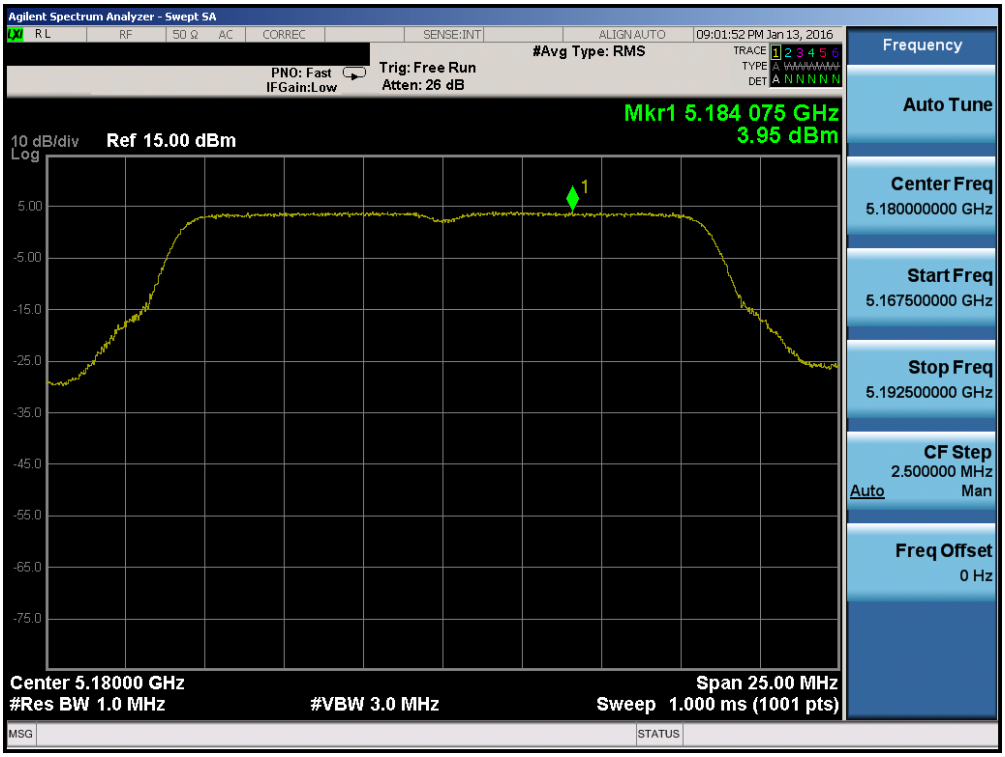
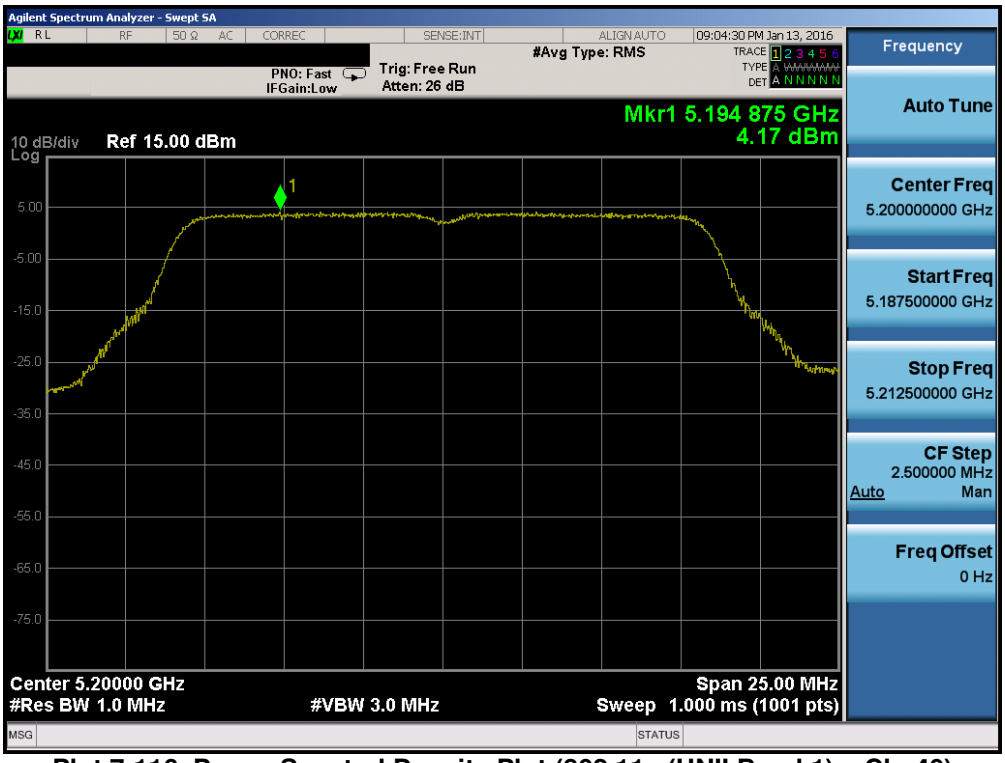
Antenna-2 Power Spectral Density Measurements

	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured Power Density [dBm]	Max Permissible Power Density [dBm/MHz]	Margin [dB]	Pass / Fail
Band 1	5180	36	a	6	3.95	11.0	-7.06	Pass
	5200	40	a	6	4.17	11.0	-6.83	Pass
	5240	48	a	6	4.18	11.0	-6.82	Pass
	5180	36	n (20MHz)	6.5/7.2 (MCS0)	4.06	11.0	-6.94	Pass
	5200	40	n (20MHz)	6.5/7.2 (MCS0)	3.97	11.0	-7.03	Pass
	5240	48	n (20MHz)	6.5/7.2 (MCS0)	3.54	11.0	-7.46	Pass
	5190	38	n (40MHz)	13.5/15 (MCS0)	-0.20	11.0	-11.20	Pass
	5230	46	n (40MHz)	13.5/15 (MCS0)	-0.26	11.0	-11.26	Pass
	5210	42	ac (80MHz)	29.3/32.5 (MCS0)	-3.32	11.0	-14.32	Pass
Band 2A	5260	52	a	6	4.12	11.0	-6.89	Pass
	5280	56	a	6	4.04	11.0	-6.96	Pass
	5320	64	a	6	4.43	11.0	-6.58	Pass
	5260	52	n (20MHz)	6.5/7.2 (MCS0)	3.50	11.0	-7.50	Pass
	5280	56	n (20MHz)	6.5/7.2 (MCS0)	3.81	11.0	-7.19	Pass
	5320	64	n (20MHz)	6.5/7.2 (MCS0)	4.07	11.0	-6.93	Pass
	5270	54	n (40MHz)	13.5/15 (MCS0)	-0.25	11.0	-11.25	Pass
	5310	62	n (40MHz)	13.5/15 (MCS0)	-0.27	11.0	-11.27	Pass
	5290	58	ac (80MHz)	29.3/32.5 (MCS0)	-3.23	11.0	-14.23	Pass
Band 2C	5500	100	a	6	4.10	11.0	-6.90	Pass
	5580	116	a	6	4.25	11.0	-6.76	Pass
	5720	144	a	6	4.33	11.0	-6.67	Pass
	5500	100	n (20MHz)	6.5/7.2 (MCS0)	3.71	11.0	-7.29	Pass
	5580	116	n (20MHz)	6.5/7.2 (MCS0)	3.86	11.0	-7.14	Pass
	5720	144	n (20MHz)	6.5/7.2 (MCS0)	3.94	11.0	-7.06	Pass
	5510	102	n (40MHz)	13.5/15 (MCS0)	-0.66	11.0	-11.66	Pass
	5550	110	n (40MHz)	13.5/15 (MCS0)	-0.30	11.0	-11.30	Pass
	5710	142	n (40MHz)	13.5/15 (MCS0)	-0.33	11.0	-11.33	Pass
	5530	106	ac (80MHz)	29.3/32.5 (MCS0)	-4.31	11.0	-15.31	Pass

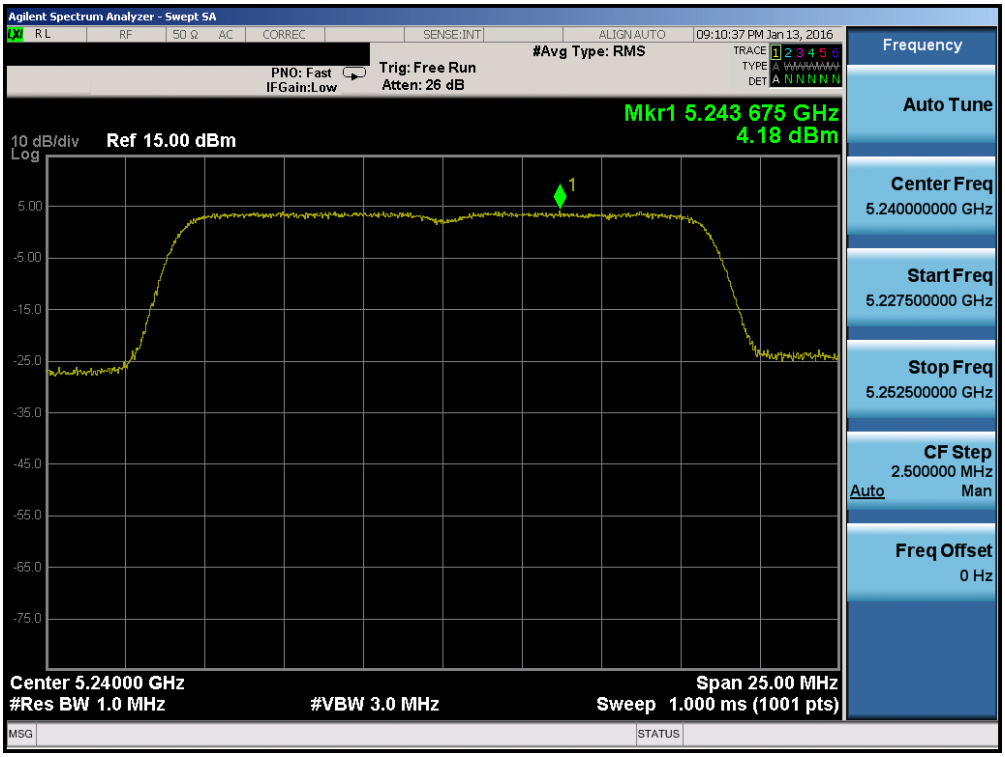
Table 7-19. Conducted Power Spectral Density Measurements



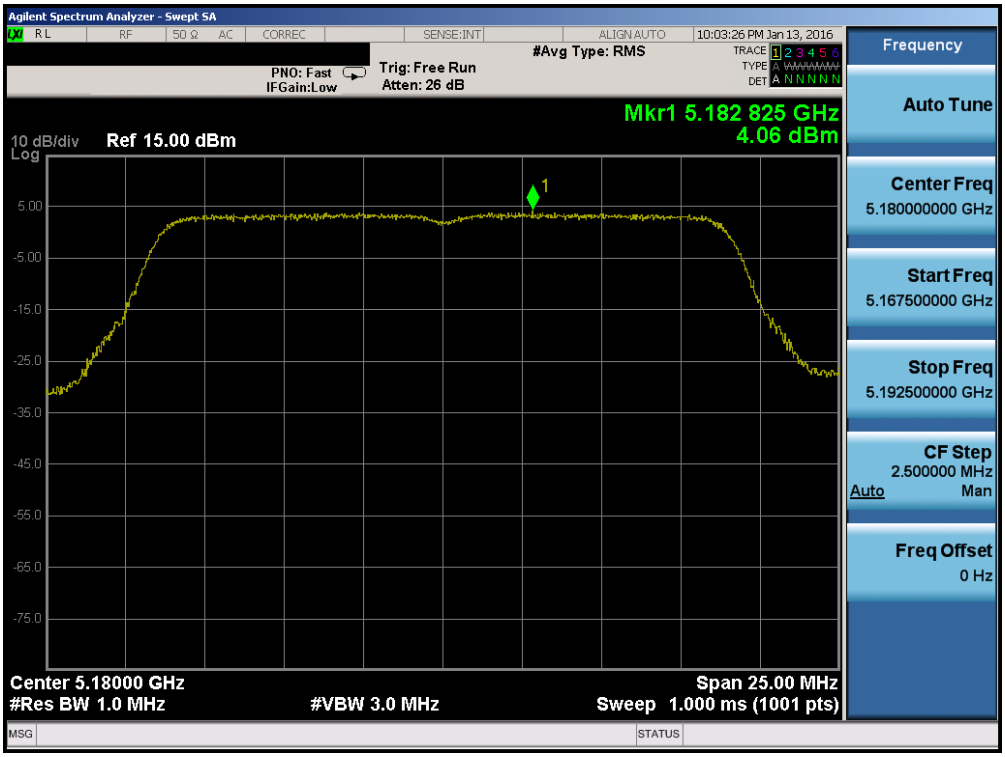
Plot 7-115. Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 36)



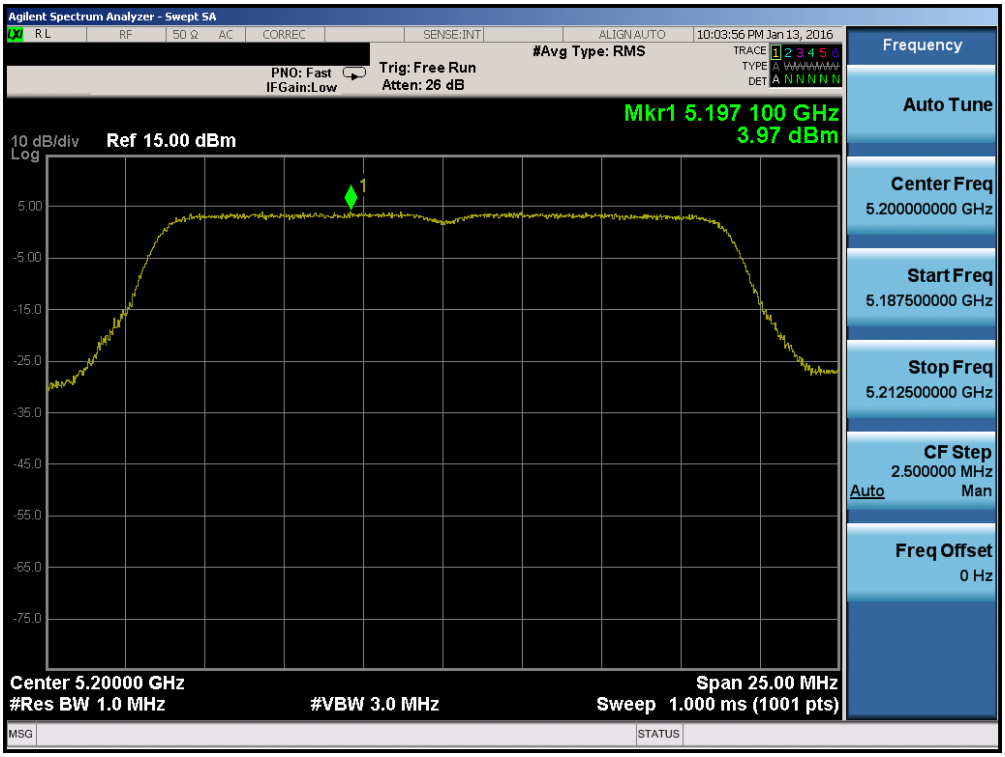
Plot 7-116. Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 40)



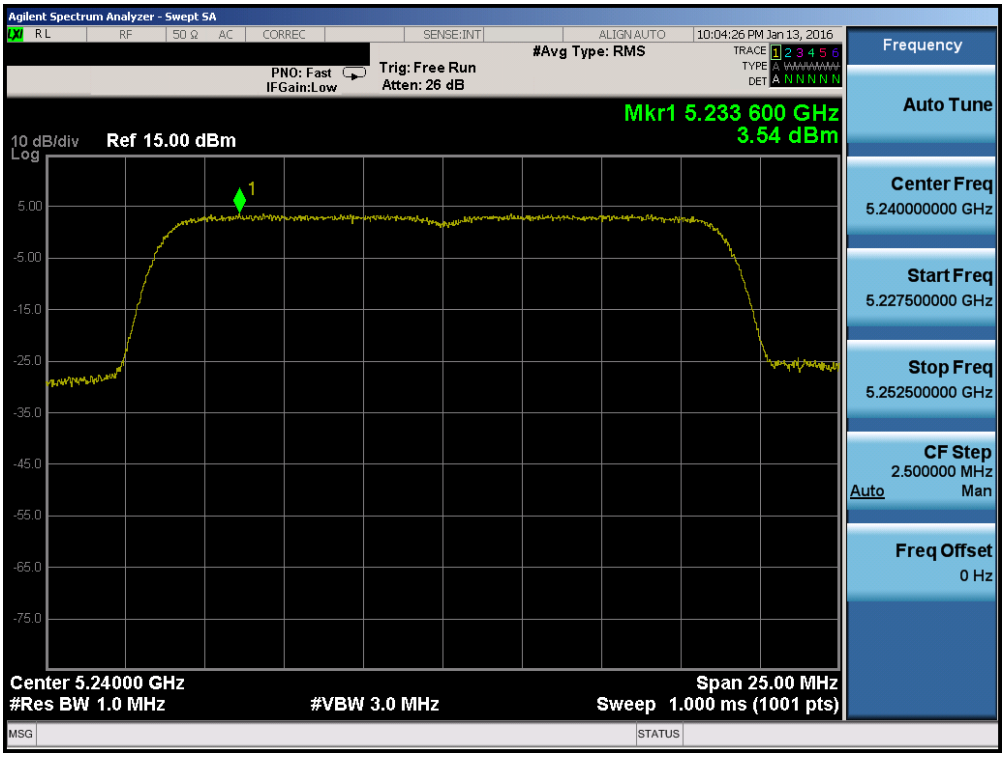
Plot 7-117. Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 48)



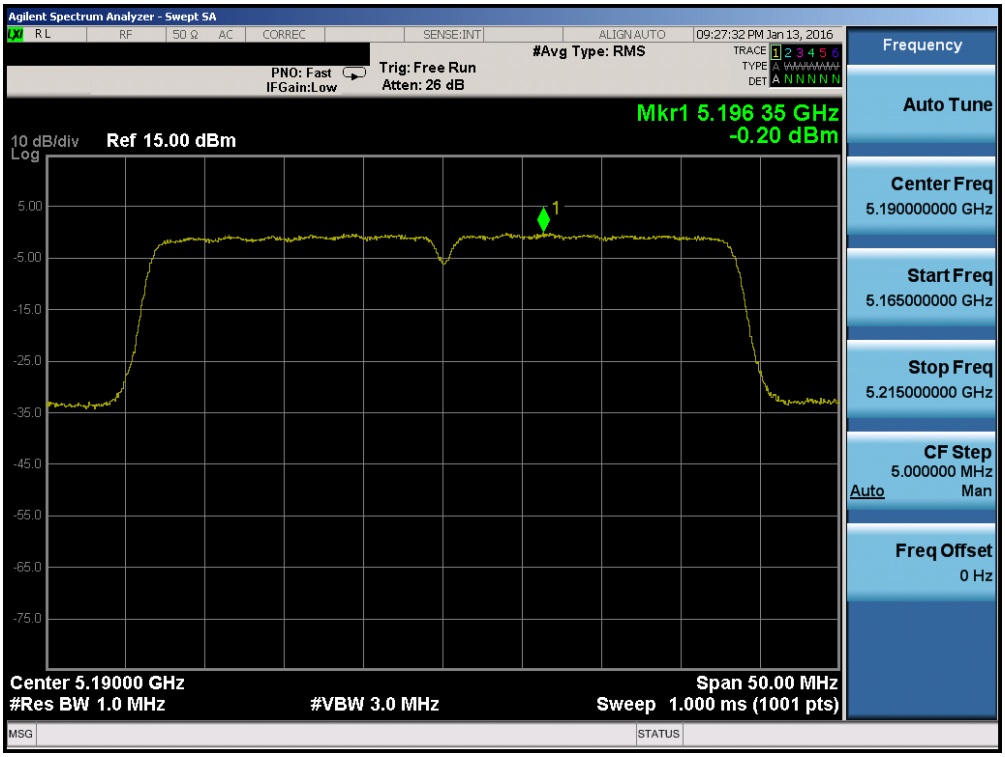
Plot 7-118. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 36)



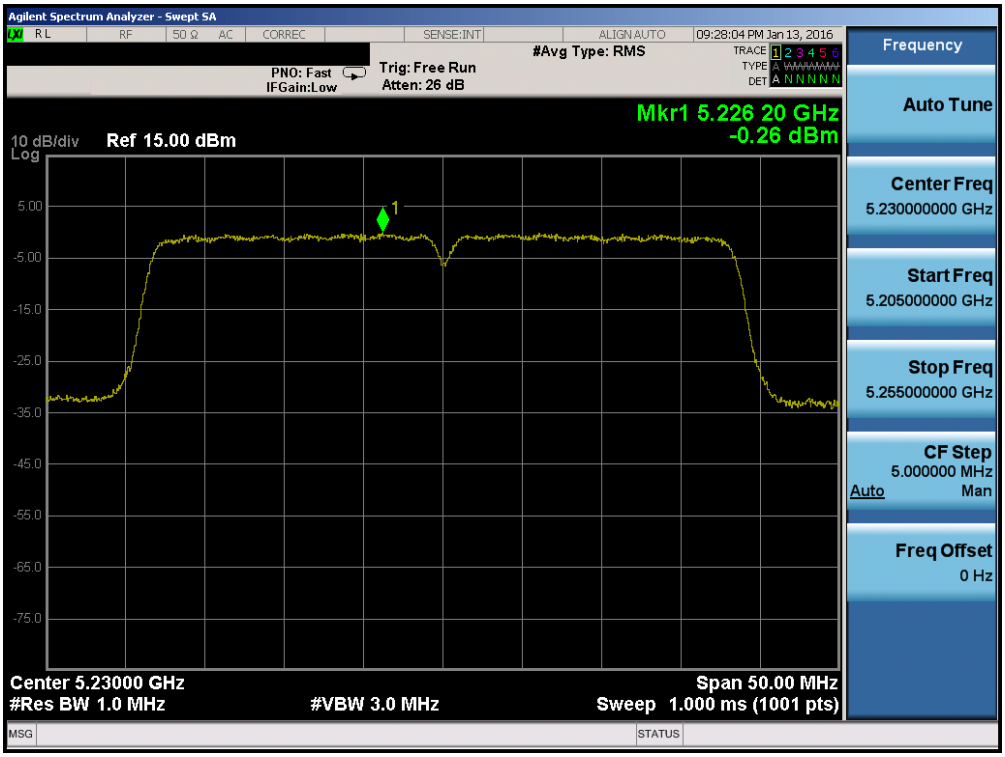
Plot 7-119. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 40)



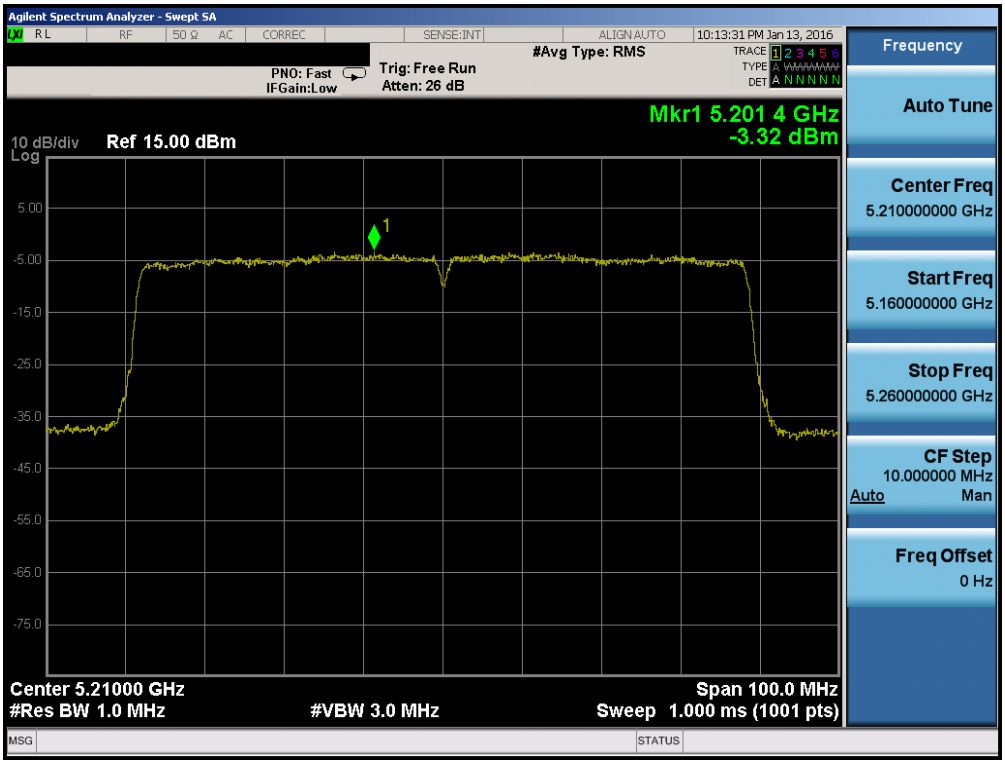
Plot 7-120. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 48)



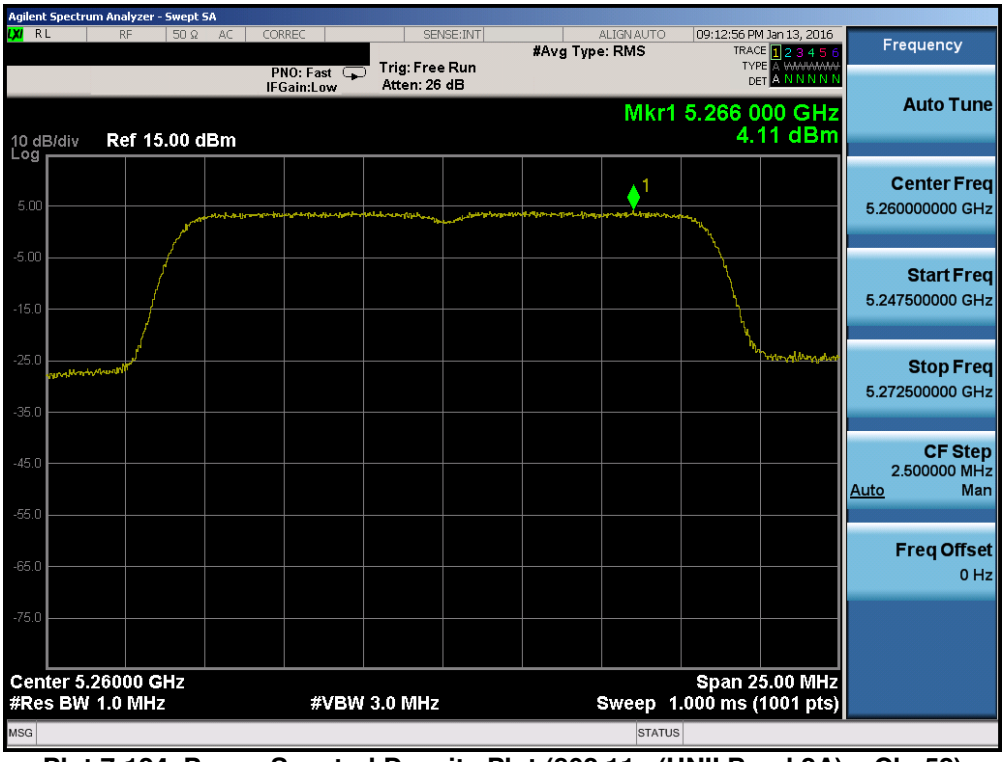
Plot 7-121. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 1) – Ch. 38)



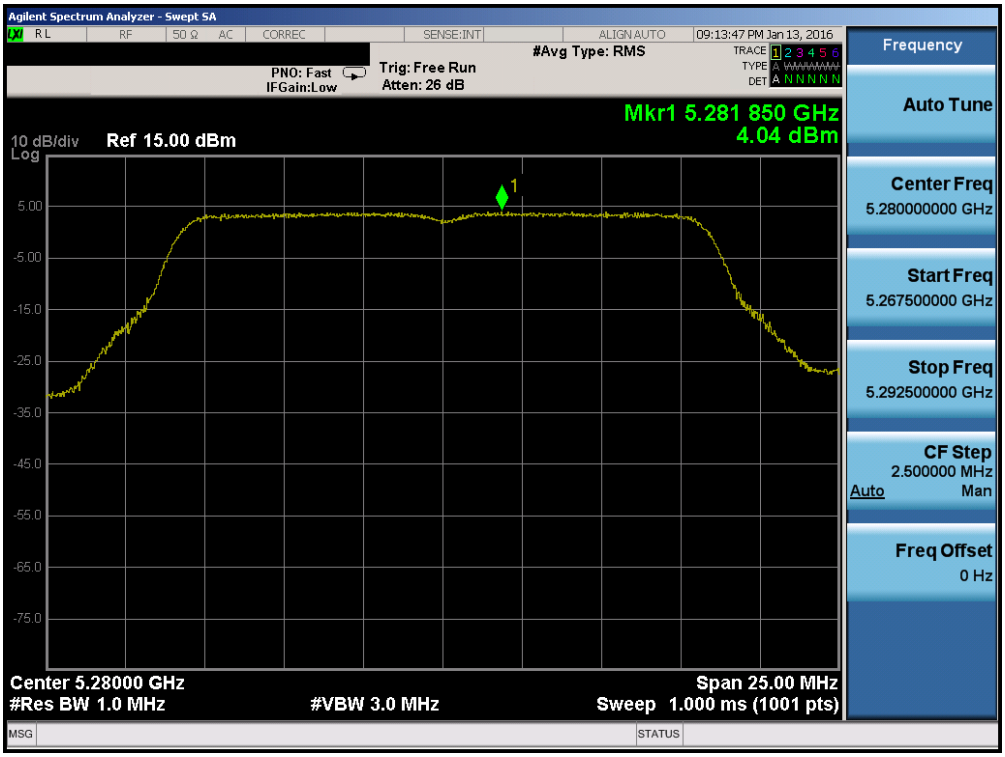
Plot 7-122. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 1) – Ch. 46)



Plot 7-123. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 1) – Ch. 42)

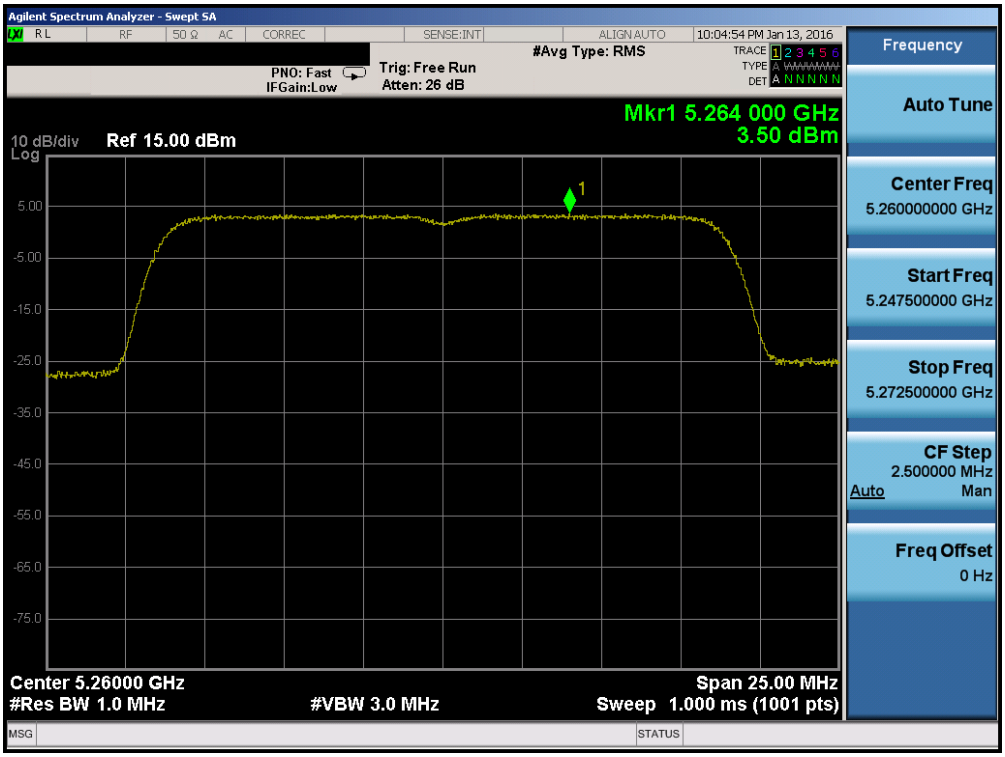


Plot 7-124. Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 52)

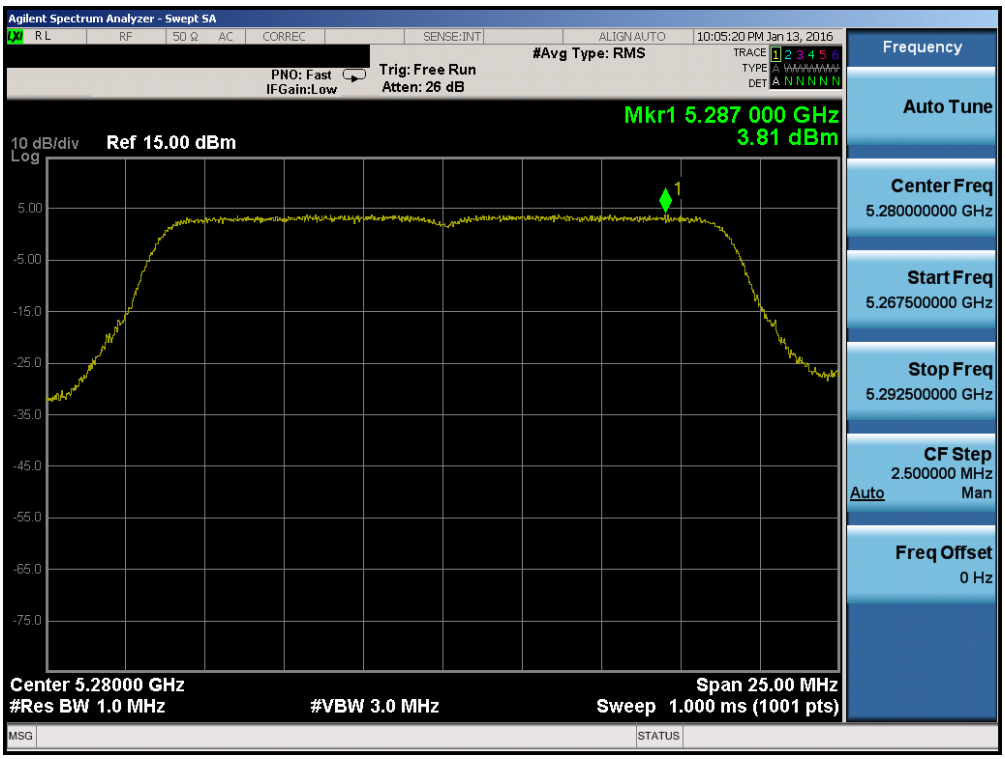


Plot 7-125. Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 56)

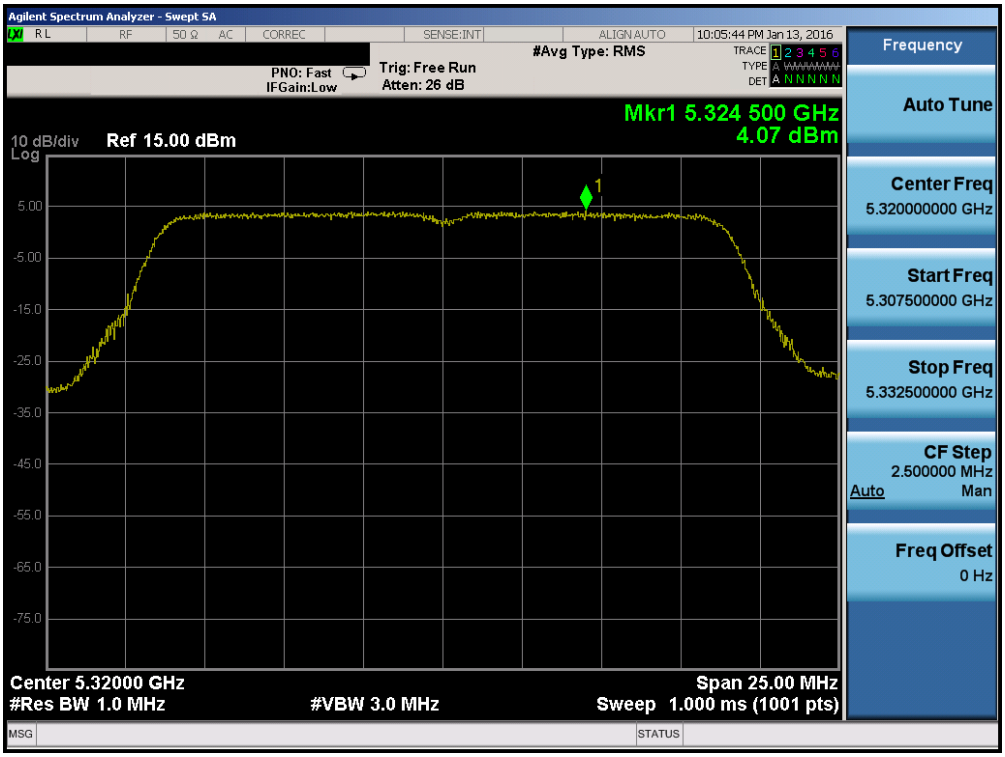
Plot 7-126. Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 64)



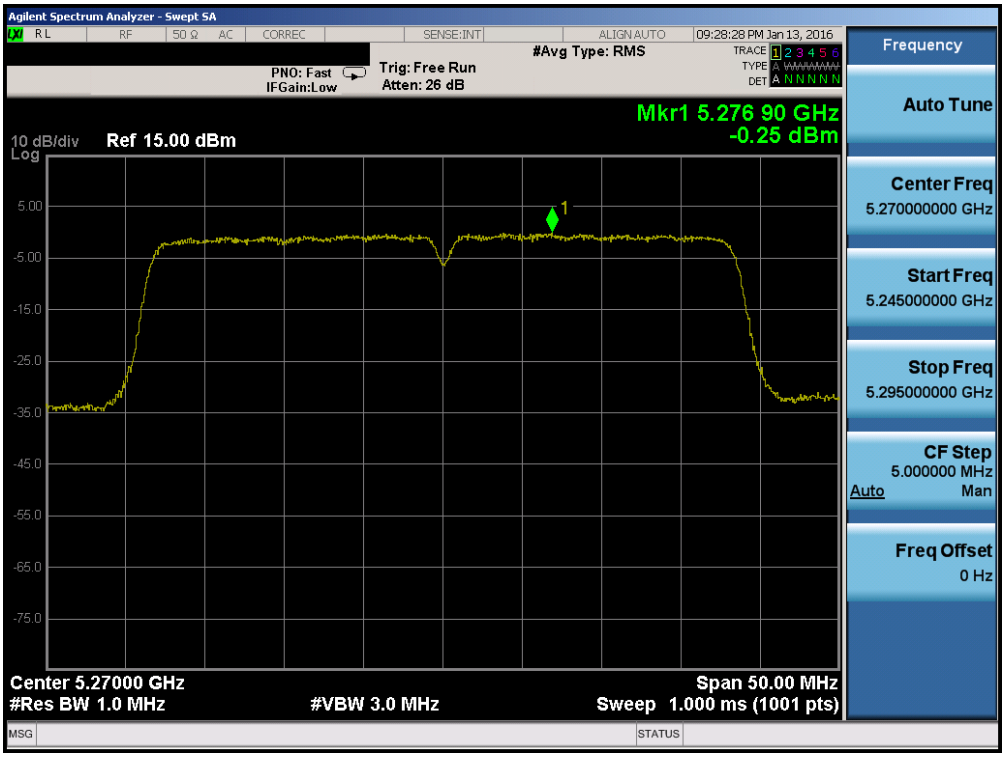
Plot 7-127. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 52)



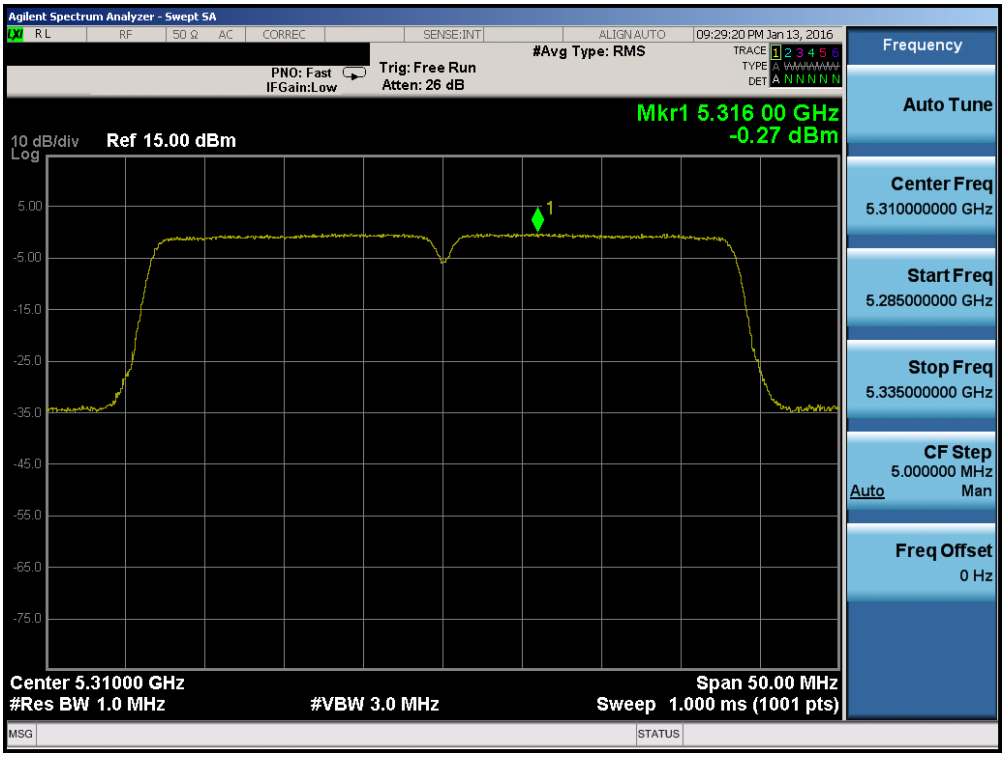
Plot 7-128. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 56)



