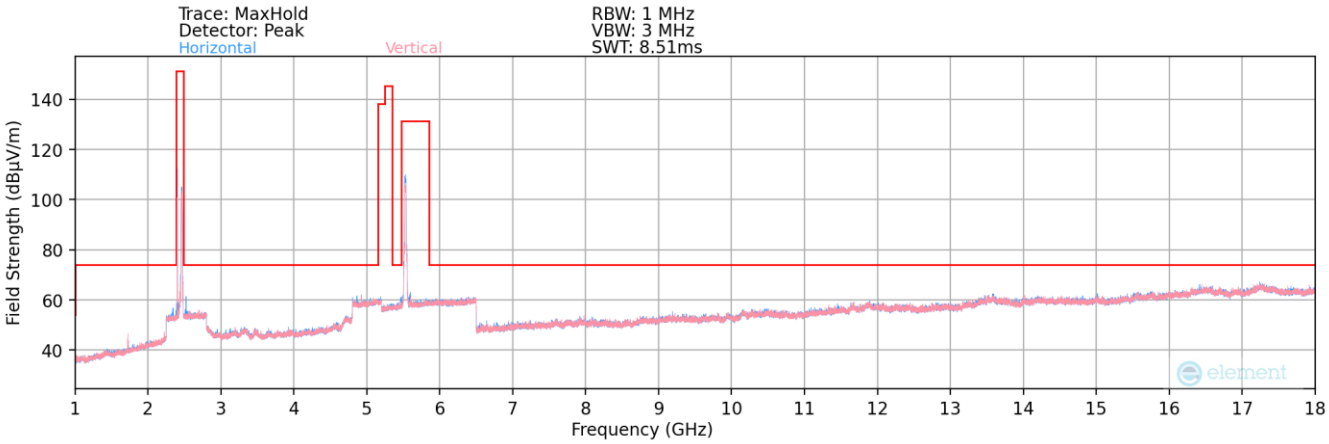
7.6.2 Simultaneous Tx Radiated Spurious Emissions Measurements

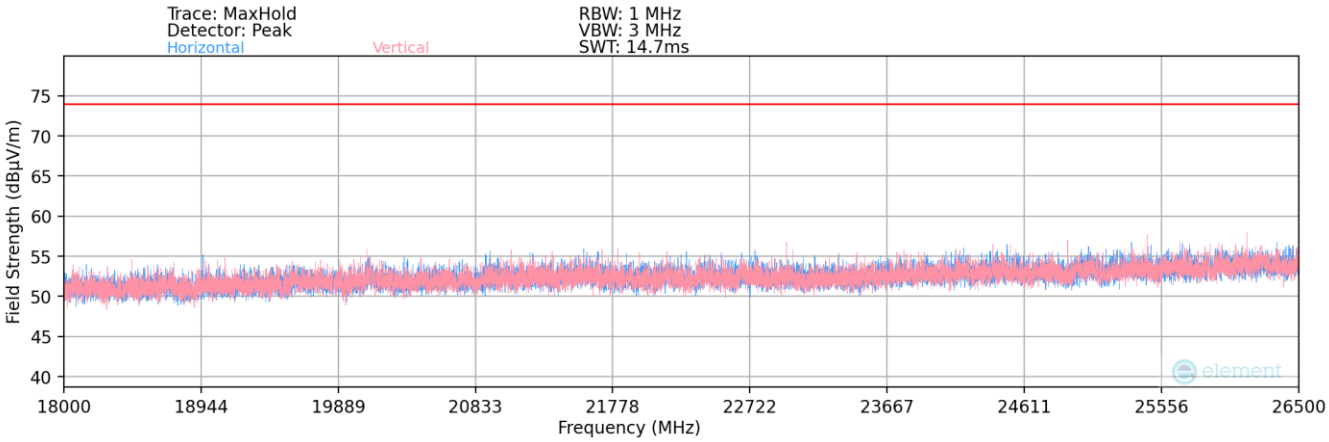
§15.407(b) §15.205 & §15.209

Description	2.4 GHz Emission	5 GHz Emission
Antenna	1	1,2
Channel	6	100
Operating Frequency (MHz)	2437	5500
Data Rate (Mbps)	1	6
Mode	802.11b	802.11a

Table 7-39. Simultaneous Transmission Config-1



Plot 7-356. Radiated Spurious Plot above 1GHz (2.4GHz – 5GHz)



Plot 7-357. Radiated Spurious Plot 18GHz – 26.5GHz (2.4GHz – 5GHz)

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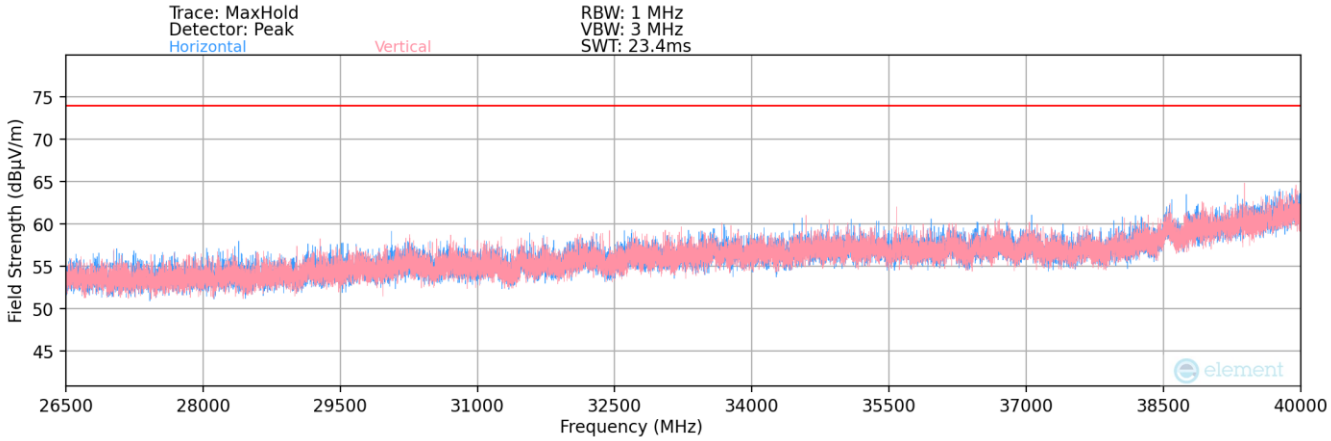

Plot 7-358. Radiated Spurious Plot above 26.5GHz (2.4GHz – 5GHz)

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
3814.00	Avg	H	-	-	-78.00	8.61	37.61	53.98	-16.37
3814.00	Peak	H	-	-	-65.21	8.61	50.40	73.98	-23.58
6952.00	Avg	H	-	-	-85.41	15.75	37.34	53.98	-16.64
6952.00	Peak	H	-	-	-78.99	15.75	43.76	73.98	-30.22
8738.00	Avg	H	-	-	-84.75	18.75	41.00	53.98	-12.98
8738.00	Peak	H	-	-	-74.69	18.75	51.06	73.98	-22.92

Table 7-40. Radiated Measurements (2.4GHz – 5GHz)

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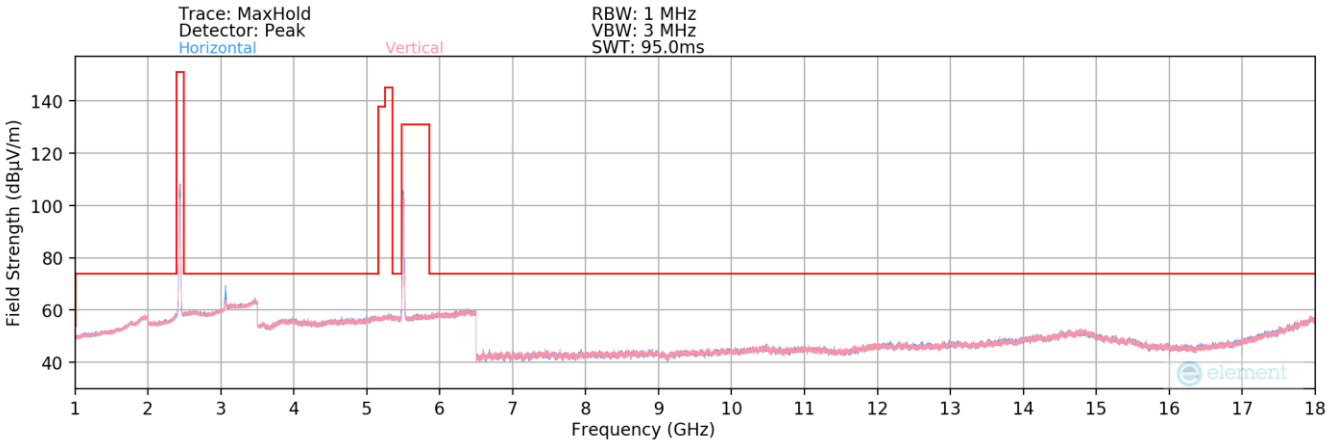
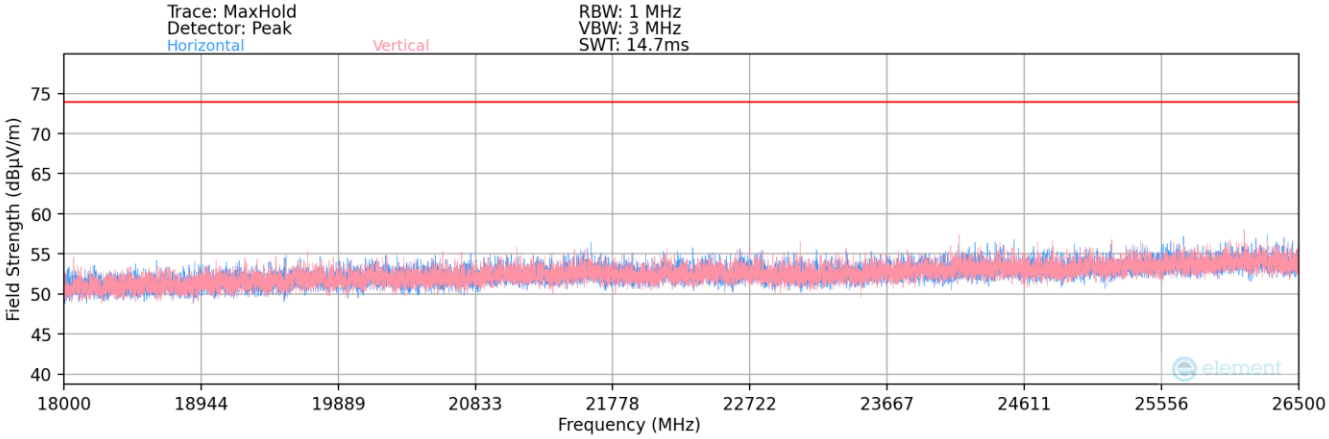
Description	2.4 GHz Emission	5 GHz Emission
Antenna	1,2	1,2
Channel	6	120
Operating Frequency (MHz)	2437	5600
Data Rate (Mbps)	1Mbps	6Mbps
Mode	b	a

Table 7-41. Dual Band Simultaneous Transmission



Plot 7-359. Radiated Spurious Plot above 1GHz (Dual Band Simult. Tx)



Plot 7-360. Radiated Spurious Plot 18GHz – 26.5GHz (Dual Band Simult. Tx)

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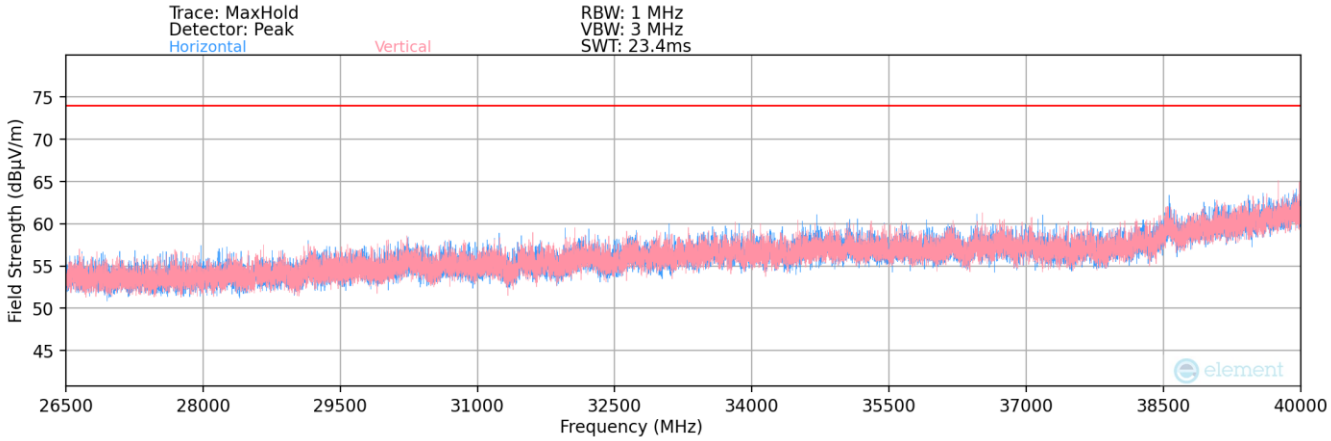

Plot 7-361. Radiated Spurious Plot above 26.5GHz (Dual Band Simult. Tx)

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4524.00	Avg	H	-	-	-77.69	9.71	39.02	53.98	-14.96
4524.00	Peak	H	-	-	-66.01	9.71	50.70	73.98	-23.28
9448.00	Avg	H	-	-	-84.99	19.65	41.66	53.98	-12.32
9448.00	Peak	H	-	-	-78.48	19.65	48.17	73.98	-25.81
11510.00	Avg	H	-	-	-84.39	23.89	46.50	53.98	-7.48
11510.00	Peak	H	-	-	-75.21	23.89	55.68	73.98	-18.30

Table 7-42. Radiated Measurements (Dual Band Simult. Tx)