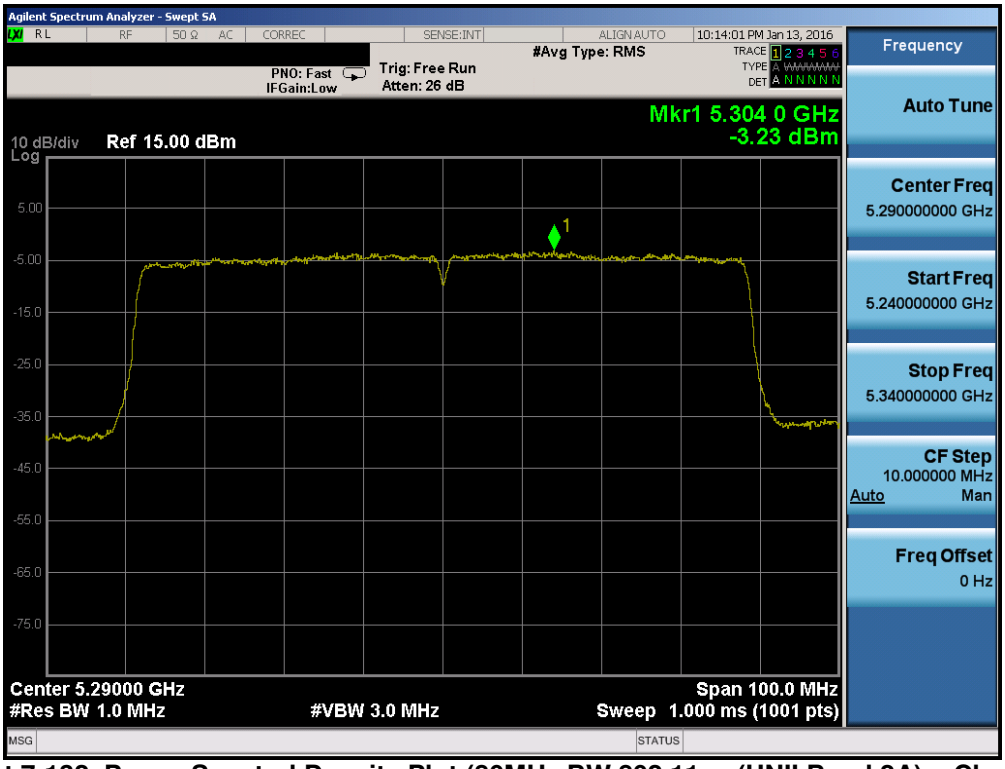
Plot 7-129. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 64)



Plot 7-130. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2A) – Ch. 54)

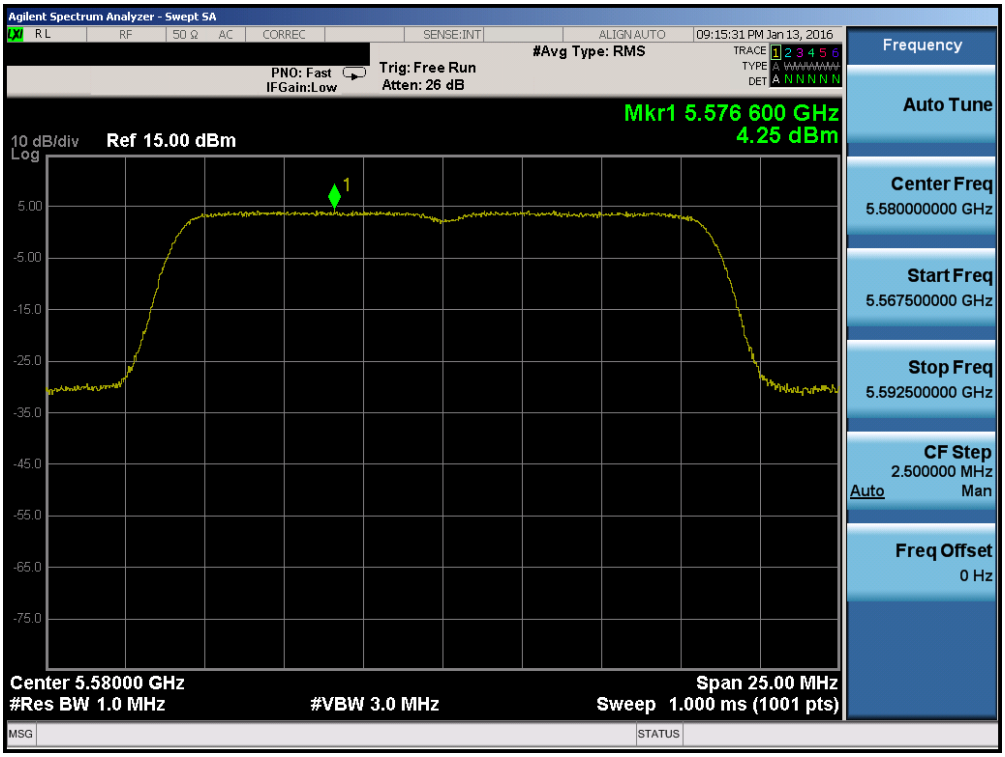


Plot 7-131. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2A) – Ch. 62)



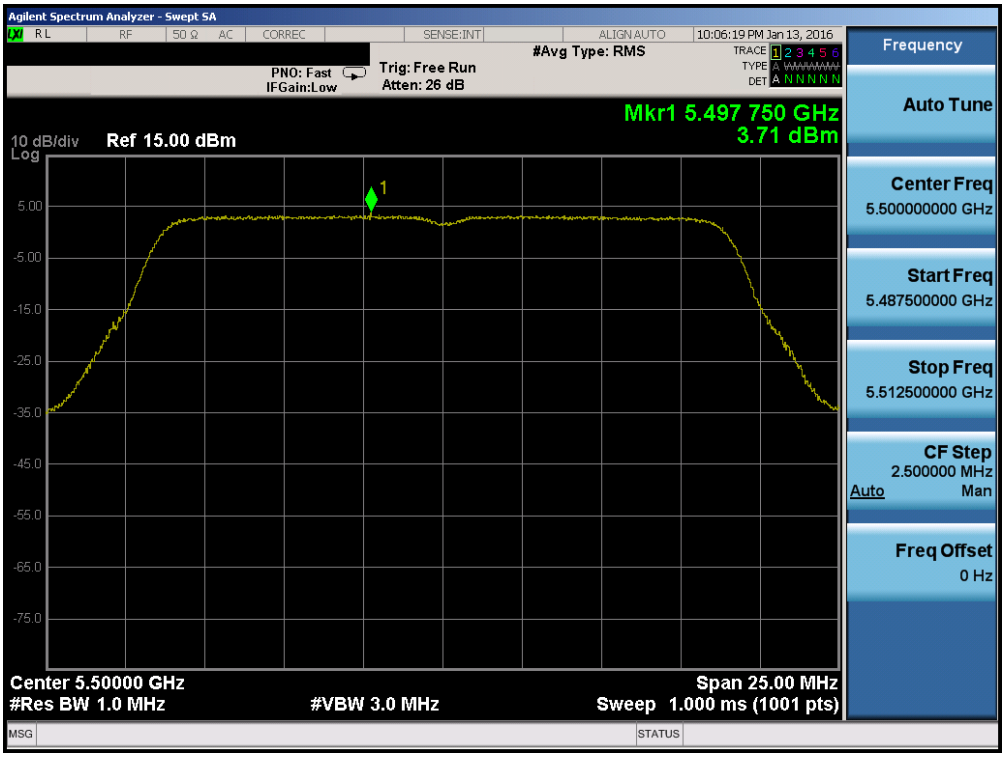
Plot 7-132. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2A) – Ch. 58)

Plot 7-133. Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 100)

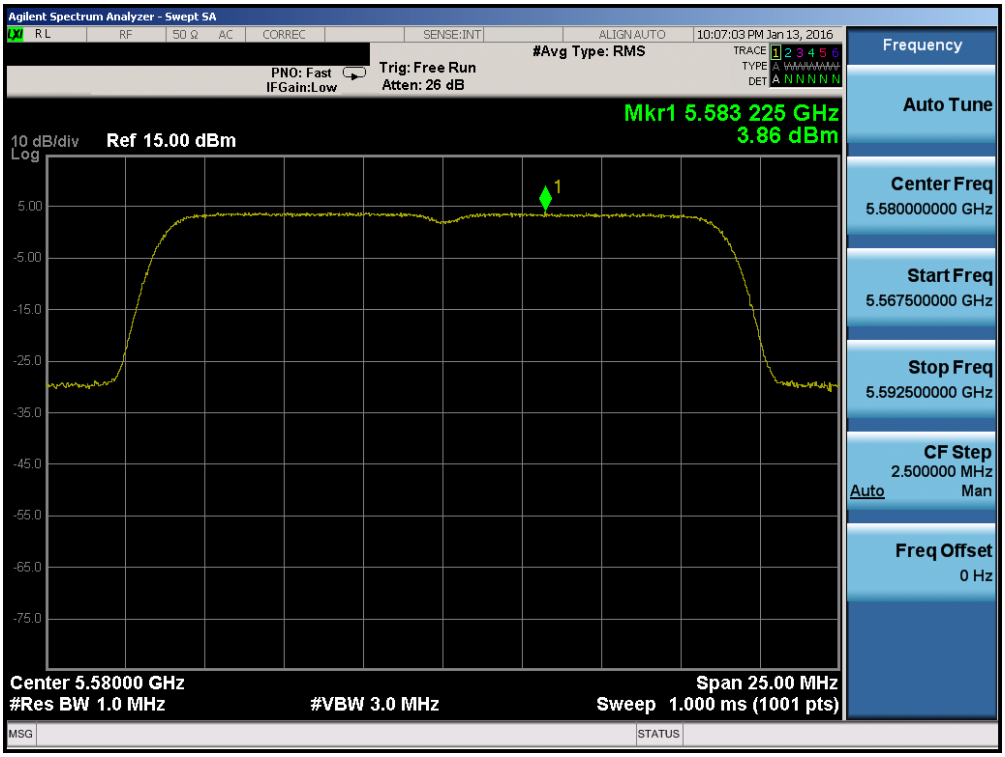


Plot 7-134. Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 116)

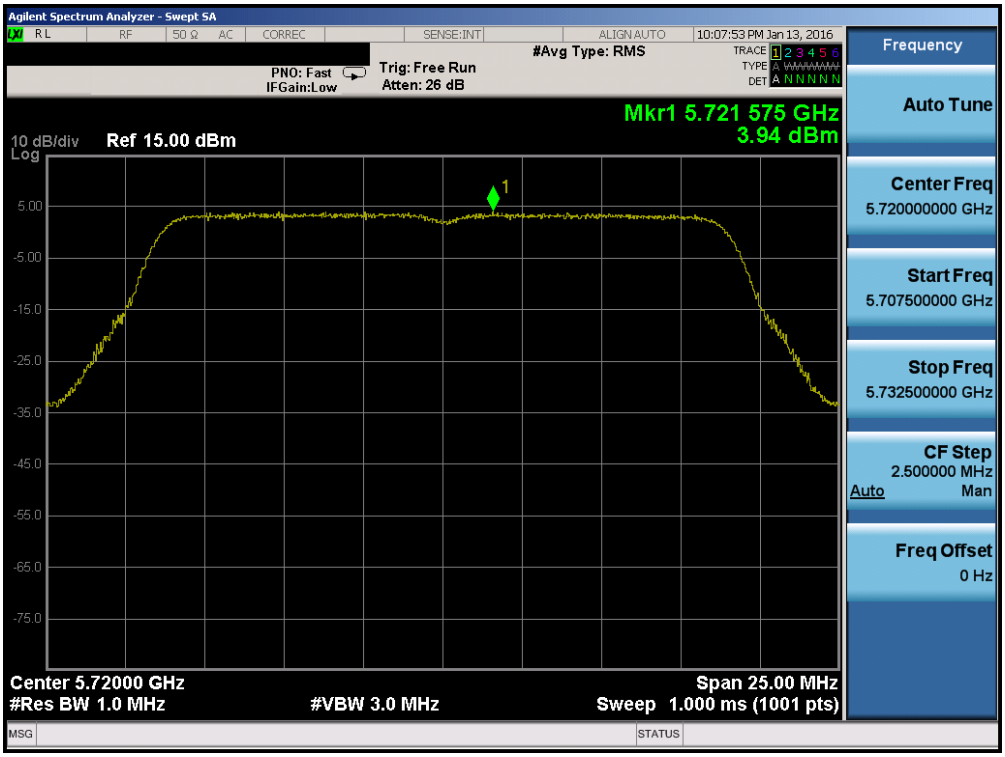
Plot 7-135. Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 144)



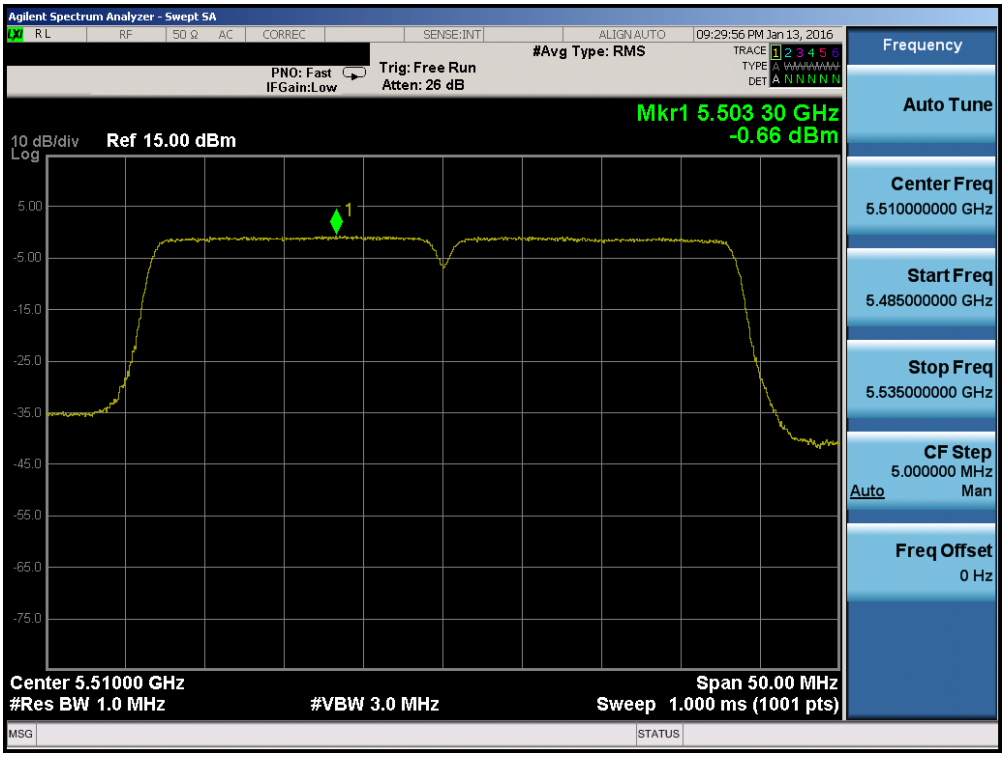
Plot 7-136. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 100)



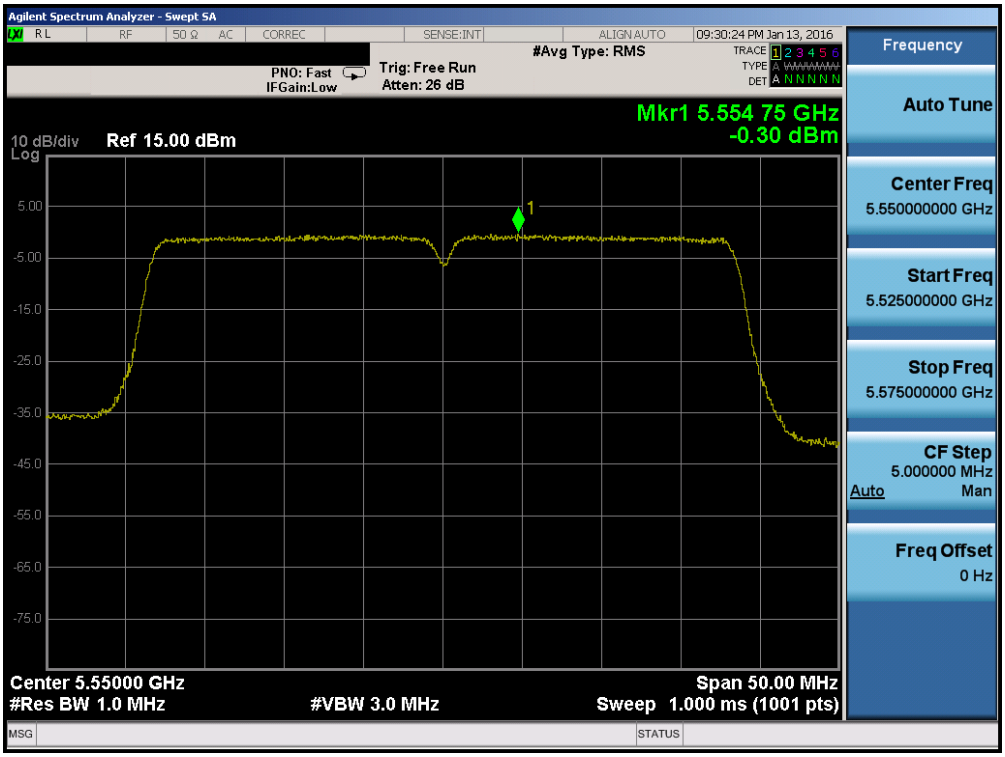
Plot 7-137. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 116)



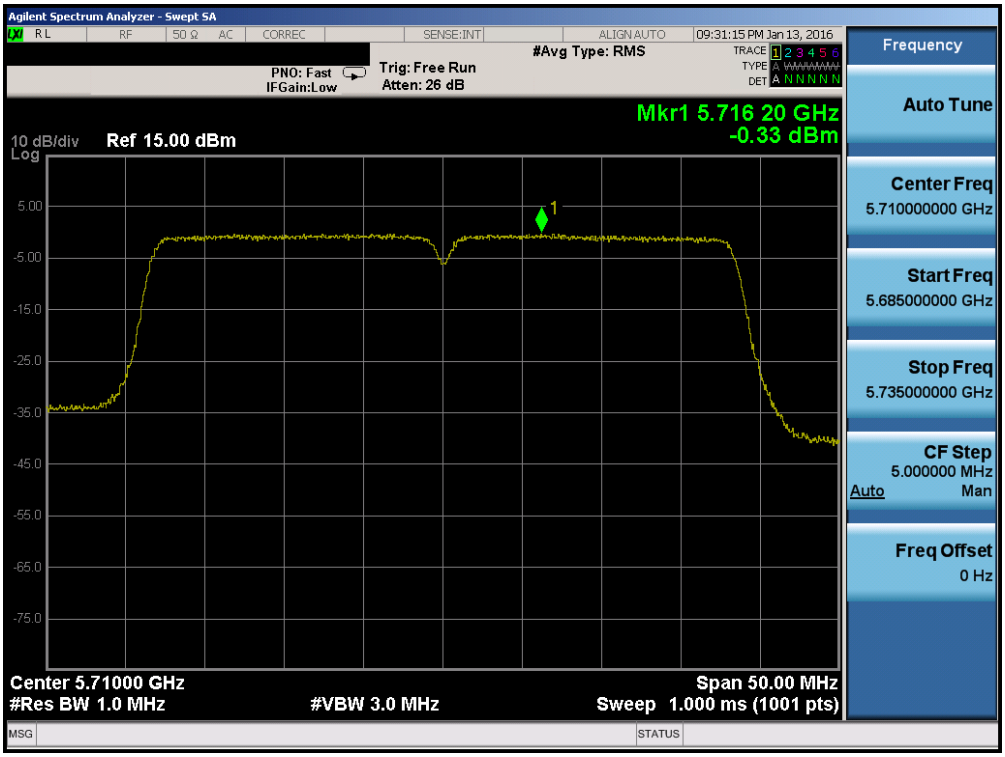
Plot 7-138. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 144)



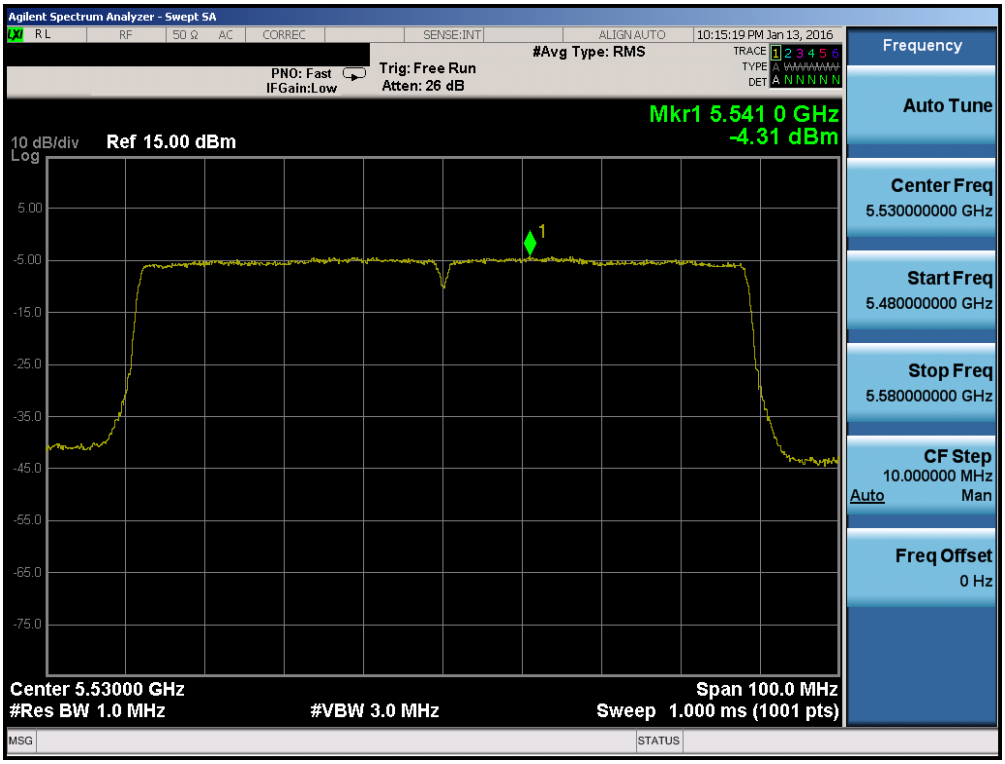
Plot 7-139. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 102)



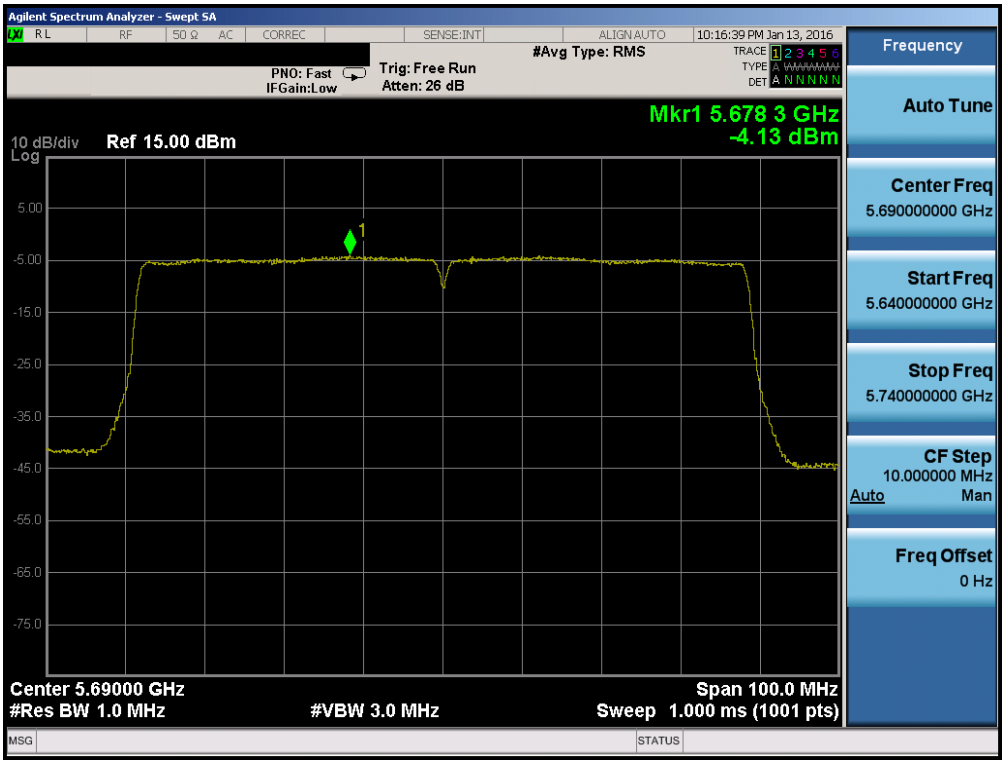
Plot 7-140. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 110)



Plot 7-141. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 142)



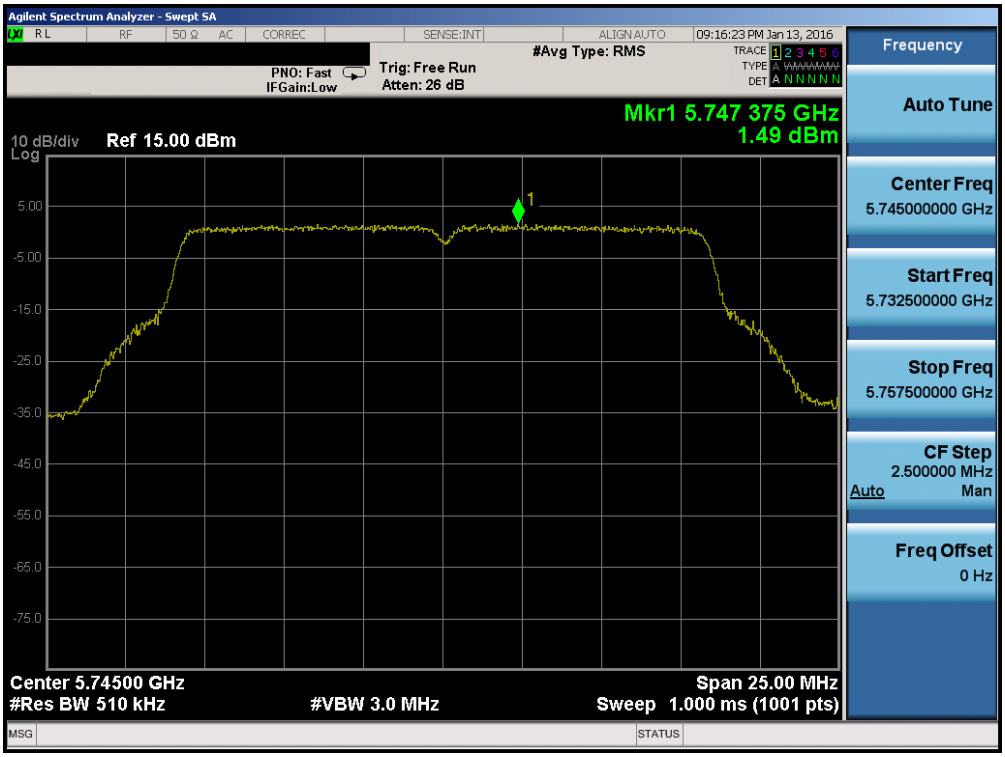
Plot 7-142. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2C) – Ch. 106)



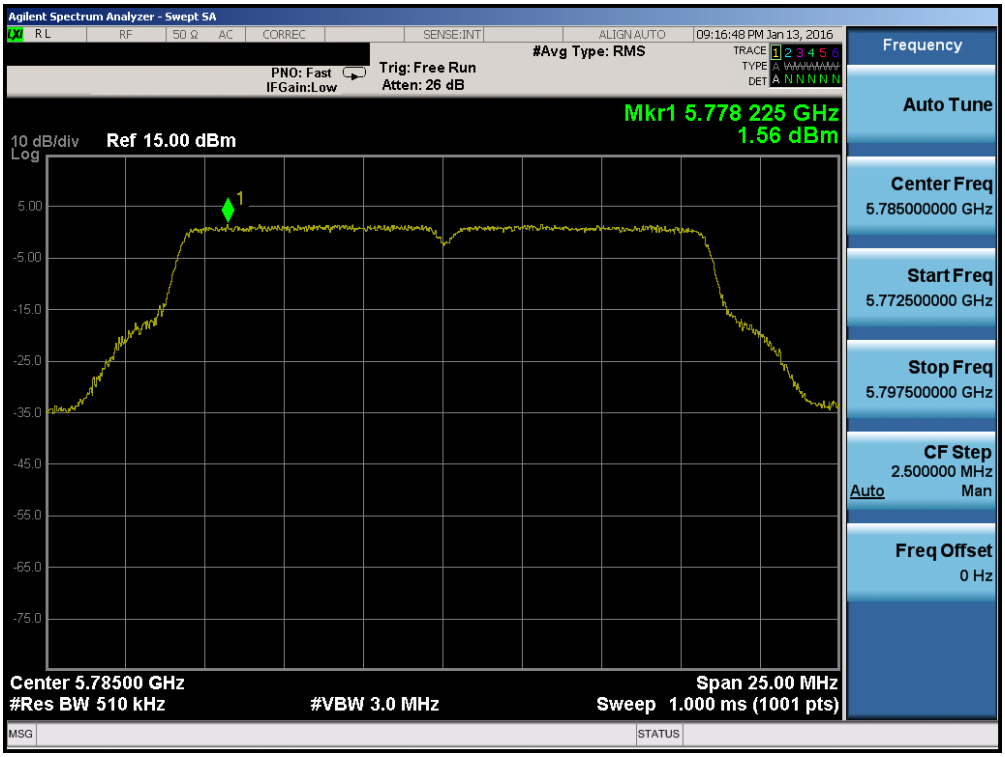
Plot 7-143. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2C) – Ch. 138)

	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured Power Density [dBm]	Max Permissible Power Density [dBm/500kHz]	Margin [dB]	Pass / Fail
Band 3	5745	149	a	6	1.49	30.0	-28.51	Pass
	5785	157	a	6	1.56	30.0	-28.44	Pass
	5825	165	a	6	1.30	30.0	-28.70	Pass
	5745	149	n (20MHz)	6.5/7.2 (MCS0)	1.14	30.0	-28.86	Pass
	5785	157	n (20MHz)	6.5/7.2 (MCS0)	0.97	30.0	-29.04	Pass
	5825	165	n (20MHz)	6.5/7.2 (MCS0)	1.07	30.0	-28.93	Pass
	5755	151	n (40MHz)	13.5/15 (MCS0)	-3.15	30.0	-33.15	Pass
	5795	159	n (40MHz)	13.5/15 (MCS0)	-3.19	30.0	-33.19	Pass
	5775	155	ac (80MHz)	29.3/32.5 (MCS0)	-6.66	30.0	-36.66	Pass

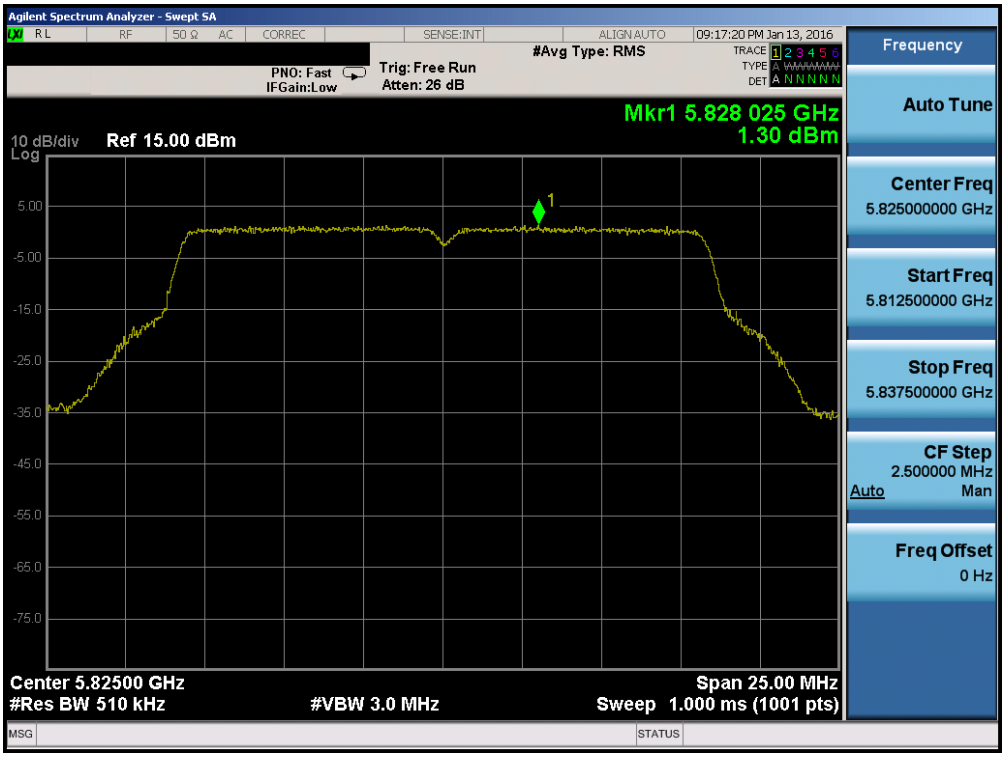
Table 7-20. Band 3 Conducted Power Spectral Density Measurements



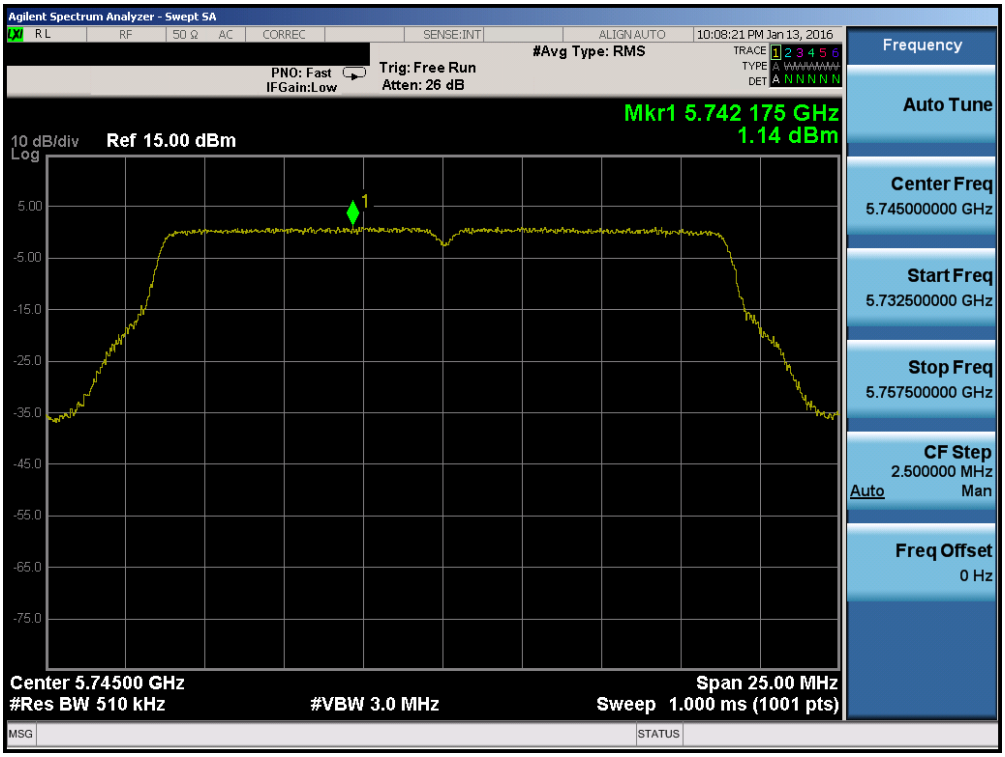
Plot 7-144. Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 149)



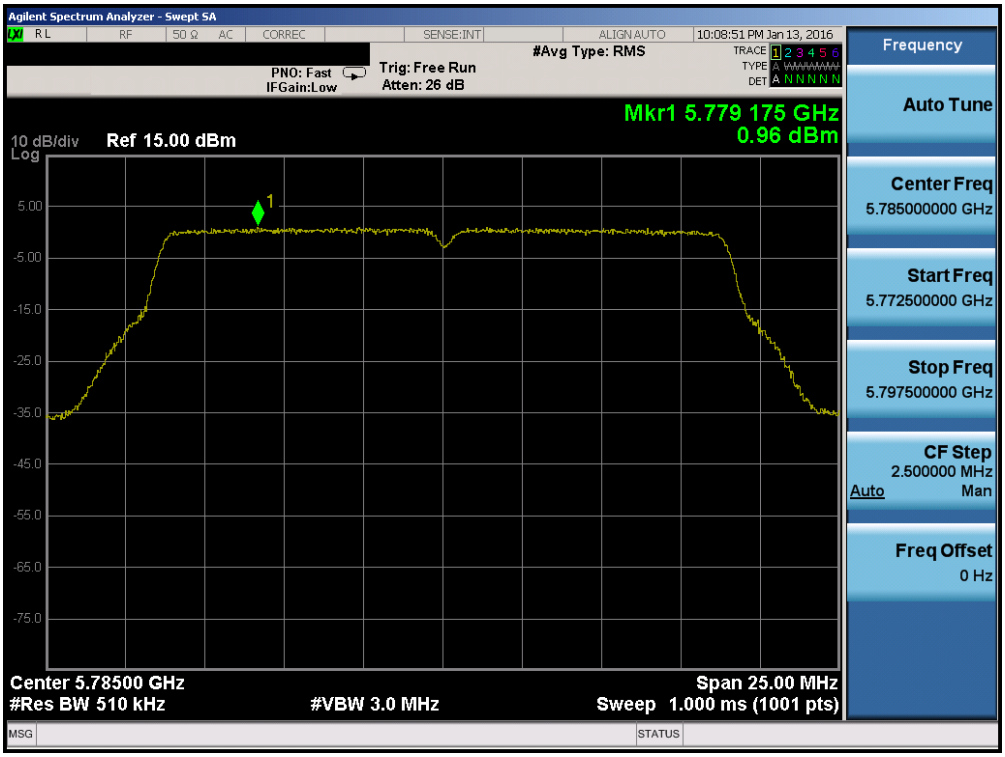
Plot 7-145. Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 157)



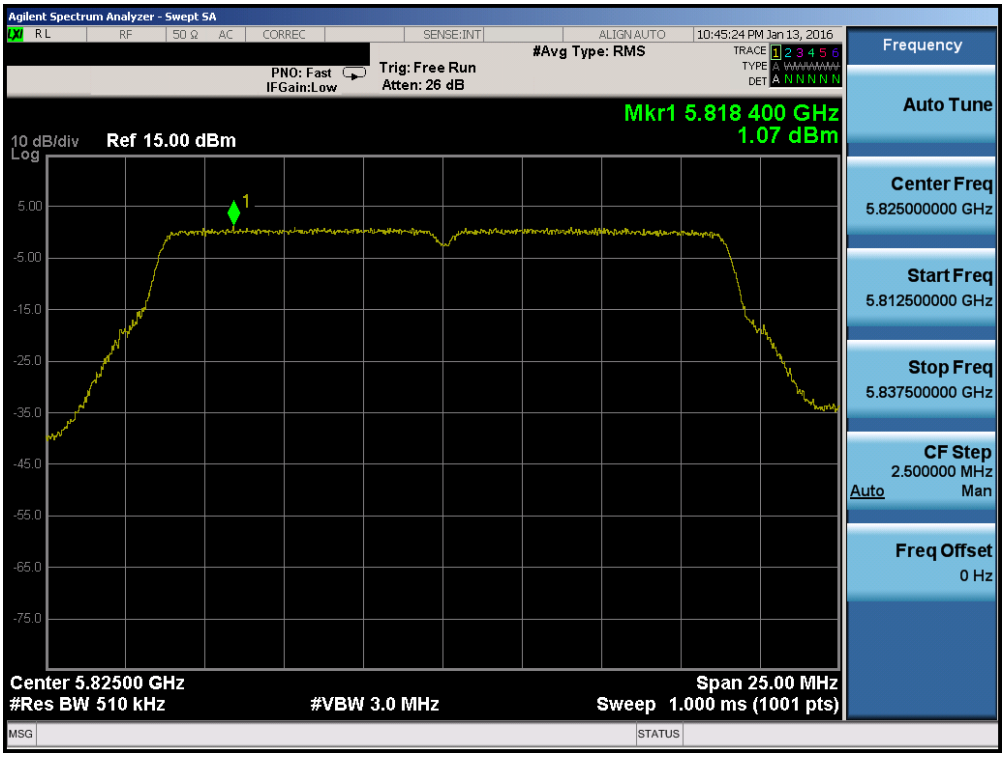
Plot 7-146. Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 165)



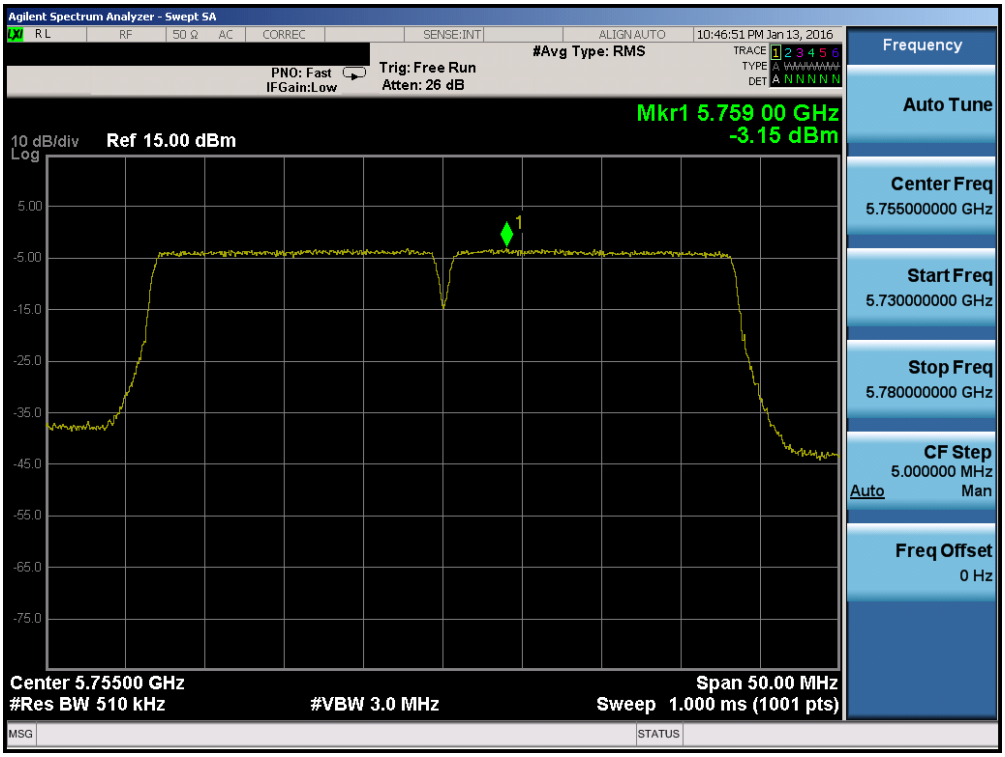
Plot 7-147. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 149)



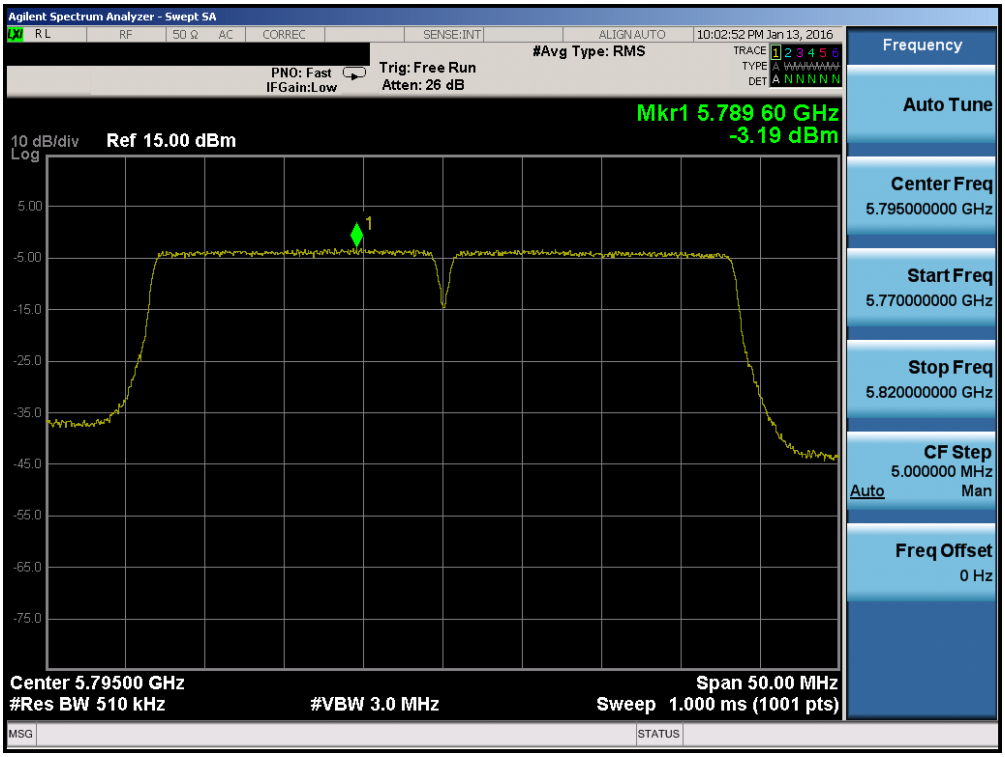
Plot 7-148. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 157)



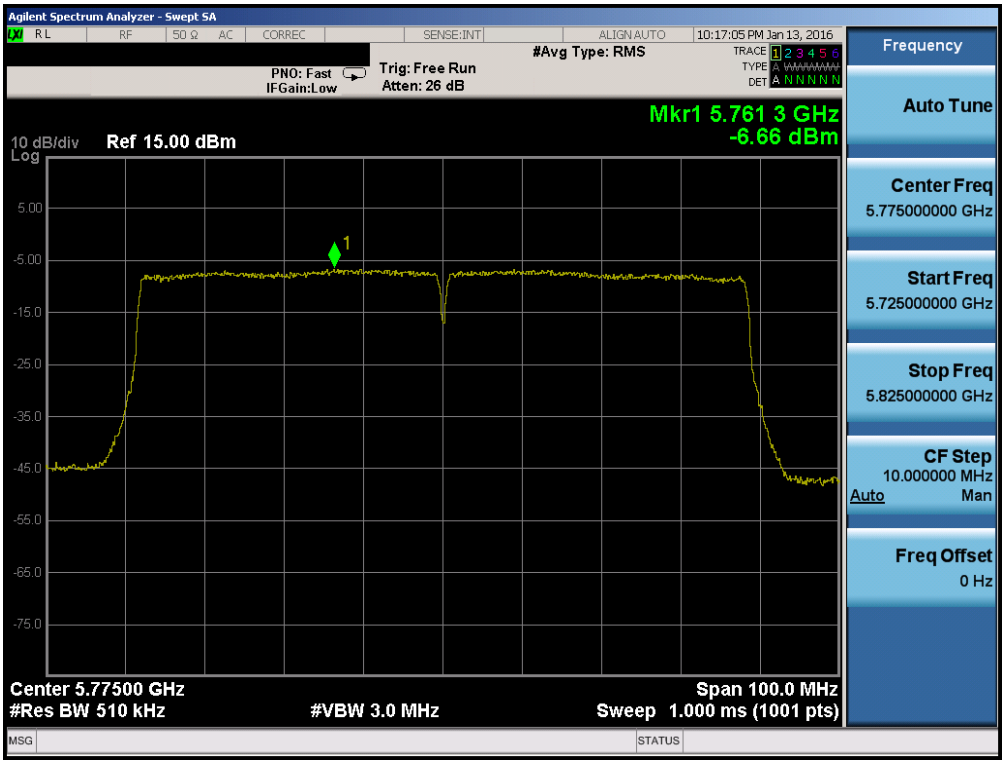
Plot 7-149. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 165)



Plot 7-150. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 3) – Ch. 151)



Plot 7-151. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 3) – Ch. 159)



Plot 7-152. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 3) – Ch. 155)

Summed MIMO Power Spectral Density Measurements

	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Antenn-1 Power Density [dBm]	Antenn-2 Power Density [dBm]	Summed MIMO Power Density [dBm]	Max Permissible Power Density [dBm/MHz]	Margin [dB]	Pass / Fail
Band 1	5180	36	n (20MHz)	6.5/7.2 (MCS0)	2.53	4.06	6.37	11.0	-4.63	Pass
	5200	40	n (20MHz)	6.5/7.2 (MCS0)	3.67	3.97	6.83	11.0	-4.17	Pass
	5240	48	n (20MHz)	6.5/7.2 (MCS0)	3.51	3.54	6.54	11.0	-4.46	Pass
	5190	38	n (40MHz)	13.5/15 (MCS0)	-1.57	-0.20	2.18	11.0	-8.82	Pass
	5230	46	n (40MHz)	13.5/15 (MCS0)	-0.64	-0.26	2.57	11.0	-8.43	Pass
	5210	42	ac (80MHz)	29.3/32.5 (MCS0)	-4.66	-3.32	-0.93	11.0	-11.93	Pass
Band 2A	5260	52	n (20MHz)	6.5/7.2 (MCS0)	3.73	3.50	6.62	11.0	-4.38	Pass
	5280	56	n (20MHz)	6.5/7.2 (MCS0)	3.42	3.81	6.63	11.0	-4.37	Pass
	5320	64	n (20MHz)	6.5/7.2 (MCS0)	3.92	4.07	7.01	11.0	-3.99	Pass
	5270	54	n (40MHz)	13.5/15 (MCS0)	-0.92	-0.25	2.44	11.0	-8.56	Pass
	5310	62	n (40MHz)	13.5/15 (MCS0)	-0.45	-0.27	2.65	11.0	-8.35	Pass
	5290	58	ac (80MHz)	29.3/32.5 (MCS0)	-4.07	-3.23	-0.62	11.0	-11.62	Pass
Band 2C	5500	100	n (20MHz)	6.5/7.2 (MCS0)	4.13	3.71	6.93	11.0	-4.07	Pass
	5580	116	n (20MHz)	6.5/7.2 (MCS0)	4.07	3.86	6.97	11.0	-4.03	Pass
	5720	144	n (20MHz)	6.5/7.2 (MCS0)	3.36	3.94	6.67	11.0	-4.33	Pass
	5510	102	n (40MHz)	13.5/15 (MCS0)	-0.38	-0.66	2.49	11.0	-8.51	Pass
	5550	110	n (40MHz)	13.5/15 (MCS0)	-0.28	-0.30	2.72	11.0	-8.28	Pass
	5710	142	n (40MHz)	13.5/15 (MCS0)	-1.28	-0.33	2.23	11.0	-8.77	Pass
	5530	106	ac (80MHz)	29.3/32.5 (MCS0)	-3.96	-4.31	-1.12	11.0	-12.12	Pass

Table 7-21. Bands 1, 2A, 2C MIMO Conducted Power Spectral Density Measurements

	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Antenn-1 Power Density [dBm]	Antenn-2 Power Density [dBm]	Summed MIMO Power Density [dBm]	Max Permissible Power Density [dBm/500kHz]	Margin [dB]	Pass / Fail
Band 3	5745	149	n (20MHz)	6.5/7.2 (MCS0)	1.50	1.14	4.34	30.0	-25.66	Pass
	5785	157	n (20MHz)	6.5/7.2 (MCS0)	1.56	0.97	4.28	30.0	-25.72	Pass
	5825	165	n (20MHz)	6.5/7.2 (MCS0)	-1.52	1.07	2.98	30.0	-27.02	Pass
	5755	151	n (40MHz)	13.5/15 (MCS0)	-2.41	-3.15	0.25	30.0	-29.75	Pass
	5795	159	n (40MHz)	13.5/15 (MCS0)	-2.72	-3.19	0.06	30.0	-29.94	Pass
	5775	155	ac (80MHz)	29.3/32.5 (MCS0)	-5.87	-6.66	-3.24	30.0	-33.24	Pass

Table 7-22. Band 3 MIMO Conducted Power Spectral Density Measurements

Note:

Per 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 the average conducted power spectral density was measured to be 2.53 dBm for Antenna-1 and 4.06 dBm for Antenna-2.

Antenna 1 + Antenna 2 = MIMO

(2.53 dBm + 4.06 dBm) = (1.79 mW + 2.55 mW) = 4.34 mW = 6.37 dBm

7.6 Frequency Stability

§15.407(g)

The EUT was placed inside of an environmental chamber as the temperature in the chamber was varied between -30°C and +50°C. The temperature was incremented by 10° intervals and the unit was allowed to stabilize at each temperature before each measurement. The center frequency of the transmitting channel was evaluated at each temperature and the frequency deviation from the channel's center frequency was recorded. Data for the worst case channel is shown below.

OPERATING FREQUENCY: 5,180,000,000 Hz

CHANNEL: 36

REFERENCE VOLTAGE: 3.80 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	5,179,999,833	-167	-0.00000322
100 %		- 30	5,179,999,744	-256	-0.00000494
100 %		- 20	5,179,999,971	-29	-0.00000056
100 %		- 10	5,180,000,064	64	0.00000124
100 %		0	5,180,000,052	52	0.00000100
100 %		+ 10	5,180,000,060	60	0.00000116
100 %		+ 20	5,180,000,053	53	0.00000102
100 %		+ 30	5,180,000,029	29	0.00000056
100 %		+ 40	5,180,000,058	58	0.00000112
100 %		+ 50	5,179,999,946	-54	-0.00000104
BATT. ENDPOINT	3.40	+ 20	5,179,999,994	-6	-0.00000012

Table 7-23. Frequency Stability Measurements for UNII Band 1 (Ch. 36)

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

Frequency Stability

§15.407(g)

The EUT was placed inside of an environmental chamber as the temperature in the chamber was varied between -30°C and +50°C. The temperature was incremented by 10° intervals and the unit was allowed to stabilize at each temperature before each measurement. The center frequency of the transmitting channel was evaluated at each temperature and the frequency deviation from the channel's center frequency was recorded. Data for the worst case channel is shown below.

OPERATING FREQUENCY: 5,260,000,000 Hz

CHANNEL: 52

REFERENCE VOLTAGE: 3.80 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	5,260,000,058	58	0.00000110
100 %		- 30	5,259,999,848	-152	-0.00000289
100 %		- 20	5,260,000,097	97	0.00000184
100 %		- 10	5,260,000,138	138	0.00000262
100 %		0	5,260,000,041	41	0.00000078
100 %		+ 10	5,259,999,817	-183	-0.00000348
100 %		+ 20	5,260,000,324	324	0.00000616
100 %		+ 30	5,260,000,235	235	0.00000447
100 %		+ 40	5,259,999,919	-81	-0.00000154
100 %		+ 50	5,260,000,060	60	0.00000114
BATT. ENDPOINT	3.40	+ 20	5,259,999,880	-120	-0.00000228

Table 7-24. Frequency Stability Measurements for UNII Band 2A (Ch. 52)

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

Frequency Stability

§15.407(g)

The EUT was placed inside of an environmental chamber as the temperature in the chamber was varied between -30°C and +50°C. The temperature was incremented by 10° intervals and the unit was allowed to stabilize at each temperature before each measurement. The center frequency of the transmitting channel was evaluated at each temperature and the frequency deviation from the channel's center frequency was recorded. Data for the worst case channel is shown below.

OPERATING FREQUENCY: 5,500,000,000 Hz

CHANNEL: 100

REFERENCE VOLTAGE: 3.80 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	5,500,000,089	89	0.00000162
100 %		- 30	5,500,000,133	133	0.00000242
100 %		- 20	5,500,000,172	172	0.00000313
100 %		- 10	5,499,999,796	-204	-0.00000371
100 %		0	5,499,999,769	-231	-0.00000420
100 %		+ 10	5,499,999,877	-123	-0.00000224
100 %		+ 20	5,499,999,959	-41	-0.00000075
100 %		+ 30	5,499,999,976	-24	-0.00000044
100 %		+ 40	5,500,000,036	36	0.00000065
100 %		+ 50	5,499,999,839	-161	-0.00000293
BATT. ENDPOINT	3.40	+ 20	5,500,000,038	38	0.00000069

Table 7-25. Frequency Stability Measurements for UNII Band 2C (Ch. 100)

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

Frequency Stability

§15.407(g)

The EUT was placed inside of an environmental chamber as the temperature in the chamber was varied between -30°C and +50°C. The temperature was incremented by 10° intervals and the unit was allowed to stabilize at each temperature before each measurement. The center frequency of the transmitting channel was evaluated at each temperature and the frequency deviation from the channel's center frequency was recorded. Data for the worst case channel is shown below.

OPERATING FREQUENCY: 5,745,000,000 Hz

CHANNEL: 149

REFERENCE VOLTAGE: 3.80 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	5,745,000,179	179	0.00000312
100 %		- 30	5,744,999,949	-51	-0.00000089
100 %		- 20	5,744,999,688	-312	-0.00000543
100 %		- 10	5,744,999,845	-155	-0.00000270
100 %		0	5,744,999,845	-155	-0.00000270
100 %		+ 10	5,744,999,989	-11	-0.00000019
100 %		+ 20	5,744,999,900	-100	-0.00000174
100 %		+ 30	5,745,000,081	81	0.00000141
100 %		+ 40	5,745,000,132	132	0.00000230
100 %		+ 50	5,745,000,022	22	0.00000038
BATT. ENDPOINT	3.40	+ 20	5,745,000,387	387	0.00000674

Table 7-26. Frequency Stability Measurements for UNII Band 3 (Ch. 149)

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

7.7 Radiated Spurious Emission Measurements – Above 1GHz

§15.407(b.1)(b.6) §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 KDB 789033 D02 v01, 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.

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Table 7-27 per Section 15.209.

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

Table 7-27. Radiated Limits

Test Procedures Used

KDB 789033 D02 v01 – 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

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.

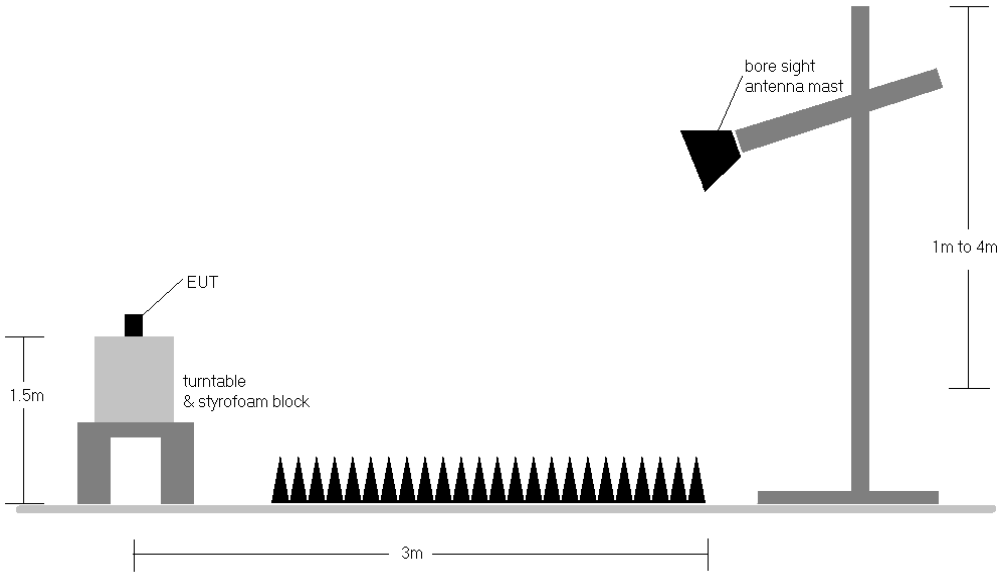


Figure 7-5. Test Instrument & Measurement Setup

Test Notes

1. All radiated spurious emissions levels were measured in a radiated test setup per the guidance of KDB 789033 D02 v01 Section H.
2. All emissions that lie in the restricted bands (denoted by a * next to the frequency) specified in §15.205 are below the limit shown in Table 7-27.
3. All spurious emissions lying in restricted bands specified in §15.205 are below the limit shown in Table 6-11. 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.

4. The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
5. This unit was tested with its standard battery.
6. 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.
7. 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.
8. 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.
9. 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. Rohde & Schwarz EMC32, Version 9.15.00 automated test software was used to perform the Radiated Spurious Emissions Pre-Scan testing.

Sample Calculations

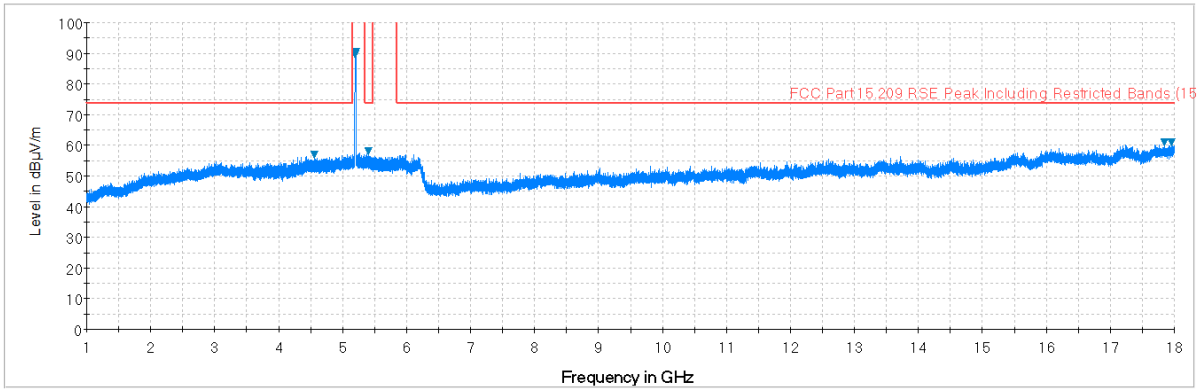
Determining Spurious Emissions Levels

- Field Strength Level $_{[dB\mu V/m]}$ = Analyzer Level $_{[dBm]}$ + 107 + AFCL $_{[dB/m]}$
- AFCL $_{[dB/m]}$ = Antenna Factor $_{[dB/m]}$ + Cable Loss $_{[dB]}$
- Margin $_{[dB]}$ = Field Strength Level $_{[dB\mu V/m]}$ – Limit $_{[dB\mu V/m]}$

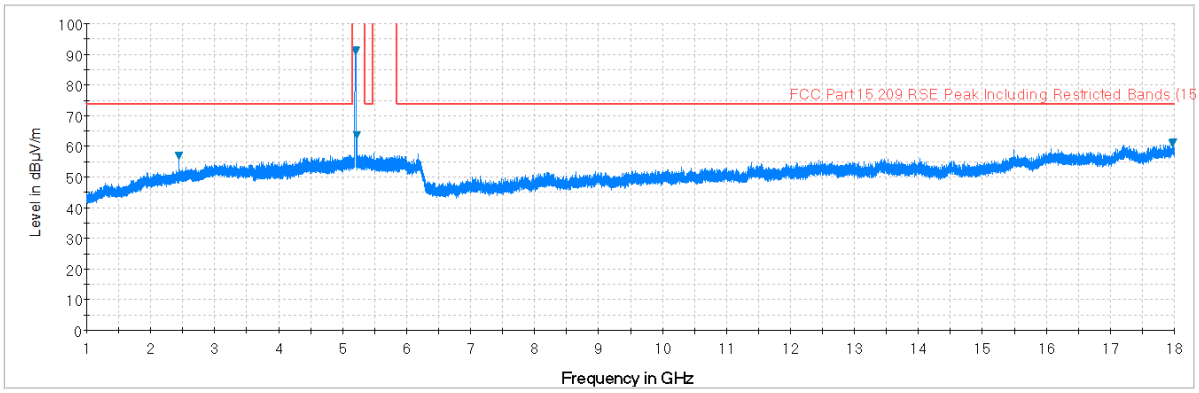
Radiated Band Edge Measurement Offset

- The amplitude offset shown in the radiated restricted band edge plots in Section 6.8 was calculated using the formula:
  Offset (dB) = (Antenna Factor + Cable Loss + 10 dB Attenuator) – Preamplifier Gain

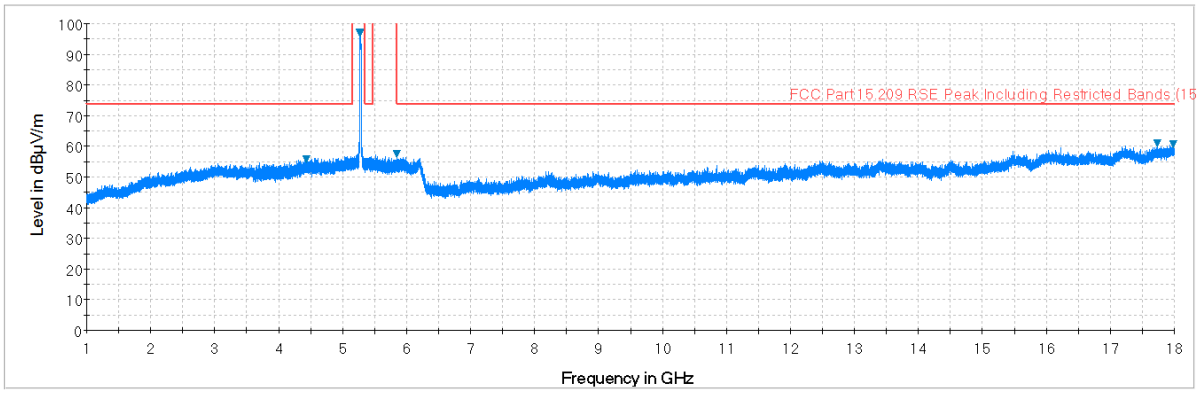
7.7.1 Antenna-1 Radiated Spurious Emission Measurements



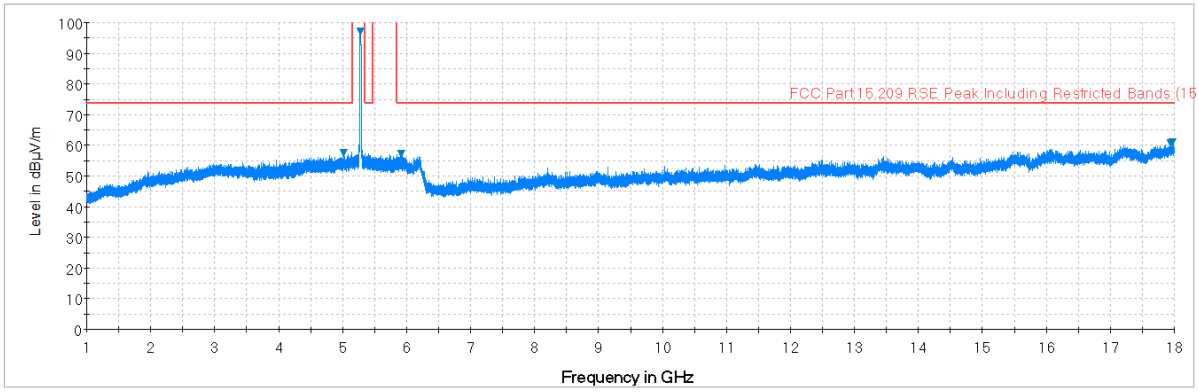
Plot 7-153. Radiated Spurious Plot above 1GHz (802.11a – U1 Ch. 40, Ant. Pol. H)



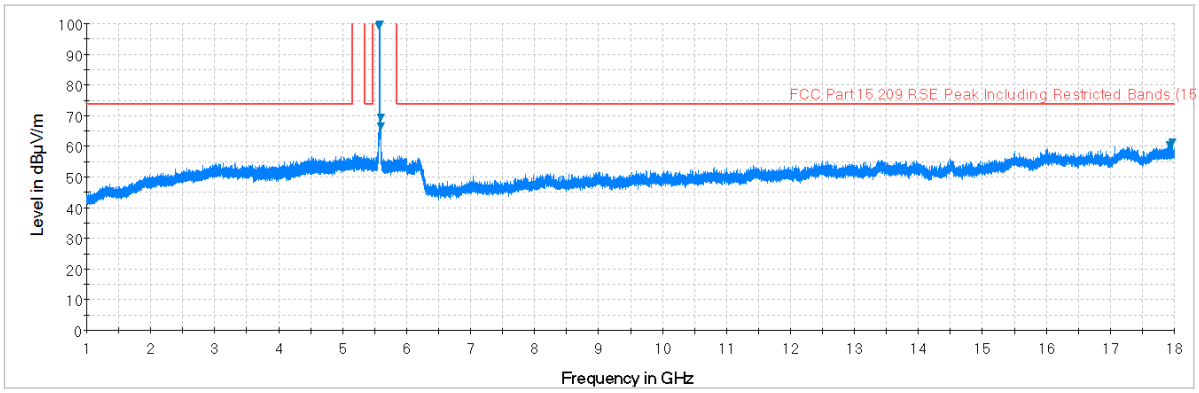
Plot 7-154. Radiated Spurious Plot above 1GHz (802.11a – U1 Ch. 40, Ant. Pol. V)



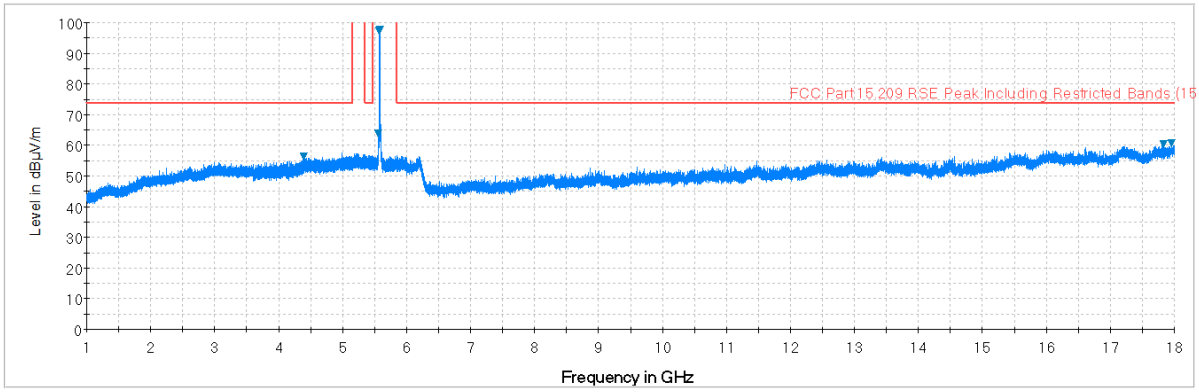
Plot 7-155. Radiated Spurious Plot above 1GHz (802.11a – U2A Ch. 56, Ant. Pol. H)



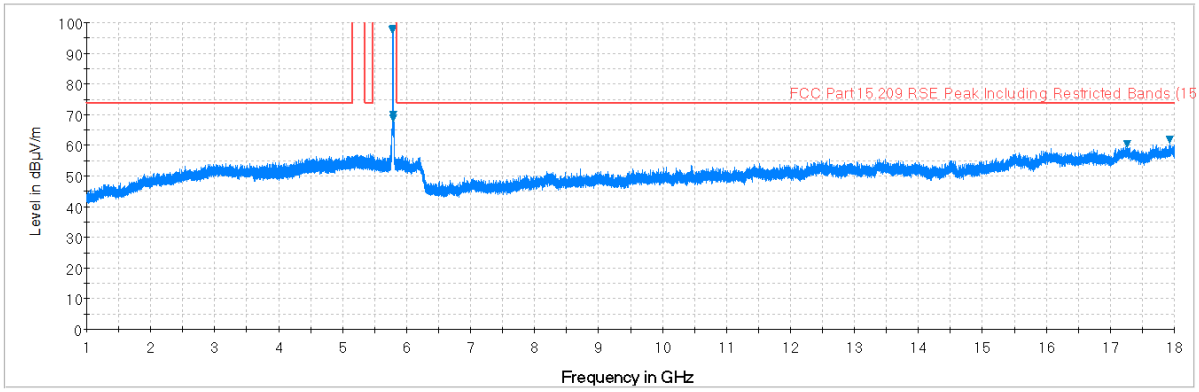
Plot 7-156. Radiated Spurious Plot above 1GHz (802.11a – U2A Ch. 56, Ant. Pol. V)



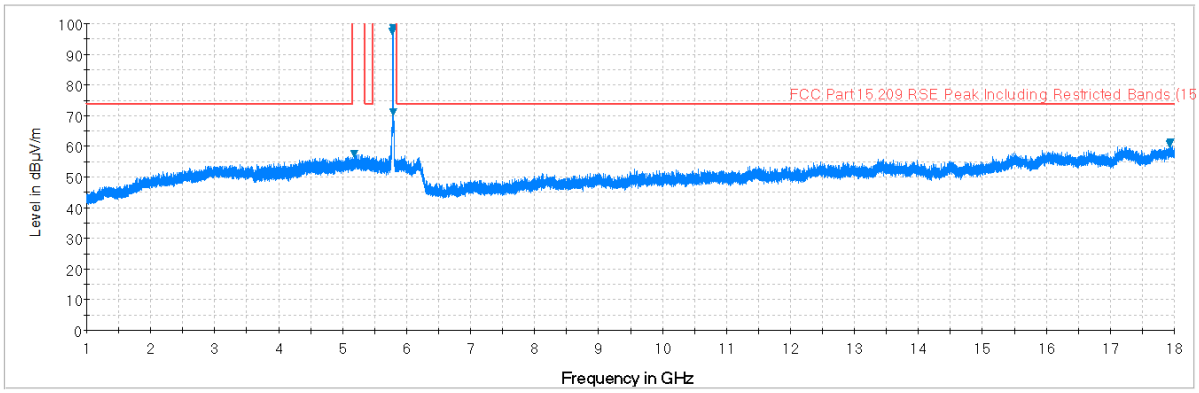
Plot 7-157. Radiated Spurious Plot above 1GHz (802.11a – U2C Ch. 116, Ant. Pol. H)



Plot 7-158. Radiated Spurious Plot above 1GHz (802.11a – U2C Ch. 116, Ant. Pol. V)



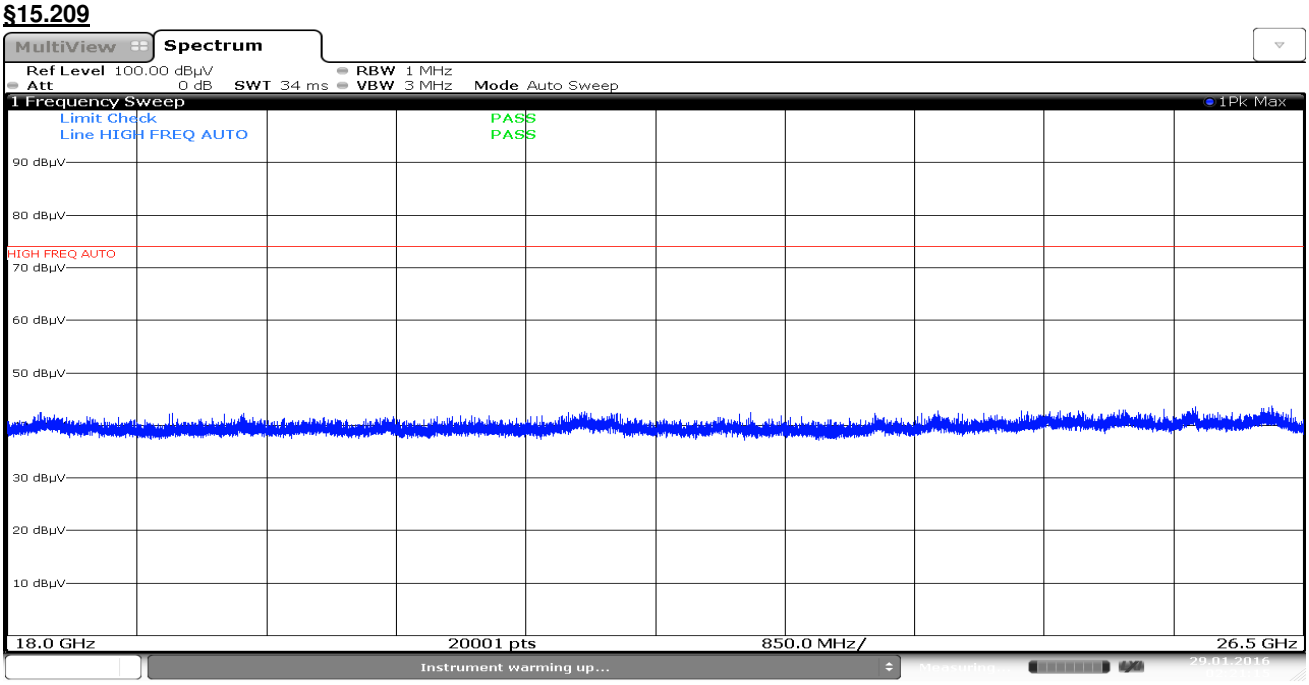
Plot 7-159. Radiated Spurious Plot above 1GHz (802.11a – U3 Ch. 157, Ant. Pol. H)



Plot 7-160. Radiated Spurious Plot above 1GHz (802.11a – U3 Ch. 157, Ant. Pol. V)

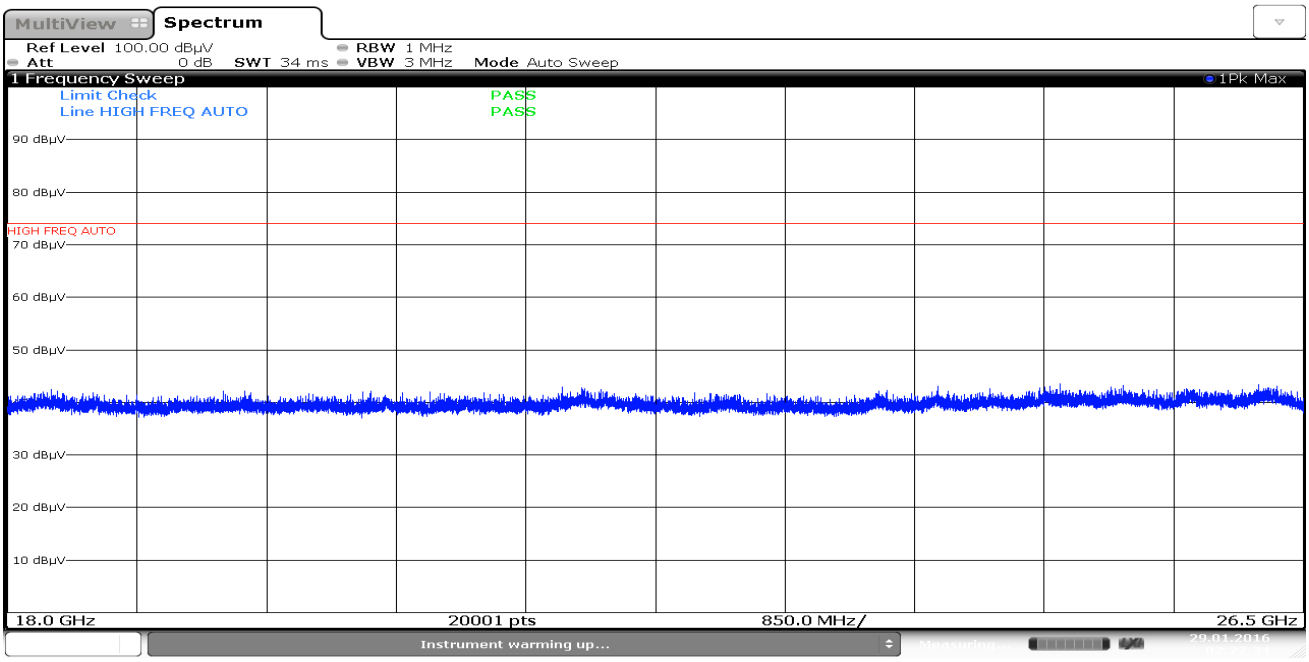
Antenna-1 Radiated Spurious Emissions Measurements (Above 18GHz)

§15.209



Date: 29.JAN.2016 02:21:15

Plot 7-161. Radiated Spurious Plot above 18GHz (802.11a – Ant. Pol. H)



Date: 29.JAN.2016 02:22:34

Plot 7-162. Radiated Spurious Plot above 18GHz (802.11a – Ant. Pol. V)

Antenna-1 Radiated Spurious Emission Measurements

§15.247(d) §15.205 & §15.209

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

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [m]	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	H	-	-	-99.47	48.05	0.00	55.58	68.20	-12.62
*	15540.00	Average	H	-	-	-111.66	53.93	0.00	49.27	53.98	-4.71
*	15540.00	Peak	H	-	-	-99.17	53.93	0.00	61.76	73.98	-12.22
*	20720.00	Average	H	-	-	-113.24	44.39	-9.54	28.61	53.98	-25.37
*	20720.00	Peak	H	-	-	-101.60	44.39	-9.54	40.25	73.98	-33.73
	25900.00	Peak	H	-	-	-99.54	45.11	-9.54	43.03	68.20	-25.17

Table 7-28. Radiated Measurements

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

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [m]	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	H	-	-	-99.42	48.16	0.00	55.73	68.20	-12.47
*	15600.00	Average	H	-	-	-111.23	53.51	0.00	49.27	53.98	-4.71
*	15600.00	Peak	H	-	-	-99.14	53.51	0.00	61.36	73.98	-12.62
*	20800.00	Average	H	-	-	-112.94	44.39	-9.54	28.91	53.98	-25.07
*	20800.00	Peak	H	-	-	-100.94	44.39	-9.54	40.91	73.98	-33.07
	26000.00	Peak	H	-	-	-100.45	45.12	-9.54	42.12	68.20	-26.08

Table 7-29. Radiated Measurements

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

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [m]	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	H	-	-	-99.59	48.37	0.00	55.79	68.20	-12.41
*	15720.00	Average	H	-	-	-111.23	52.90	0.00	48.66	53.98	-5.31
*	15720.00	Peak	H	-	-	-97.69	52.90	0.00	62.20	73.98	-11.77
*	20960.00	Average	H	-	-	-113.04	44.31	-9.54	28.73	53.98	-25.25
*	20960.00	Peak	H	-	-	-101.94	44.31	-9.54	39.83	73.98	-34.15
	26200.00	Peak	H	-	-	-100.59	45.01	-9.54	41.88	68.20	-26.32

Table 7-30. Radiated Measurements

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

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [m]	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	H	-	-	-97.97	48.42	0.00	57.45	68.20	-10.75
*	15780.00	Average	H	-	-	-112.71	52.64	0.00	46.93	53.98	-7.05
*	15780.00	Peak	H	-	-	-101.02	52.64	0.00	58.62	73.98	-15.36
*	21040.00	Average	H	-	-	-112.67	44.29	-9.54	29.07	53.98	-24.91
*	21040.00	Peak	H	-	-	-100.64	44.29	-9.54	41.10	73.98	-32.88
	26300.00	Peak	H	-	-	-100.42	45.00	-9.54	42.04	68.20	-26.16

Table 7-31. Radiated Measurements

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

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [m]	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	H	-	-	-99.96	48.40	0.00	55.44	68.20	-12.76
*	15840.00	Average	H	-	-	-112.47	52.60	0.00	47.13	53.98	-6.85
*	15840.00	Peak	H	-	-	-101.05	52.60	0.00	58.55	73.98	-15.43
*	21120.00	Average	H	-	-	-112.73	44.28	-9.54	29.01	53.98	-24.97
*	21120.00	Peak	H	-	-	-100.91	44.28	-9.54	40.83	73.98	-33.15
	26400.00	Peak	H	-	-	-99.81	45.02	-9.54	42.67	68.20	-25.53

Table 7-32. Radiated Measurements

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

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [m]	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	H	-	-	-110.92	48.40	0.00	44.48	53.98	-9.50
*	10640.00	Peak	H	-	-	-98.77	48.40	0.00	56.63	73.98	-17.35
*	15960.00	Average	H	-	-	-111.79	52.79	0.00	47.99	53.98	-5.99
*	15960.00	Peak	H	-	-	-99.95	52.79	0.00	59.83	73.98	-14.15
*	21280.00	Average	H	-	-	-112.60	44.26	-9.54	29.12	53.98	-24.86
*	21280.00	Peak	H	-	-	-101.24	44.26	-9.54	40.48	73.98	-33.50
	26600.00	Peak	H	-	-	-101.88	47.61	-9.54	43.19	68.20	-25.01

Table 7-33. Radiated Measurements

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

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [m]	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	H	-	-	-111.02	48.20	0.00	44.18	53.98	-9.80
*	11000.00	Peak	H	-	-	-99.69	48.20	0.00	55.51	73.98	-18.47
	16500.00	Peak	H	-	-	-101.00	51.96	0.00	57.96	68.20	-10.24
	22000.00	Peak	H	-	-	-100.96	44.50	-9.54	40.99	68.20	-27.21
	27500.00	Peak	H	-	-	-101.70	47.97	-9.54	43.73	68.20	-24.47

Table 7-34. Radiated Measurements

Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6 Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5580MHz
Channel: 116

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11160.00	Average	H	-	-	-110.65	48.34	0.00	44.69	53.98	-9.29
*	11160.00	Peak	H	-	-	-98.80	48.34	0.00	56.54	73.98	-17.44
	16740.00	Peak	H	-	-	-99.73	52.35	0.00	59.62	68.20	-8.58
*	22320.00	Average	H	-	-	-112.16	44.56	-9.54	29.86	53.98	-24.12
*	22320.00	Peak	H	-	-	-100.82	44.56	-9.54	41.20	73.98	-32.78
	27900.00	Peak	H	-	-	-102.23	48.08	-9.54	43.31	68.20	-24.89

Table 7-35. Radiated Measurements

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

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [m]	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	H	-	-	-111.29	48.28	0.00	44.00	53.98	-9.98
*	11440.00	Peak	H	-	-	-99.77	48.28	0.00	55.52	73.98	-18.46
	17160.00	Peak	H	-	-	-99.52	54.24	0.00	61.72	68.20	-6.48
*	22880.00	Average	H	-	-	-112.84	44.61	-9.54	29.23	53.98	-24.75
*	22880.00	Peak	H	-	-	-101.65	44.61	-9.54	40.42	73.98	-33.56
	28600.00	Peak	H	-	-	-101.72	48.29	-9.54	44.03	68.20	-24.17