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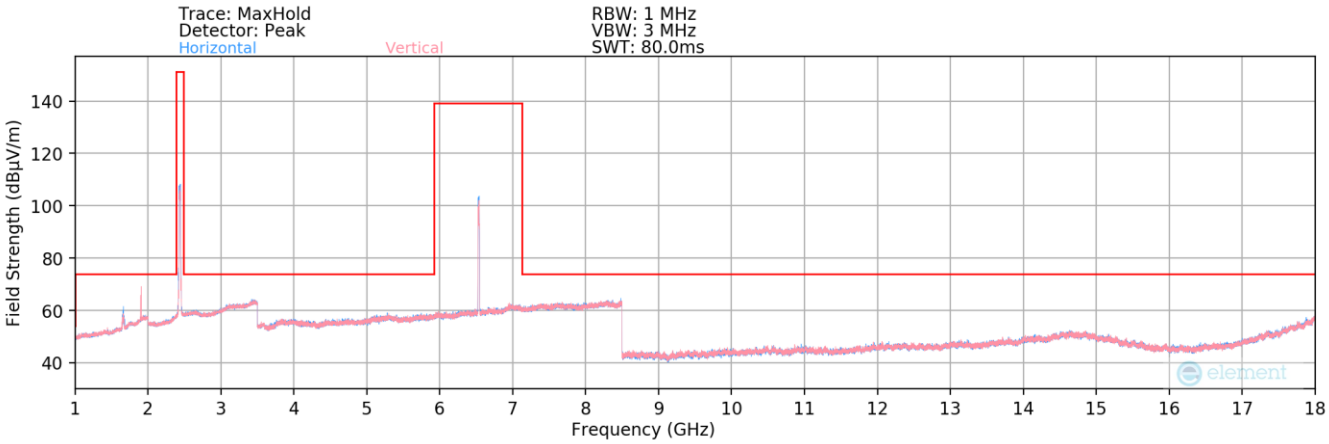
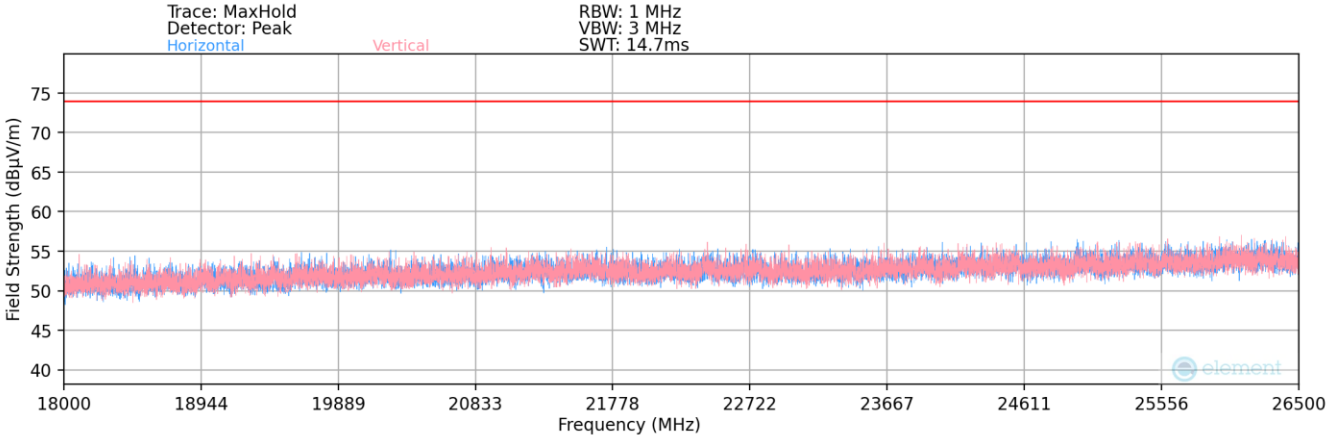
Description	2.4 GHz Emission	6 GHz Emission
Antenna	1,2	1,2
Channel	6	117
Operating Frequency (MHz)	2437	6535
Data Rate (Mbps)	1Mbps	6Mbps
Mode	b	a

Table 7-43. Dual Band Simultaneous Transmission



Plot 7-362. Radiated Spurious Plot above 1GHz (Dual Band Simult. Tx)



Plot 7-363. Radiated Spurious Plot 18GHz – 26.5GHz (Dual Band Simult. Tx)

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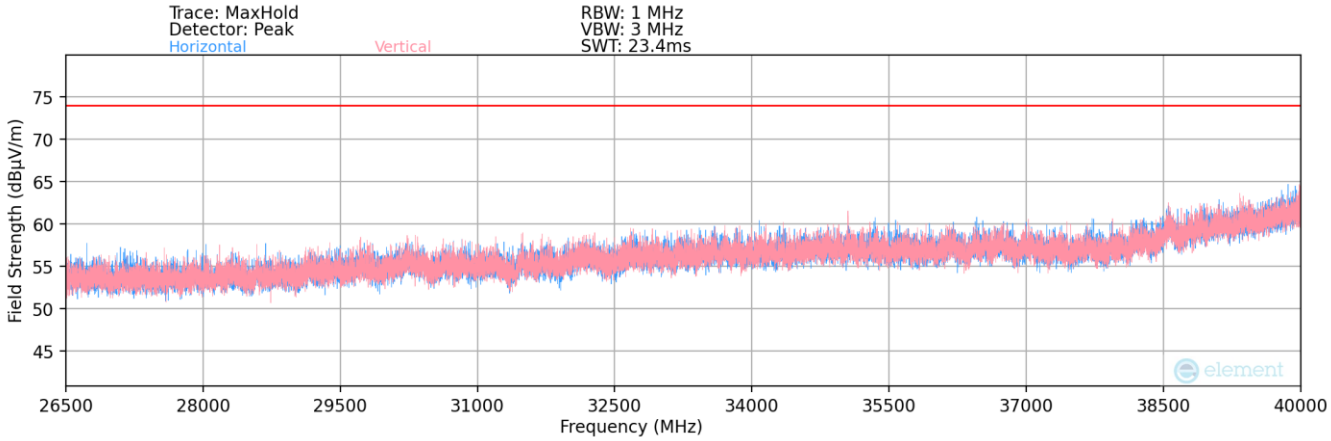

Plot 7-364. Radiated Spurious Plot above 26.5GHz (Dual Band Simult. Tx)

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
3094.00	Avg	H	-	-	-78.11	7.95	36.84	53.98	-17.14
3094.00	Peak	H	-	-	-65.13	7.95	49.82	73.98	-24.16
7898.00	Avg	H	-	-	-85.36	16.45	38.09	53.98	-15.89
7898.00	Peak	H	-	-	-73.27	16.45	50.18	73.98	-23.80
10676.00	Avg	H	-	-	-85.99	20.30	41.31	53.98	-12.67
10676.00	Peak	H	-	-	-70.65	20.30	56.65	73.98	-17.33

Table 7-44. Radiated Measurements (Dual Band Simult. Tx)

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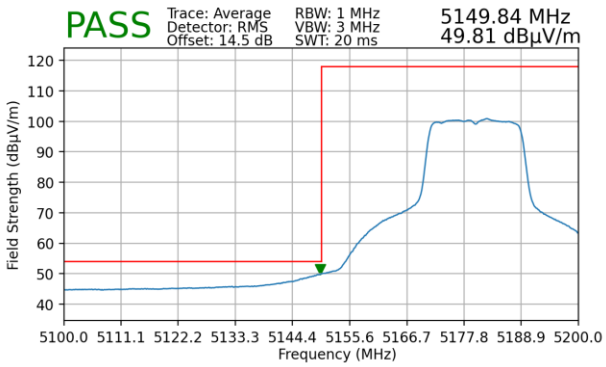
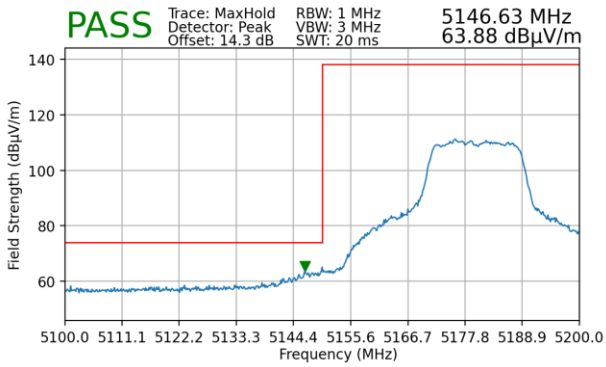
7.6.3 MIMO/CDD Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

Worst Case Mode:	802.11n
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5180MHz
Channel:	36

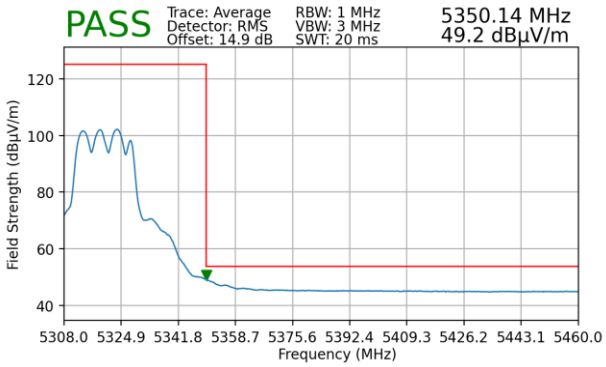


Plot 7-365. Radiated Lower Band Edge Plot MIMO (Average – UNII Band 1)

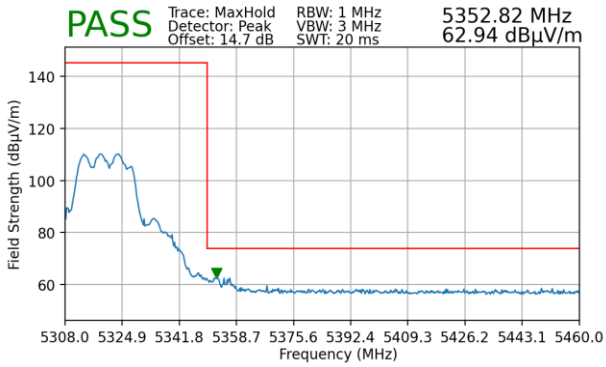


Plot 7-366. Radiated Lower Band Edge Plot MIMO (Peak – UNII Band 1)

Worst Case Mode:	802.11a
Worst Case Transfer Rate:	6Mbps
Distance of Measurements:	3 Meters
Operating Frequency:	5320MHz
Channel:	64



Plot 7-367. Radiated Upper Band Edge Plot CDD (Average – UNII Band 2A)



Plot 7-368. Radiated Upper Band Edge Plot CDD (Peak – UNII Band 2A)

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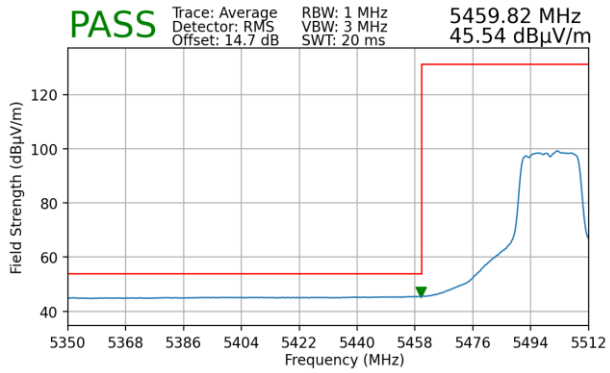
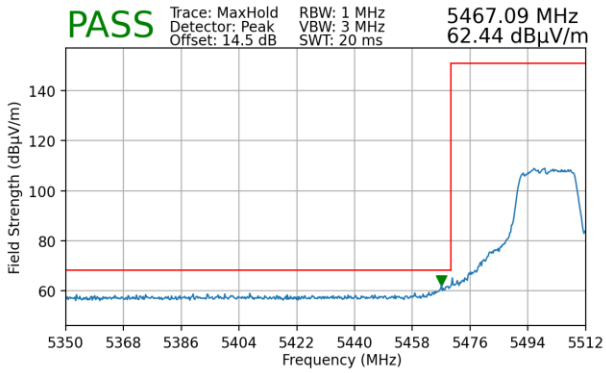
Worst Case Mode:	802.11n
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5500MHz
Channel:	100

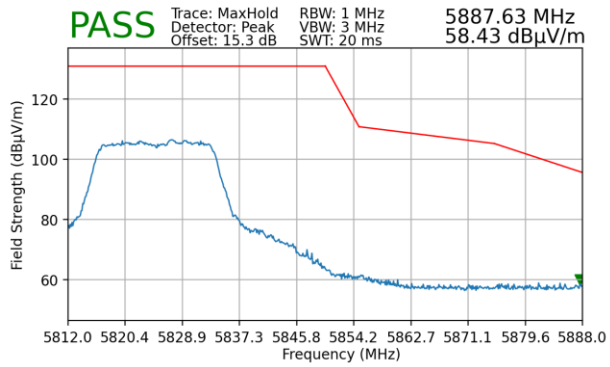


Plot 7-369. Radiated Lower Band Edge Plot CDD (Average – UNII Band 2C)



Plot 7-370. Radiated Lower Band Edge Plot CDD (Peak – UNII Band 2C)

Worst Case Mode:	802.11a
Worst Case Transfer Rate:	6Mbps
Distance of Measurements:	3 Meters
Operating Frequency:	5825MHz
Channel:	165



Plot 7-371. Radiated Upper Band Edge Plot CDD (Peak – UNII Band 3)

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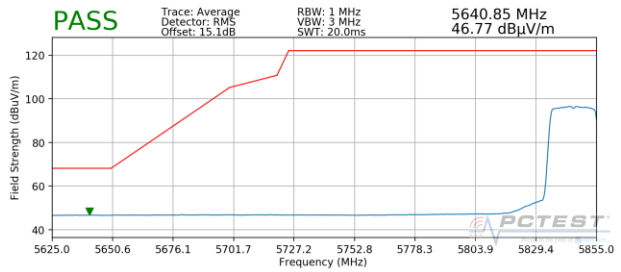
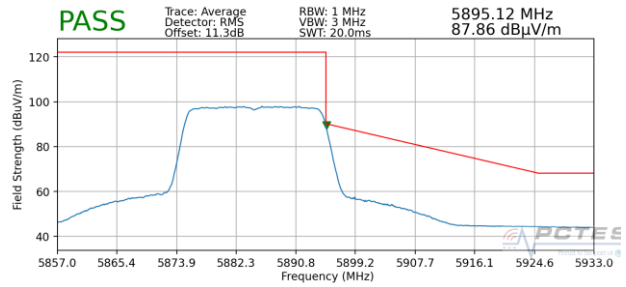
Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5845MHz
Channel:	169



Plot 7-372. Radiated Lower Band Edge Plot MIMO (Average – UNII Band 4)

Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5885MHz
Channel:	177



Plot 7-373. Radiated Upper Band Edge Plot MIMO (Average – UNII Band 4)

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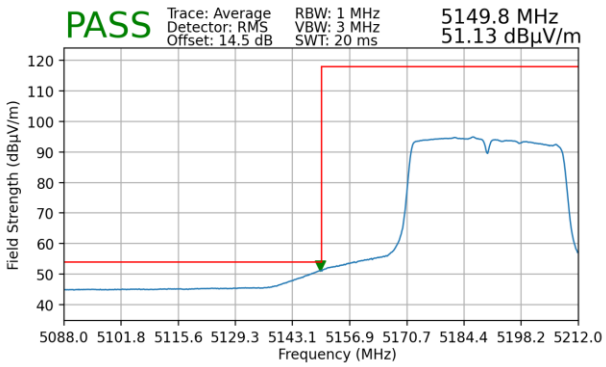
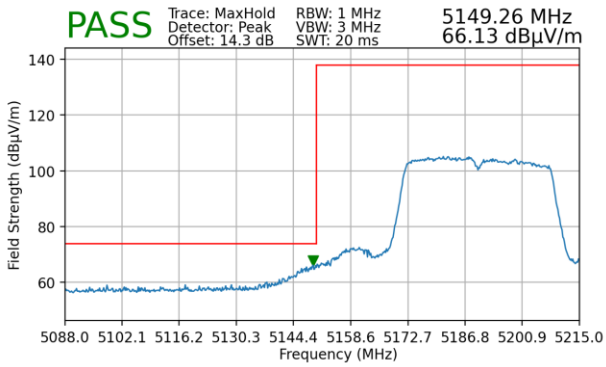
7.6.4 MIMO Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