Table 7-36. Radiated Measurements

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

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [m]	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	H	-	-	-111.34	48.29	0.00	43.96	53.98	-10.02
*	11490.00	Peak	H	-	-	-99.11	48.29	0.00	56.19	73.98	-17.79
	17235.00	Peak	H	-	-	-99.26	54.54	0.00	62.29	68.20	-5.91
*	22980.00	Average	H	-	-	-113.16	44.68	-9.54	28.98	53.98	-25.00
*	22980.00	Peak	H	-	-	-101.86	44.68	-9.54	40.28	73.98	-33.70
	28725.00	Peak	H	-	-	-101.71	48.26	-9.54	44.01	68.20	-24.19

Table 7-37. Radiated Measurements

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

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [m]	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	H	-	-	-111.28	48.63	0.00	44.35	53.98	-9.63
*	11570.00	Peak	H	-	-	-99.54	48.63	0.00	56.09	73.98	-17.89
	17355.00	Peak	H	-	-	-100.31	54.81	0.00	61.50	68.20	-6.70
	23140.00	Peak	H	-	-	-101.08	44.75	-9.54	41.13	68.20	-27.07
	28925.00	Peak	H	-	-	-101.36	48.29	-9.54	44.39	68.20	-23.81

Table 7-38. Radiated Measurements

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

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [m]	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	H	-	-	-111.17	48.87	0.00	44.70	53.98	-9.27
*	11650.00	Peak	H	-	-	-100.03	48.87	0.00	55.84	73.98	-18.13
	17475.00	Peak	H	-	-	-99.36	55.45	0.00	63.09	68.20	-5.11
	23300.00	Peak	H	-	-	-101.64	44.75	-9.54	40.56	68.20	-27.64
	29125.00	Peak	H	-	-	-102.15	48.28	-9.54	43.60	68.20	-24.60

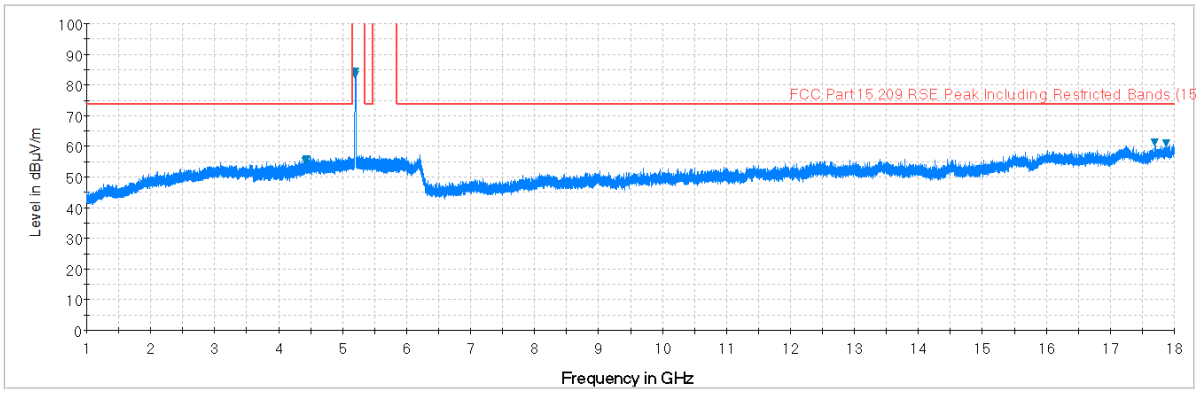
Table 7-39. Radiated Measurements

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

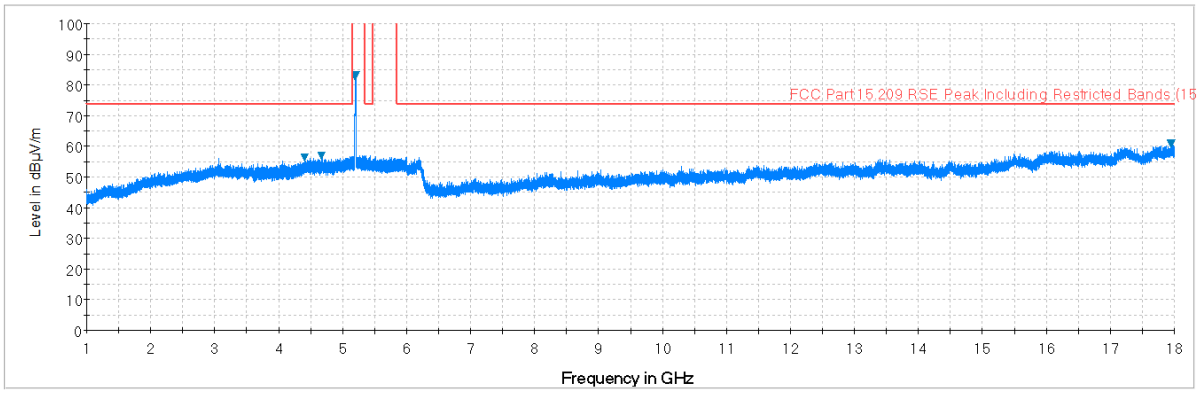
	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10360.00	Peak	H	-	-	-100.14	48.05	0.00	54.91	68.20	-13.29
*	15540.00	Average	H	-	-	-112.08	53.93	0.00	48.85	53.98	-5.13
*	15540.00	Peak	H	-	-	-100.16	53.93	0.00	60.77	73.98	-13.21

Table 7-40. Radiated Measurements with Camera Module Accessory

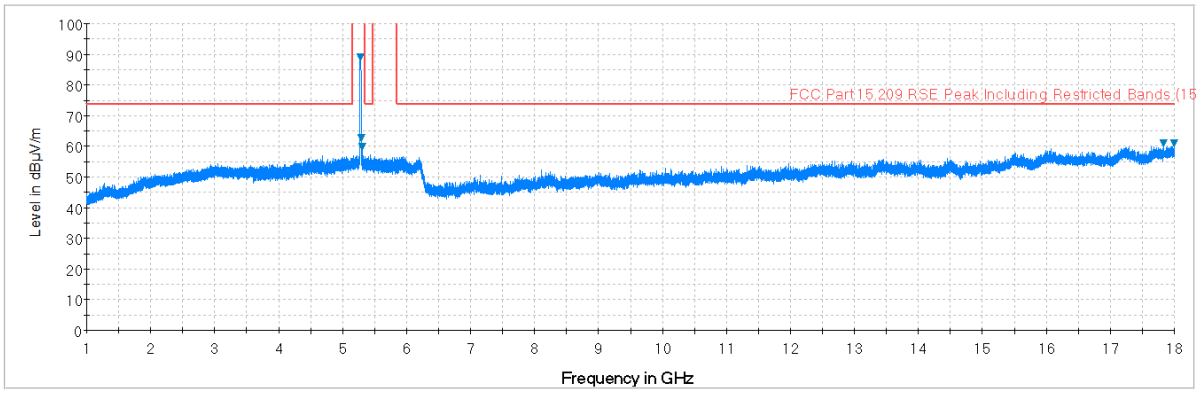
7.7.2 Antenna-2 Radiated Spurious Emission Measurements



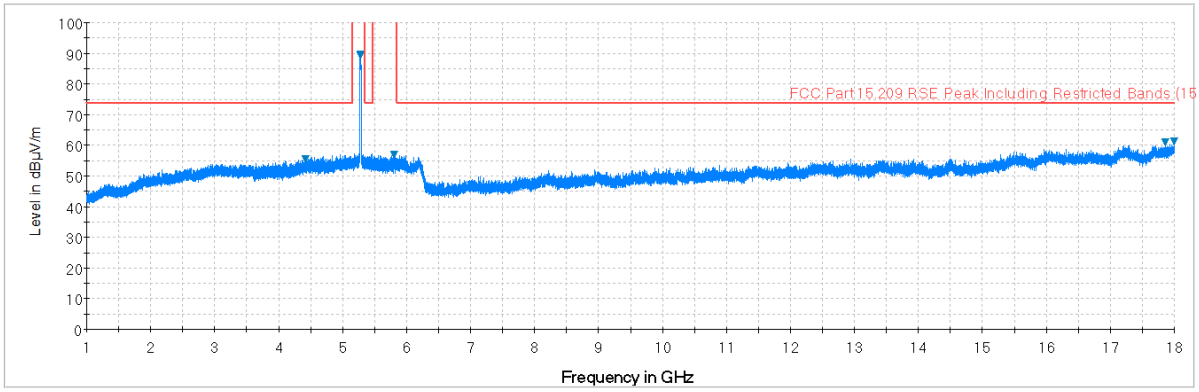
Plot 7-163. Radiated Spurious Plot above 1GHz (802.11a – U1 Ch. 40, Ant. Pol. H)



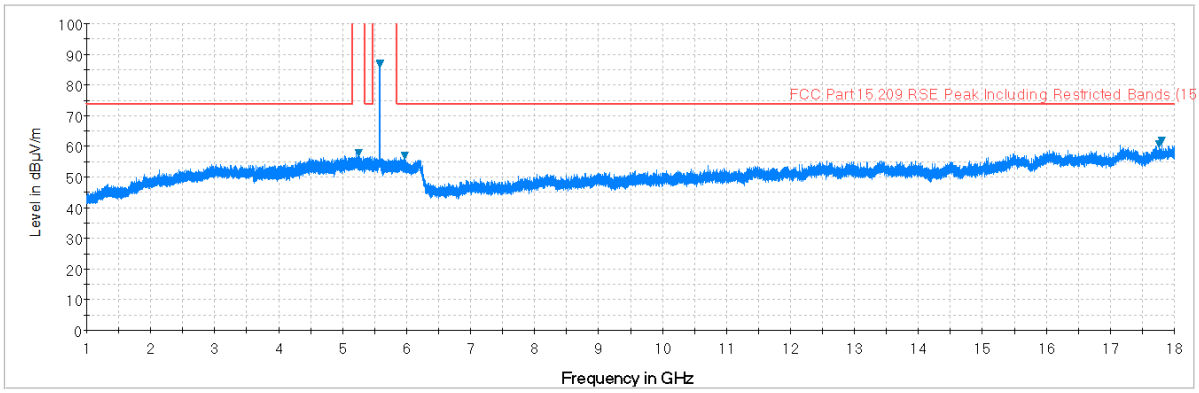
Plot 7-164. Radiated Spurious Plot above 1GHz (802.11a – U1 Ch. 40, Ant. Pol. V)



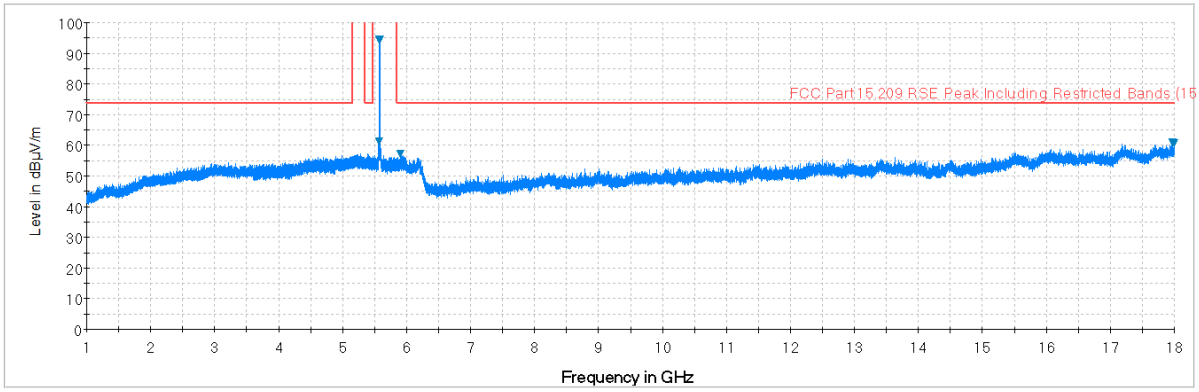
Plot 7-165. Radiated Spurious Plot above 1GHz (802.11a – U2A Ch. 56, Ant. Pol. H)



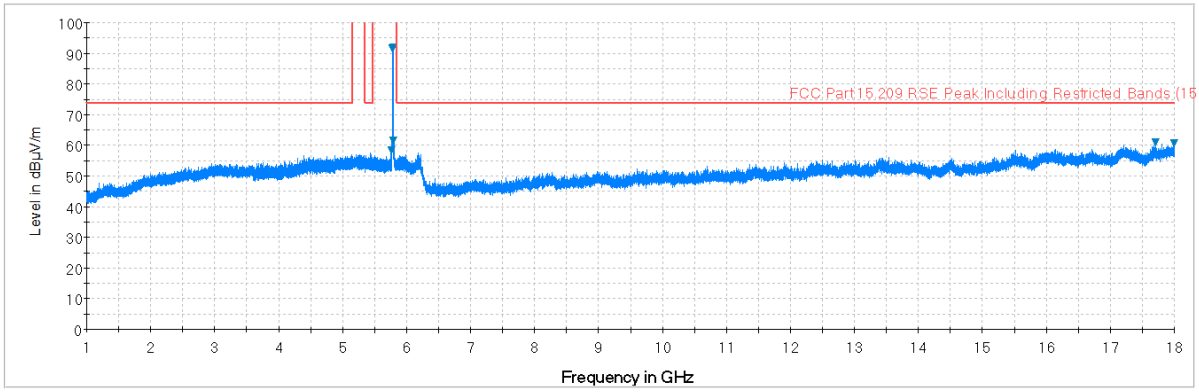
Plot 7-166. Radiated Spurious Plot above 1GHz (802.11a – U2A Ch. 56, Ant. Pol. V)



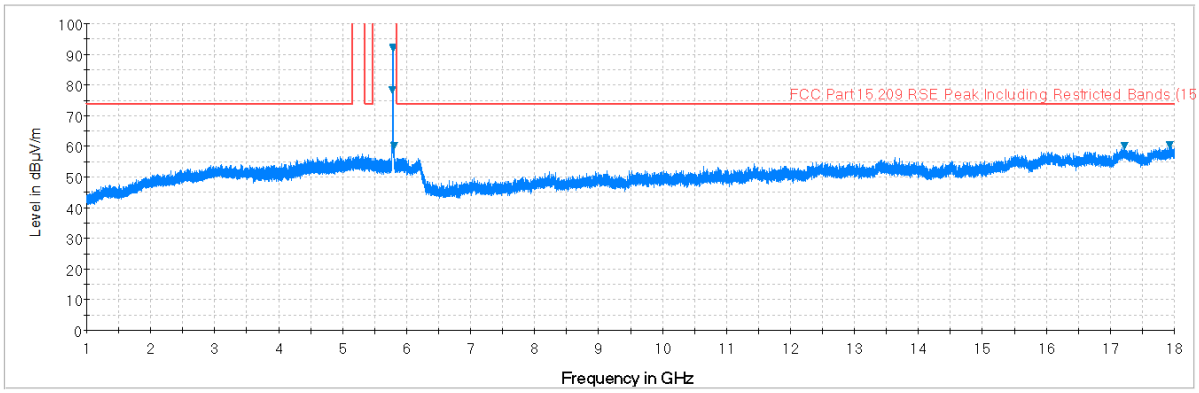
Plot 7-167. Radiated Spurious Plot above 1GHz (802.11a – U2C Ch. 116, Ant. Pol. H)



Plot 7-168. Radiated Spurious Plot above 1GHz (802.11a – U2C Ch. 116, Ant. Pol. V)



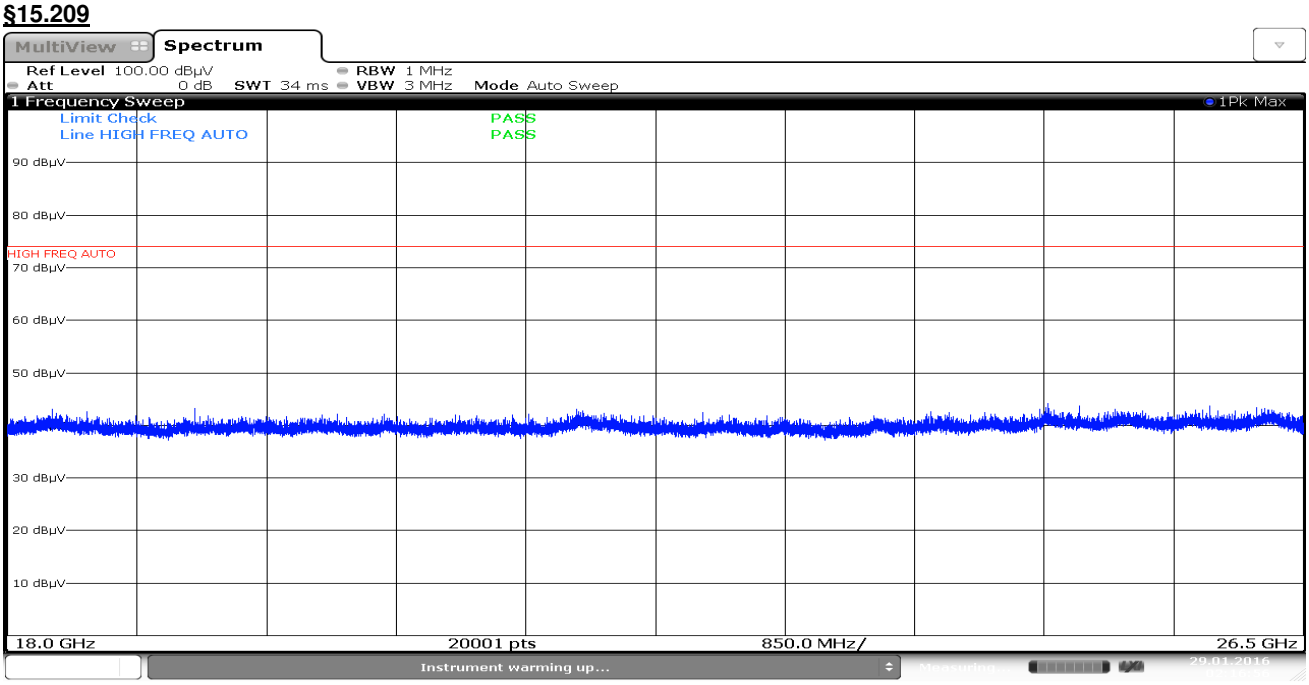
Plot 7-169. Radiated Spurious Plot above 1GHz (802.11a – U3 Ch. 157, Ant. Pol. H)



Plot 7-170. Radiated Spurious Plot above 1GHz (802.11a – U3 Ch. 157, Ant. Pol. V)

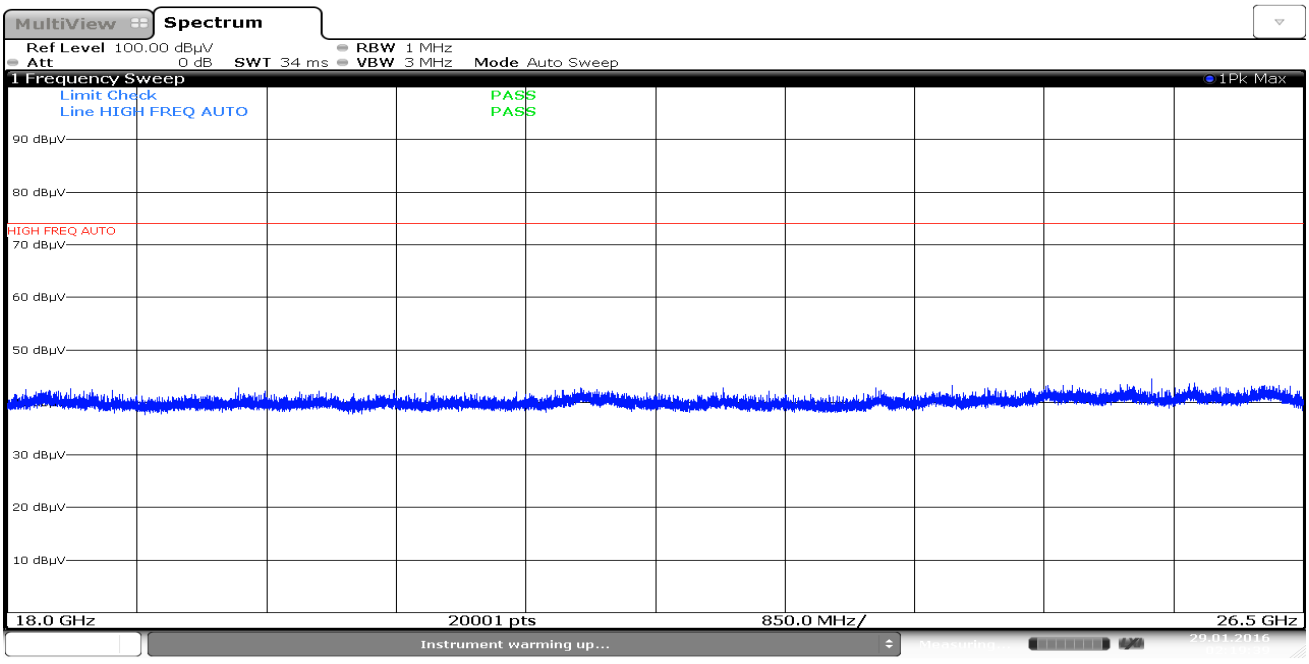
Antenna-2 Radiated Spurious Emissions Measurements (Above 18GHz)

§15.209



Date: 29.JAN.2016 02:16:57

Plot 7-171. Radiated Spurious Plot above 18GHz (802.11a – Ant. Pol. H)



Date: 29.JAN.2016 02:19:38

Plot 7-172. Radiated Spurious Plot above 18GHz (802.11a – Ant. Pol. V)

Antenna-2 Radiated Spurious Emission Measurements

§15.247(d) §15.205 & §15.209

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

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [m]	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	H	-	-	-98.04	48.05	0.00	57.01	68.20	-11.19
*	15540.00	Average	H	-	-	-111.43	53.93	0.00	49.50	53.98	-4.48
*	15540.00	Peak	H	-	-	-99.48	53.93	0.00	61.45	73.98	-12.53
*	20720.00	Average	H	-	-	-112.90	44.39	-9.54	28.95	53.98	-25.03
*	20720.00	Peak	H	-	-	-101.82	44.39	-9.54	40.03	73.98	-33.95
	25900.00	Peak	H	-	-	-99.62	45.11	-9.54	42.95	68.20	-25.25

Table 7-41. Radiated Measurements

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

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [m]	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	H	-	-	-99.48	48.16	0.00	55.67	68.20	-12.53
*	15600.00	Average	H	-	-	-111.43	53.51	0.00	49.07	53.98	-4.91
*	15600.00	Peak	H	-	-	-99.38	53.51	0.00	61.12	73.98	-12.86
*	20800.00	Average	H	-	-	-113.11	44.39	-9.54	28.74	53.98	-25.24
*	20800.00	Peak	H	-	-	-101.69	44.39	-9.54	40.16	73.98	-33.82
	26000.00	Peak	H	-	-	-100.54	45.12	-9.54	42.03	68.20	-26.17

Table 7-42. Radiated Measurements

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

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [m]	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	H	-	-	-98.77	48.37	0.00	56.61	68.20	-11.59
*	15720.00	Average	H	-	-	-111.38	52.90	0.00	48.51	53.98	-5.46
*	15720.00	Peak	H	-	-	-99.46	52.90	0.00	60.43	73.98	-13.54
*	20960.00	Average	H	-	-	-112.91	44.31	-9.54	28.86	53.98	-25.12
*	20960.00	Peak	H	-	-	-101.40	44.31	-9.54	40.37	73.98	-33.61
	26200.00	Peak	H	-	-	-100.55	45.01	-9.54	41.92	68.20	-26.28

Table 7-43. Radiated Measurements

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

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [m]	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	H	-	-	-99.41	48.42	0.00	56.01	68.20	-12.19
*	15780.00	Average	H	-	-	-112.26	52.64	0.00	47.38	53.98	-6.60
*	15780.00	Peak	H	-	-	-100.60	52.64	0.00	59.04	73.98	-14.94
*	21040.00	Average	H	-	-	-112.78	44.29	-9.54	28.96	53.98	-25.02
*	21040.00	Peak	H	-	-	-101.69	44.29	-9.54	40.05	73.98	-33.93
	26300.00	Peak	H	-	-	-98.70	45.00	-9.54	43.76	68.20	-24.44

Table 7-44. Radiated Measurements

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

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [m]	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	H	-	-	-98.68	48.40	0.00	56.72	68.20	-11.48
*	15840.00	Average	H	-	-	-112.51	52.60	0.00	47.09	53.98	-6.89
*	15840.00	Peak	H	-	-	-100.47	52.60	0.00	59.13	73.98	-14.85
*	21120.00	Average	H	-	-	-112.81	44.28	-9.54	28.93	53.98	-25.05
*	21120.00	Peak	H	-	-	-101.53	44.28	-9.54	40.21	73.98	-33.77
	26400.00	Peak	H	-	-	-98.55	45.02	-9.54	43.93	68.20	-24.27

Table 7-45. Radiated Measurements

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

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [m]	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	H	-	-	-111.10	48.40	0.00	44.30	53.98	-9.68
*	10640.00	Peak	H	-	-	-99.14	48.40	0.00	56.26	73.98	-17.72
*	15960.00	Average	H	-	-	-111.98	52.79	0.00	47.80	53.98	-6.18
*	15960.00	Peak	H	-	-	-99.91	52.79	0.00	59.87	73.98	-14.11
*	21280.00	Average	H	-	-	-112.57	44.26	-9.54	29.15	53.98	-24.83
*	21280.00	Peak	H	-	-	-100.36	44.26	-9.54	41.36	73.98	-32.62
	26600.00	Peak	H	-	-	-102.00	47.61	-9.54	43.07	68.20	-25.13

Table 7-46. Radiated Measurements

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

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [m]	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	H	-	-	-111.02	48.20	0.00	44.18	53.98	-9.80
*	11000.00	Peak	H	-	-	-99.27	48.20	0.00	55.93	73.98	-18.05
	16500.00	Peak	H	-	-	-99.69	51.96	0.00	59.27	68.20	-8.93
	22000.00	Peak	H	-	-	-100.01	44.50	-9.54	41.94	68.20	-26.26
	27500.00	Peak	H	-	-	-101.47	47.97	-9.54	43.96	68.20	-24.24

Table 7-47. Radiated Measurements

Worst Case Mode:	802.11a
Worst Case Transfer Rate:	6 Mbps
Distance of Measurements:	1 & 3 Meters
Operating Frequency:	5580MHz
Channel:	116

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11160.00	Average	H	-	-	-110.67	48.34	0.00	44.67	53.98	-9.31
*	11160.00	Peak	H	-	-	-99.05	48.34	0.00	56.29	73.98	-17.69
	16740.00	Peak	H	-	-	-100.65	52.35	0.00	58.70	68.20	-9.50
*	22320.00	Average	H	-	-	-112.52	44.56	-9.54	29.50	53.98	-24.48
*	22320.00	Peak	H	-	-	-101.24	44.56	-9.54	40.78	73.98	-33.20
	27900.00	Peak	H	-	-	-101.70	48.08	-9.54	43.84	68.20	-24.36

Table 7-48. Radiated Measurements

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

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [m]	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	H	-	-	-111.30	48.28	0.00	43.99	53.98	-9.99
*	11440.00	Peak	H	-	-	-99.62	48.28	0.00	55.67	73.98	-18.31
	17160.00	Peak	H	-	-	-98.33	54.24	0.00	62.91	68.20	-5.29
*	22880.00	Average	H	-	-	-112.68	44.61	-9.54	29.39	53.98	-24.59
*	22880.00	Peak	H	-	-	-100.48	44.61	-9.54	41.59	73.98	-32.39
	28600.00	Peak	H	-	-	-102.13	48.29	-9.54	43.62	68.20	-24.58

Table 7-49. Radiated Measurements

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

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [m]	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	H	-	-	-111.25	48.29	0.00	44.05	53.98	-9.93
*	11490.00	Peak	H	-	-	-98.71	48.29	0.00	56.59	73.98	-17.39
	17235.00	Peak	H	-	-	-98.29	54.54	0.00	63.26	68.20	-4.94
*	22980.00	Average	H	-	-	-112.93	44.68	-9.54	29.21	53.98	-24.77
*	22980.00	Peak	H	-	-	-102.08	44.68	-9.54	40.06	73.98	-33.92
	28725.00	Peak	H	-	-	-101.42	48.26	-9.54	44.30	68.20	-23.90

Table 7-50. Radiated Measurements

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

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [m]	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	H	-	-	-110.75	48.63	0.00	44.88	53.98	-9.10
*	11570.00	Peak	H	-	-	-99.15	48.63	0.00	56.48	73.98	-17.50
	17355.00	Peak	H	-	-	-99.98	54.81	0.00	61.83	68.20	-6.37
	23140.00	Peak	H	-	-	-100.33	44.75	-9.54	41.88	68.20	-26.32
	28925.00	Peak	H	-	-	-102.69	48.29	-9.54	43.06	68.20	-25.14

Table 7-51. Radiated Measurements

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

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [m]	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	H	-	-	-110.71	48.87	0.00	45.16	53.98	-8.81
*	11650.00	Peak	H	-	-	-99.43	48.87	0.00	56.44	73.98	-17.53
	17475.00	Peak	H	-	-	-98.77	55.45	0.00	63.68	68.20	-4.52
	23300.00	Peak	H	-	-	-101.39	44.75	-9.54	40.81	68.20	-27.39
	29125.00	Peak	H	-	-	-101.46	48.28	-9.54	44.29	68.20	-23.91

Table 7-52. Radiated Measurements

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

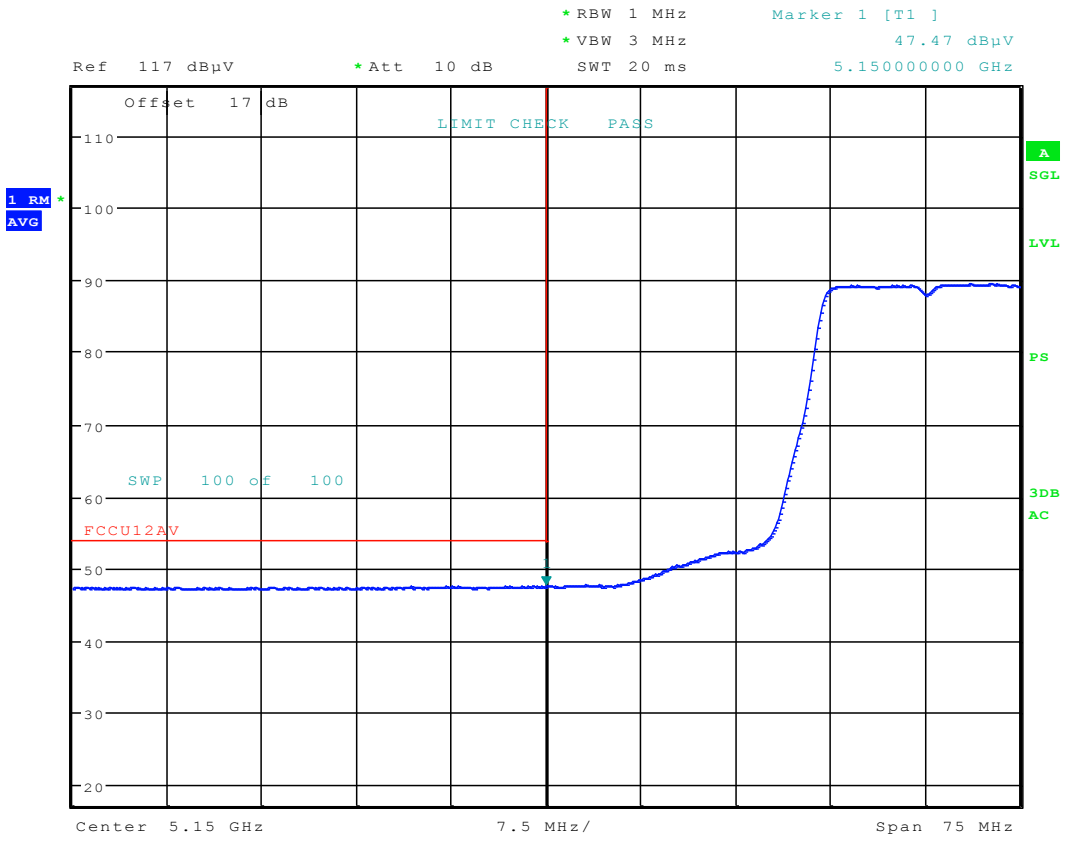
	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10360.00	Peak	H	-	-	-100.44	48.05	0.00	54.61	68.20	-13.59
*	15540.00	Average	H	-	-	-112.13	53.93	0.00	48.80	53.98	-5.18
*	15540.00	Peak	H	-	-	-99.80	53.93	0.00	61.13	73.98	-12.85

Table 7-53. Radiated Measurements with Camera Module Accessory

7.7.3 Antenna-1 Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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

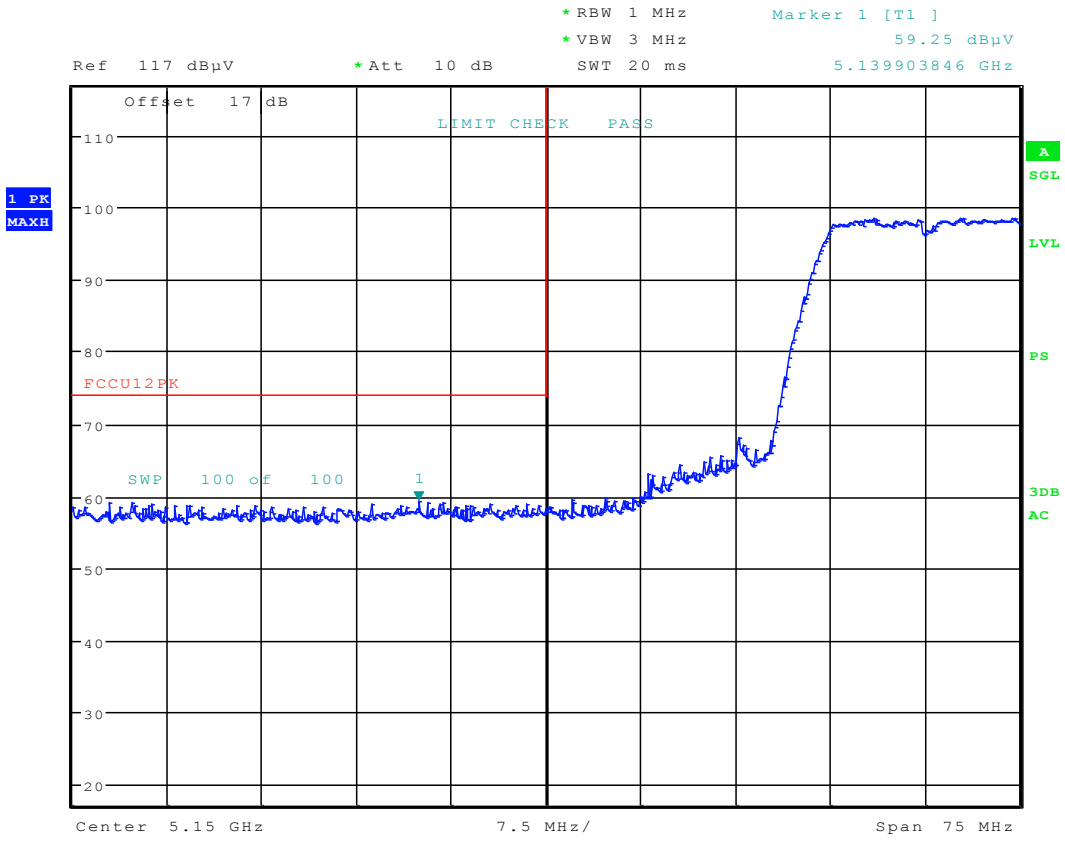


Date: 27.JAN.2016 19:23:41

Plot 7-173. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

Antenna-1 Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



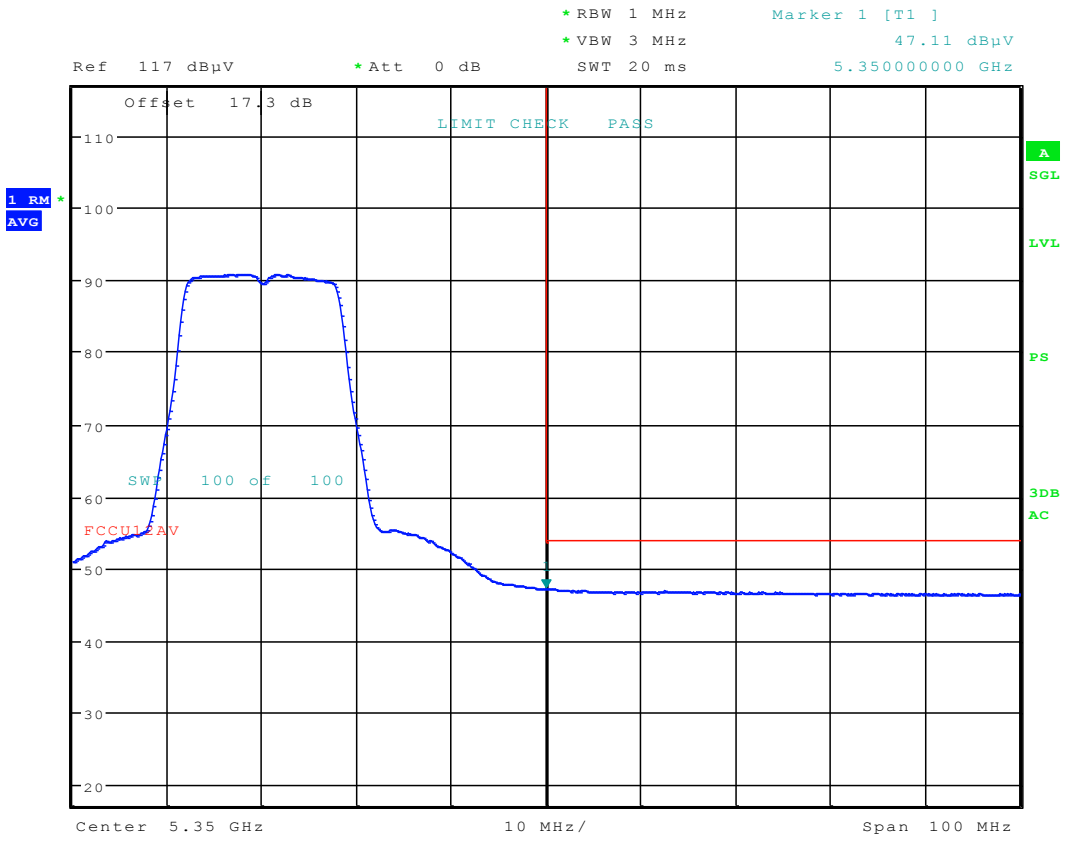
Date: 27.JAN.2016 19:24:02

Plot 7-174. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)

Antenna-1 Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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

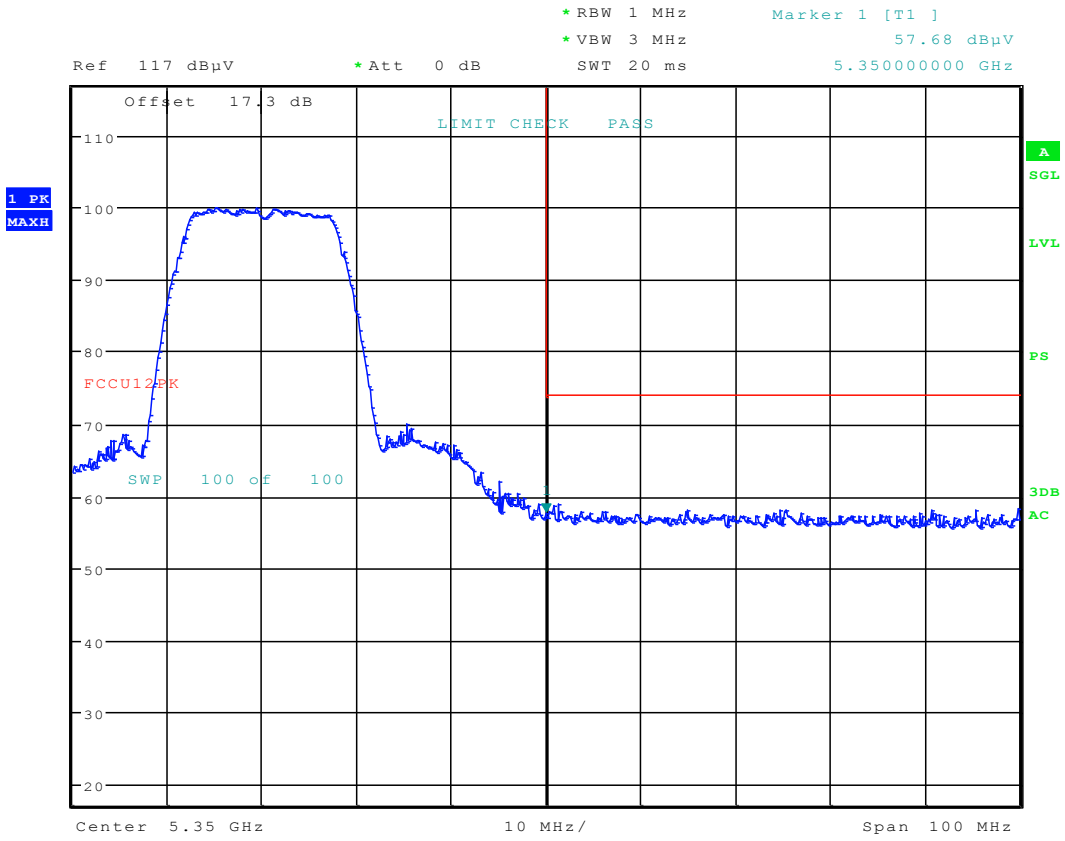


Date: 27.JAN.2016 20:02:18

Plot 7-175. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

Antenna-1 Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



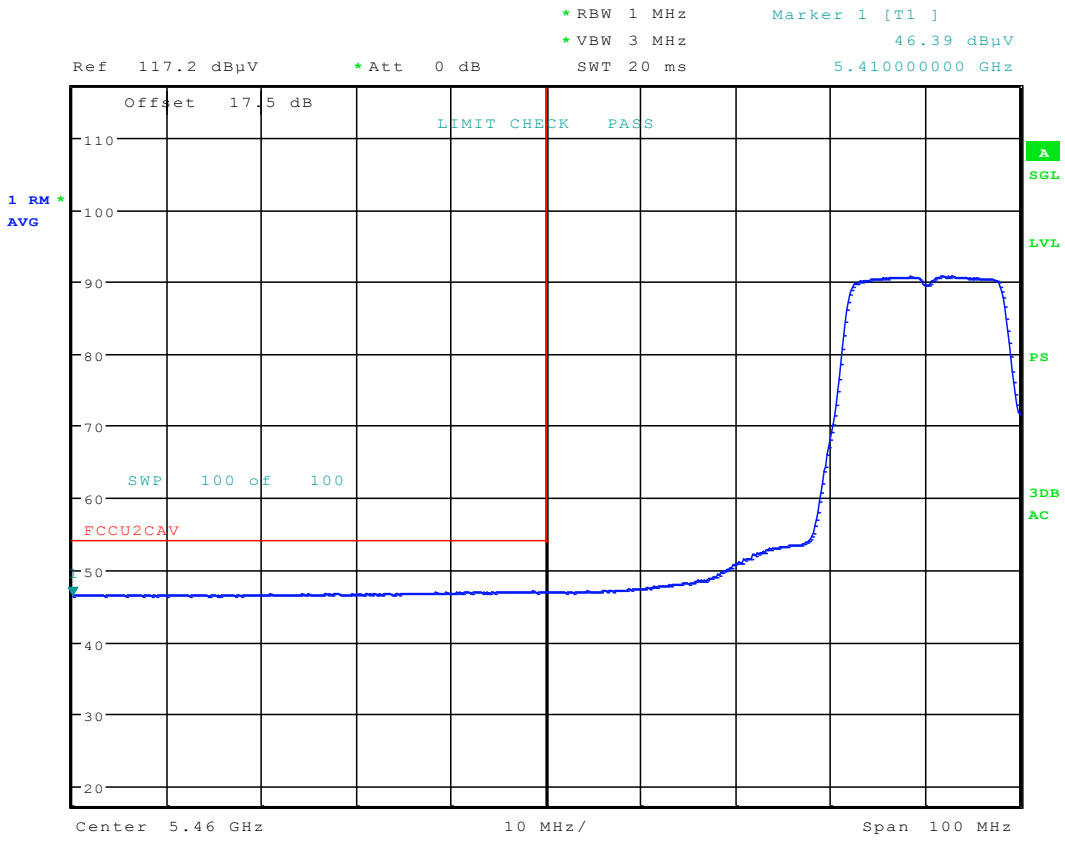
Date: 27.JAN.2016 20:02:36

Plot 7-176. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

Antenna-1 Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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

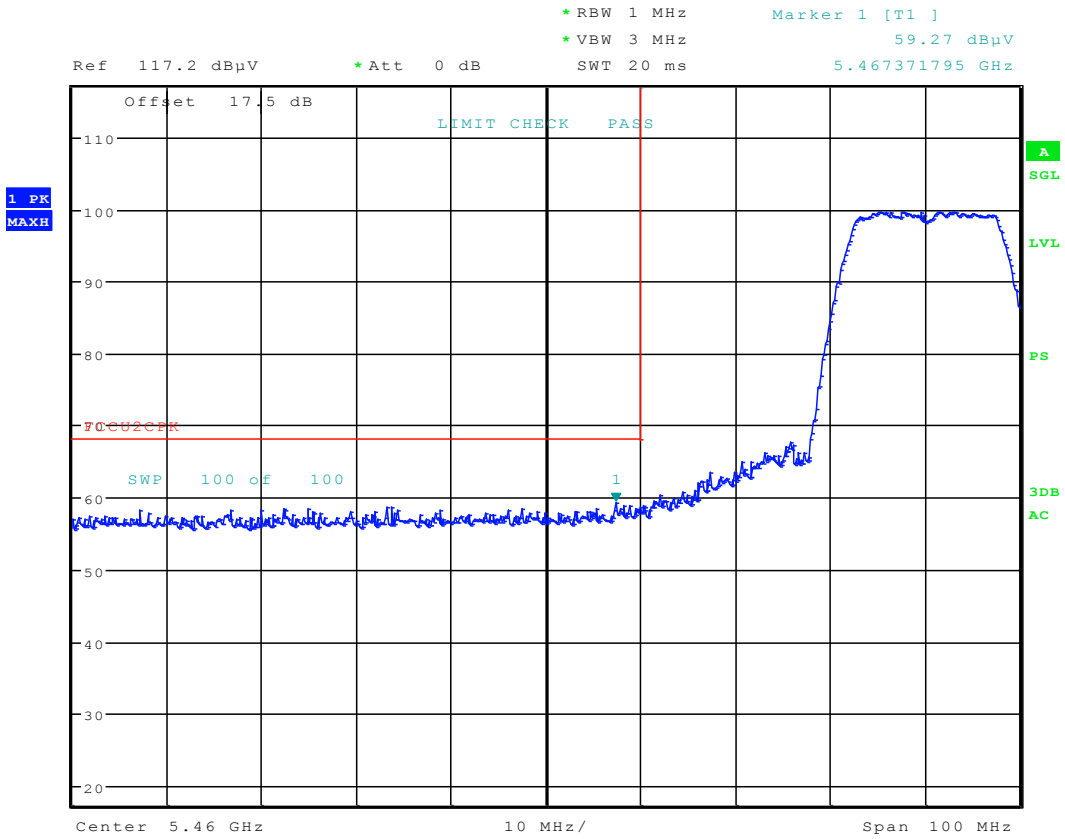


Date: 27.JAN.2016 20:45:39

Plot 7-177. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

Antenna-1 Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



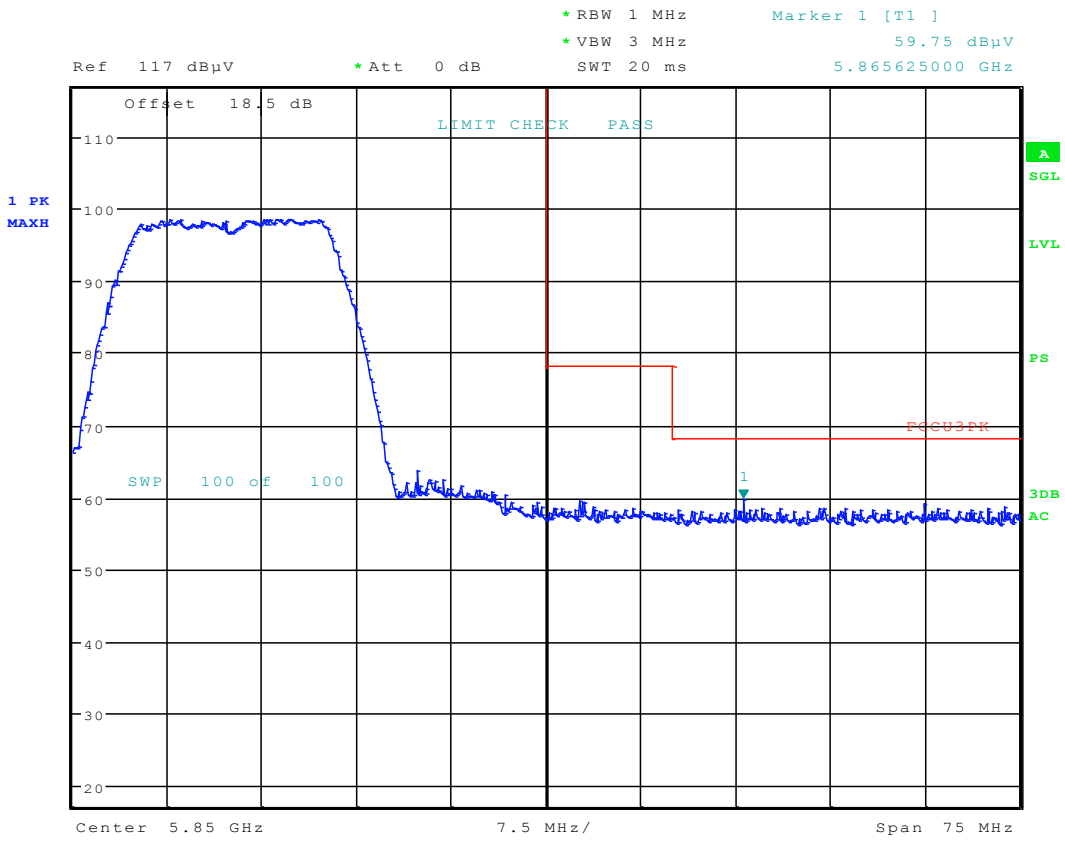
Date: 27.JAN.2016 20:46:06

Plot 7-178. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

Antenna-1 Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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



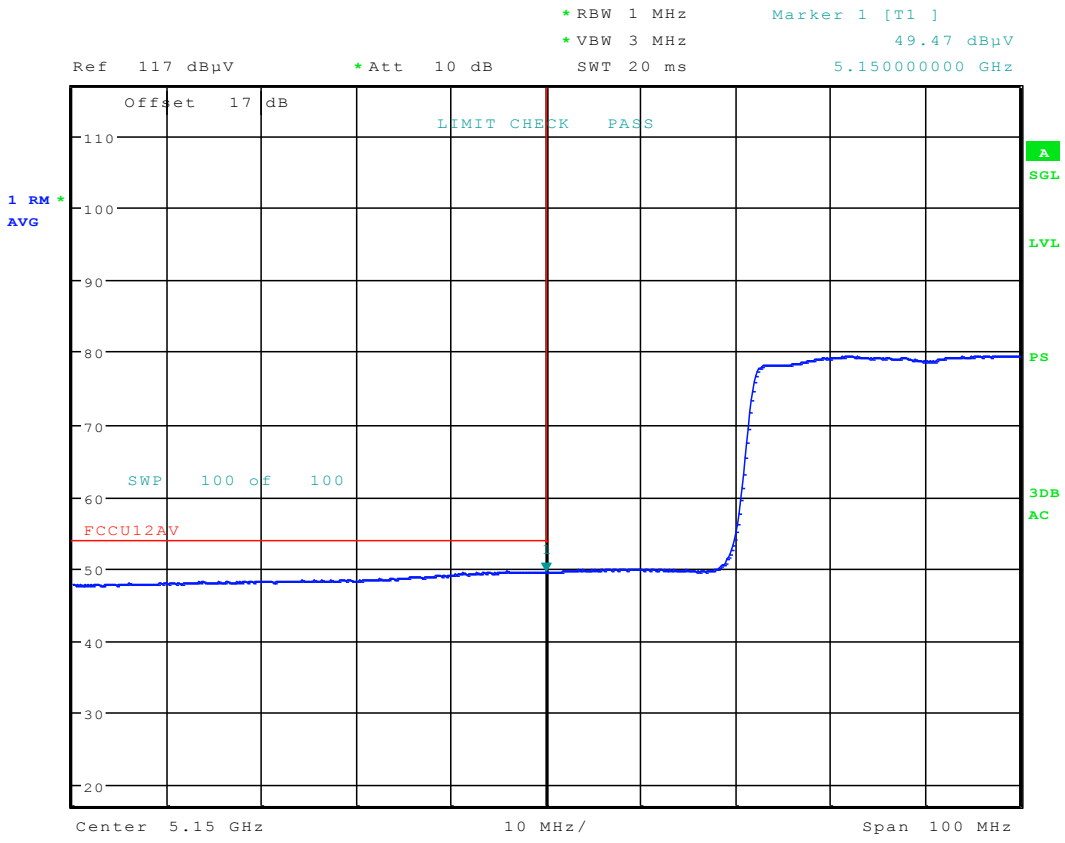
Date: 27.JAN.2016 21:02:20

Plot 7-179. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

7.7.4 Antenna-1 Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

Worst Case Mode:	802.11n (40MHz)
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5190MHz
Channel:	38

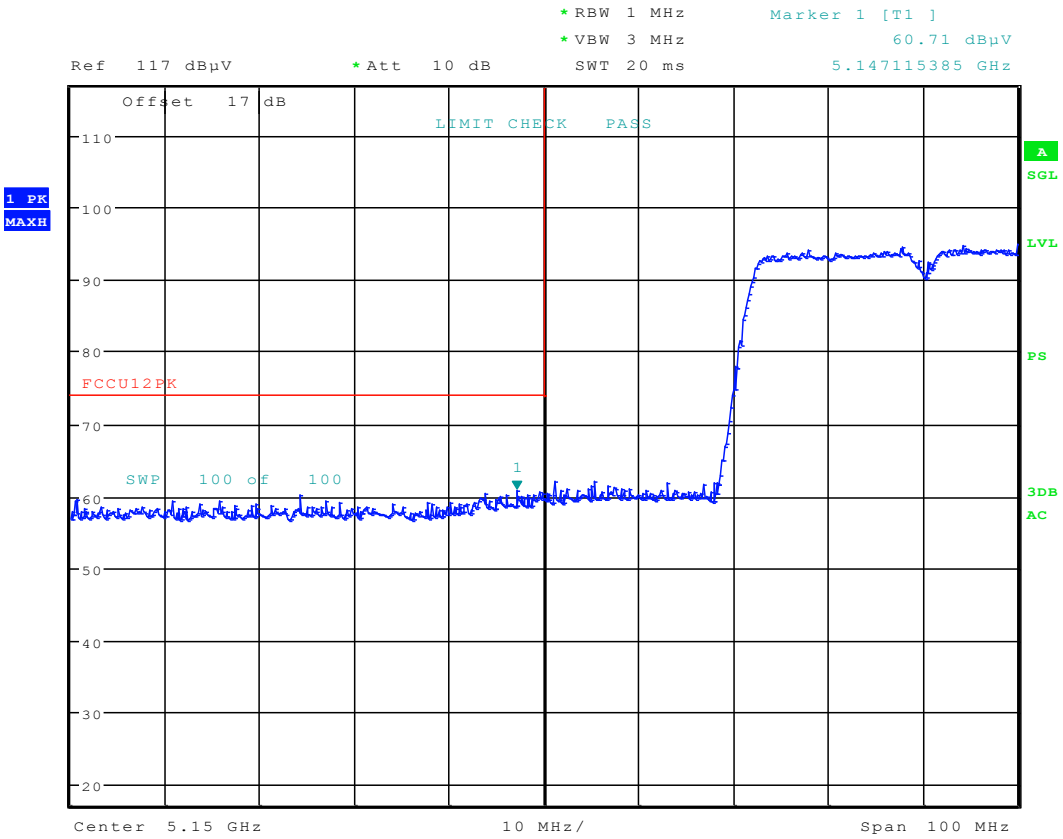


Date: 27.JAN.2016 19:46:28

Plot 7-180. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

Antenna-1 Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



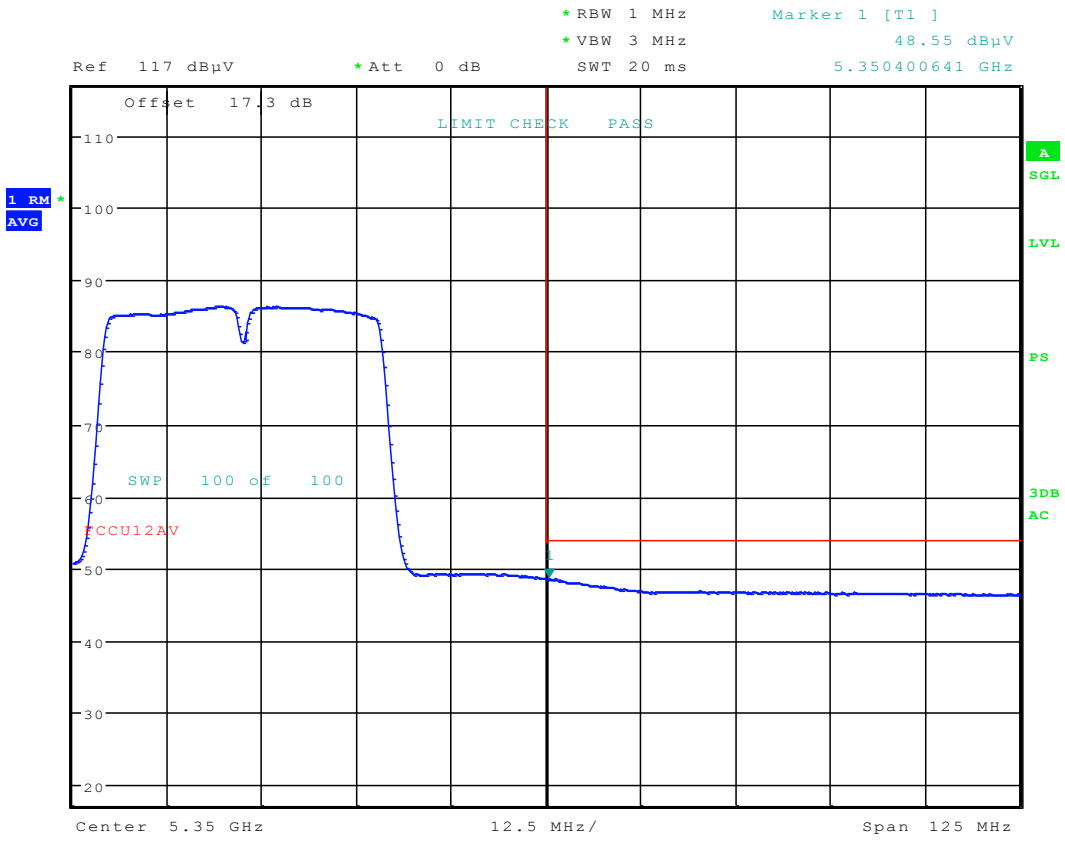
Date: 27.JAN.2016 19:39:16

Plot 7-181. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)

Antenna-1 Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

Worst Case Mode:	802.11n (40MHz)
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5310MHz
Channel:	62

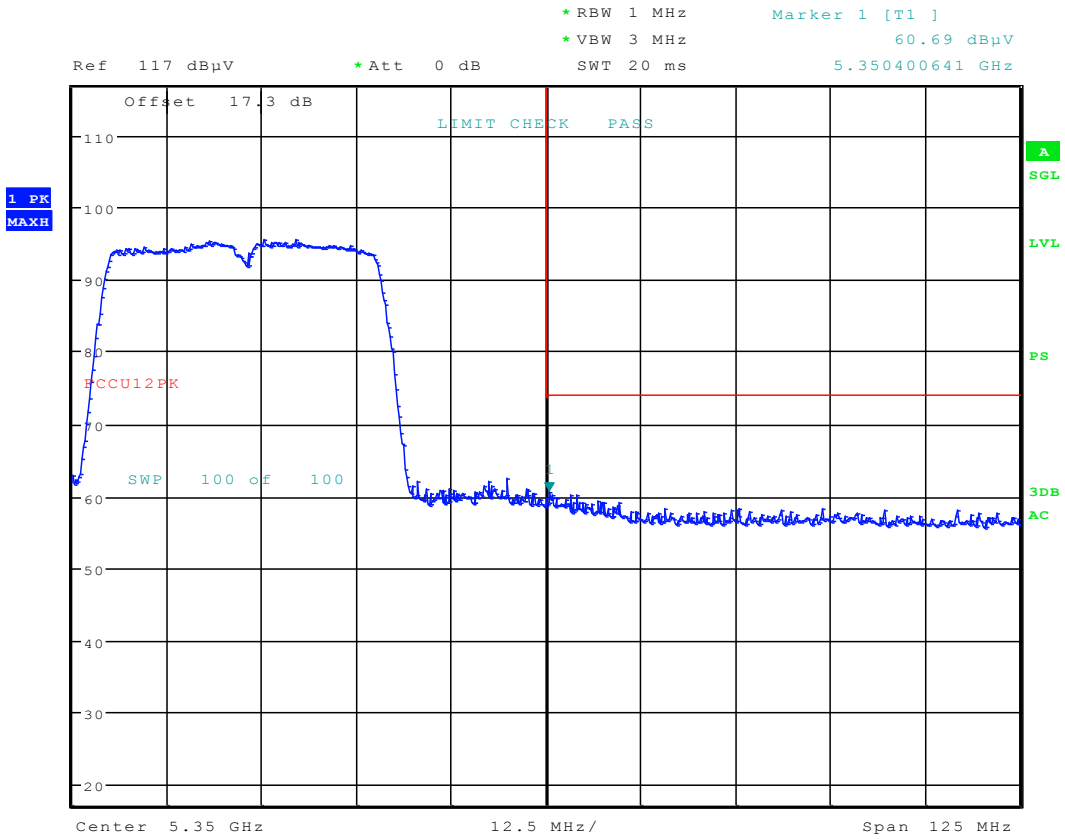


Date: 27.JAN.2016 20:05:15

Plot 7-182. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

Antenna-1 Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



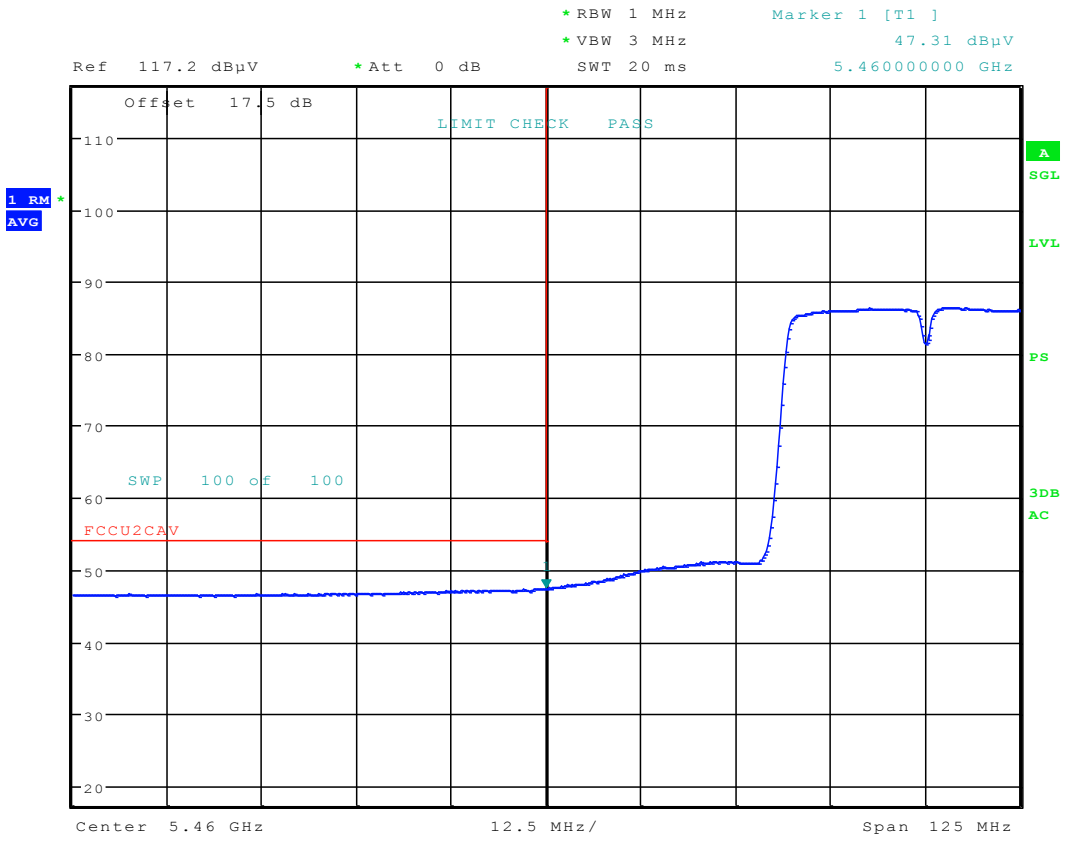
Date: 27.JAN.2016 20:04:43

Plot 7-183. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

Antenna-1 Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

Worst Case Mode:	802.11n (40MHz)
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5510MHz
Channel:	102

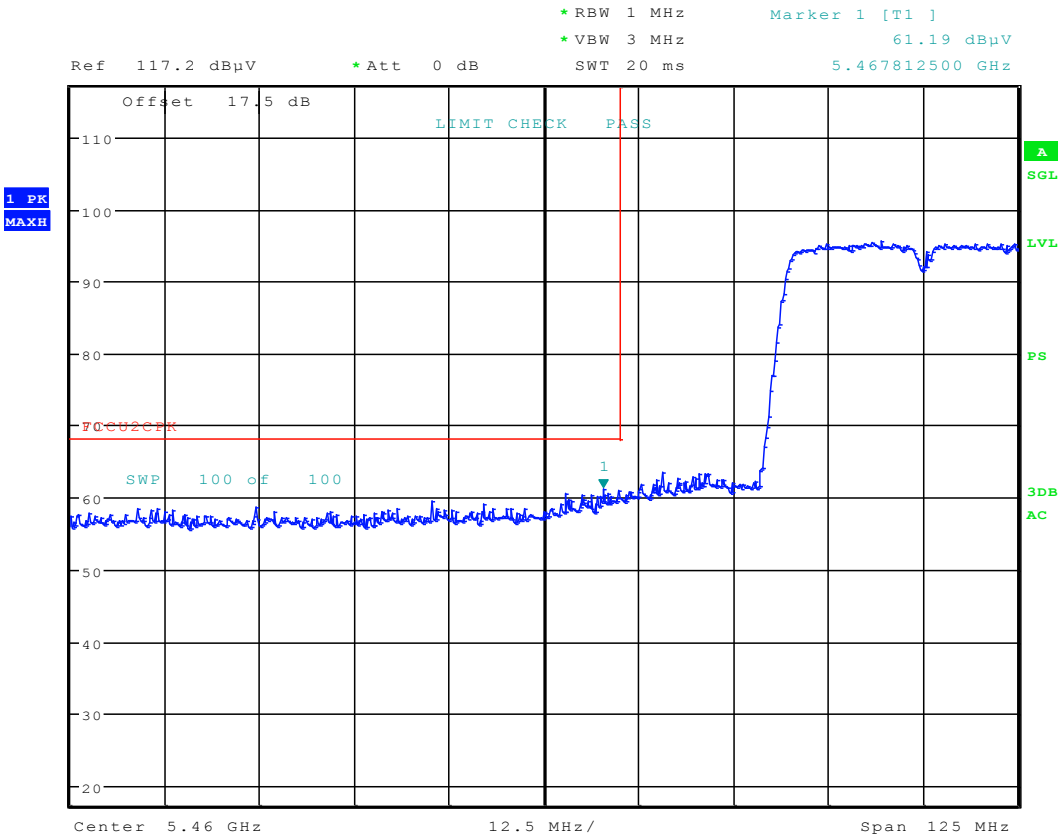


Date: 27.JAN.2016 20:49:29

Plot 7-184. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

Antenna-1 Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



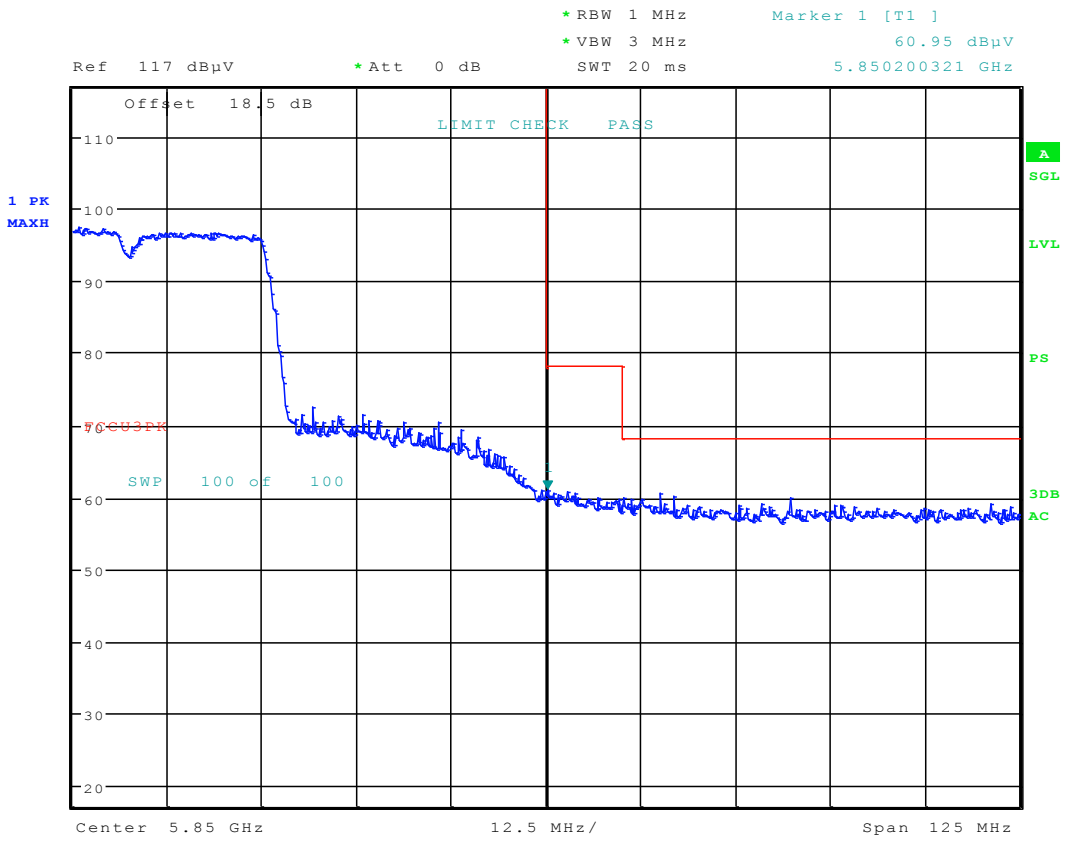
Date: 27.JAN.2016 20:49:07

Plot 7-185. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

Antenna-1 Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

Worst Case Mode:	802.11n (40MHz)
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5795MHz
Channel:	159



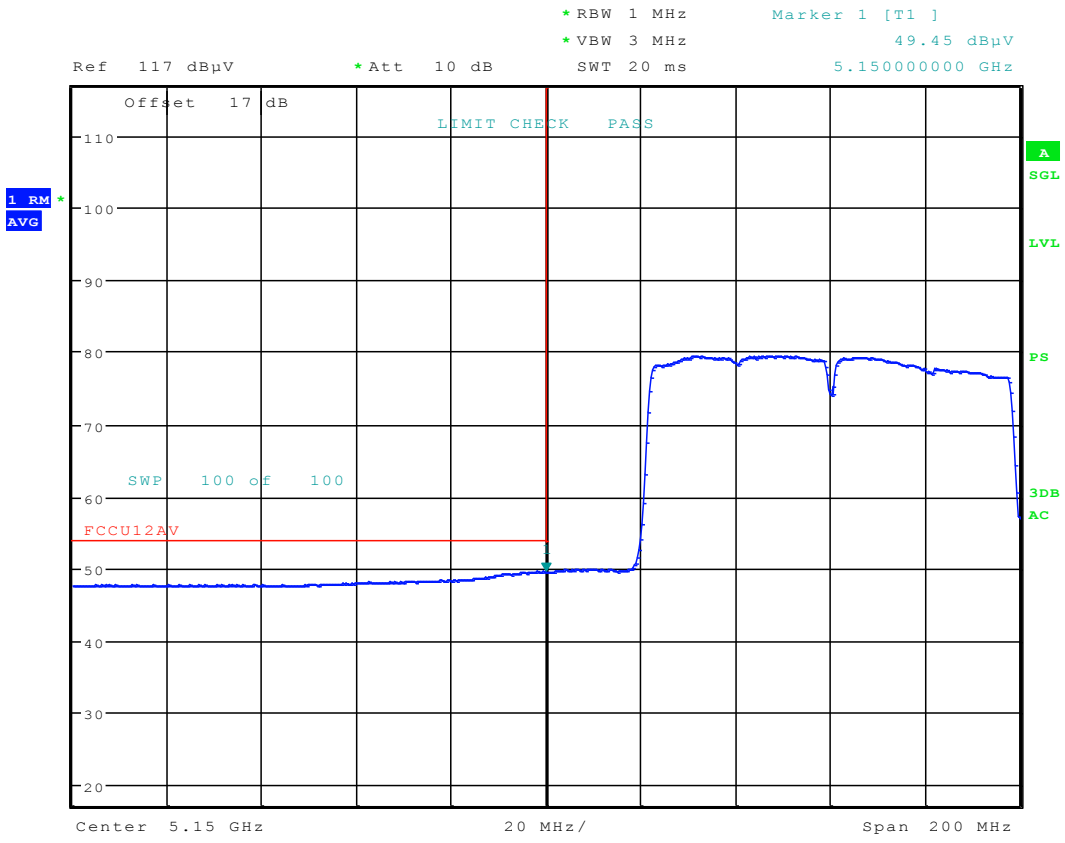
Date: 27.JAN.2016 21:06:40

Plot 7-186. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

7.7.5 Antenna-1 Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

Worst Case Mode:	802.11n (80MHz)
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5210MHz
Channel:	42

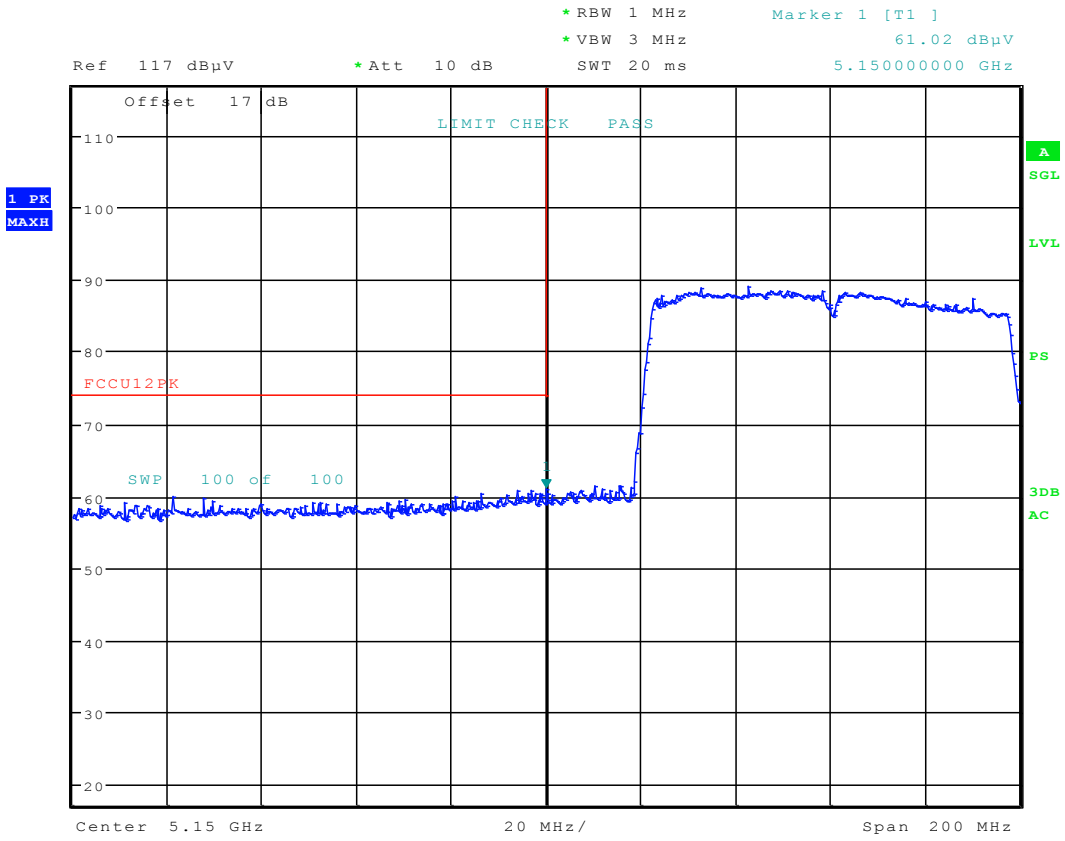


Date: 27.JAN.2016 19:47:49

Plot 7-187. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

Antenna-1 Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



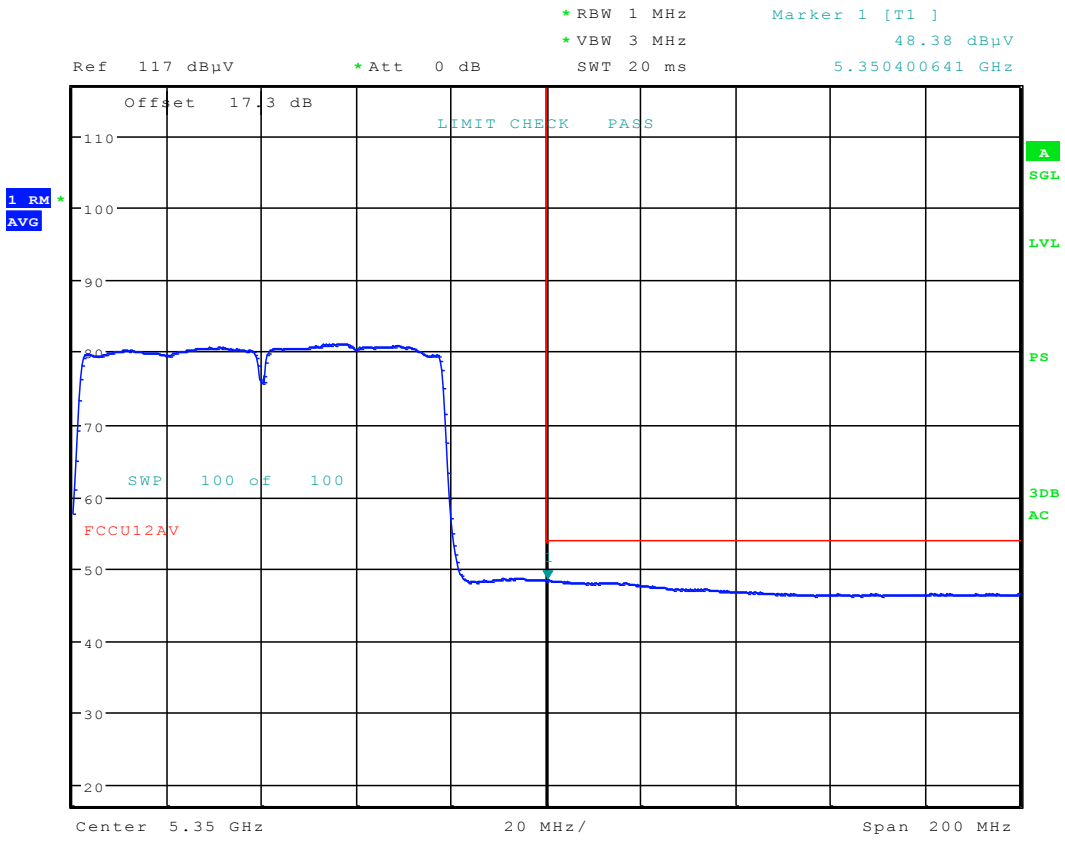
Date: 27.JAN.2016 19:48:25

Plot 7-188. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)

Antenna-1 Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

Worst Case Mode:	802.11ac (80MHz)
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5290MHz
Channel:	58

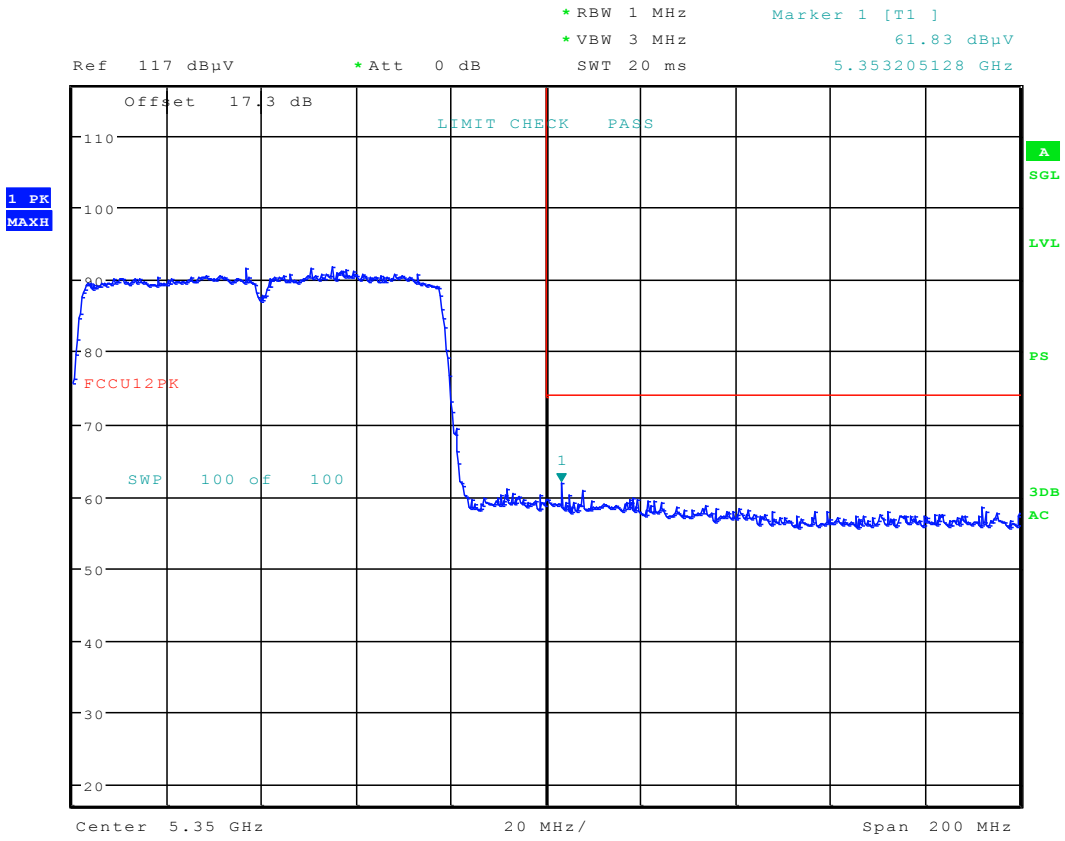


Date: 27.JAN.2016 20:08:27

Plot 7-189. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

Antenna-1 Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



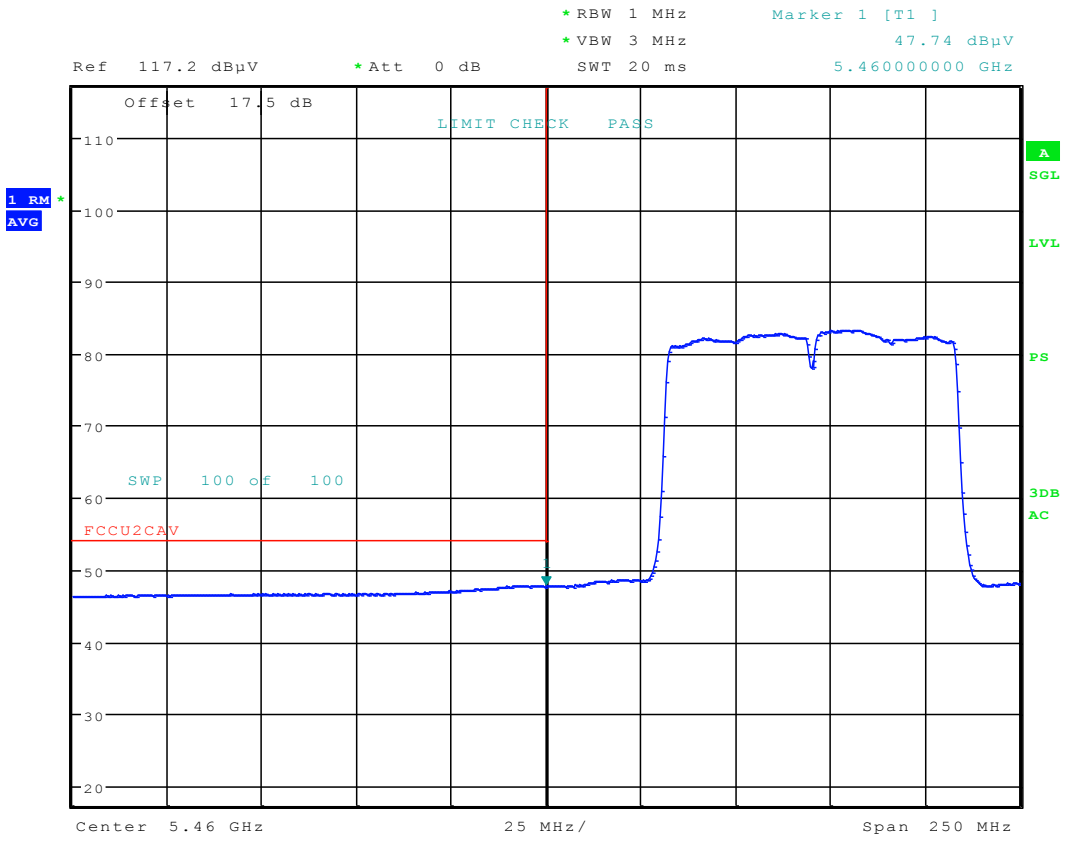
Date: 27.JAN.2016 20:09:05

Plot 7-190. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

Antenna-1 Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

Worst Case Mode:	802.11ac (80MHz)
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5530MHz
Channel:	106