Worst Case Mode:	802.11n
Worst Case Transfer Rate:	MCS8
Distance of Measurements:	3 Meters
Operating Frequency:	5190MHz
Channel:	38

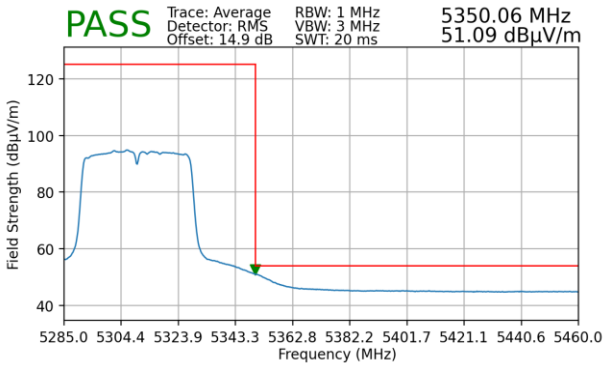


Plot 7-374. Radiated Lower Band Edge Plot MIMO (Average – UNII Band 1)

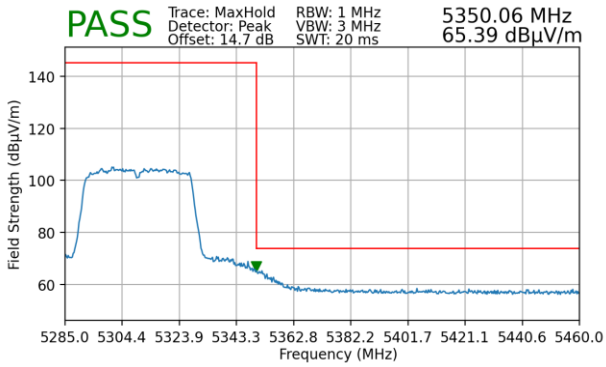


Plot 7-375. Radiated Lower Band Edge Plot MIMO (Peak – UNII Band 1)

Worst Case Mode:	802.11n
Worst Case Transfer Rate:	MCS8
Distance of Measurements:	3 Meters
Operating Frequency:	5310MHz
Channel:	62



Plot 7-376. Radiated Upper Band Edge Plot MIMO (Average – UNII Band 2A)



Plot 7-377. Radiated Upper Band Edge Plot MIMO (Peak – UNII Band 2A)

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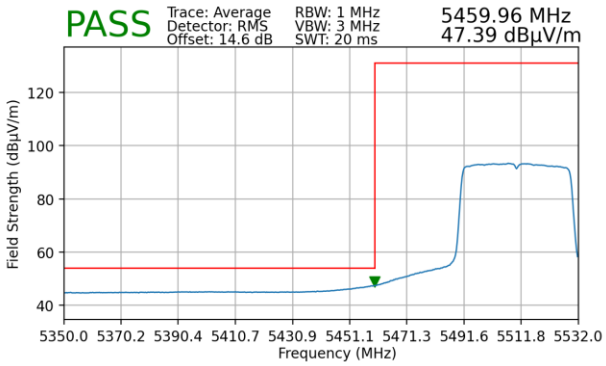
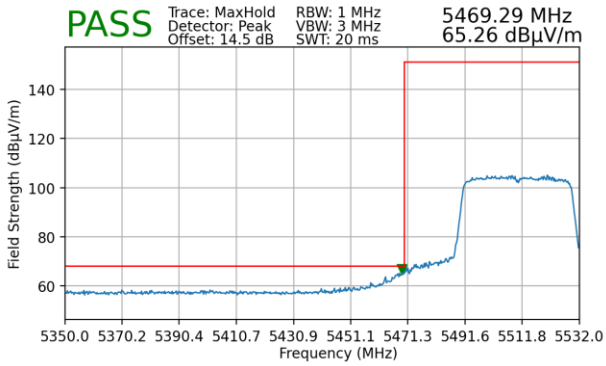
Worst Case Mode:	802.11n
Worst Case Transfer Rate:	MCS8
Distance of Measurements:	3 Meters
Operating Frequency:	5510MHz
Channel:	102

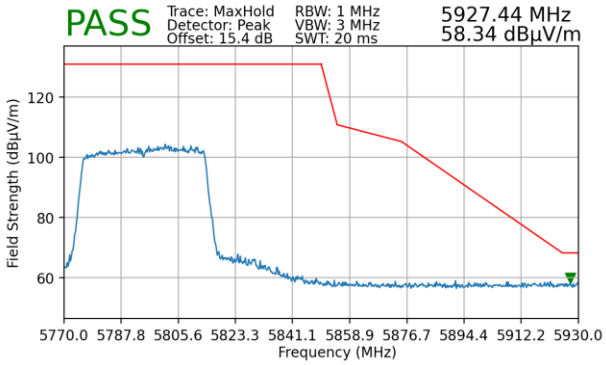


Plot 7-378. Radiated Lower Band Edge Plot MIMO (Average – UNII Band 2C)



Plot 7-379. Radiated Lower Band Edge Plot MIMO (Peak – UNII Band 2C)

Worst Case Mode:	802.11n
Worst Case Transfer Rate:	MCS8
Distance of Measurements:	3 Meters
Operating Frequency:	5795MHz
Channel:	159



Plot 7-380. Radiated Upper Band Edge Plot MIMO (Peak – UNII Band 3)

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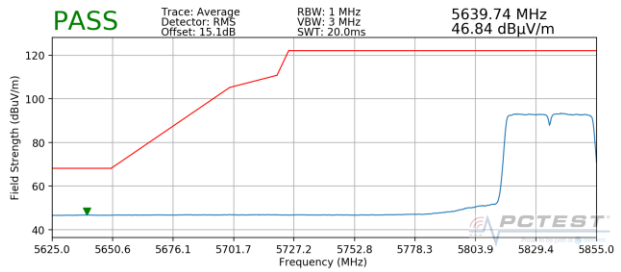
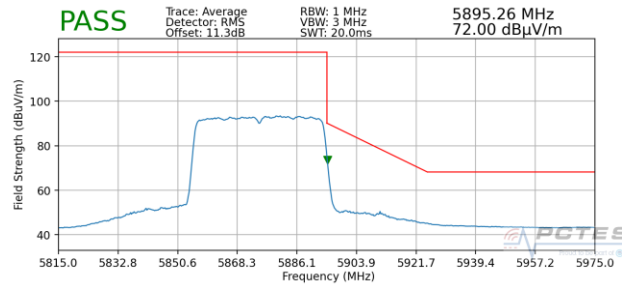
Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5835MHz
Channel:	167



Plot 7-381. Radiated Lower Band Edge Plot MIMO (Average – UNII Band 4)

Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5875MHz
Channel:	175



Plot 7-382. Radiated Upper Band Edge Plot MIMO (Average – UNII Band 4)

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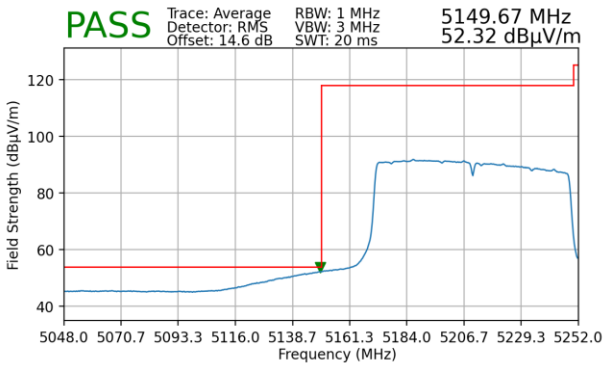
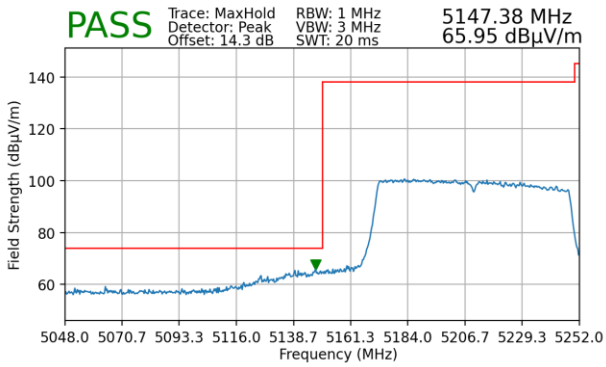
7.6.5 MIMO Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

Worst Case Mode:	802.11ac
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5210MHz
Channel:	42

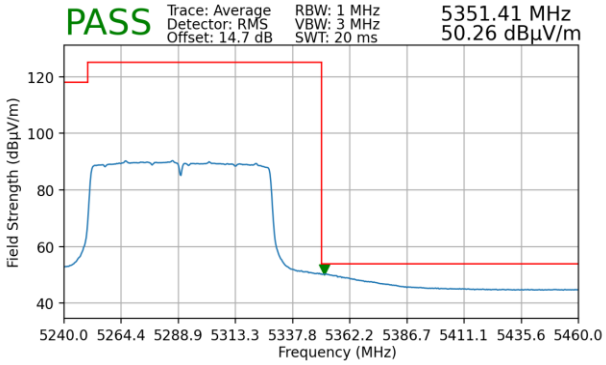


Plot 7-383. Radiated Lower Band Edge Plot MIMO (Average – UNII Band 1)

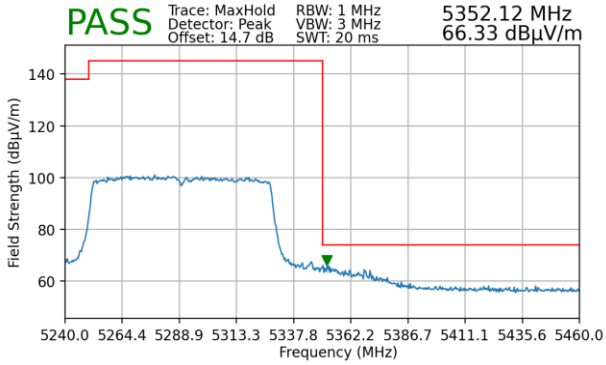


Plot 7-384. Radiated Lower Band Edge Plot MIMO (Peak – UNII Band 1)

Worst Case Mode:	802.11ac
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5290MHz
Channel:	58



Plot 7-385. Radiated Upper Band Edge Plot MIMO (Average – UNII Band 2A)



Plot 7-386. Radiated Upper Band Edge Plot MIMO (Peak – UNII Band 2A)

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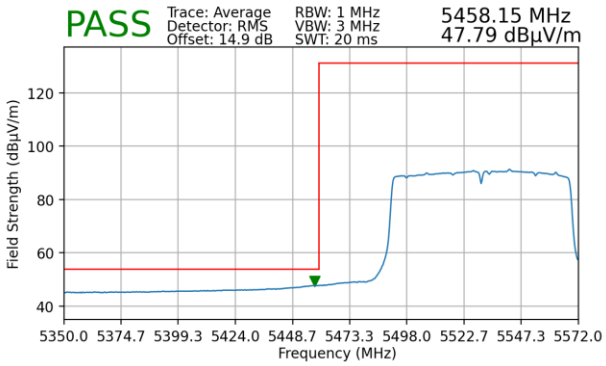
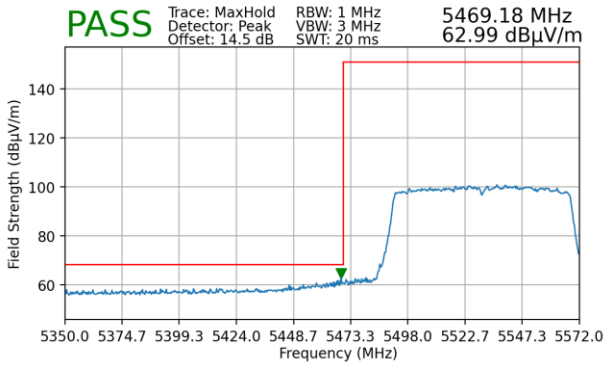
Worst Case Mode:	802.11ac
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5530MHz
Channel:	106

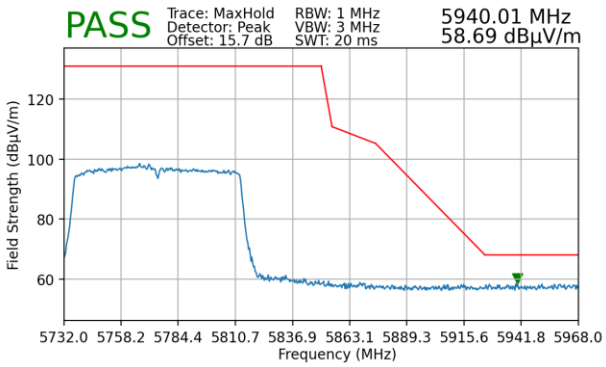


Plot 7-387. Radiated Lower Band Edge Plot MIMO (Average – UNII Band 2C)



Plot 7-388. Radiated Lower Band Edge Plot MIMO (Peak – UNII Band 2C)

Worst Case Mode:	802.11ac
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5775MHz
Channel:	155



Plot 7-389. Radiated Upper Band Edge Plot MIMO (Peak – UNII Band 3)

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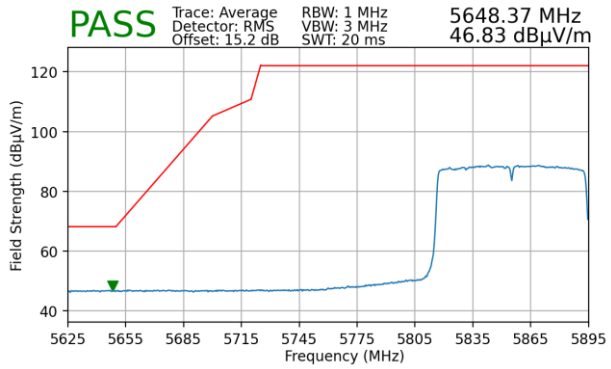
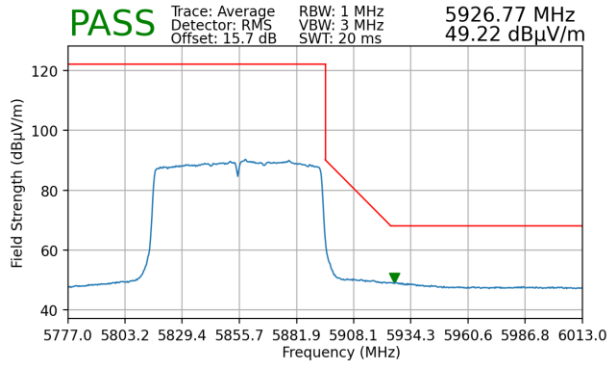
Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5855MHz
Channel:	171



Plot 7-390. Radiated Lower Band Edge Plot MIMO (Average – UNII Band 4)

Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5855MHz
Channel:	171



Plot 7-391. Radiated Upper Band Edge Plot MIMO (Average – UNII Band 4)

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7.6.6 Radiated Spurious Emissions Measurements – Below 1GHz

§15.209

Test Overview and Limit

All out of band radiated spurious emissions are measured with a spectrum analyzer connected to a receive antenna while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates and modes were investigated for radiated spurious emissions. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR and Table 6 of RSS-Gen (8.10) must not exceed the limits shown in Table 7-45 per Section 15.209 and RSS-Gen (8.9).