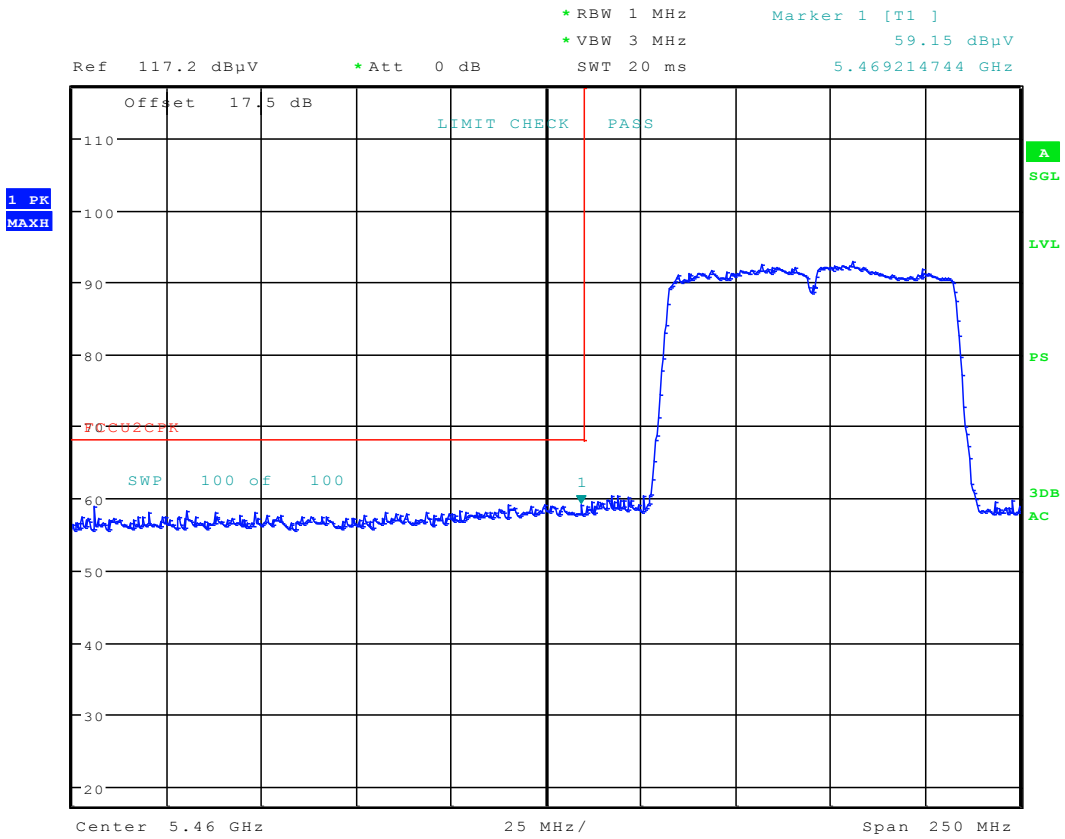


Date: 27.JAN.2016 20:55:31

Plot 7-191. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

Antenna-1 Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



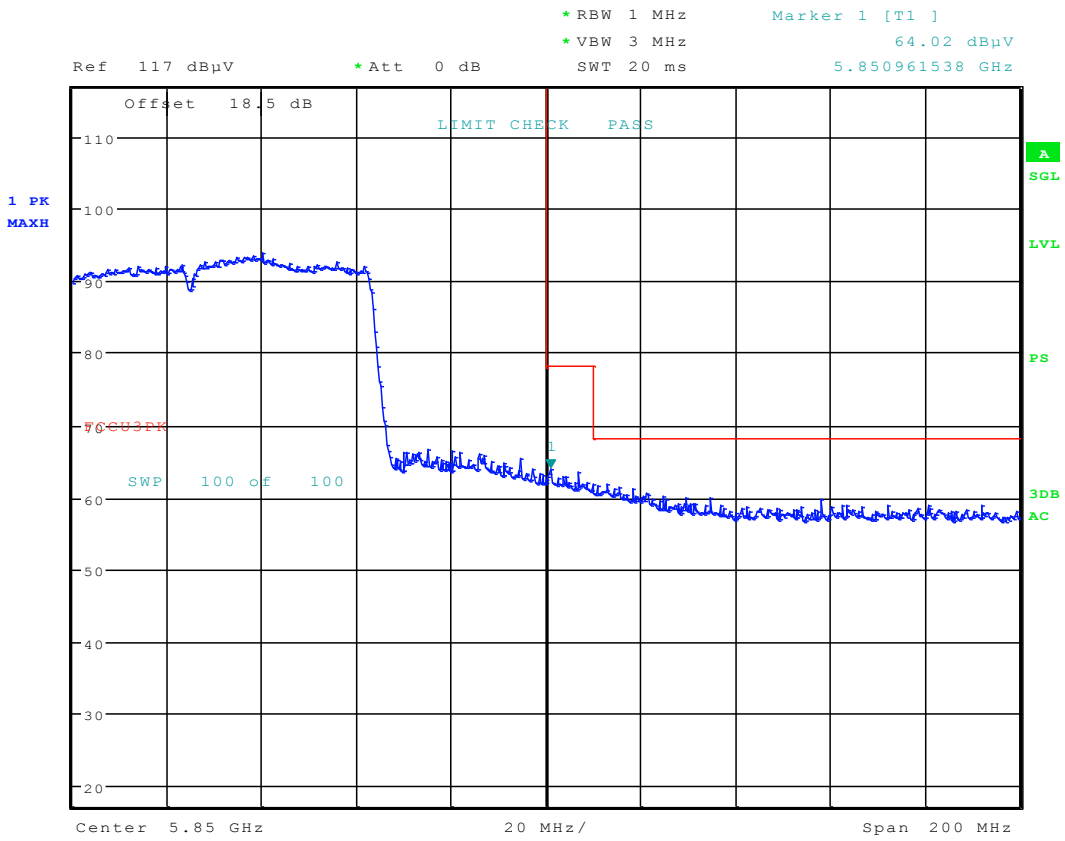
Date: 27.JAN.2016 20:54:55

Plot 7-192. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

Antenna-1 Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

Worst Case Mode:	802.11ac (80MHz)
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5775MHz
Channel:	155



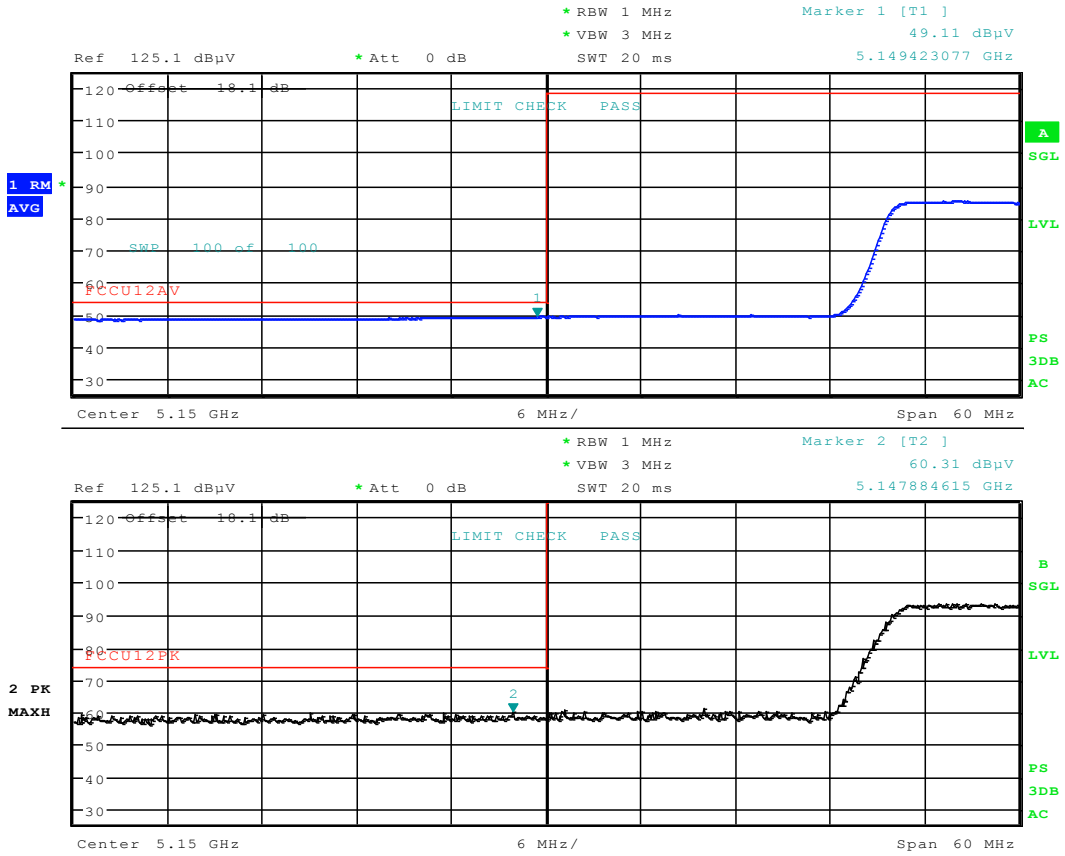
Date: 27.JAN.2016 21:08:41

Plot 7-193. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

Antenna-1 Radiated Band Edge Measurements CM Accessory (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

Worst Case Mode:	802.11n (40MHz)
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5190MHz
Channel:	38



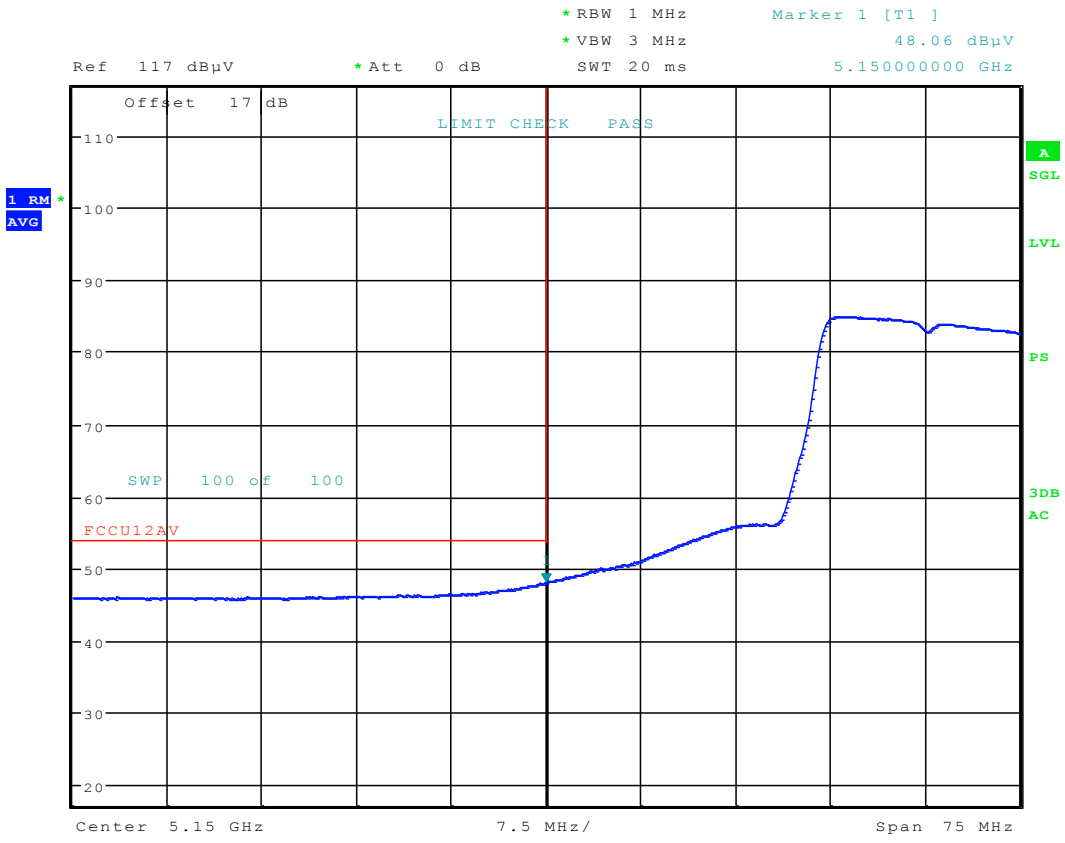
Date: 22.FEB.2016 20:23:04

Plot 7-194. Radiated Restricted Lower Band Edge Plot with Camera Module (Average & Peak – UNII Band 1)

7.7.6 Antenna-2 Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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

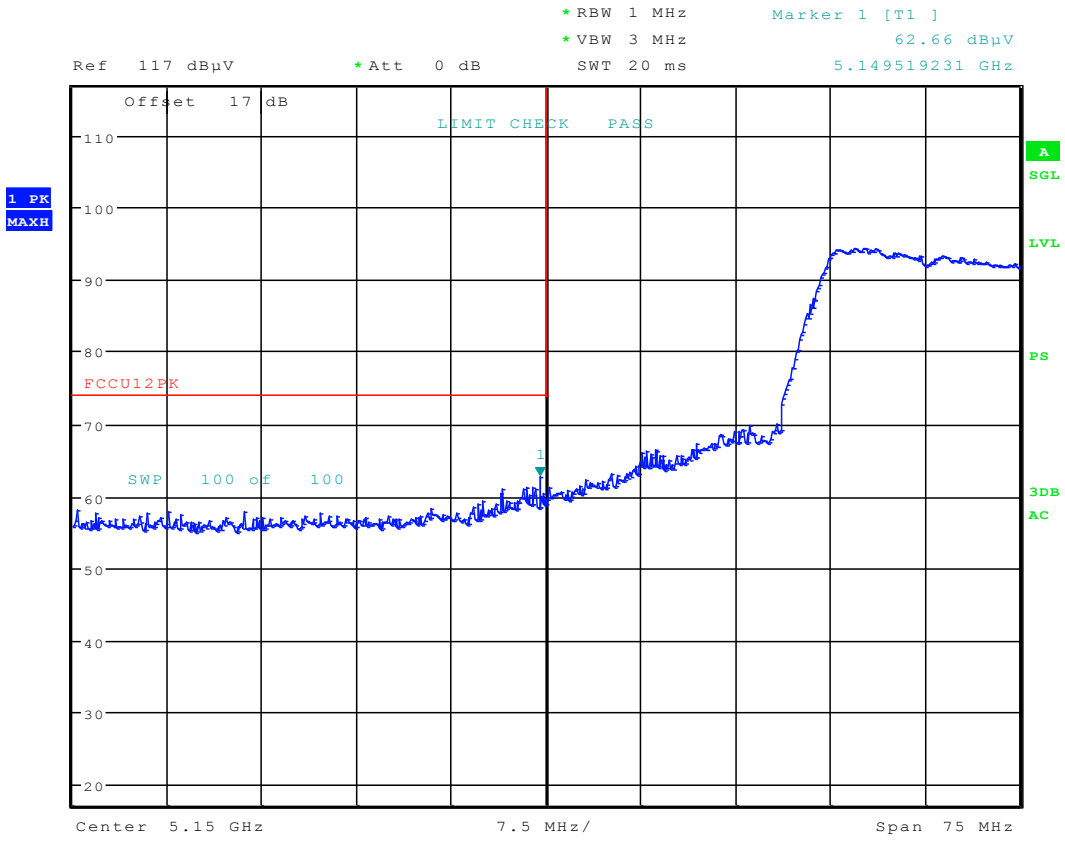


Date: 27.JAN.2016 21:35:08

Plot 7-195. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

Antenna-2 Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



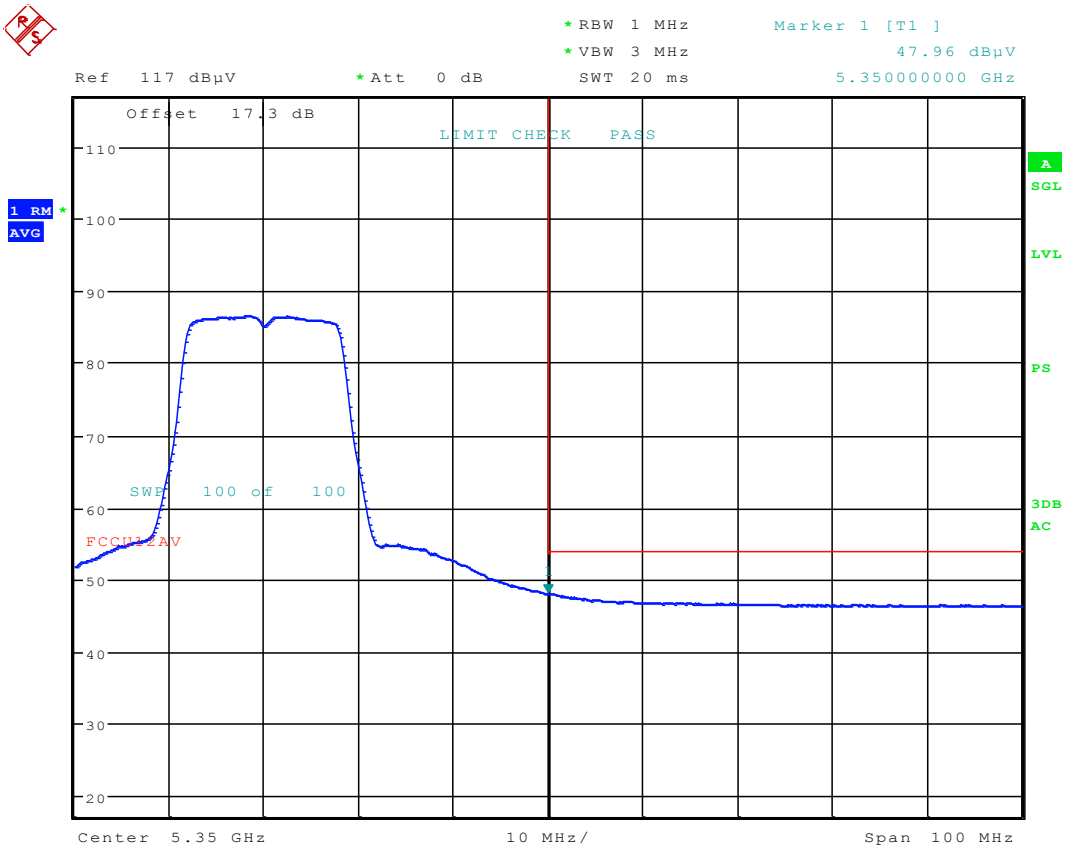
Date: 27.JAN.2016 21:35:28

Plot 7-196. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)

Antenna-2 Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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

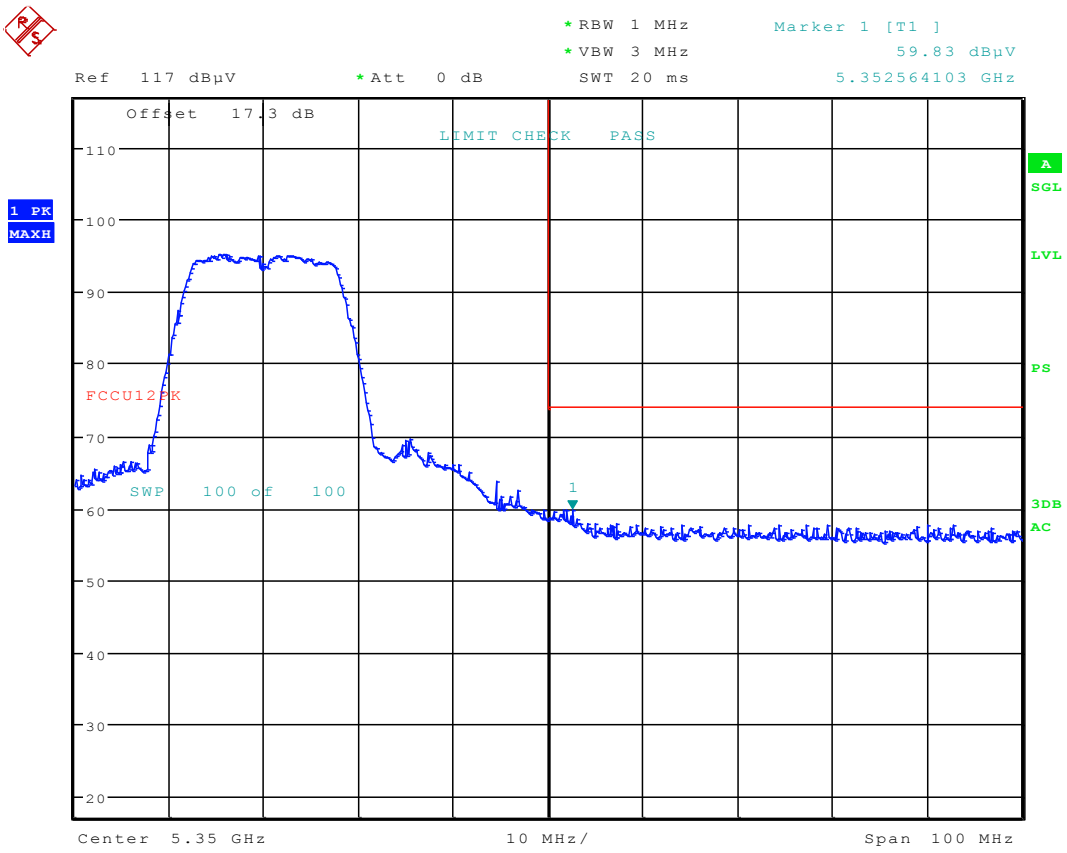


Date: 29.JAN.2016 18:56:19

Plot 7-197. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

Antenna-2 Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

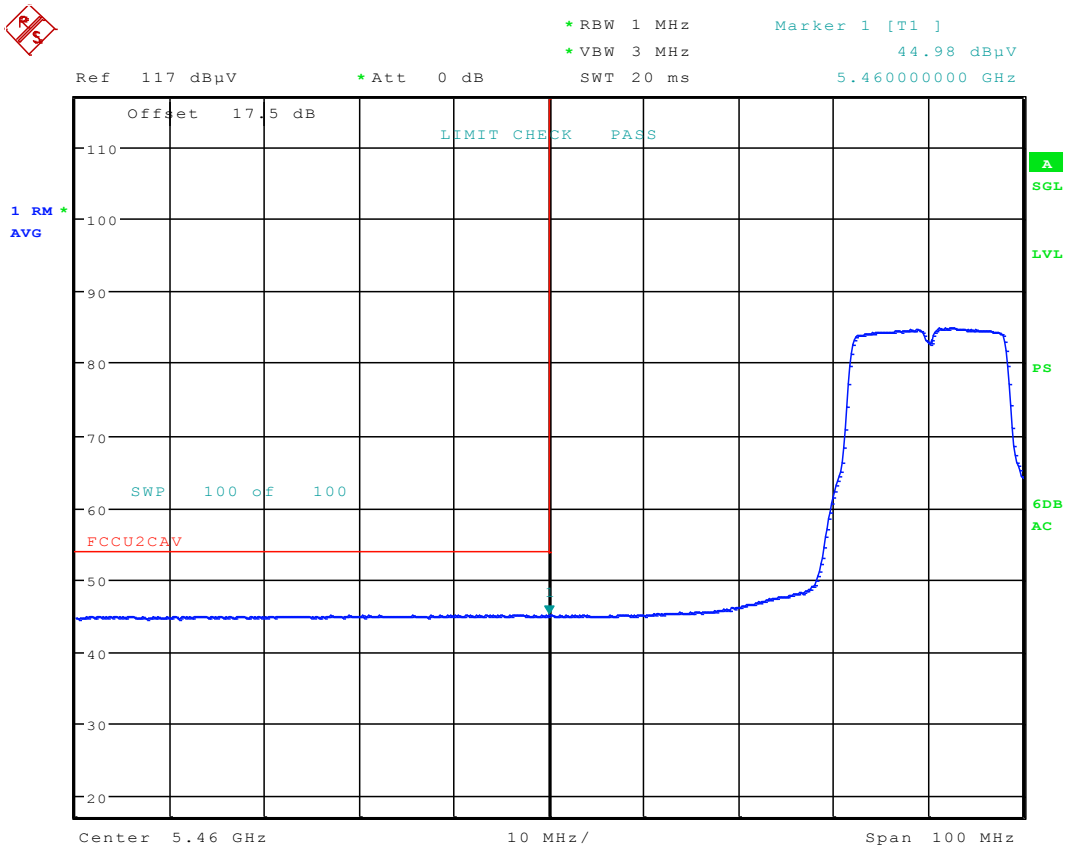


Plot 7-198. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

Antenna-2 Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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

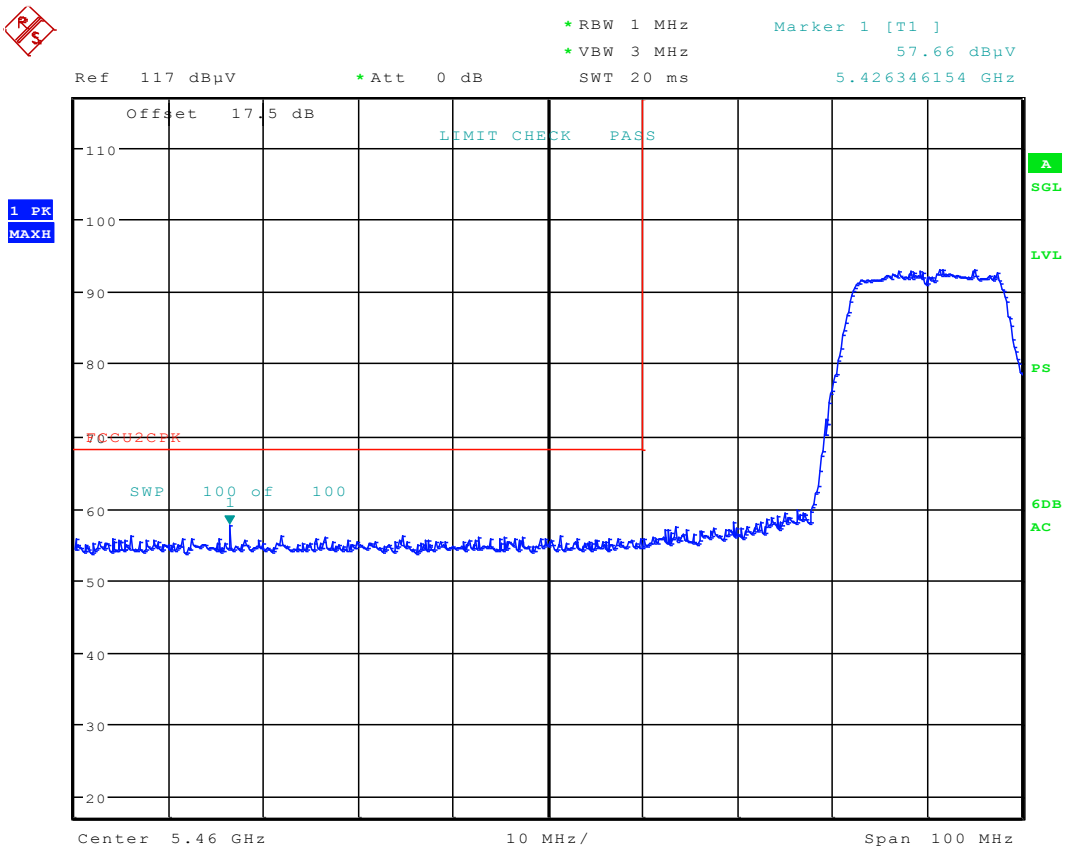


Date: 29.JAN.2016 19:15:34

Plot 7-199. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

Antenna-2 Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



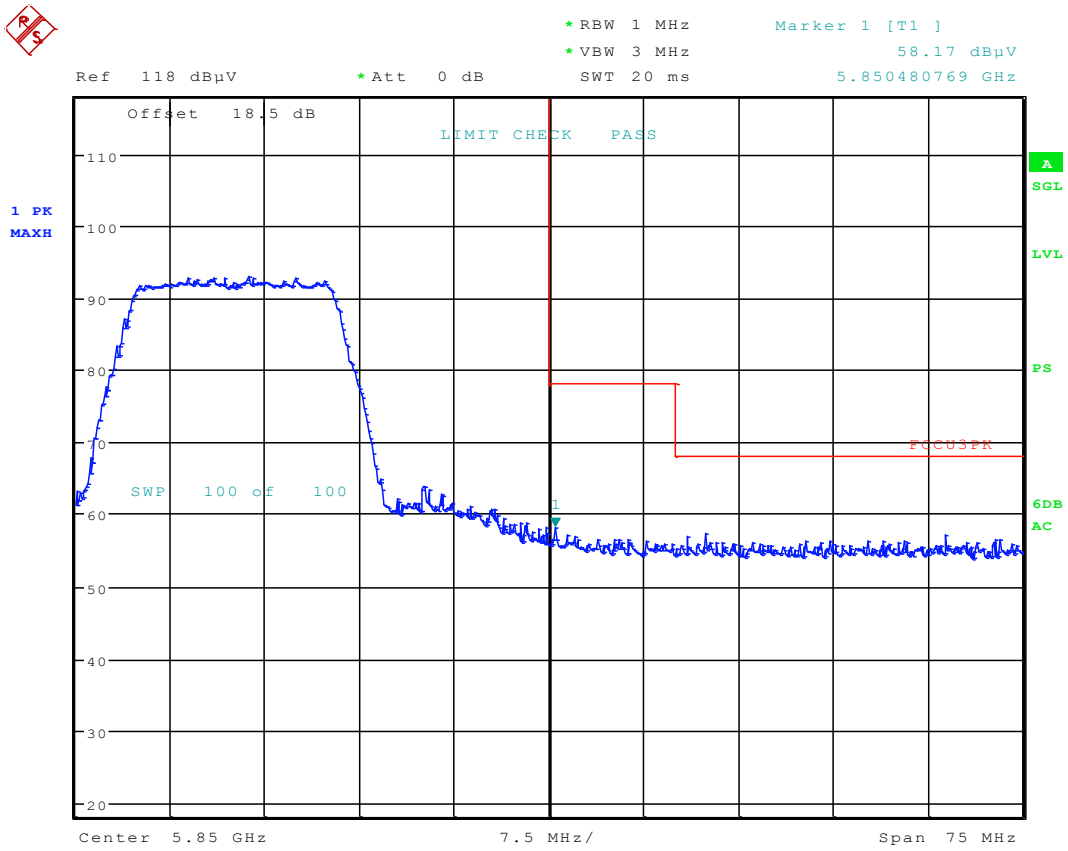
Date: 29.JAN.2016 19:16:10

Plot 7-200. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

Antenna-2 Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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



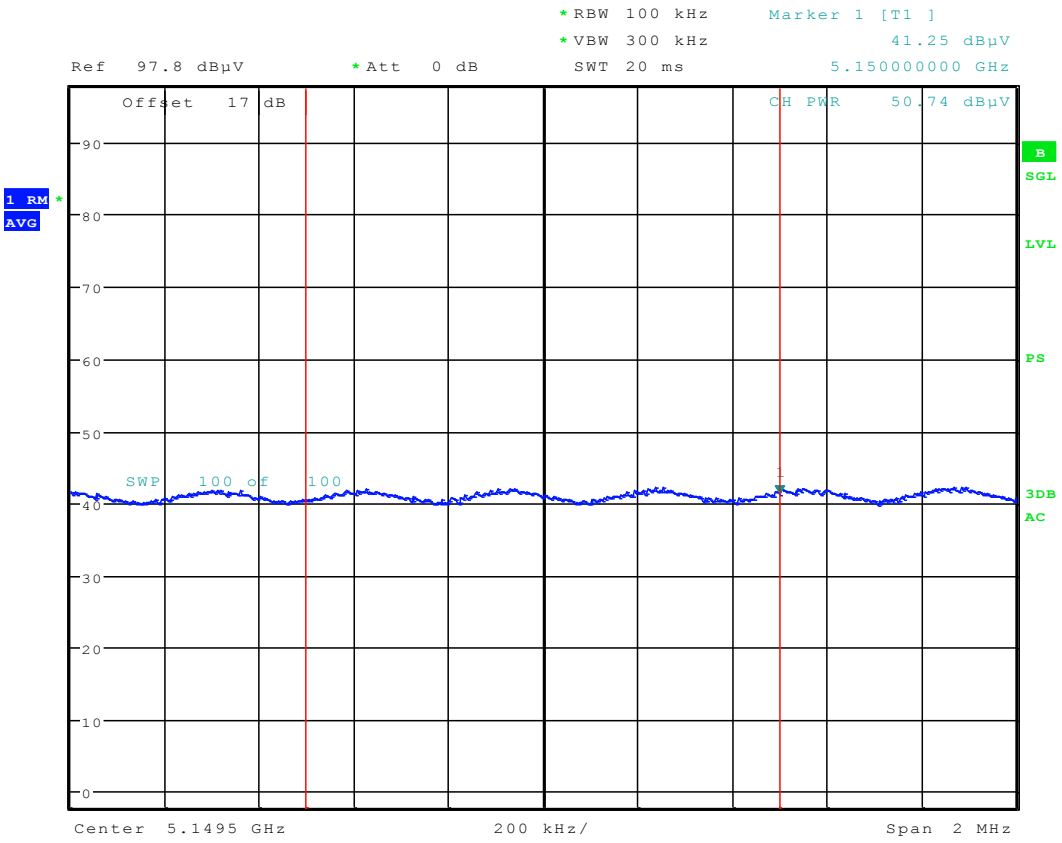
Date: 29.JAN.2016 19:39:58

Plot 7-201. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

7.7.7 Antenna-2 Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

Worst Case Mode:	802.11n (40MHz)
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5190MHz
Channel:	38

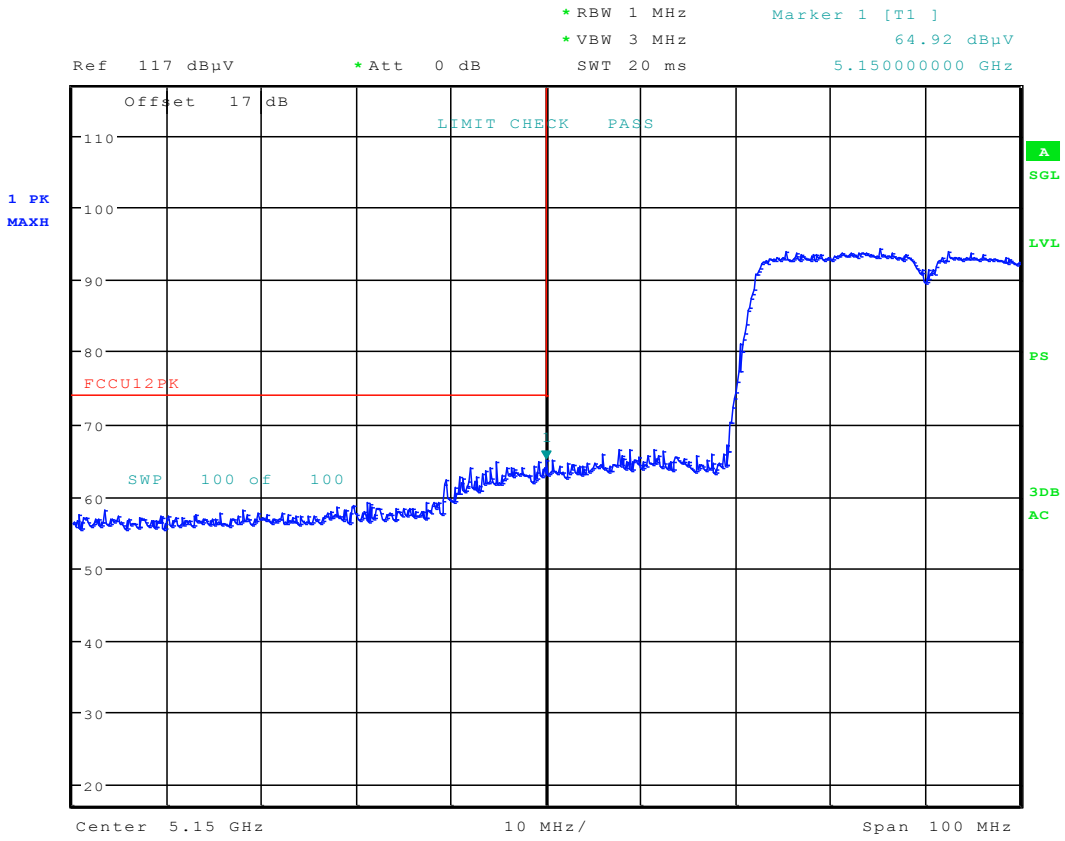


Date: 19.FEB.2016 18:19:23

Plot 7-202. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

Antenna-2 Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



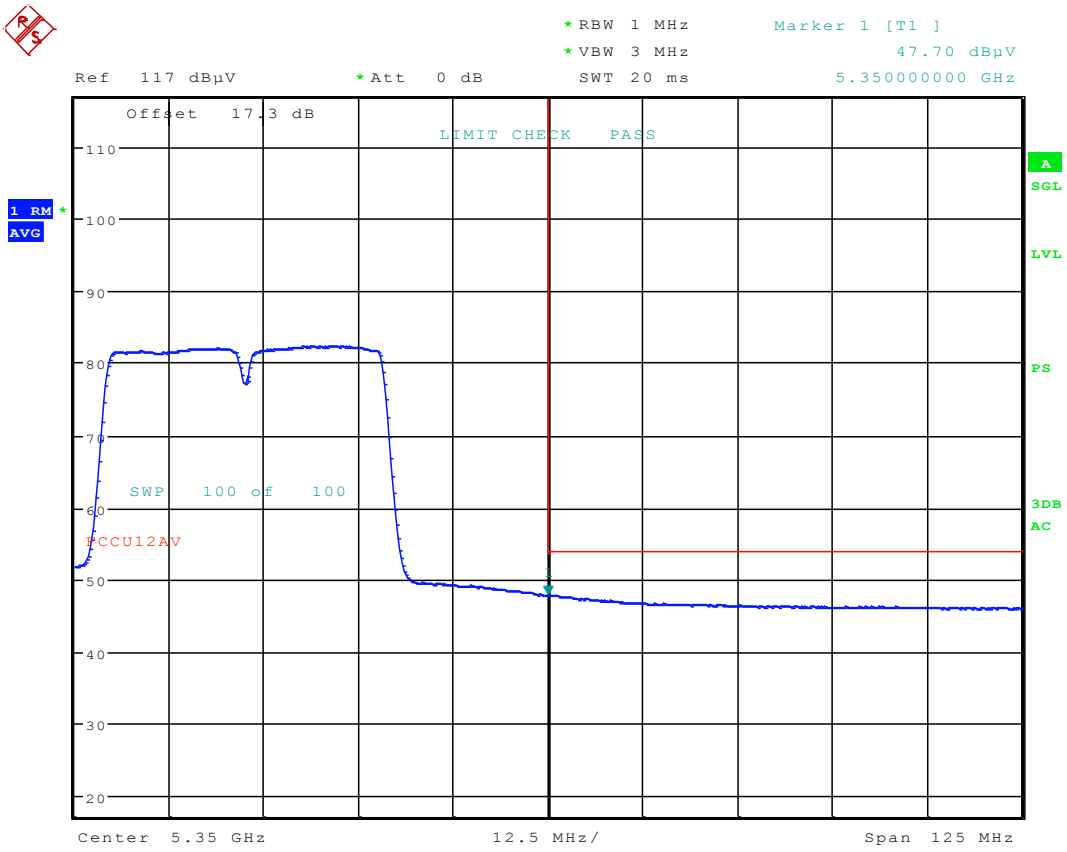
Date: 27.JAN.2016 21:43:22

Plot 7-203. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)

Antenna-2 Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

Worst Case Mode:	802.11n (40MHz)
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5310MHz
Channel:	62

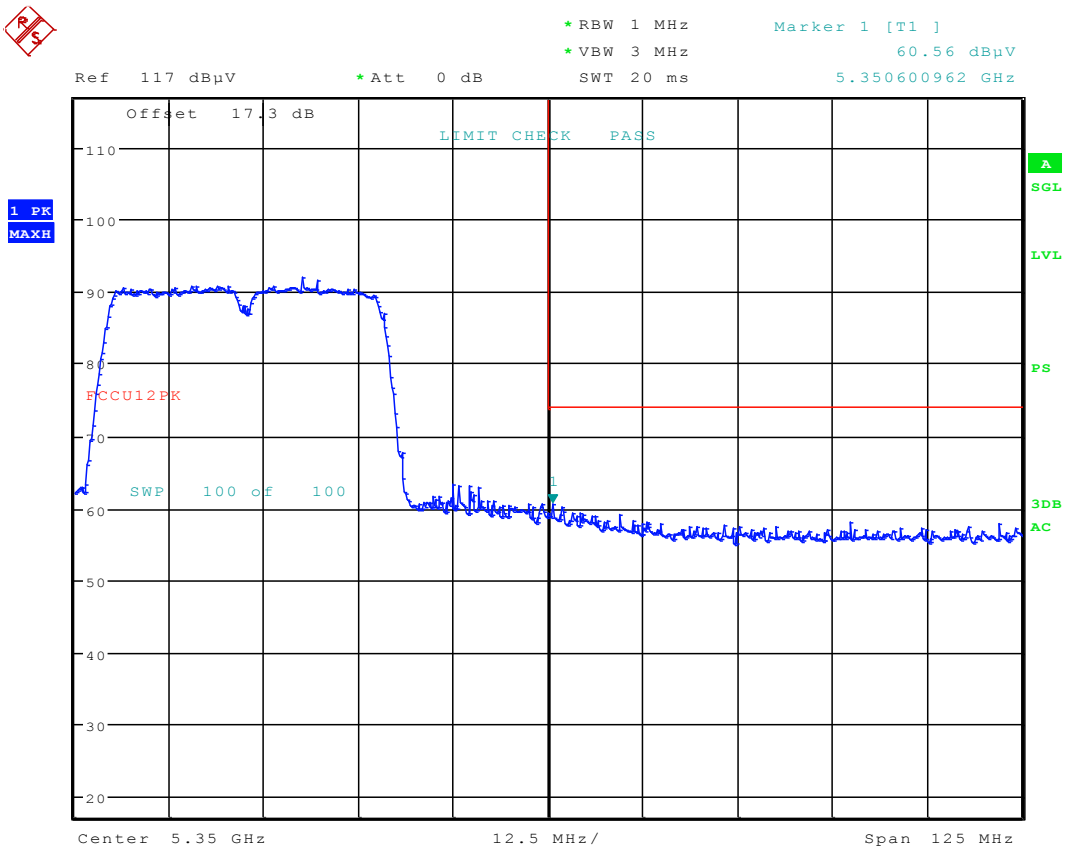


Date: 29.JAN.2016 19:01:49

Plot 7-204. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

Antenna-2 Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



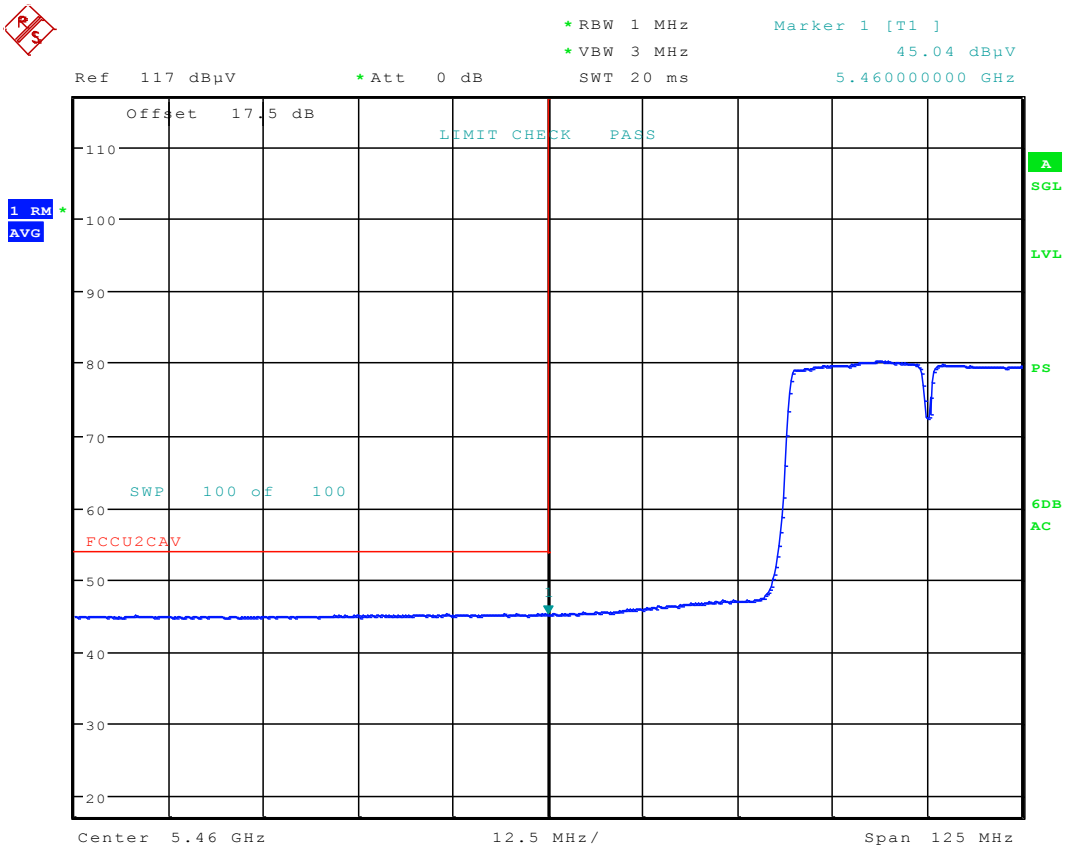
Date: 29.JAN.2016 18:59:25

Plot 7-205. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

Antenna-2 Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

Worst Case Mode:	802.11n (40MHz)
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5510MHz
Channel:	102

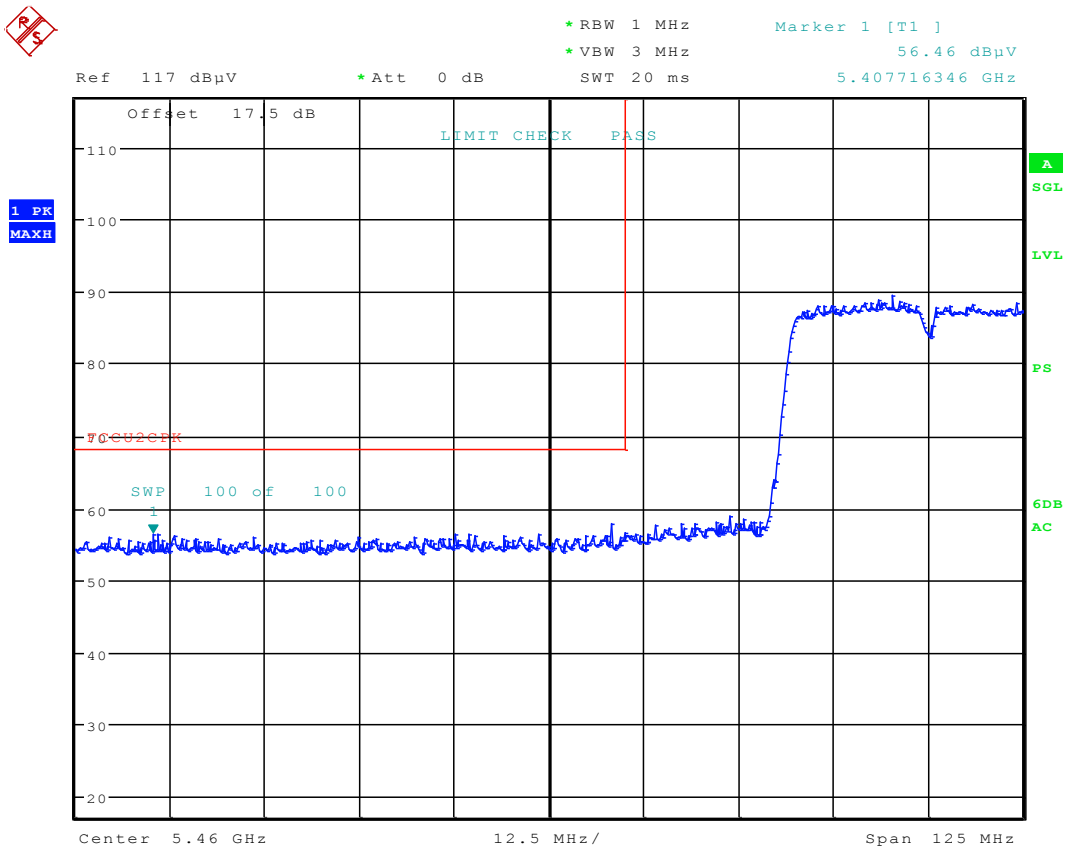


Date: 29.JAN.2016 19:20:22

Plot 7-206. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

Antenna-2 Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



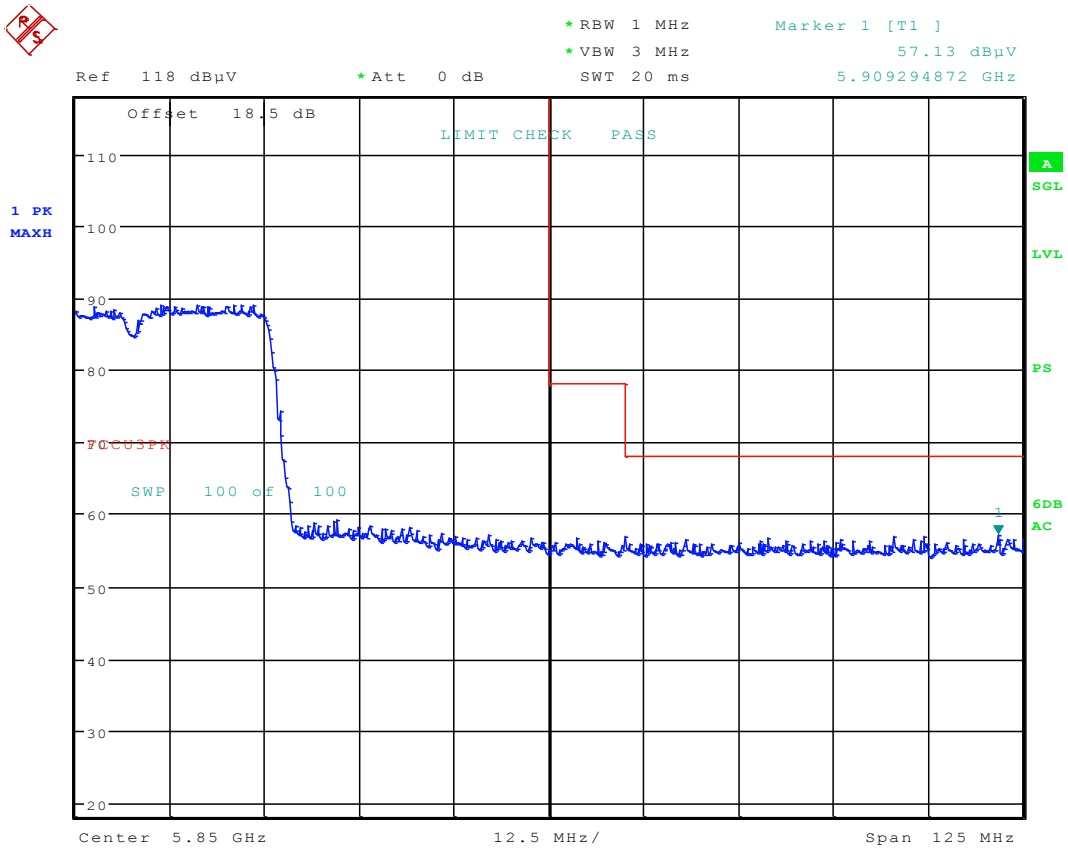
Date: 29.JAN.2016 19:19:55

Plot 7-207. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

Antenna-2 Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

Worst Case Mode:	802.11n (40MHz)
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5795MHz
Channel:	159

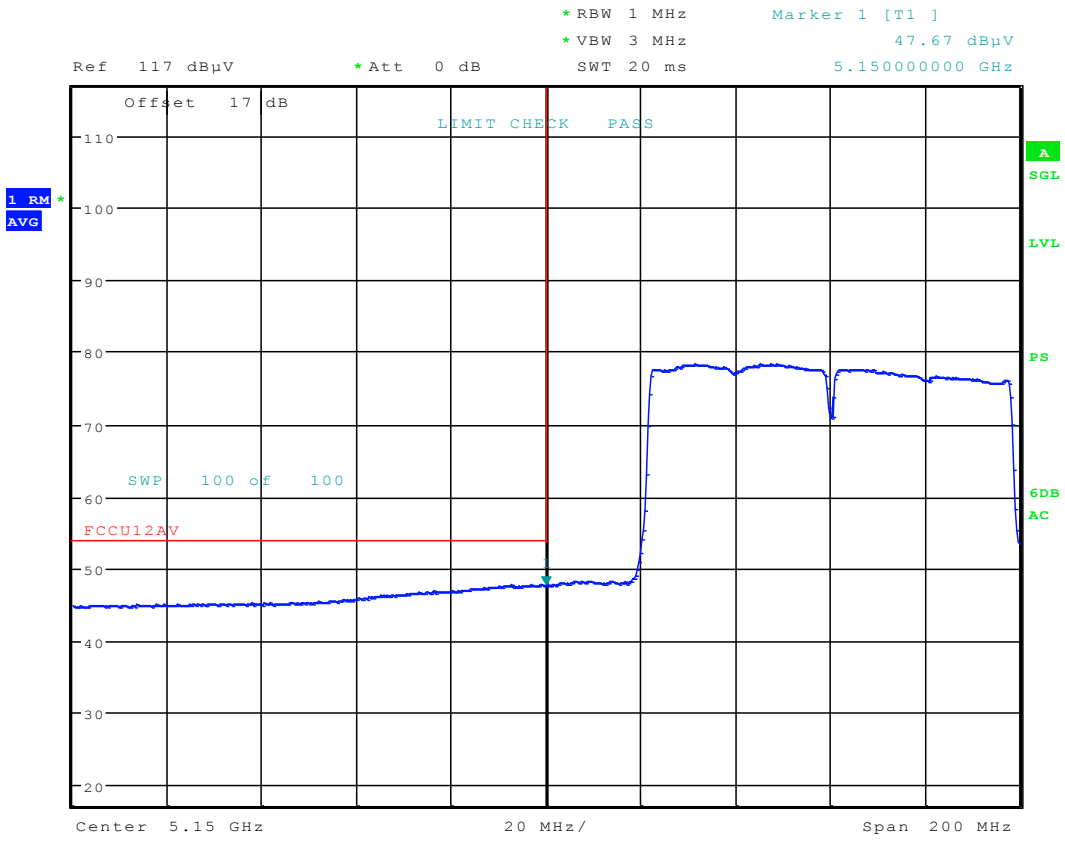


Plot 7-208. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

7.7.8 Antenna-2 Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

Worst Case Mode:	802.11n (80MHz)
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5210MHz
Channel:	42

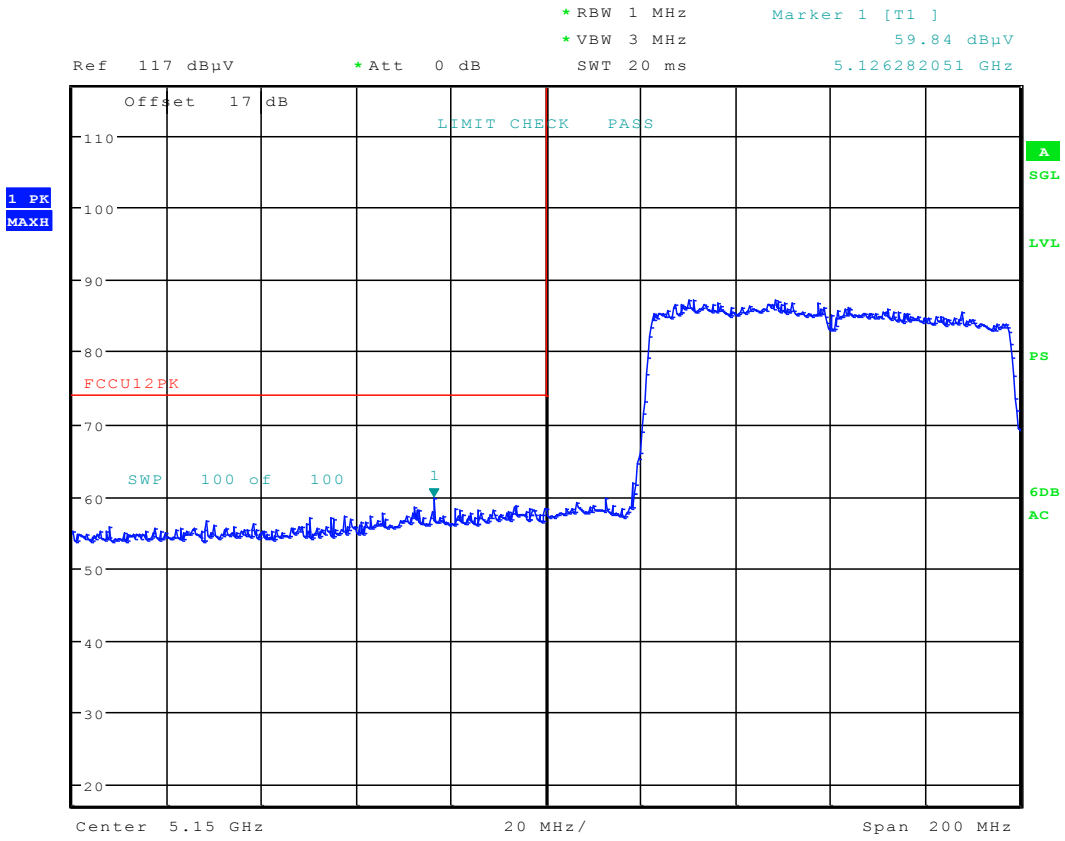


Date: 27.JAN.2016 21:53:26

Plot 7-209. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

Antenna-2 Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



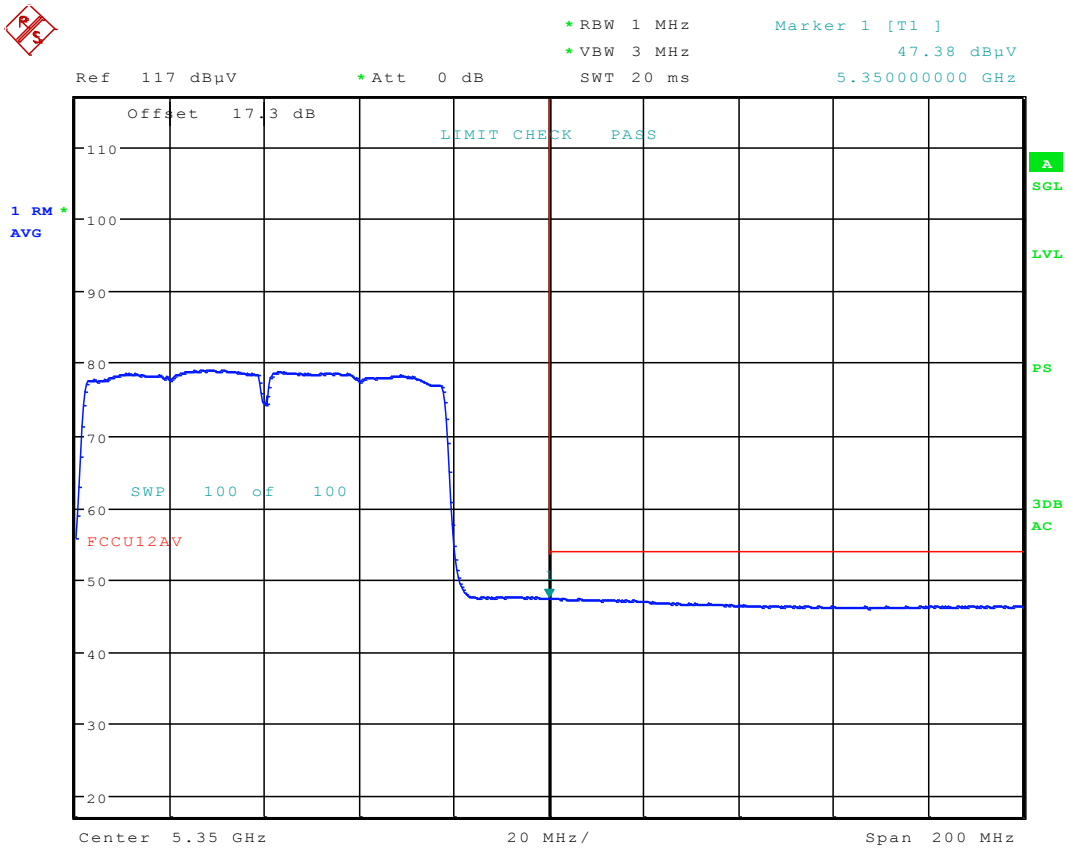
Date: 27.JAN.2016 21:54:13

Plot 7-210. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)

Antenna-2 Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

Worst Case Mode:	802.11ac (80MHz)
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5290MHz
Channel:	58

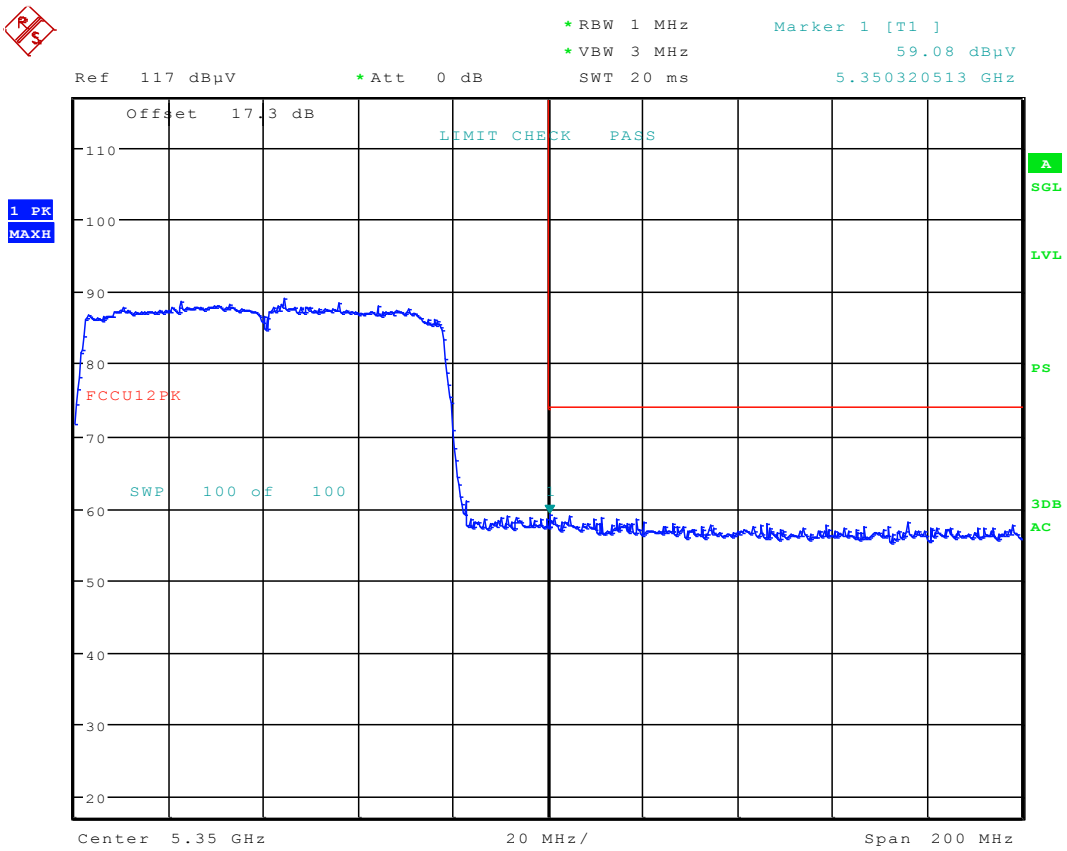


Date: 29.JAN.2016 19:05:48

Plot 7-211. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

Antenna-2 Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



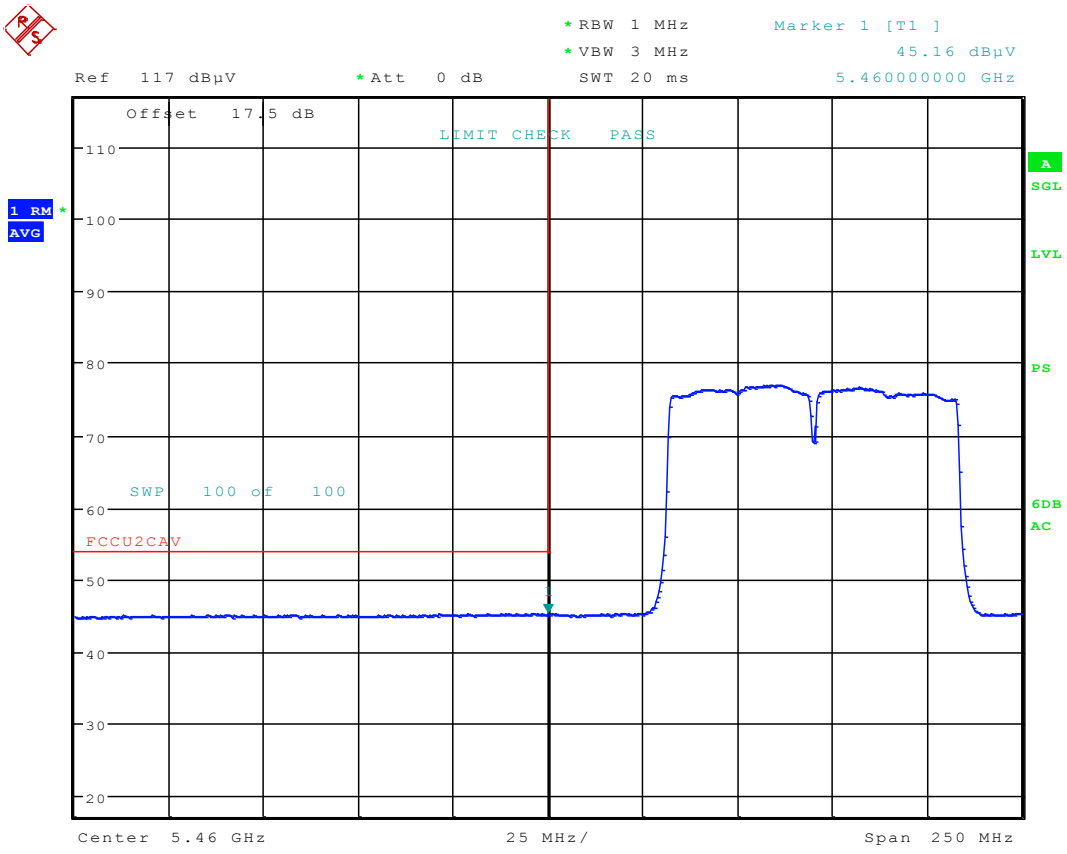
Date: 29.JAN.2016 19:06:32

Plot 7-212. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

Antenna-2 Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

Worst Case Mode:	802.11ac (80MHz)
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5530MHz
Channel:	106

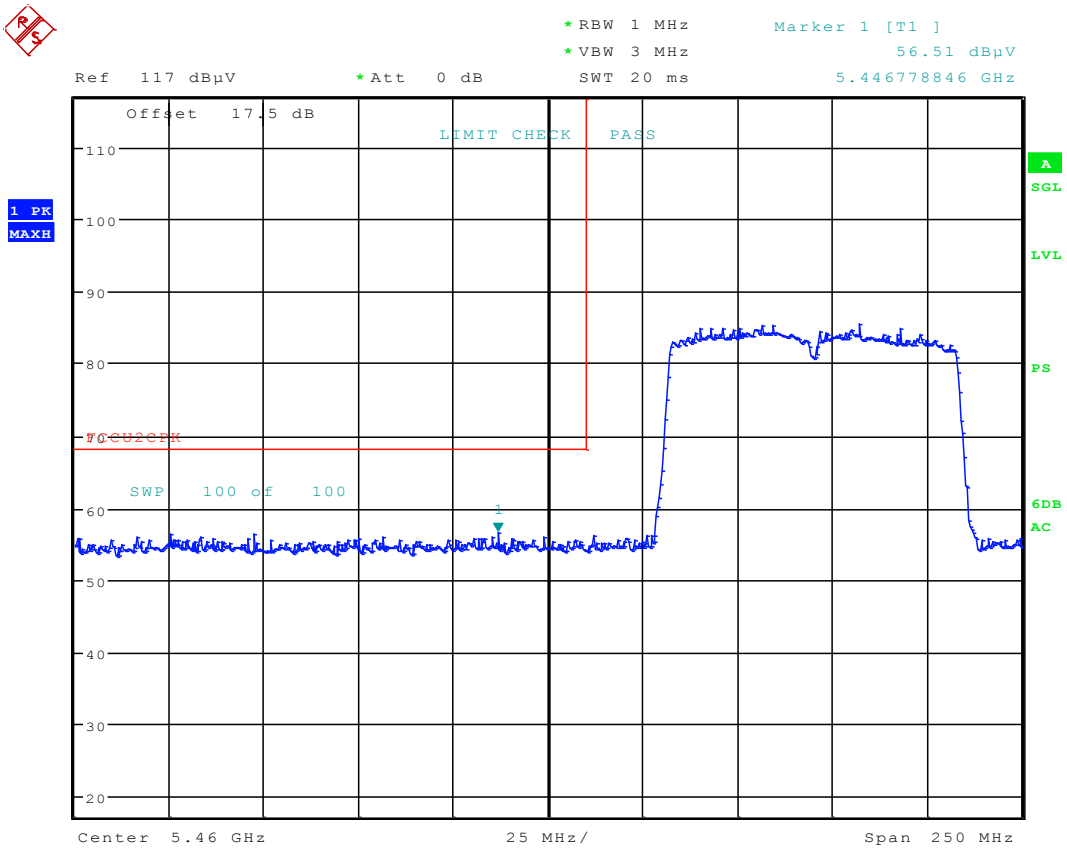


Date: 29.JAN.2016 19:24:44

Plot 7-213. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

Antenna-2 Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



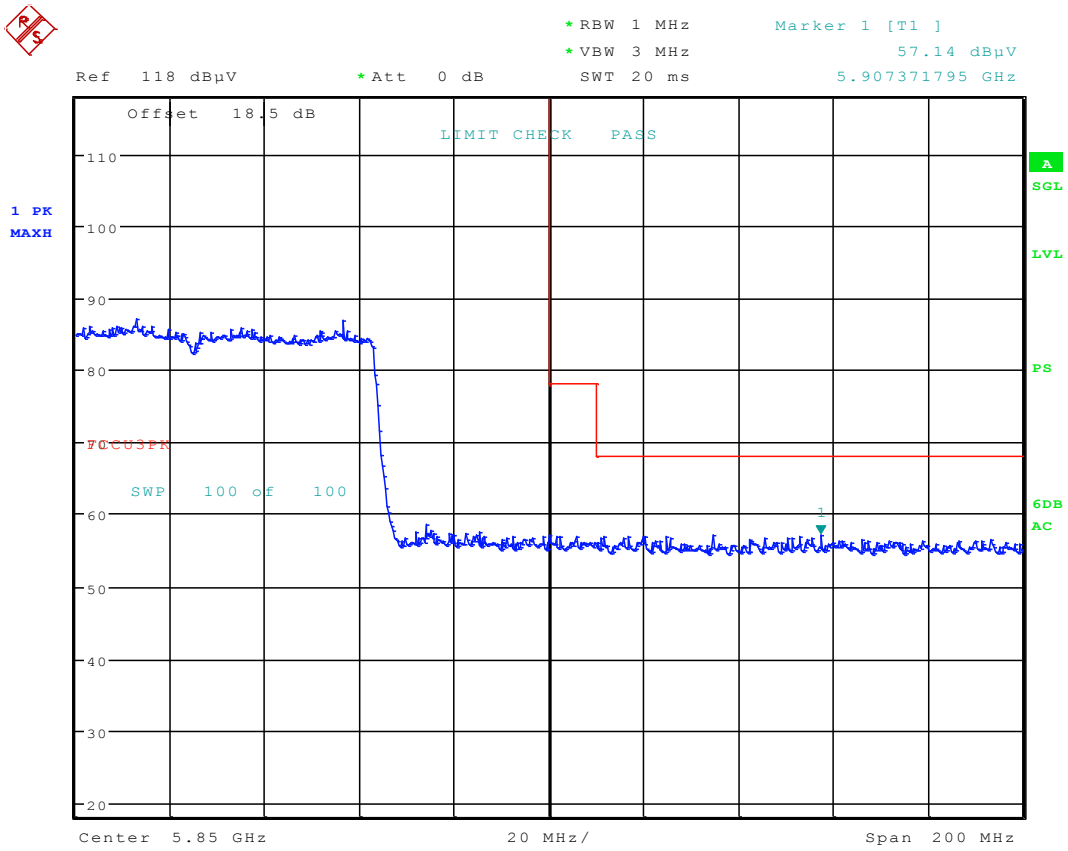
Date: 29.JAN.2016 19:26:02

Plot 7-214. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

Antenna-2 Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

Worst Case Mode:	802.11ac (80MHz)
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5775MHz
Channel:	155



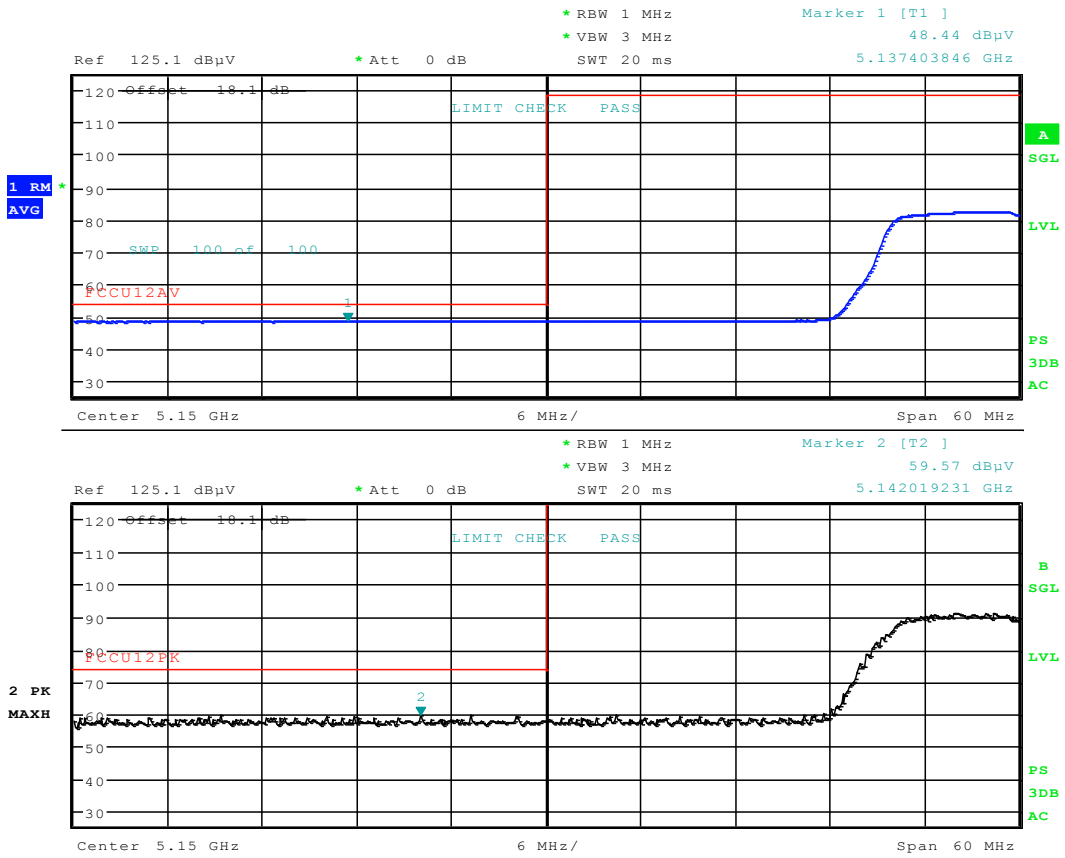
Date: 29.JAN.2016 19:36:29

Plot 7-215. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

Antenna-2 Radiated Band Edge Measurements with CM Accessory (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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



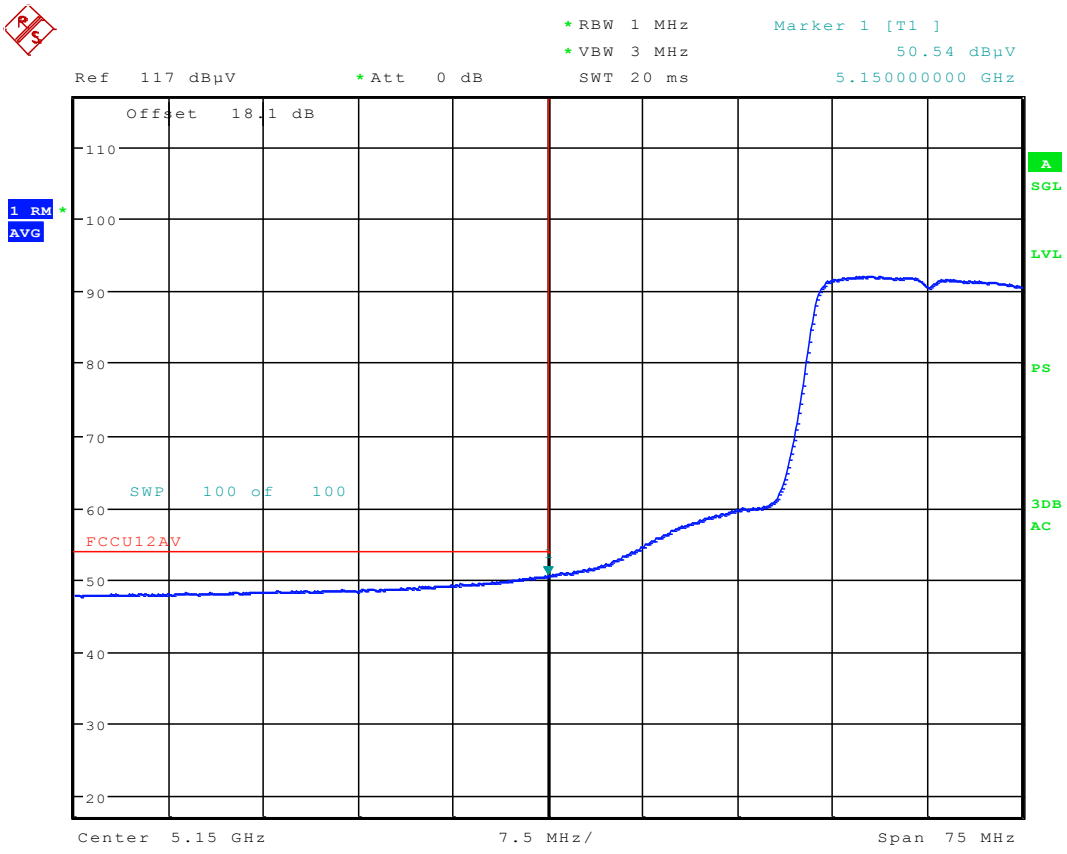
Date: 22.FEB.2016 20:33:02

Plot 7-216. Radiated Restricted Lower Band Edge Plot (Average & Peak – UNII Band 1)

7.7.9 MIMO Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

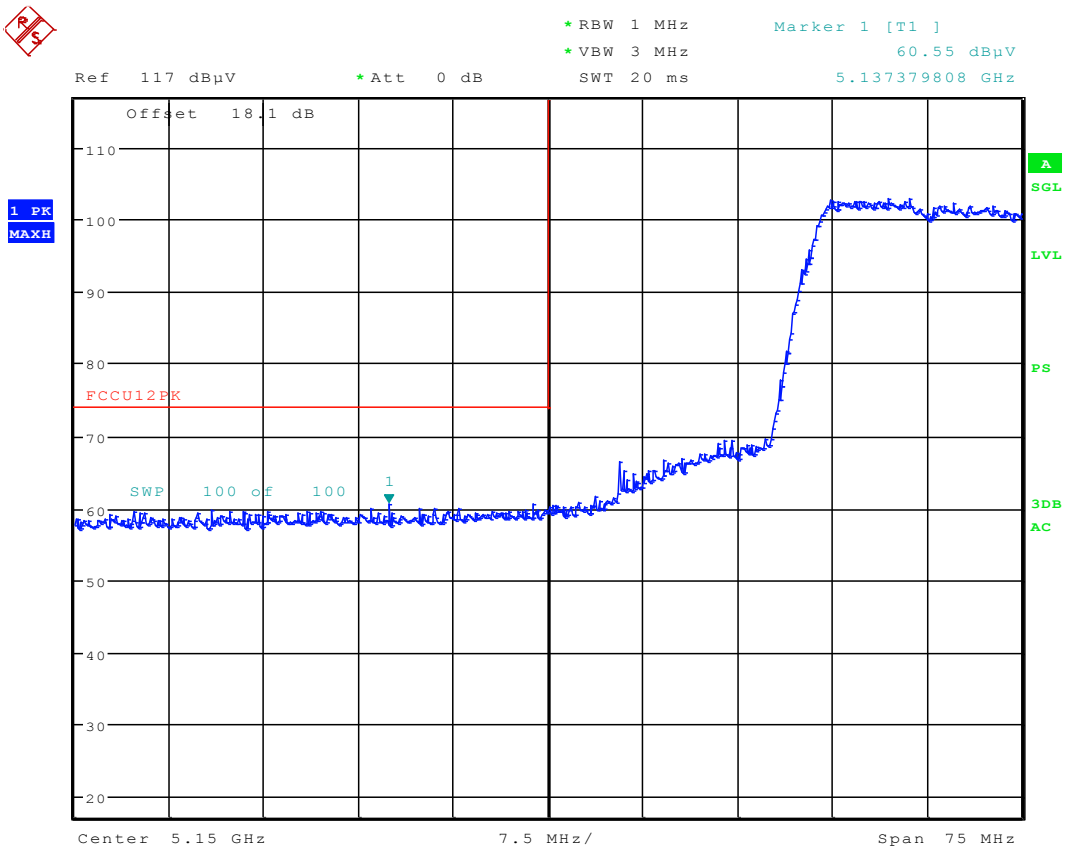
Worst Case Mode:	802.11n (20MHz)
Worst Case Transfer Rate:	MCS8
Distance of Measurements:	3 Meters
Operating Frequency:	5180MHz
Channel:	36



Plot 7-217. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

MIMO Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



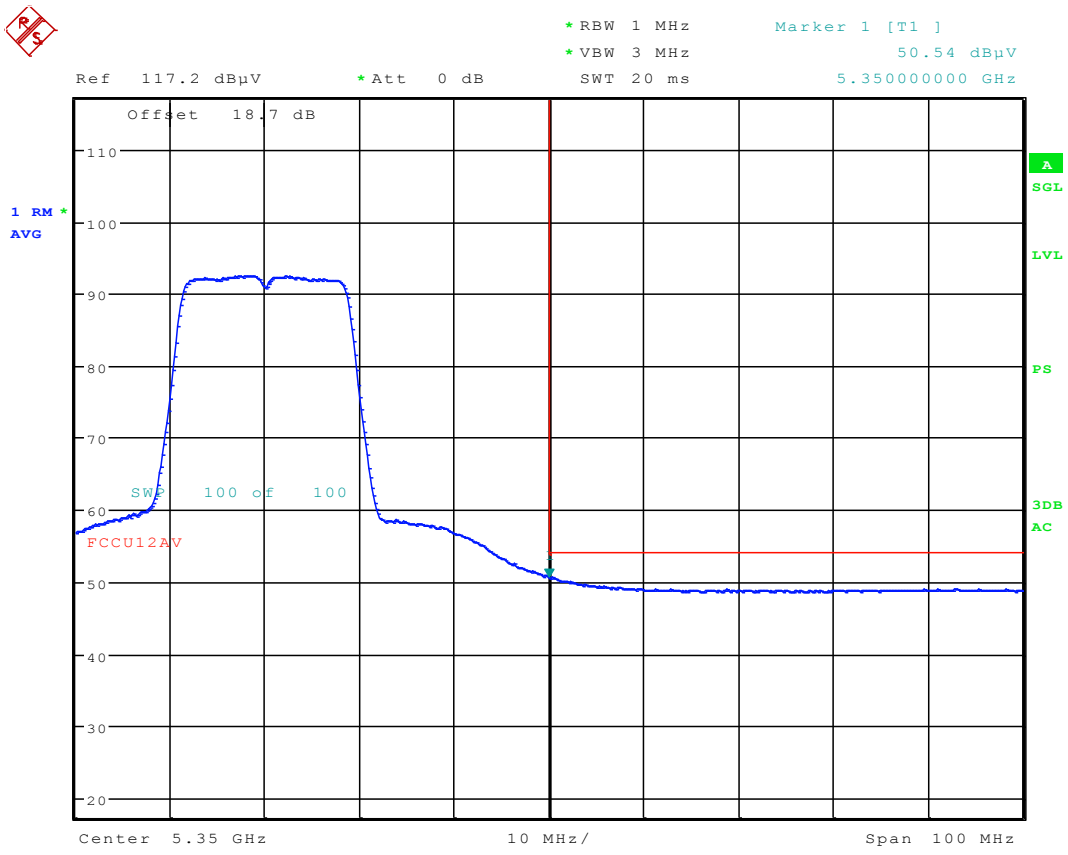
Date: 9.FEB.2016 16:47:17

Plot 7-218. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)