Frequency	Field Strength [µV/m]	Measured Distance [Meters]
0.009 – 0.490 MHz	2400/F (kHz)	300
0.490 – 1.705 MHz	24000/F (kHz)	30
1.705 – 30.00 MHz	30	30
30.00 – 88.00 MHz	100	3
88.00 – 216.0 MHz	150	3
216.0 – 960.0 MHz	200	3
Above 960.0 MHz	500	3

Table 7-45. Radiated Limits

Test Procedures Used

ANSI C63.10-2013

Test Settings

Quasi-Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 120kHz (for emissions from 30MHz – 1GHz)
3. Detector = quasi-peak
4. Sweep time = auto couple
5. Trace mode = max hold
6. Trace was allowed to stabilize

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Test Setup

The EUT and measurement equipment were set up as shown in the diagrams below.

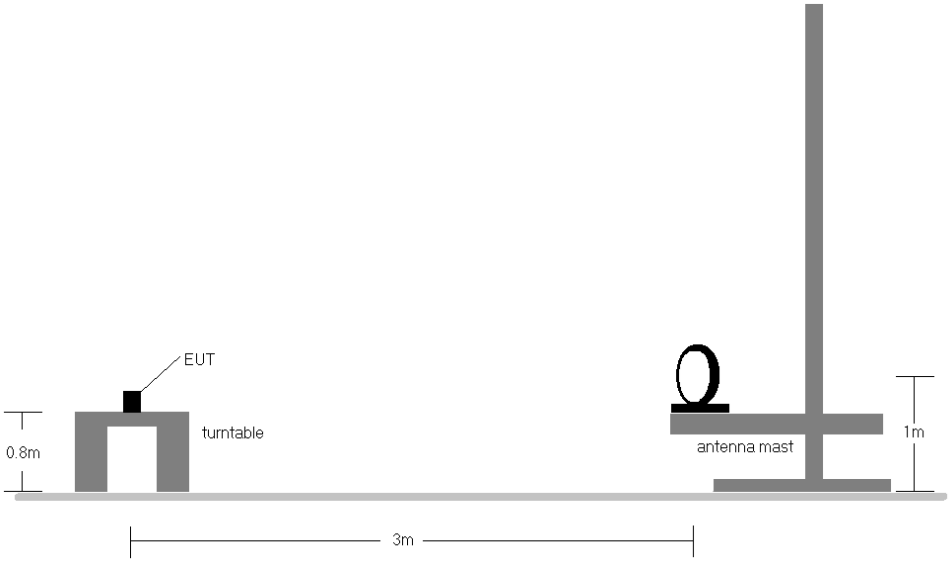

Figure 7-6. Radiated Test Setup < 30MHz

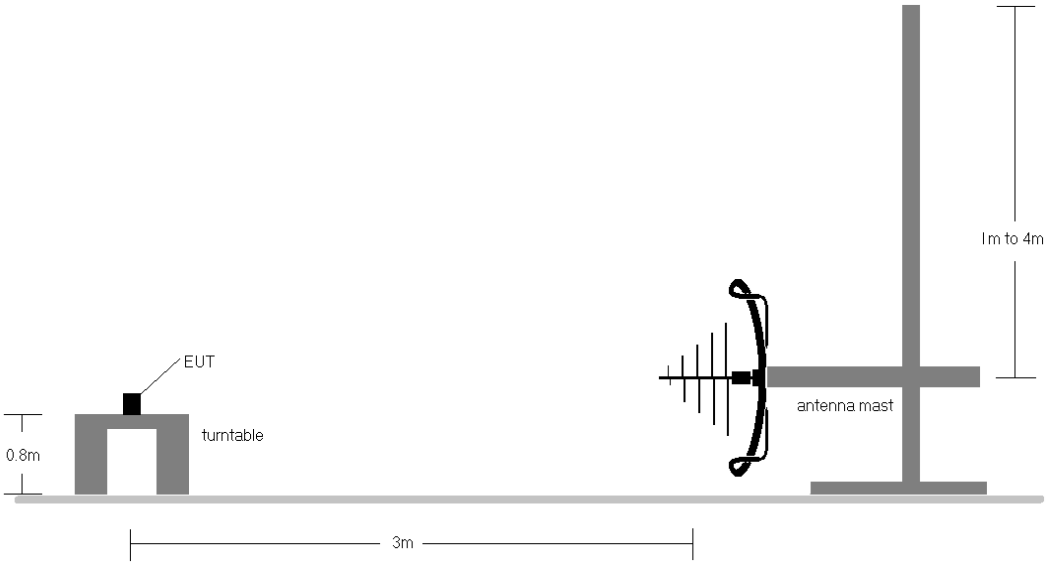

Figure 7-7. Radiated Test Setup < 1GHz

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Test Notes

1. All emissions lying in restricted bands specified in §15.205 and RSS-Gen (8.10) are below the limit shown in Table 7-45.
2. The broadband receive antenna is manipulated through vertical and horizontal polarizations during the tests. The EUT is manipulated through three orthogonal planes.
3. This unit was tested with its standard battery.
4. The spectrum is investigated using a peak detector and final measurements are recorded using CISPR quasi peak detector. The worst-case emissions are reported however emissions whose levels were not within 20dB of the respective limits were not reported.
5. Emissions were measured at a 3 meter test distance.
6. Emissions are investigated while operating on the center channel of the mode, band, and modulation that produced the worst case results during the transmitter spurious emissions testing.
7. No spurious emissions were detected within 20dB of the limit below 30MHz.
8. The results recorded using the broadband antenna is known to correlate with the results obtained by using a tuned dipole with an acceptable degree of accuracy. The VSWR for the measurement antenna was found to be less than 2:1.
9. The wide spectrum spurious emissions plots shown on the following pages are used only for the purpose of emission identification. There were no emissions detected in the 30MHz – 1GHz frequency range, as shown in the subsequent plots.

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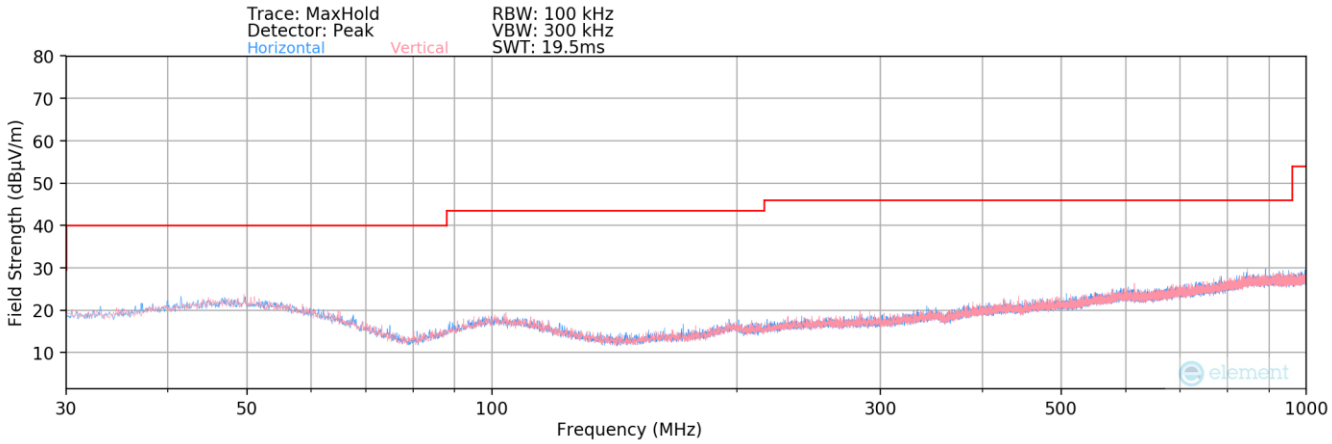
MIMO Radiated Spurious Emissions Measurements (Below 1GHz)

§15.209



Plot 7-392. Radiated Spurious Plot below 1GHz MIMO (802.11a – U3 Ch. 157)

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
32.36	Quasi-Peak	V	-	-	-96.96	26.09	36.13	40.00	-3.87
35.98	Quasi-Peak	V	-	-	-98.32	22.54	31.22	40.00	-8.78
81.00	Quasi-Peak	V	-	-	-96.47	14.80	25.33	40.00	-14.67
711.00	Quasi-Peak	V	-	-	-95.24	28.85	40.61	46.02	-5.41

Table 7-46. Radiated Spurious Emissions below 1GHz MIMO

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7.7 Line-Conducted Test Data

§15.407

Test Overview and Limit

All AC line conducted spurious emissions are measured with a receiver connected to a grounded LISN while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates and modes were investigated for conducted spurious emissions. Only the conducted emissions of the configuration that produced the worst case emissions are reported in this section.

All conducted emissions must not exceed the limits shown in the table below, per Section 15.207 and RSS-Gen (8.8).

Frequency of emission (MHz)	Conducted Limit (dBμV)	
	Quasi-peak	Average
0.15 – 0.5	66 to 56*	56 to 46*
0.5 – 5	56	46
5 – 30	60	50

Table 7-47. Conducted Limits

*Decreases with the logarithm of the frequency.

Test Procedures Used

ANSI C63.10-2013, Section 6.2

Test Settings

Quasi-Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the spurious emission of interest
2. RBW = 9kHz (for emissions from 150kHz – 30MHz)
3. Detector = quasi-peak
4. Sweep time = auto couple
5. Trace mode = max hold
6. Trace was allowed to stabilize

Average Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the spurious emission of interest
2. RBW = 9kHz (for emissions from 150kHz – 30MHz)
3. Detector = RMS
4. Sweep time = auto couple
5. Trace mode = max hold
6. Trace was allowed to stabilize

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Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

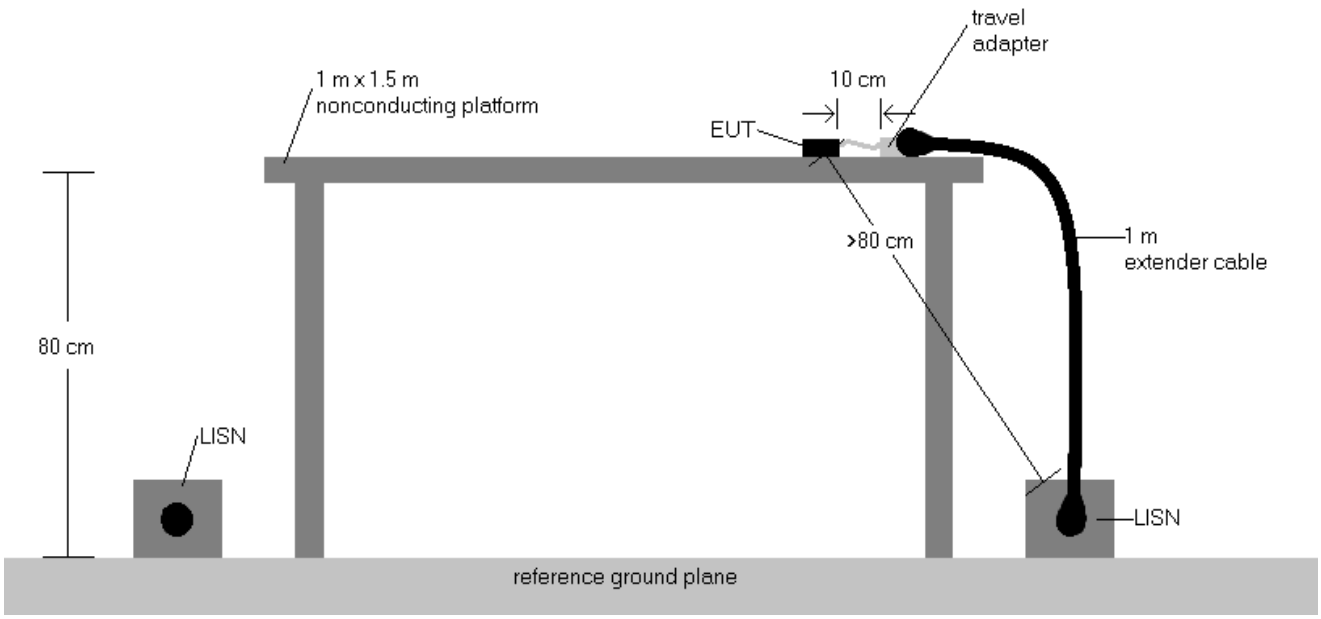

Figure 7-8. Test Instrument & Measurement Setup

Test Notes

1. All modes of operation were investigated and the worst-case emissions are reported using mid channel. The emissions found were not affected by the choice of channel used during testing.
2. The limit for an intentional radiator from 150kHz to 30MHz are specified in 15.207 and RSS-Gen (8.8).
3. Corr. (dB) = Cable loss (dB) + LISN insertion factor (dB)
4. QP/AV Level (dBμV) = QP/AV Analyzer/Receiver Level (dBμV) + Corr. (dB)
5. Margin (dB) = QP/AV Limit (dBμV) - QP/AV Level (dBμV)
6. Traces shown in plot are made using a peak detector.
7. Deviations to the Specifications: None.

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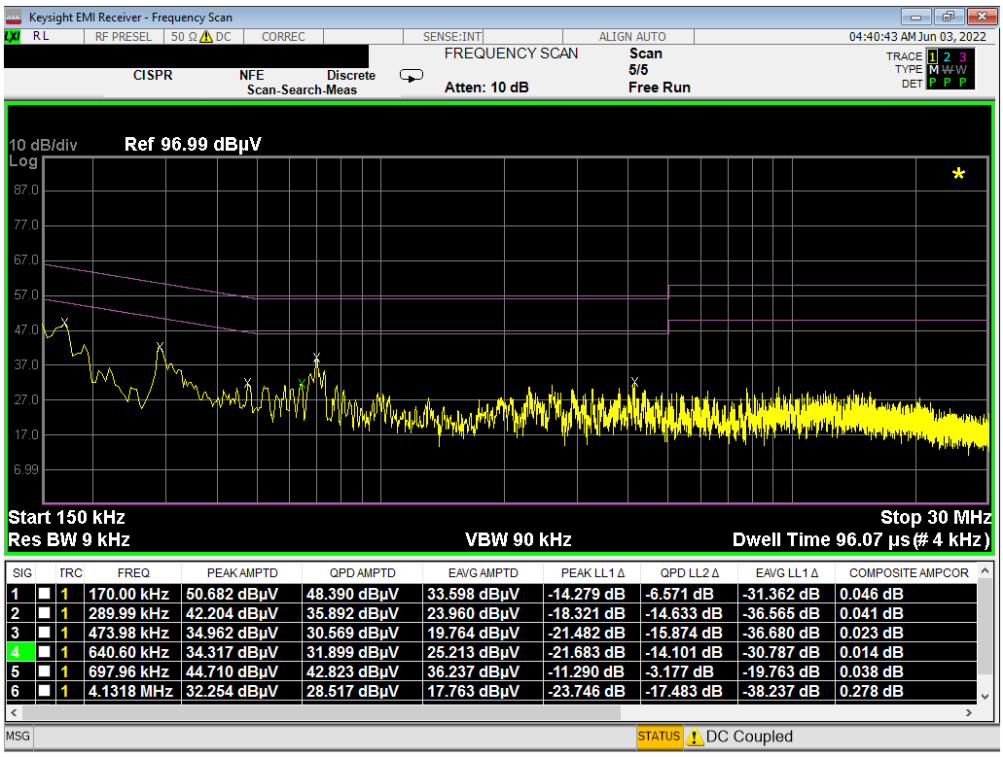
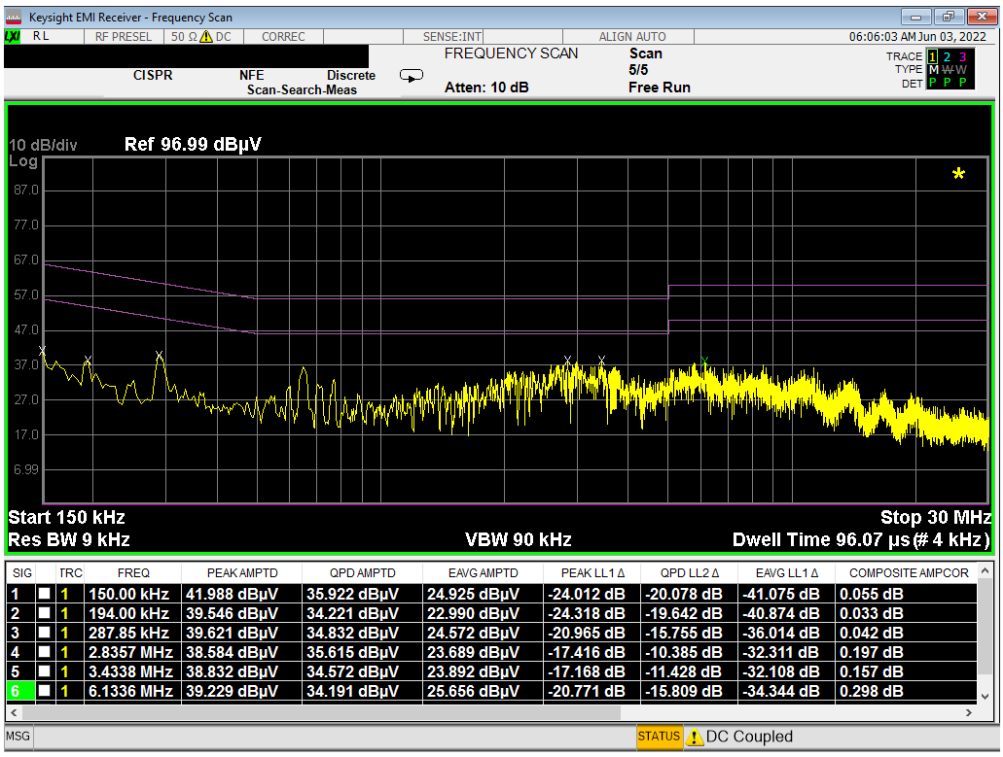


SIG	TRC	FREQ	PEAK AMPTD	QPD AMPTD	EAVG AMPTD	PEAK LL1 Δ	QPD LL2 Δ	EAVG LL1 Δ	COMPOSITE AMPCOR
1	1	170.00 kHz	50.682 dBµV	48.390 dBµV	33.598 dBµV	-14.279 dB	-6.571 dB	-31.362 dB	0.046 dB
2	1	289.99 kHz	42.204 dBµV	35.892 dBµV	23.960 dBµV	-18.321 dB	-14.633 dB	-36.565 dB	0.041 dB
3	1	473.98 kHz	34.962 dBµV	30.569 dBµV	19.764 dBµV	-21.482 dB	-15.874 dB	-36.680 dB	0.023 dB
4	1	640.60 kHz	34.317 dBµV	31.899 dBµV	25.213 dBµV	-21.683 dB	-14.101 dB	-30.787 dB	0.014 dB
5	1	697.96 kHz	44.710 dBµV	42.823 dBµV	36.237 dBµV	-11.290 dB	-3.177 dB	-19.763 dB	0.038 dB
6	1	4.1318 MHz	32.254 dBµV	28.517 dBµV	17.763 dBµV	-23.746 dB	-17.483 dB	-38.237 dB	0.278 dB

Plot 7-393. Line Conducted Plot with 802.11a UNII Band 1 (L1) - Open



SIG	TRC	FREQ	PEAK AMPTD	QPD AMPTD	EAVG AMPTD	PEAK LL1 Δ	QPD LL2 Δ	EAVG LL1 Δ	COMPOSITE AMPCOR
1	1	150.00 kHz	41.988 dBµV	35.922 dBµV	24.925 dBµV	-24.012 dB	-20.078 dB	-41.075 dB	0.055 dB
2	1	194.00 kHz	39.546 dBµV	34.221 dBµV	22.990 dBµV	-24.318 dB	-19.642 dB	-40.874 dB	0.033 dB
3	1	287.85 kHz	39.621 dBµV	34.832 dBµV	24.572 dBµV	-20.965 dB	-15.755 dB	-36.014 dB	0.042 dB
4	1	2.8357 MHz	38.584 dBµV	35.615 dBµV	23.689 dBµV	-17.416 dB	-10.385 dB	-32.311 dB	0.197 dB
5	1	3.4338 MHz	38.832 dBµV	34.572 dBµV	23.892 dBµV	-17.168 dB	-11.428 dB	-32.108 dB	0.157 dB
6	1	6.1336 MHz	39.229 dBµV	34.191 dBµV	25.656 dBµV	-20.771 dB	-15.809 dB	-34.344 dB	0.298 dB

Plot 7-394. Line Conducted Plot with 802.11a UNII Band 1 (N) - Open

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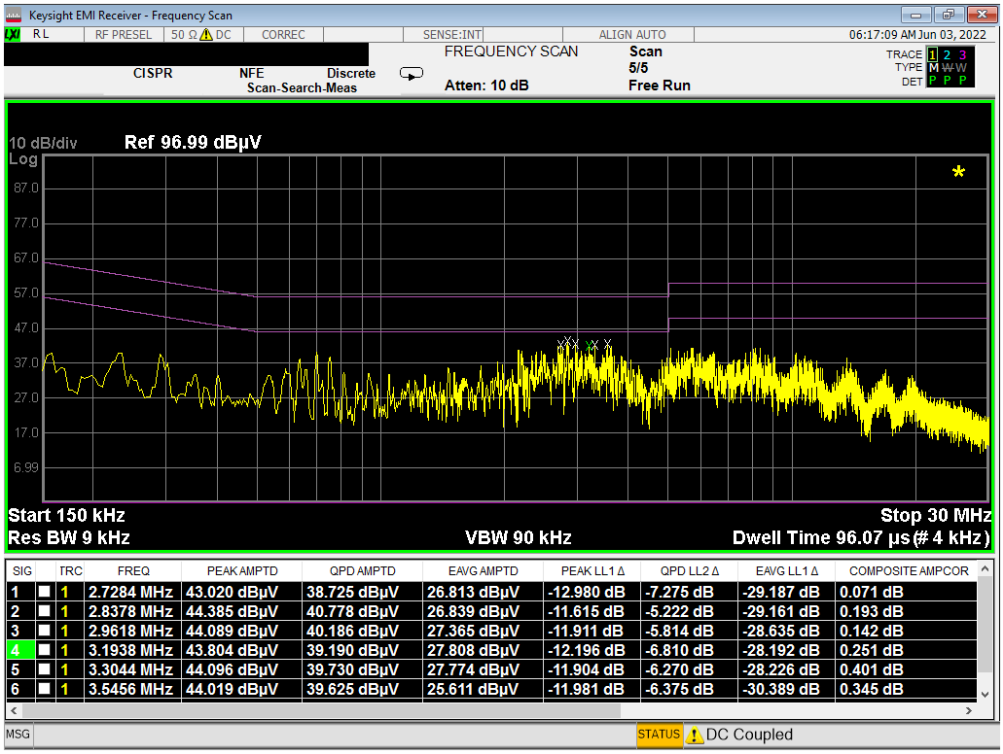
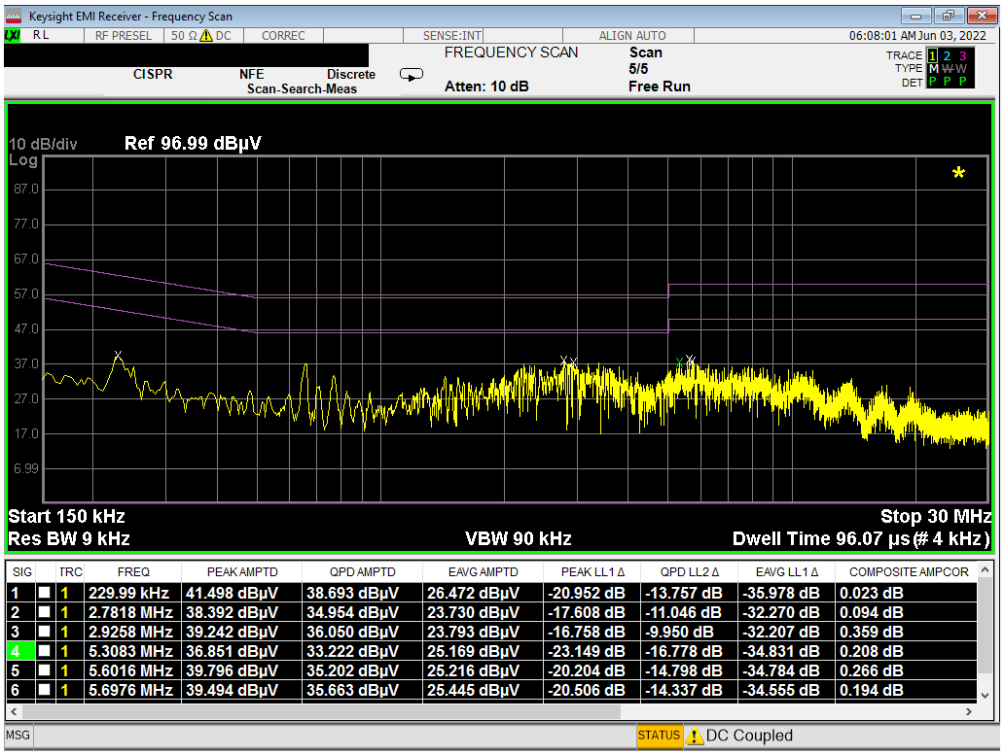


SIG	TRC	FREQ	PEAK AMPTD	QPD AMPTD	EAVG AMPTD	PEAK LL1 Δ	QPD LL2 Δ	EAVG LL1 Δ	COMPOSITE AMPCOR
1	1	2.7284 MHz	43.020 dBµV	38.725 dBµV	26.813 dBµV	-12.980 dB	-7.275 dB	-29.187 dB	0.071 dB
2	1	2.8378 MHz	44.385 dBµV	40.778 dBµV	26.839 dBµV	-11.615 dB	-5.222 dB	-29.161 dB	0.193 dB
3	1	2.9618 MHz	44.089 dBµV	40.186 dBµV	27.365 dBµV	-11.911 dB	-5.814 dB	-28.635 dB	0.142 dB
4	1	3.1938 MHz	43.804 dBµV	39.190 dBµV	27.808 dBµV	-12.196 dB	-6.810 dB	-28.192 dB	0.251 dB
5	1	3.3044 MHz	44.096 dBµV	39.730 dBµV	27.774 dBµV	-11.904 dB	-6.270 dB	-28.226 dB	0.401 dB
6	1	3.5456 MHz	44.019 dBµV	39.625 dBµV	25.611 dBµV	-11.981 dB	-6.375 dB	-30.389 dB	0.345 dB

Plot 7-395. Line Conducted Plot with 802.11a UNII Band 2A (L1) - Open



SIG	TRC	FREQ	PEAK AMPTD	QPD AMPTD	EAVG AMPTD	PEAK LL1 Δ	QPD LL2 Δ	EAVG LL1 Δ	COMPOSITE AMPCOR
1	1	229.99 kHz	41.498 dBµV	38.693 dBµV	26.472 dBµV	-20.952 dB	-13.757 dB	-35.978 dB	0.023 dB
2	1	2.7818 MHz	38.392 dBµV	34.954 dBµV	23.730 dBµV	-17.608 dB	-11.046 dB	-32.270 dB	0.094 dB
3	1	2.9258 MHz	39.242 dBµV	36.050 dBµV	23.793 dBµV	-16.758 dB	-9.950 dB	-32.207 dB	0.359 dB
4	1	5.3083 MHz	36.851 dBµV	33.222 dBµV	25.169 dBµV	-23.149 dB	-16.778 dB	-34.831 dB	0.208 dB
5	1	5.6016 MHz	39.796 dBµV	35.202 dBµV	25.216 dBµV	-20.204 dB	-14.798 dB	-34.784 dB	0.266 dB
6	1	5.6976 MHz	39.494 dBµV	35.663 dBµV	25.445 dBµV	-20.506 dB	-14.337 dB	-34.555 dB	0.194 dB

Plot 7-396. Line Conducted Plot with 802.11a UNII Band 2A (N) - Open

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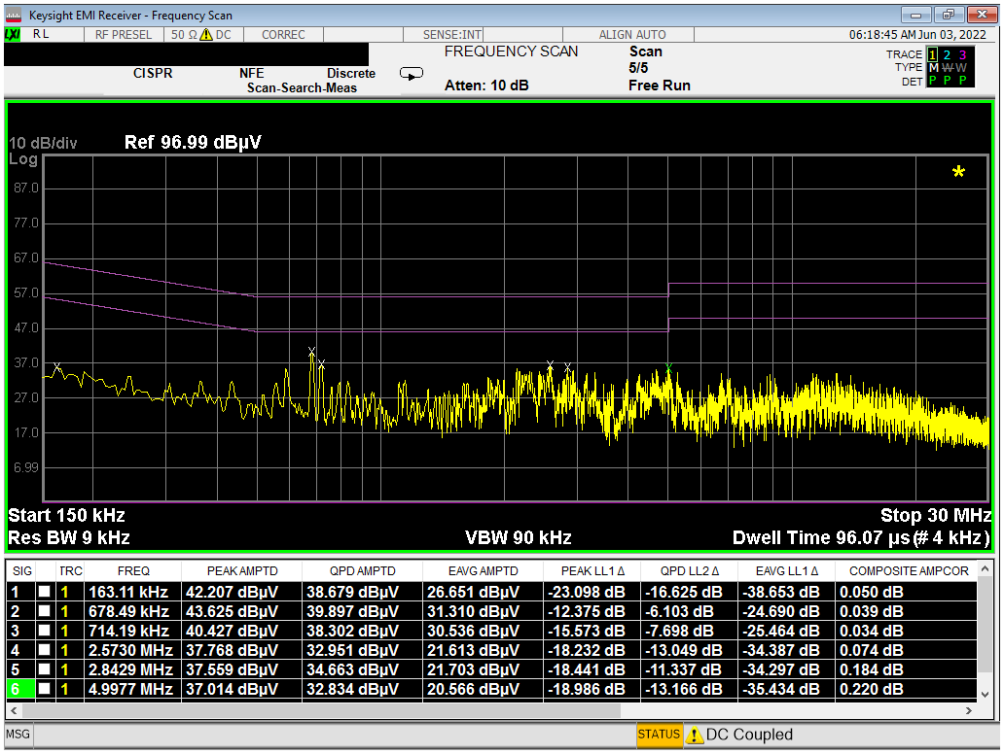
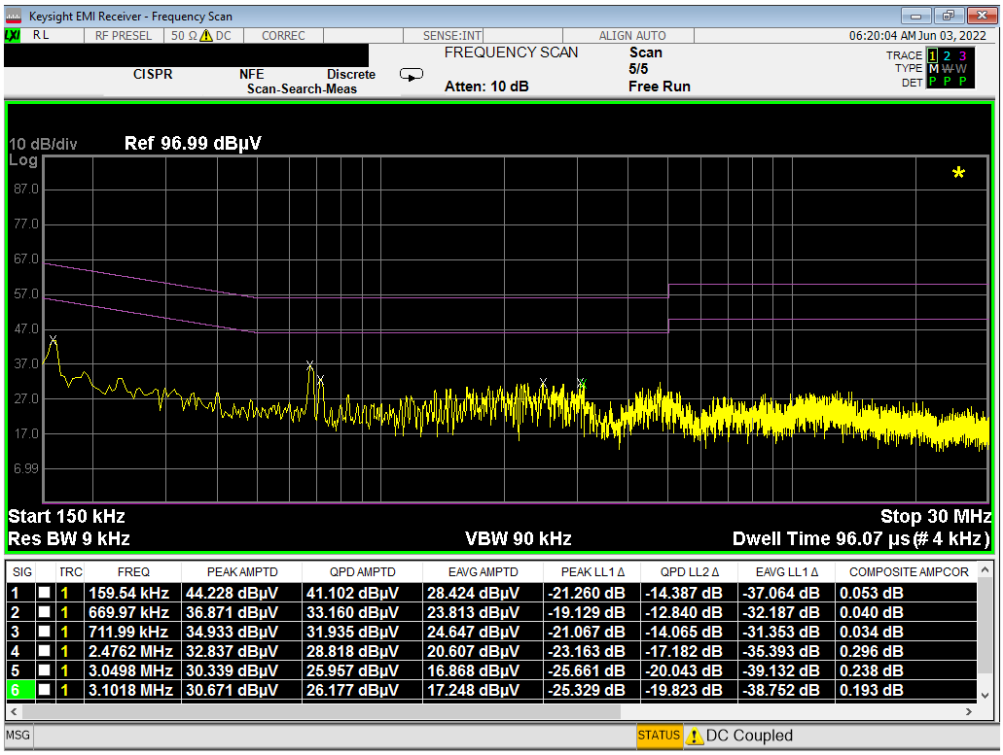


SIG	TRC	FREQ	PEAK AMPTD	QPD AMPTD	EAVG AMPTD	PEAK LL1 Δ	QPD LL2 Δ	EAVG LL1 Δ	COMPOSITE AMPCOR
1	1	163.11 kHz	42.207 dBµV	38.679 dBµV	26.651 dBµV	-23.098 dB	-16.625 dB	-38.653 dB	0.050 dB
2	1	678.49 kHz	43.625 dBµV	39.897 dBµV	31.310 dBµV	-12.375 dB	-6.103 dB	-24.690 dB	0.039 dB
3	1	714.19 kHz	40.427 dBµV	38.302 dBµV	30.536 dBµV	-15.573 dB	-7.698 dB	-25.464 dB	0.034 dB
4	1	2.5730 MHz	37.768 dBµV	32.951 dBµV	21.613 dBµV	-18.232 dB	-13.049 dB	-34.387 dB	0.074 dB
5	1	2.8429 MHz	37.559 dBµV	34.663 dBµV	21.703 dBµV	-18.441 dB	-11.337 dB	-34.297 dB	0.184 dB
6	1	4.9977 MHz	37.014 dBµV	32.834 dBµV	20.566 dBµV	-18.986 dB	-13.166 dB	-35.434 dB	0.220 dB

Plot 7-397. Line Conducted Plot with 802.11a UNII Band 2C (L1) - Open



SIG	TRC	FREQ	PEAK AMPTD	QPD AMPTD	EAVG AMPTD	PEAK LL1 Δ	QPD LL2 Δ	EAVG LL1 Δ	COMPOSITE AMPCOR
1	1	159.54 kHz	44.228 dBµV	41.102 dBµV	28.424 dBµV	-21.260 dB	-14.387 dB	-37.064 dB	0.053 dB
2	1	669.97 kHz	36.871 dBµV	33.160 dBµV	23.813 dBµV	-19.129 dB	-12.840 dB	-32.187 dB	0.040 dB
3	1	711.99 kHz	34.933 dBµV	31.935 dBµV	24.647 dBµV	-21.067 dB	-14.065 dB	-31.353 dB	0.034 dB
4	1	2.4762 MHz	32.837 dBµV	28.818 dBµV	20.607 dBµV	-23.163 dB	-17.182 dB	-35.393 dB	0.296 dB
5	1	3.0498 MHz	30.339 dBµV	25.957 dBµV	16.868 dBµV	-25.661 dB	-20.043 dB	-39.132 dB	0.238 dB
6	1	3.1018 MHz	30.671 dBµV	26.177 dBµV	17.248 dBµV	-25.329 dB	-19.823 dB	-38.752 dB	0.193 dB

Plot 7-398. Line Conducted Plot with 802.11a UNII Band 2C (N) - Open

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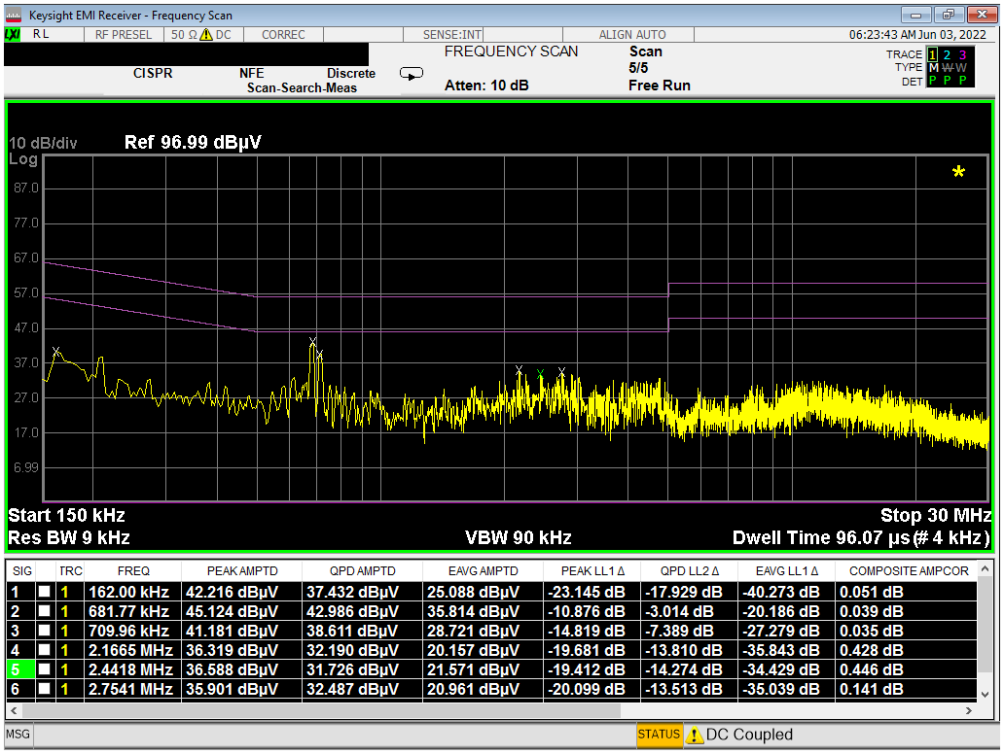
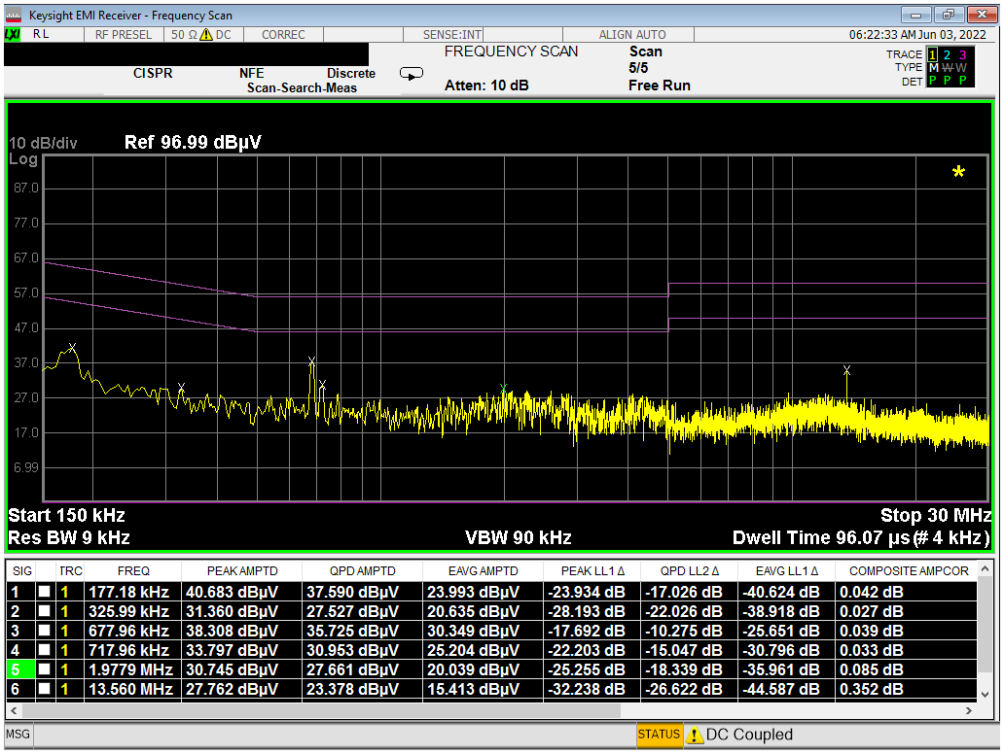


SIG	TRC	FREQ	PEAK AMPTD	QPD AMPTD	EAVG AMPTD	PEAK LL1 Δ	QPD LL2 Δ	EAVG LL1 Δ	COMPOSITE AMPCOR
1	1	162.00 kHz	42.216 dBµV	37.432 dBµV	25.088 dBµV	-23.145 dB	-17.929 dB	-40.273 dB	0.051 dB
2	1	681.77 kHz	45.124 dBµV	42.986 dBµV	35.814 dBµV	-10.876 dB	-3.014 dB	-20.186 dB	0.039 dB
3	1	709.96 kHz	41.181 dBµV	38.611 dBµV	28.721 dBµV	-14.819 dB	-7.389 dB	-27.279 dB	0.035 dB
4	1	2.1665 MHz	36.319 dBµV	32.190 dBµV	20.157 dBµV	-19.681 dB	-13.810 dB	-35.843 dB	0.428 dB
5	1	2.4418 MHz	36.588 dBµV	31.726 dBµV	21.571 dBµV	-19.412 dB	-14.274 dB	-34.429 dB	0.446 dB
6	1	2.7541 MHz	35.901 dBµV	32.487 dBµV	20.961 dBµV	-20.099 dB	-13.513 dB	-35.039 dB	0.141 dB

Plot 7-399. Line Conducted Plot with 802.11a UNII Band 3 (L1) - Open



SIG	TRC	FREQ	PEAK AMPTD	QPD AMPTD	EAVG AMPTD	PEAK LL1 Δ	QPD LL2 Δ	EAVG LL1 Δ	COMPOSITE AMPCOR
1	1	177.18 kHz	40.683 dBµV	37.590 dBµV	23.993 dBµV	-23.934 dB	-17.026 dB	-40.624 dB	0.042 dB
2	1	325.99 kHz	31.360 dBµV	27.527 dBµV	20.635 dBµV	-28.193 dB	-22.026 dB	-38.918 dB	0.027 dB
3	1	677.96 kHz	38.308 dBµV	35.725 dBµV	30.349 dBµV	-17.692 dB	-10.275 dB	-25.651 dB	0.039 dB
4	1	717.96 kHz	33.797 dBµV	30.953 dBµV	25.204 dBµV	-22.203 dB	-15.047 dB	-30.796 dB	0.033 dB
5	1	1.9779 MHz	30.745 dBµV	27.661 dBµV	20.039 dBµV	-25.255 dB	-18.339 dB	-35.961 dB	0.085 dB
6	1	13.560 MHz	27.762 dBµV	23.378 dBµV	15.413 dBµV	-32.238 dB	-26.622 dB	-44.587 dB	0.352 dB

Plot 7-400. Line Conducted Plot with 802.11a UNII Band 3 (N) - Open

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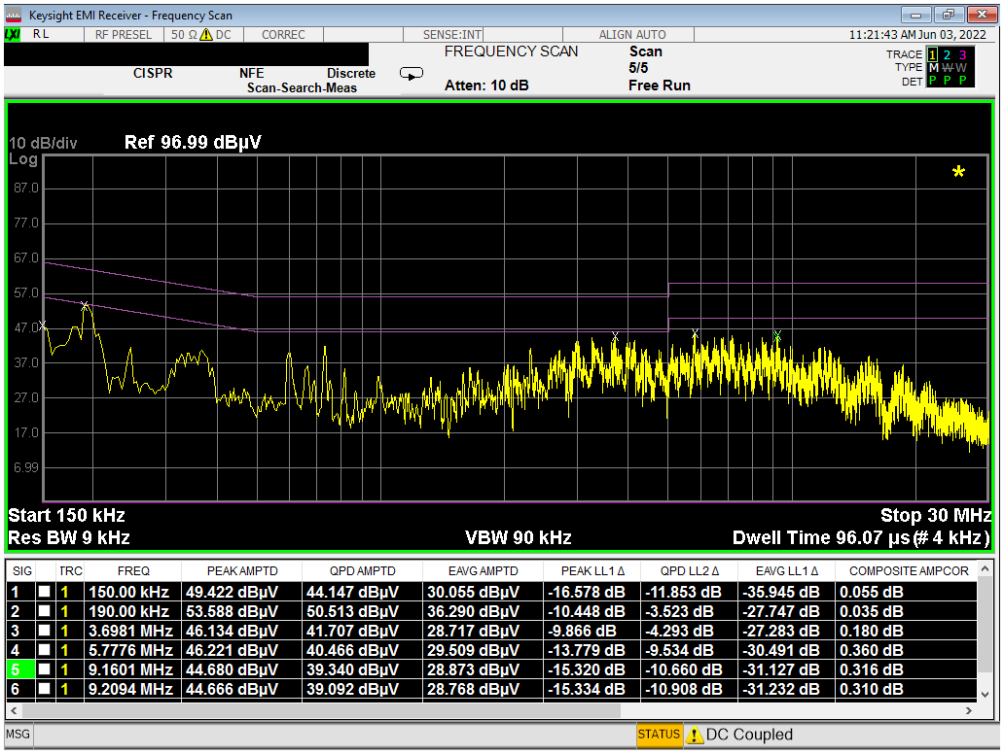
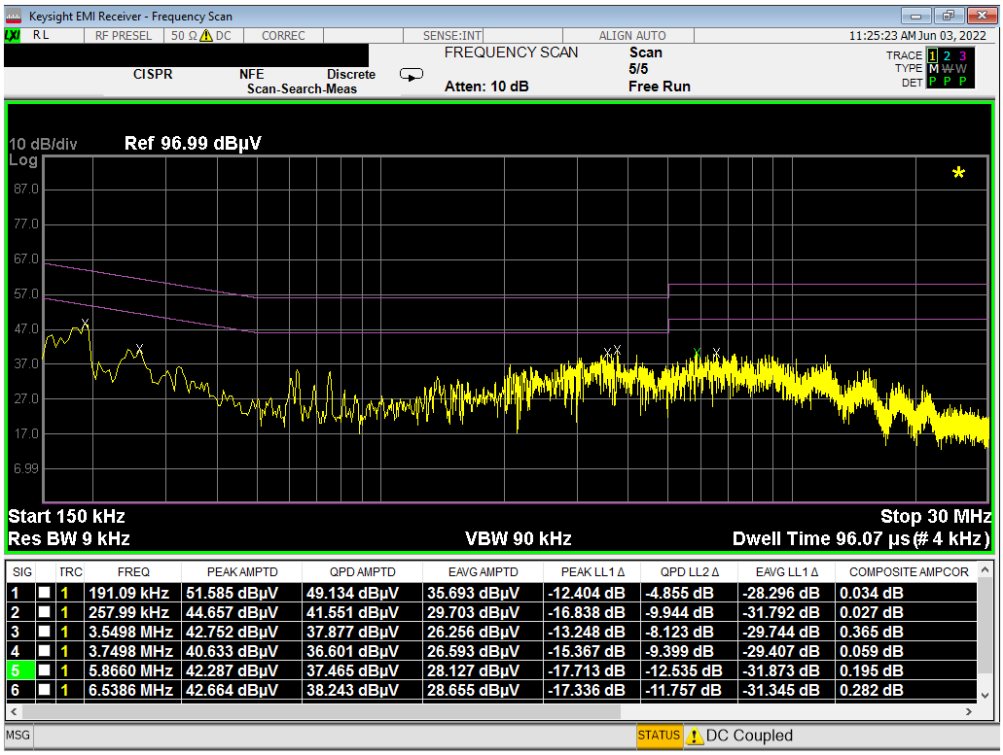


SIG	TRC	FREQ	PEAK AMPTD	QPD AMPTD	EAVG AMPTD	PEAK LL1 Δ	QPD LL2 Δ	EAVG LL1 Δ	COMPOSITE AMPCOR
1	1	150.00 kHz	49.422 dBµV	44.147 dBµV	30.055 dBµV	-16.578 dB	-11.853 dB	-35.945 dB	0.055 dB
2	1	190.00 kHz	53.588 dBµV	50.513 dBµV	36.290 dBµV	-10.448 dB	-3.523 dB	-27.747 dB	0.035 dB
3	1	3.6981 MHz	46.134 dBµV	41.707 dBµV	28.717 dBµV	-9.866 dB	-4.293 dB	-27.283 dB	0.180 dB
4	1	5.7776 MHz	46.221 dBµV	40.466 dBµV	29.509 dBµV	-13.779 dB	-9.534 dB	-30.491 dB	0.360 dB
5	1	9.1601 MHz	44.680 dBµV	39.340 dBµV	28.873 dBµV	-15.320 dB	-10.660 dB	-31.127 dB	0.316 dB
6	1	9.2094 MHz	44.666 dBµV	39.092 dBµV	28.768 dBµV	-15.334 dB	-10.908 dB	-31.232 dB	0.310 dB

Plot 7-401. Line Conducted Plot with 802.11a UNII Band 1 (L1) - Closed



SIG	TRC	FREQ	PEAK AMPTD	QPD AMPTD	EAVG AMPTD	PEAK LL1 Δ	QPD LL2 Δ	EAVG LL1 Δ	COMPOSITE AMPCOR
1	1	191.09 kHz	51.585 dBµV	49.134 dBµV	35.693 dBµV	-12.404 dB	-4.855 dB	-28.296 dB	0.034 dB
2	1	257.99 kHz	44.657 dBµV	41.551 dBµV	29.703 dBµV	-16.838 dB	-9.944 dB	-31.792 dB	0.027 dB
3	1	3.5498 MHz	42.752 dBµV	37.877 dBµV	26.256 dBµV	-13.248 dB	-8.123 dB	-29.744 dB	0.365 dB
4	1	3.7498 MHz	40.633 dBµV	36.601 dBµV	26.593 dBµV	-15.367 dB	-9.399 dB	-29.407 dB	0.059 dB
5	1	5.8660 MHz	42.287 dBµV	37.465 dBµV	28.127 dBµV	-17.713 dB	-12.535 dB	-31.873 dB	0.195 dB
6	1	6.5386 MHz	42.664 dBµV	38.243 dBµV	28.655 dBµV	-17.336 dB	-11.757 dB	-31.345 dB	0.282 dB

Plot 7-402. Line Conducted Plot with 802.11a UNII Band 1 (N) - Closed

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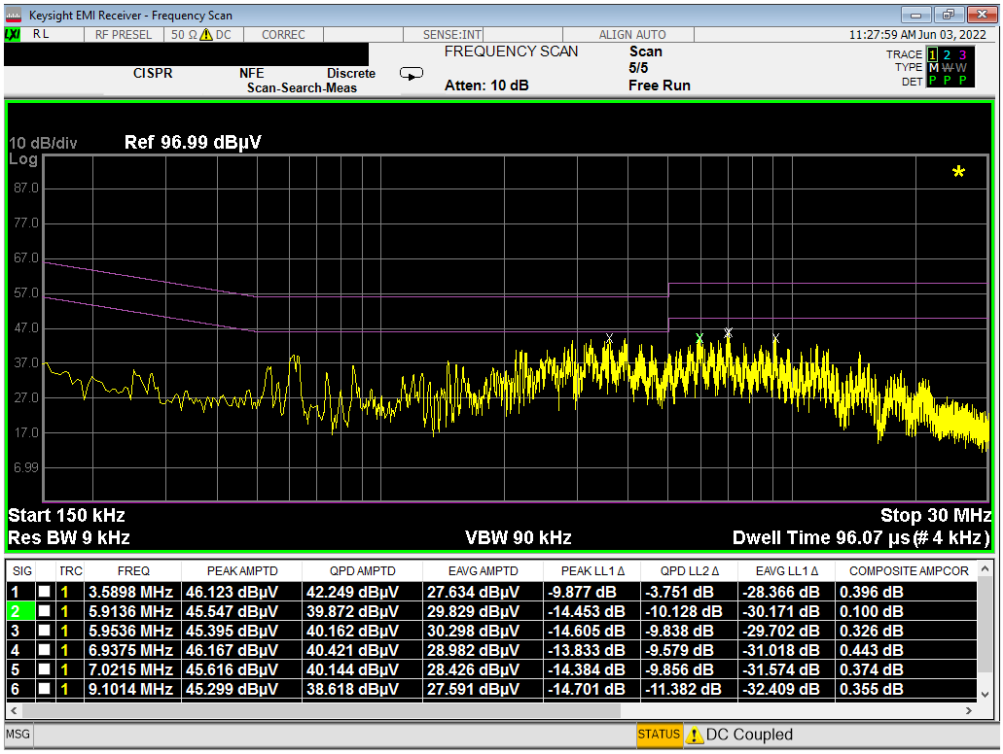
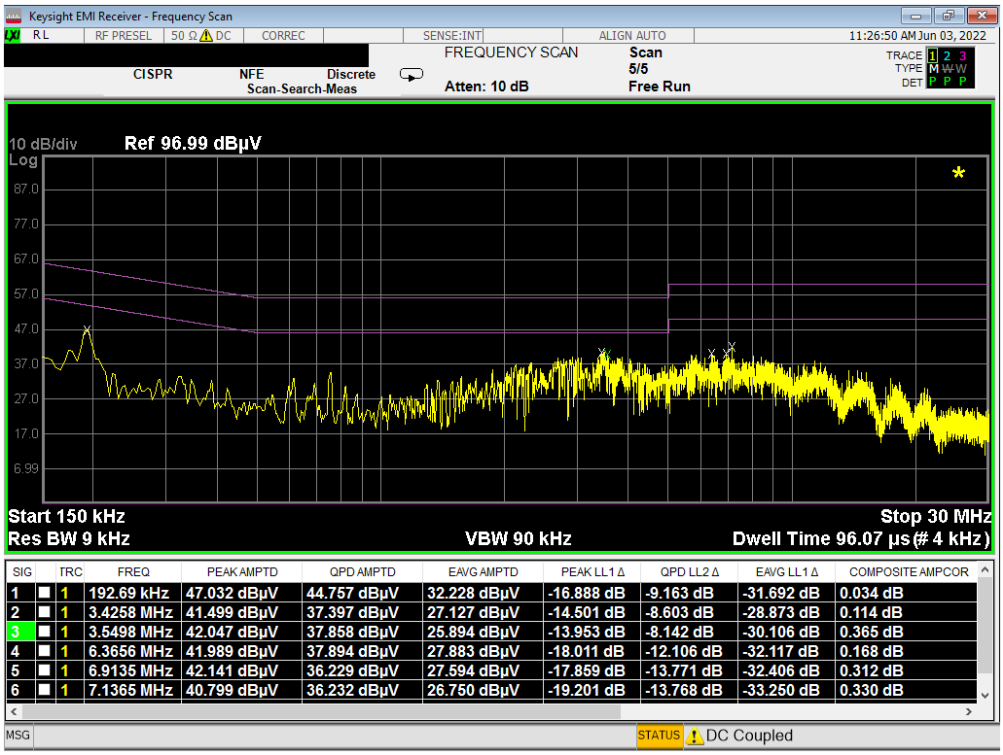


SIG	TRC	FREQ	PEAK AMPTD	QPD AMPTD	EAVG AMPTD	PEAK LL1 Δ	QPD LL2 Δ	EAVG LL1 Δ	COMPOSITE AMPCOR
1	1	3.5898 MHz	46.123 dBµV	42.249 dBµV	27.634 dBµV	-9.877 dB	-3.751 dB	-28.366 dB	0.396 dB
2	1	5.9136 MHz	45.547 dBµV	39.872 dBµV	29.829 dBµV	-14.453 dB	-10.128 dB	-30.171 dB	0.100 dB
3	1	5.9536 MHz	45.395 dBµV	40.162 dBµV	30.298 dBµV	-14.605 dB	-9.838 dB	-29.702 dB	0.326 dB
4	1	6.9375 MHz	46.167 dBµV	40.421 dBµV	28.982 dBµV	-13.833 dB	-9.579 dB	-31.018 dB	0.443 dB
5	1	7.0215 MHz	45.616 dBµV	40.144 dBµV	28.426 dBµV	-14.384 dB	-9.856 dB	-31.574 dB	0.374 dB
6	1	9.1014 MHz	45.299 dBµV	38.618 dBµV	27.591 dBµV	-14.701 dB	-11.382 dB	-32.409 dB	0.355 dB

Plot 7-403. Line Conducted Plot with 802.11a UNII Band 2A (L1) - Closed



SIG	TRC	FREQ	PEAK AMPTD	QPD AMPTD	EAVG AMPTD	PEAK LL1 Δ	QPD LL2 Δ	EAVG LL1 Δ	COMPOSITE AMPCOR
1	1	192.69 kHz	47.032 dBµV	44.757 dBµV	32.228 dBµV	-16.888 dB	-9.163 dB	-31.692 dB	0.034 dB
2	1	3.4258 MHz	41.499 dBµV	37.397 dBµV	27.127 dBµV	-14.501 dB	-8.603 dB	-28.873 dB	0.114 dB
3	1	3.5498 MHz	42.047 dBµV	37.858 dBµV	25.894 dBµV	-13.953 dB	-8.142 dB	-30.106 dB	0.365 dB
4	1	6.3656 MHz	41.989 dBµV	37.894 dBµV	27.883 dBµV	-18.011 dB	-12.106 dB	-32.117 dB	0.168 dB
5	1	6.9135 MHz	42.141 dBµV	36.229 dBµV	27.594 dBµV	-17.859 dB	-13.771 dB	-32.406 dB	0.312 dB
6	1	7.1365 MHz	40.799 dBµV	36.232 dBµV	26.750 dBµV	-19.201 dB	-13.768 dB	-33.250 dB	0.330 dB

Plot 7-404. Line Conducted Plot with 802.11a UNII Band 2A (N) - Closed

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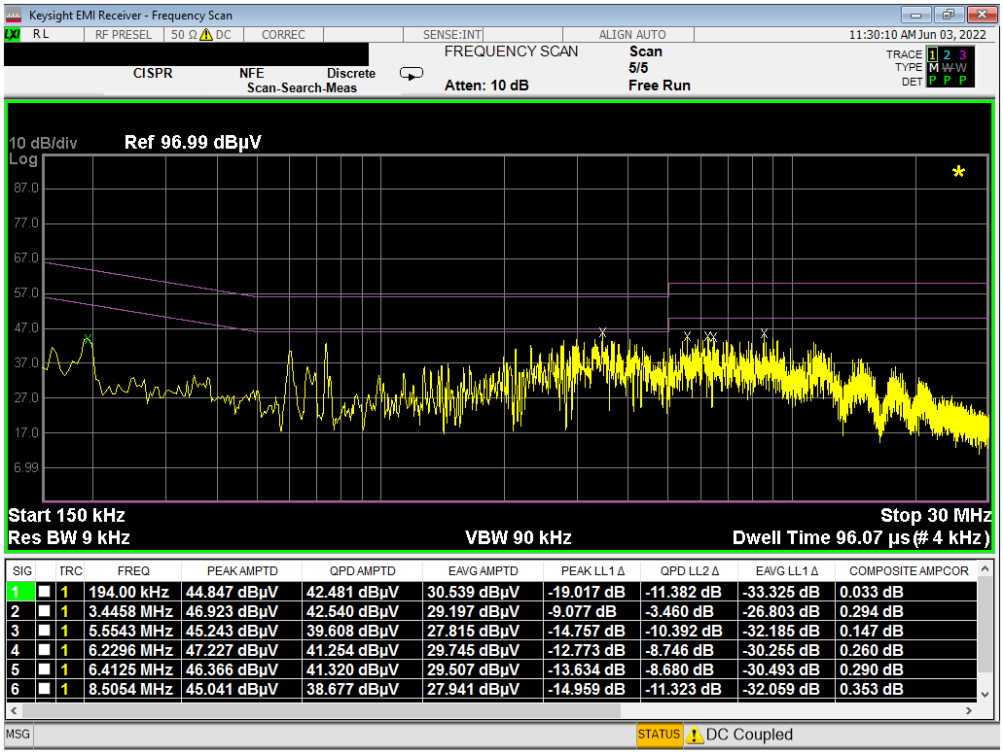
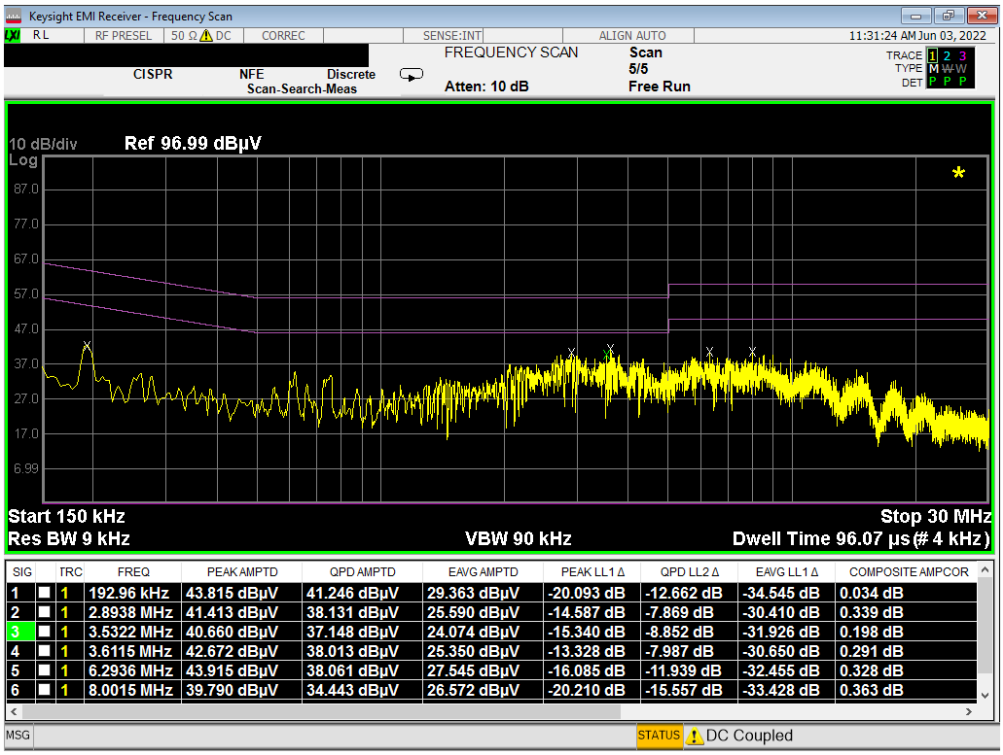


SIG	TRC	FREQ	PEAK AMPTD	QPD AMPTD	EAVG AMPTD	PEAK LL1 Δ	QPD LL2 Δ	EAVG LL1 Δ	COMPOSITE AMPCOR
1	1	194.00 kHz	44.847 dBµV	42.481 dBµV	30.539 dBµV	-19.017 dB	-11.382 dB	-33.325 dB	0.033 dB
2	1	3.4458 MHz	46.923 dBµV	42.540 dBµV	29.197 dBµV	-9.077 dB	-3.460 dB	-26.803 dB	0.294 dB
3	1	5.5543 MHz	45.243 dBµV	39.608 dBµV	27.815 dBµV	-14.757 dB	-10.392 dB	-32.185 dB	0.147 dB
4	1	6.2296 MHz	47.227 dBµV	41.254 dBµV	29.745 dBµV	-12.773 dB	-8.746 dB	-30.255 dB	0.260 dB
5	1	6.4125 MHz	46.366 dBµV	41.320 dBµV	29.507 dBµV	-13.634 dB	-8.680 dB	-30.493 dB	0.290 dB
6	1	8.5054 MHz	45.041 dBµV	38.677 dBµV	27.941 dBµV	-14.959 dB	-11.323 dB	-32.059 dB	0.353 dB

Plot 7-405. Line Conducted Plot with 802.11a UNII Band 2C (L1) - Closed



SIG	TRC	FREQ	PEAK AMPTD	QPD AMPTD	EAVG AMPTD	PEAK LL1 Δ	QPD LL2 Δ	EAVG LL1 Δ	COMPOSITE AMPCOR
1	1	192.96 kHz	43.815 dBµV	41.246 dBµV	29.363 dBµV	-20.093 dB	-12.662 dB	-34.545 dB	0.034 dB
2	1	2.8938 MHz	41.413 dBµV	38.131 dBµV	25.590 dBµV	-14.587 dB	-7.869 dB	-30.410 dB	0.339 dB
3	1	3.5322 MHz	40.660 dBµV	37.148 dBµV	24.074 dBµV	-15.340 dB	-8.852 dB	-31.926 dB	0.198 dB
4	1	3.6115 MHz	42.672 dBµV	38.013 dBµV	25.350 dBµV	-13.328 dB	-7.987 dB	-30.650 dB	0.291 dB
5	1	6.2936 MHz	43.915 dBµV	38.061 dBµV	27.545 dBµV	-16.085 dB	-11.939 dB	-32.455 dB	0.328 dB
6	1	8.0015 MHz	39.790 dBµV	34.443 dBµV	26.572 dBµV	-20.210 dB	-15.557 dB	-33.428 dB	0.363 dB

Plot 7-406. Line Conducted Plot with 802.11a UNII Band 2C (N) - Closed

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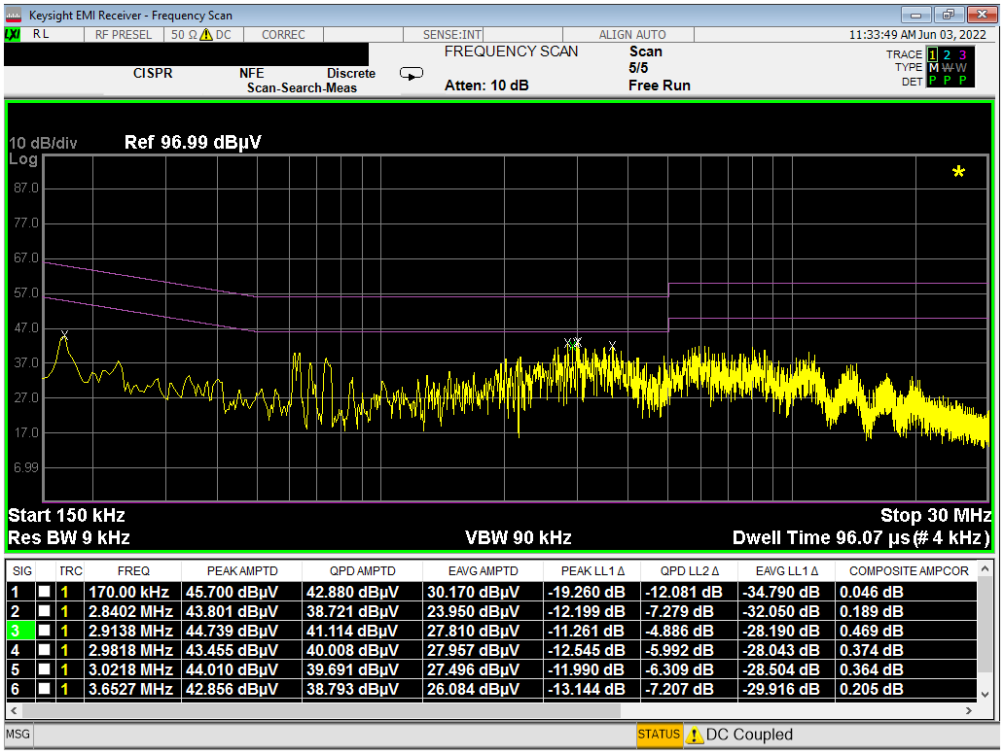
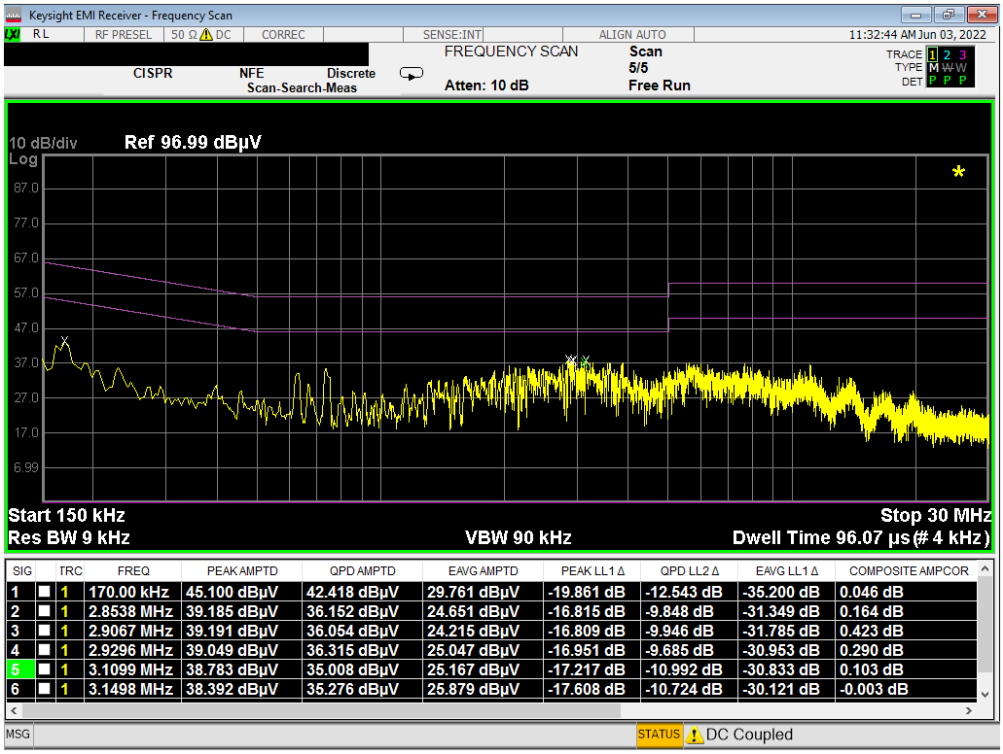


SIG	TRC	FREQ	PEAK AMPTD	QPD AMPTD	EAVG AMPTD	PEAK LL1 Δ	QPD LL2 Δ	EAVG LL1 Δ	COMPOSITE AMPCOR
1	1	170.00 kHz	45.700 dBµV	42.880 dBµV	30.170 dBµV	-19.260 dB	-12.081 dB	-34.790 dB	0.046 dB
2	1	2.8402 MHz	43.801 dBµV	38.721 dBµV	23.950 dBµV	-12.199 dB	-7.279 dB	-32.050 dB	0.189 dB
3	1	2.9138 MHz	44.739 dBµV	41.114 dBµV	27.810 dBµV	-11.261 dB	-4.886 dB	-28.190 dB	0.469 dB
4	1	2.9818 MHz	43.455 dBµV	40.008 dBµV	27.957 dBµV	-12.545 dB	-5.992 dB	-28.043 dB	0.374 dB
5	1	3.0218 MHz	44.010 dBµV	39.691 dBµV	27.496 dBµV	-11.990 dB	-6.309 dB	-28.504 dB	0.364 dB
6	1	3.6527 MHz	42.856 dBµV	38.793 dBµV	26.084 dBµV	-13.144 dB	-7.207 dB	-29.916 dB	0.205 dB

Plot 7-407. Line Conducted Plot with 802.11a UNII Band 3 (L1) - Closed



SIG	TRC	FREQ	PEAK AMPTD	QPD AMPTD	EAVG AMPTD	PEAK LL1 Δ	QPD LL2 Δ	EAVG LL1 Δ	COMPOSITE AMPCOR
1	1	170.00 kHz	45.100 dBµV	42.418 dBµV	29.761 dBµV	-19.861 dB	-12.543 dB	-35.200 dB	0.046 dB
2	1	2.8538 MHz	39.185 dBµV	36.152 dBµV	24.651 dBµV	-16.815 dB	-9.848 dB	-31.349 dB	0.164 dB
3	1	2.9067 MHz	39.191 dBµV	36.054 dBµV	24.215 dBµV	-16.809 dB	-9.946 dB	-31.785 dB	0.423 dB
4	1	2.9296 MHz	39.049 dBµV	36.315 dBµV	25.047 dBµV	-16.951 dB	-9.685 dB	-30.953 dB	0.290 dB
5	1	3.1099 MHz	38.783 dBµV	35.008 dBµV	25.167 dBµV	-17.217 dB	-10.992 dB	-30.833 dB	0.103 dB
6	1	3.1498 MHz	38.392 dBµV	35.276 dBµV	25.879 dBµV	-17.608 dB	-10.724 dB	-30.121 dB	-0.003 dB

Plot 7-408. Line Conducted Plot with 802.11a UNII Band 3 (N) - Closed

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8.0 CONCLUSION

The data collected relate only the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSMF936U** is in compliance with Part 15 Subpart E (15.407) of the FCC Rules.

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