MIMO Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

Worst Case Mode:	802.11n (20MHz)
Worst Case Transfer Rate:	MCS8
Distance of Measurements:	3 Meters
Operating Frequency:	5320MHz
Channel:	64

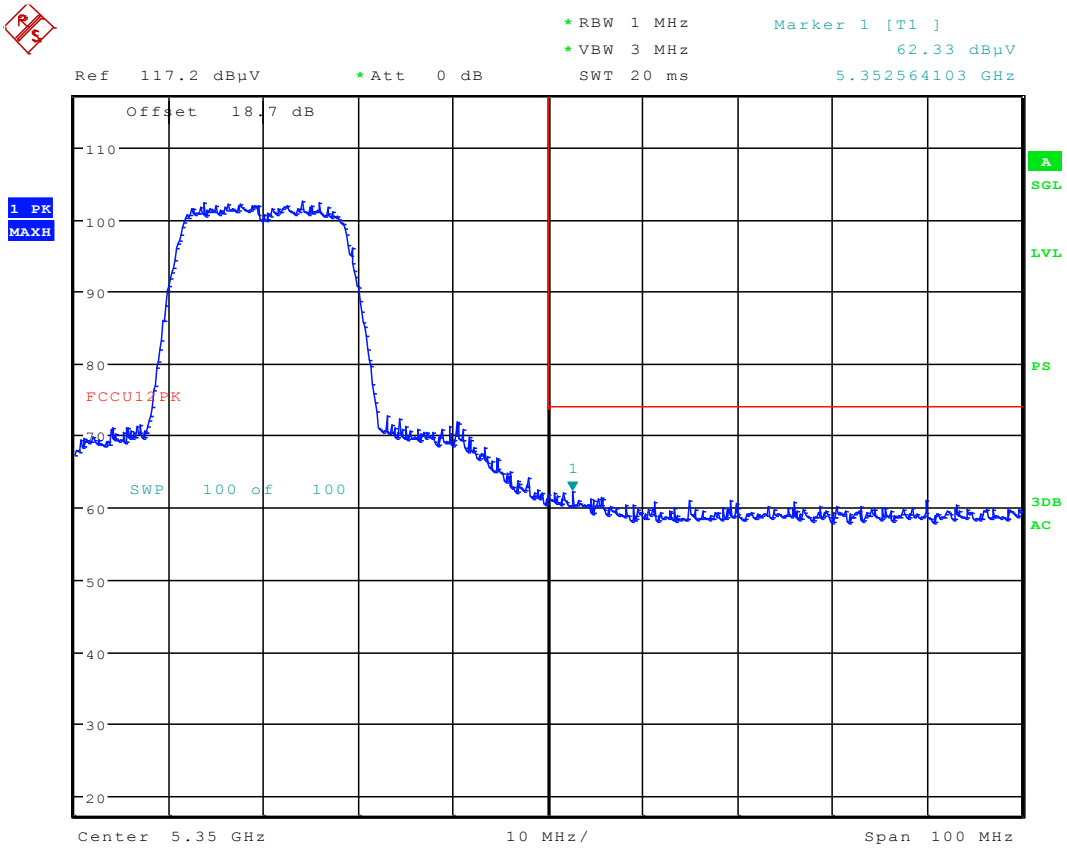


Date: 9.FEB.2016 17:09:38

Plot 7-219. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

MIMO Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



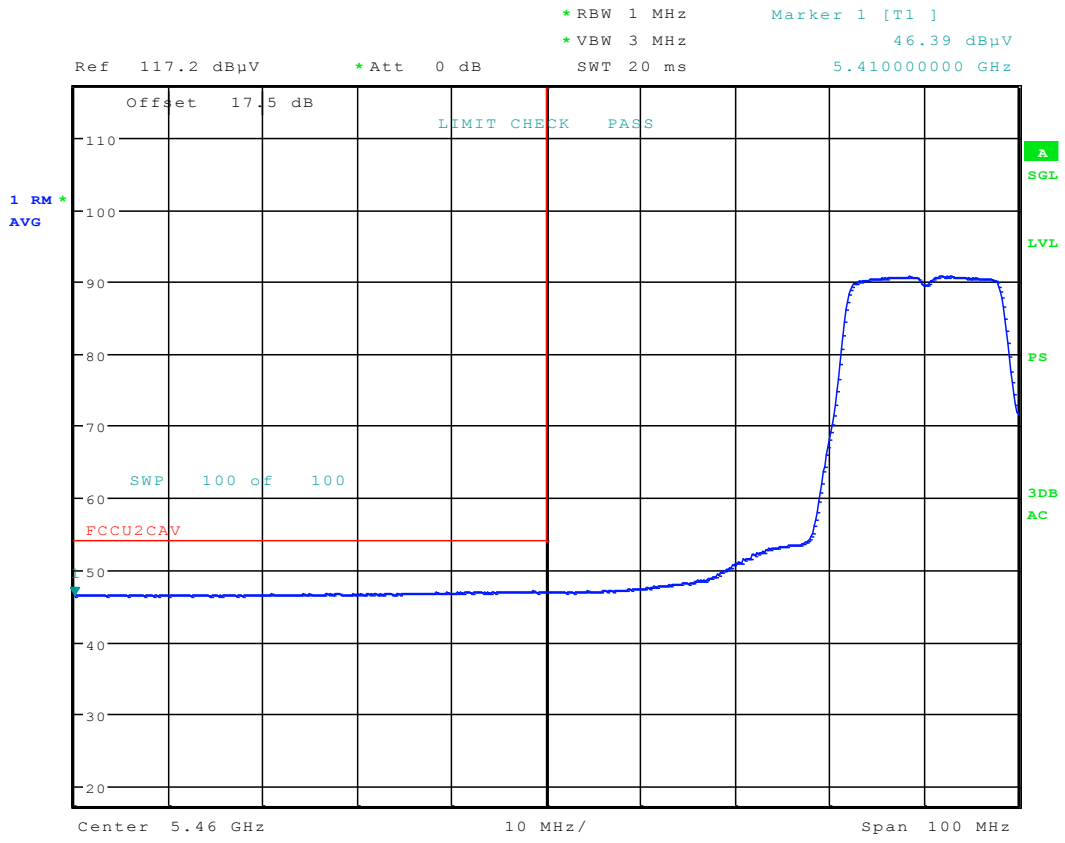
Date: 9.FEB.2016 17:09:59

Plot 7-220. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

MIMO Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

Worst Case Mode:	802.11n (20MHz)
Worst Case Transfer Rate:	MCS8
Distance of Measurements:	3 Meters
Operating Frequency:	5500MHz
Channel:	100

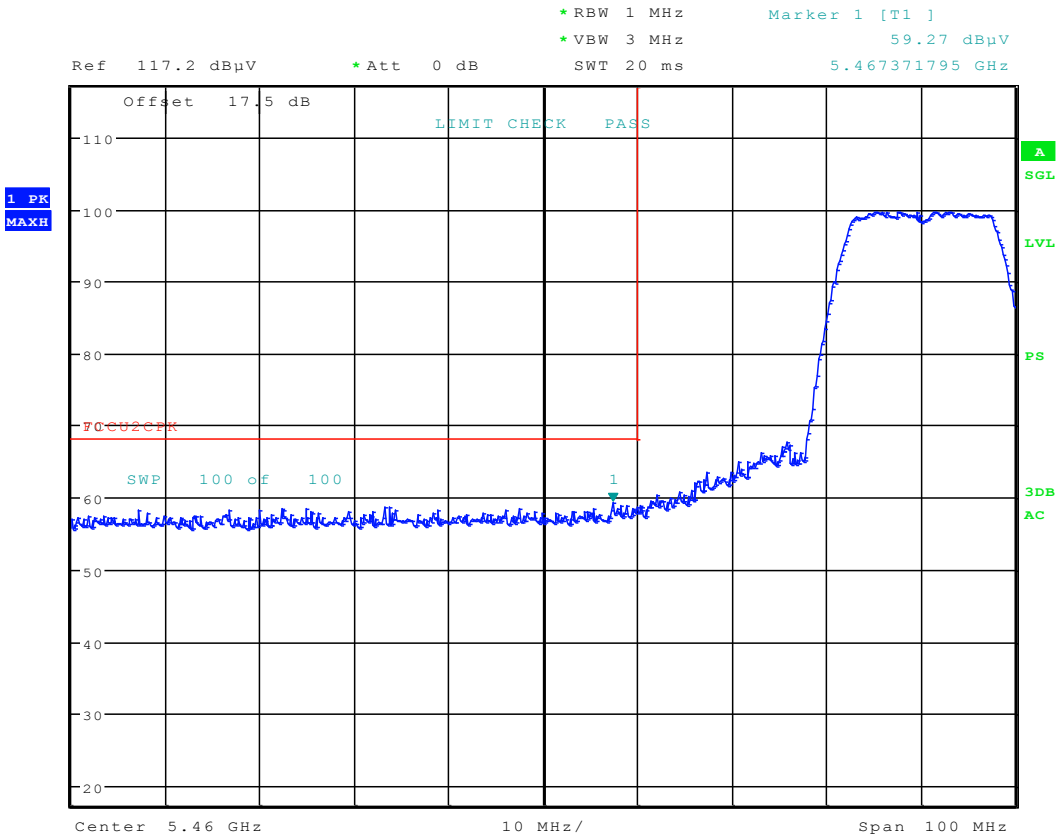


Date: 27.JAN.2016 20:45:39

Plot 7-221. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

MIMO Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



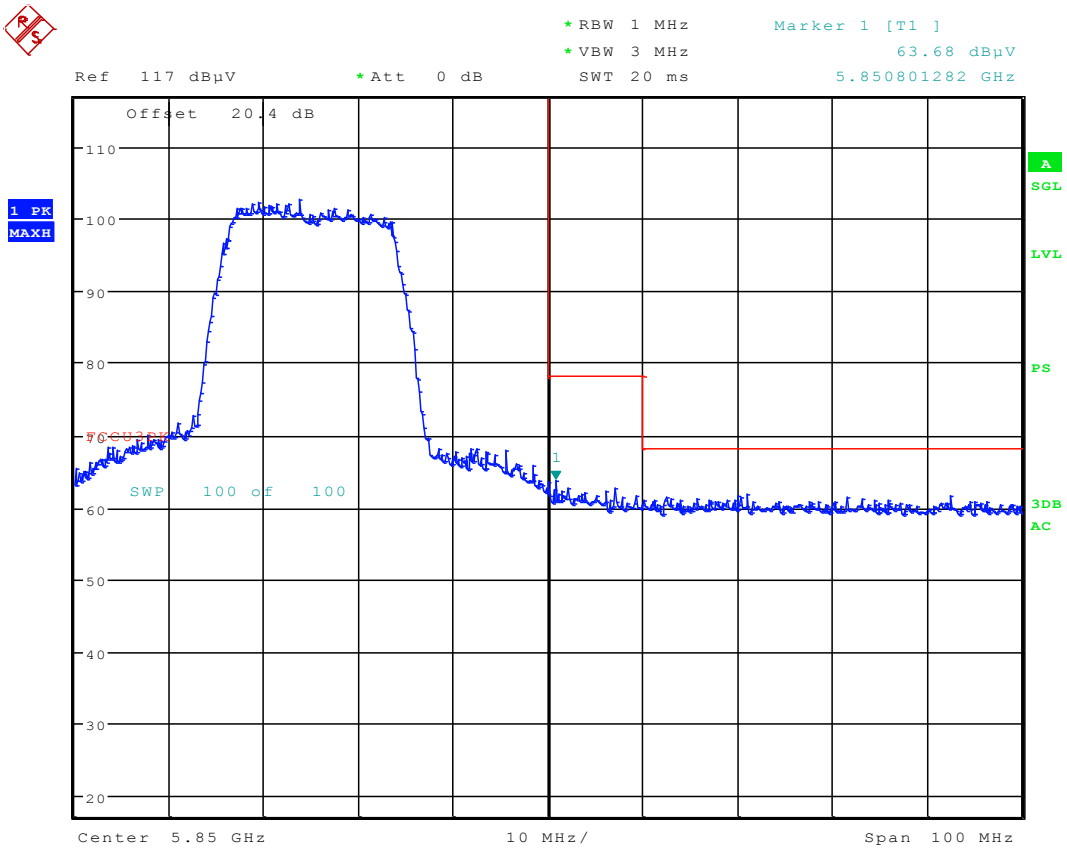
Date: 27.JAN.2016 20:46:06

Plot 7-222. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

MIMO Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

Worst Case Mode:	802.11n (20MHz)
Worst Case Transfer Rate:	MCS8
Distance of Measurements:	3 Meters
Operating Frequency:	5825MHz
Channel:	165



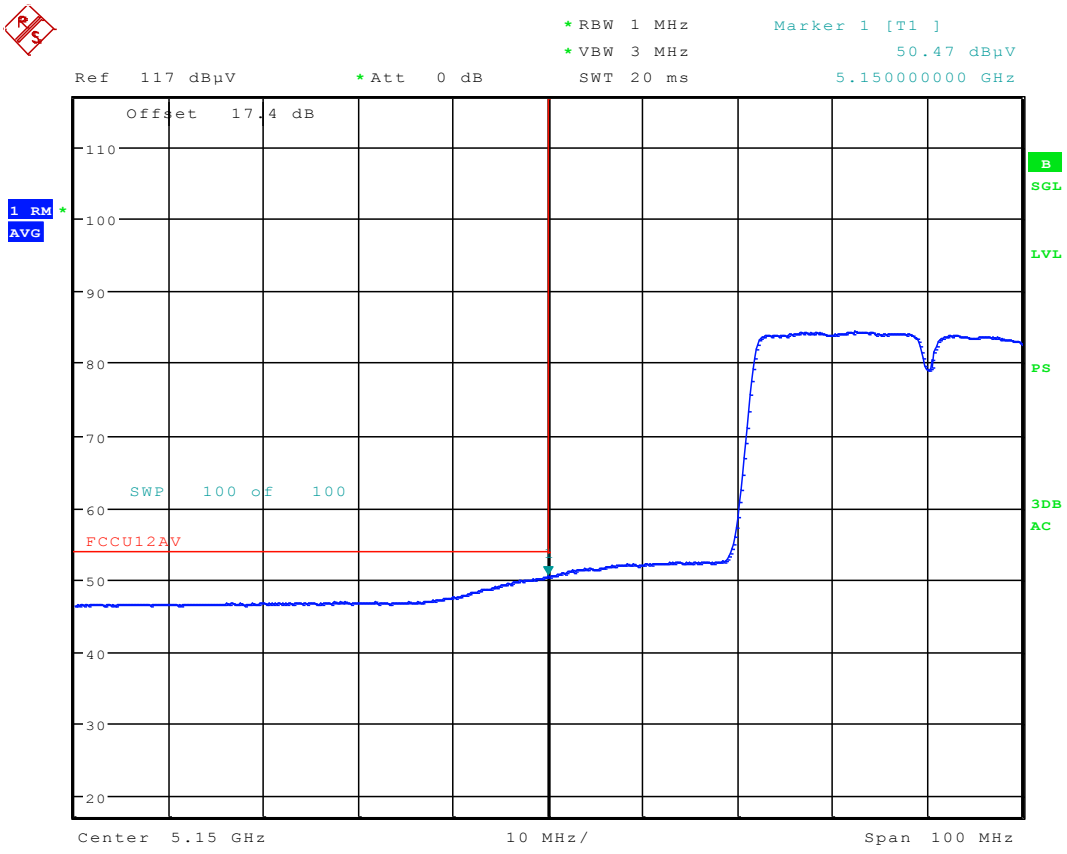
Date: 9.FEB.2016 17:39:36

Plot 7-223. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

7.7.10 MIMO Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

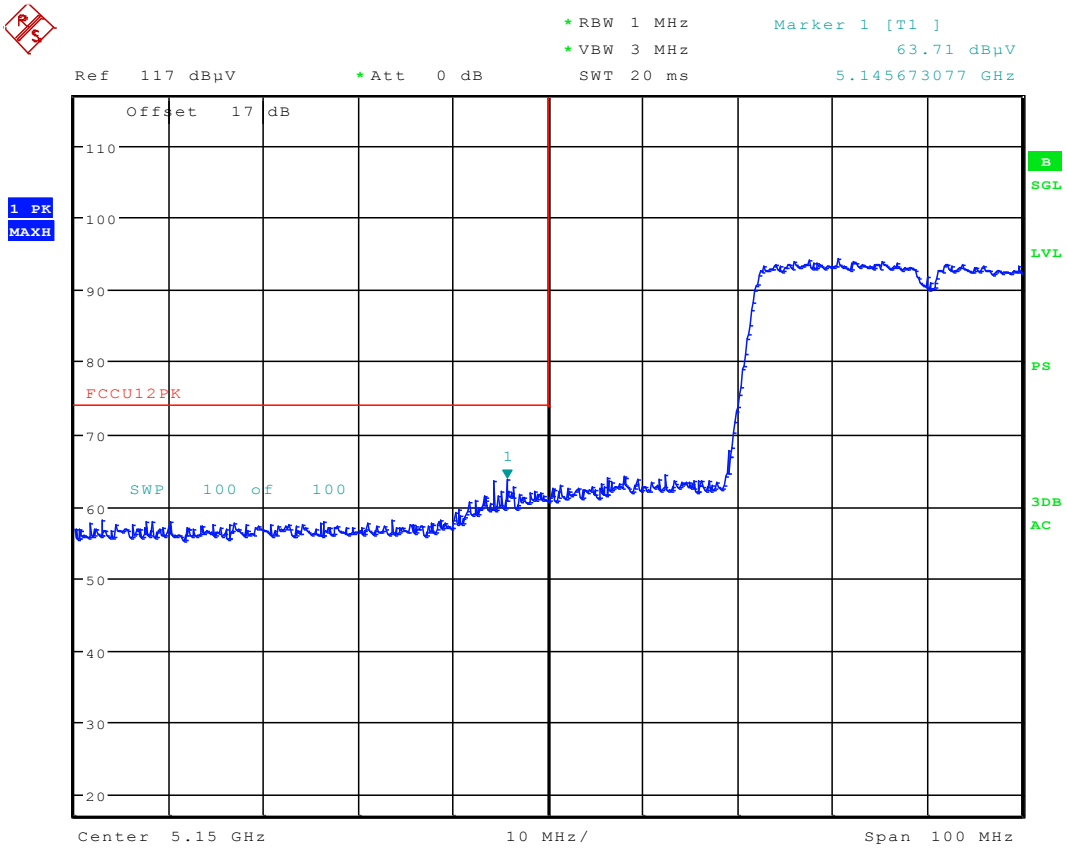
Worst Case Mode:	802.11n (40MHz)
Worst Case Transfer Rate:	MCS8
Distance of Measurements:	3 Meters
Operating Frequency:	5190MHz
Channel:	38



Plot 7-224. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

MIMO Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



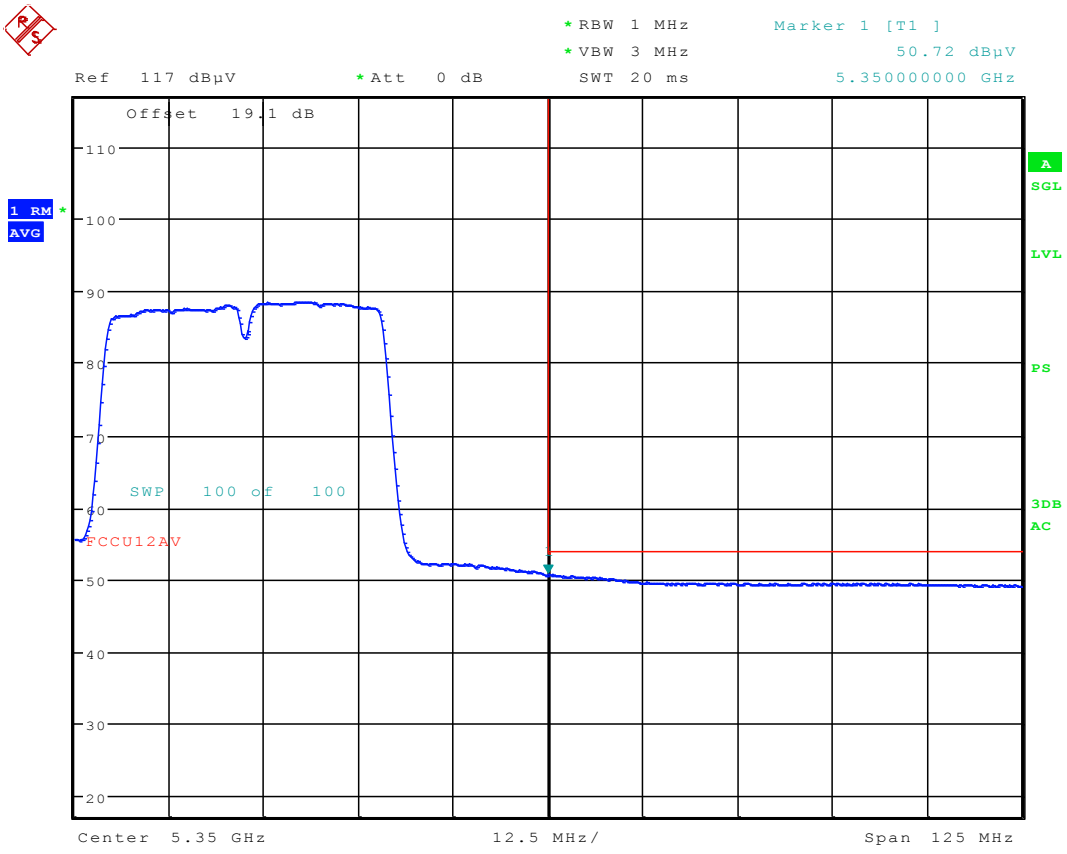
Date: 10.FEB.2016 01:05:26

Plot 7-225. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)

MIMO Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

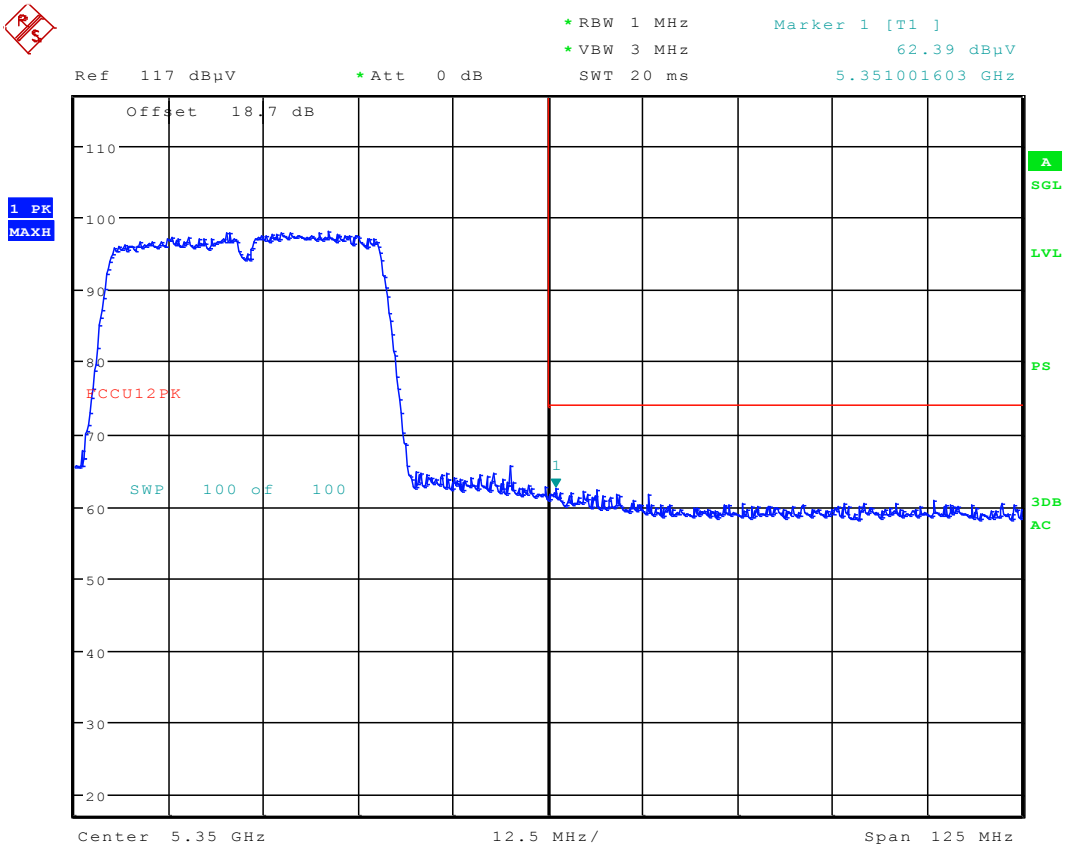
Worst Case Mode:	802.11n (40MHz)
Worst Case Transfer Rate:	MCS8
Distance of Measurements:	3 Meters
Operating Frequency:	5310MHz
Channel:	62



Plot 7-226. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

MIMO Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



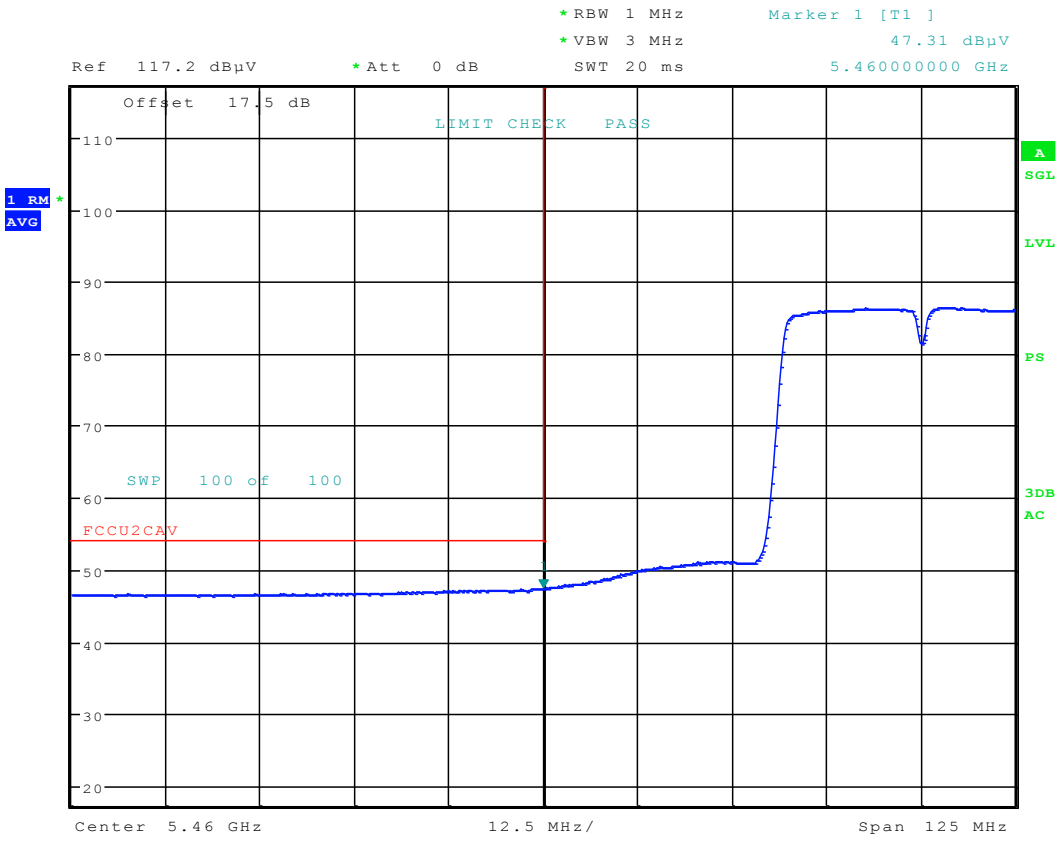
Date: 9.FEB.2016 17:12:00

Plot 7-227. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

MIMO Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

Worst Case Mode:	802.11n (40MHz)
Worst Case Transfer Rate:	MCS8
Distance of Measurements:	3 Meters
Operating Frequency:	5510MHz
Channel:	102

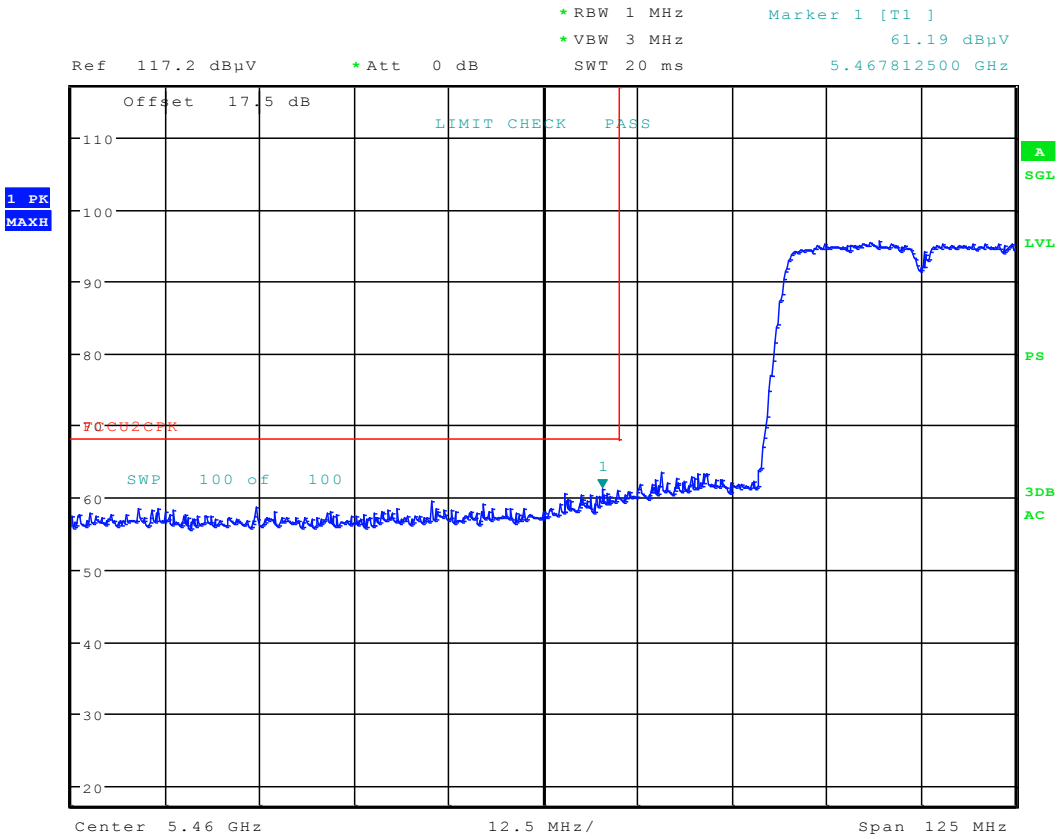


Date: 27.JAN.2016 20:49:29

Plot 7-228. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

MIMO Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



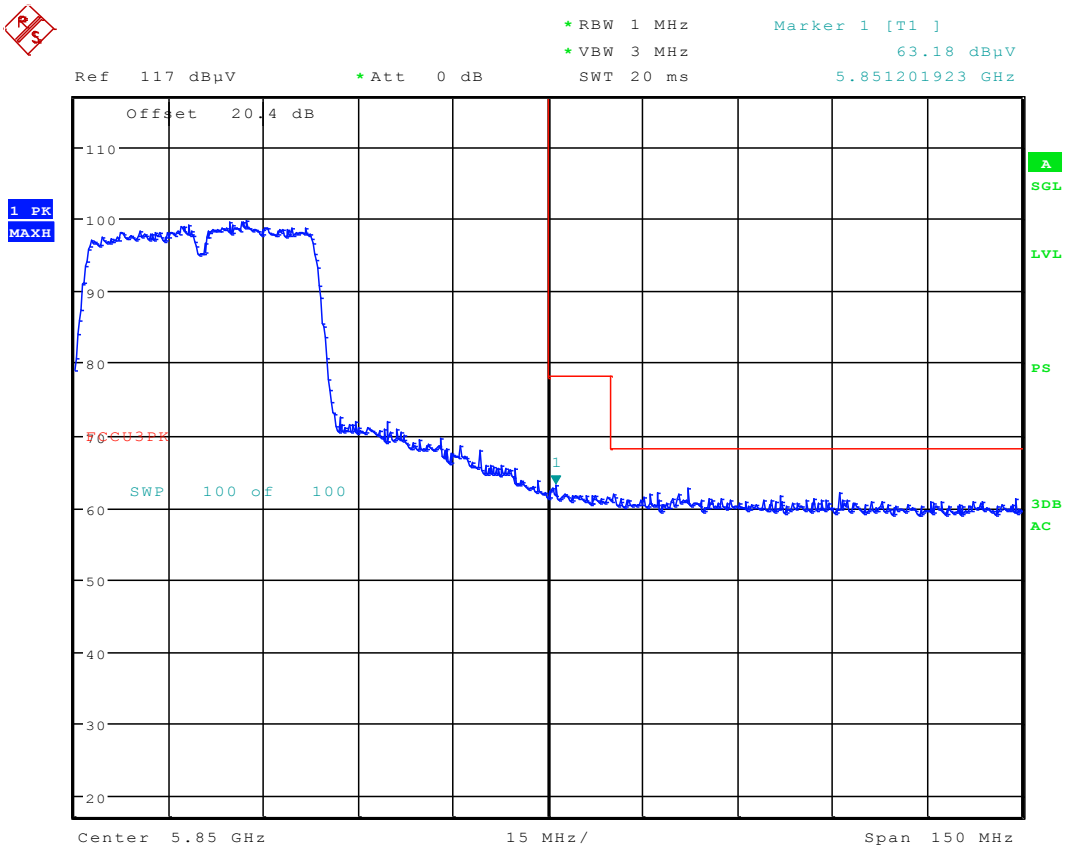
Date: 27.JAN.2016 20:49:07

Plot 7-229. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

MIMO Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

Worst Case Mode:	802.11n (40MHz)
Worst Case Transfer Rate:	MCS8
Distance of Measurements:	3 Meters
Operating Frequency:	5795MHz
Channel:	159



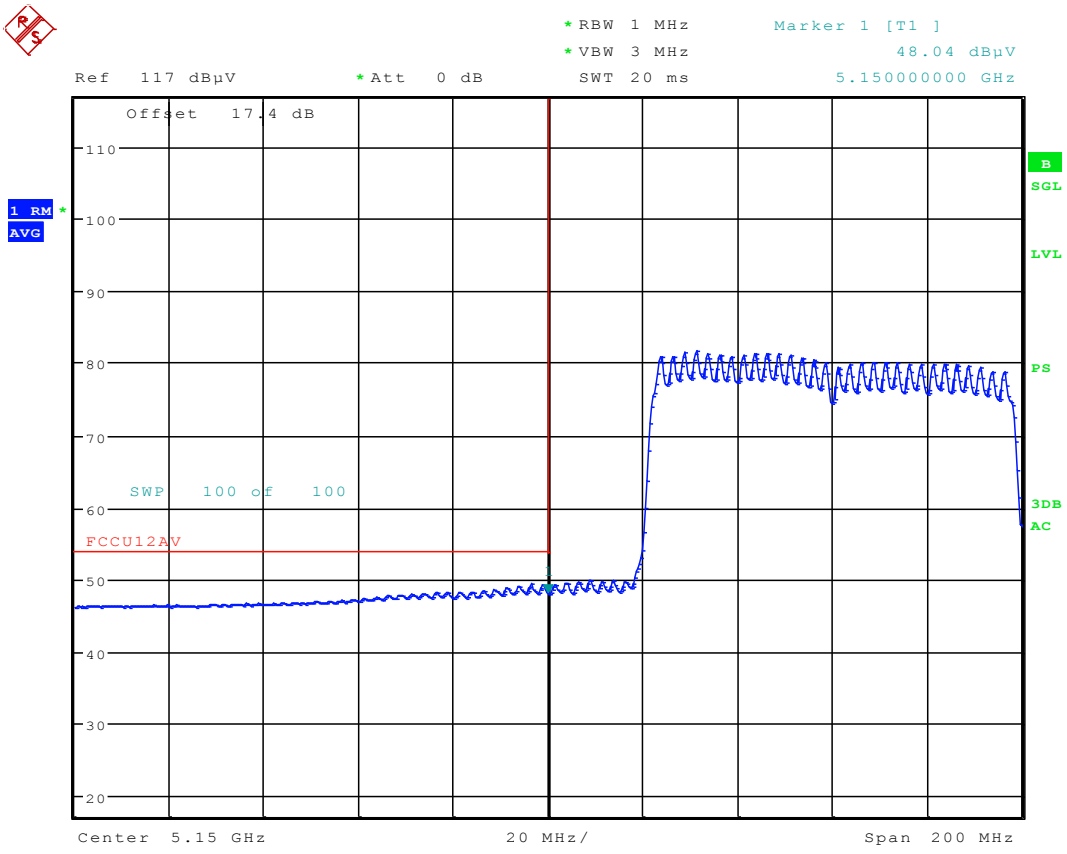
Date: 9.FEB.2016 17:41:01

Plot 7-230. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

7.7.11 MIMO Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

Worst Case Mode:	802.11ac (80MHz)
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5210MHz
Channel:	42

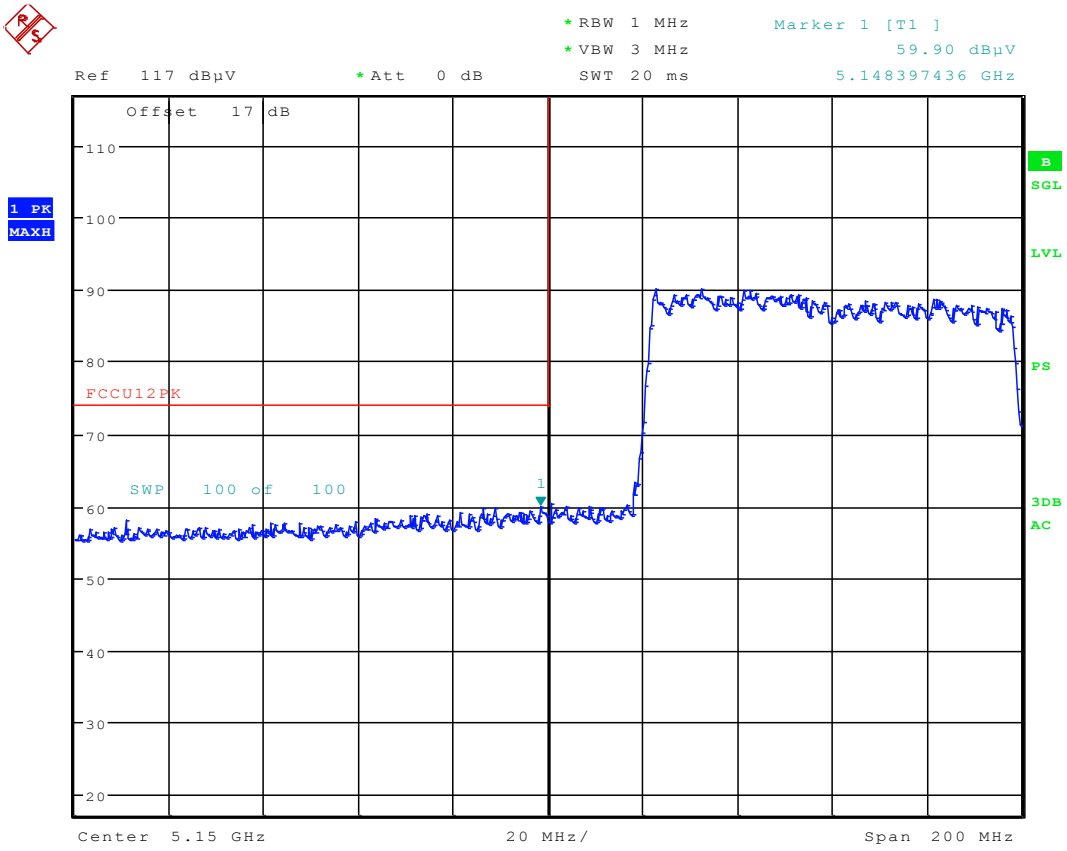


Date: 10.FEB.2016 01:09:00

Plot 7-231. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

MIMO Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



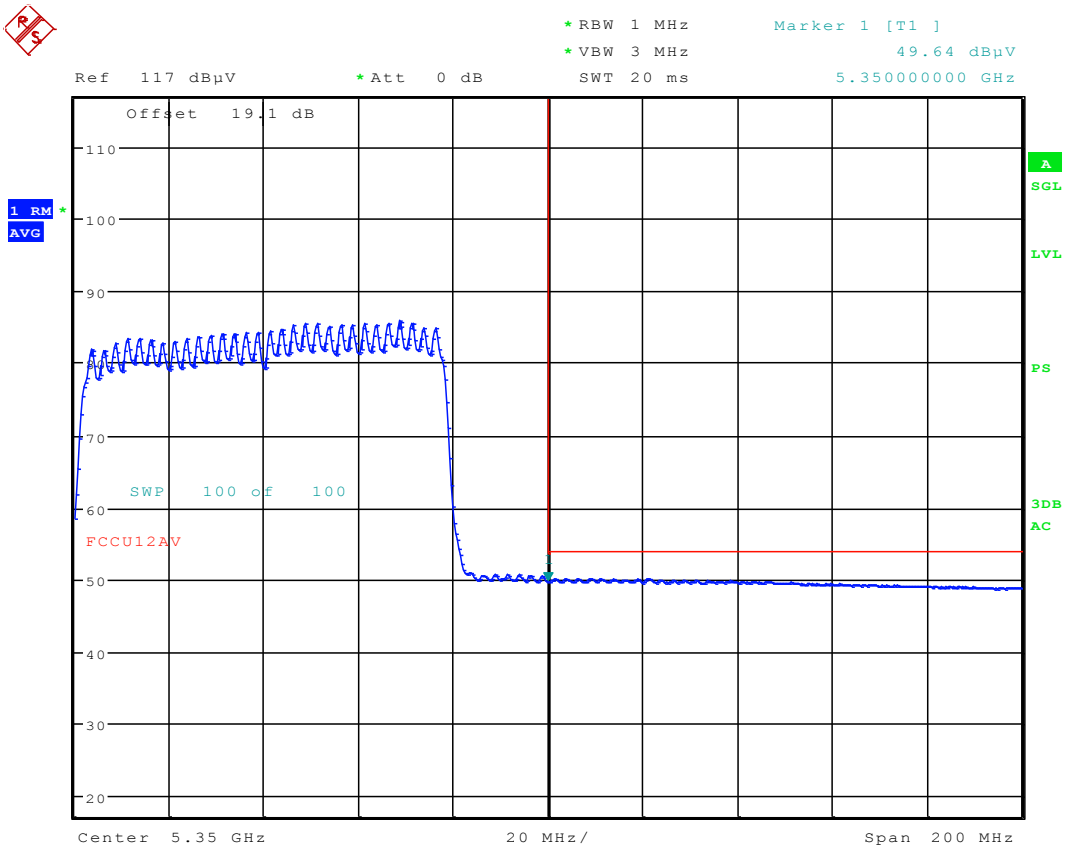
Date: 10.FEB.2016 01:07:17

Plot 7-232. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)

MIMO Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

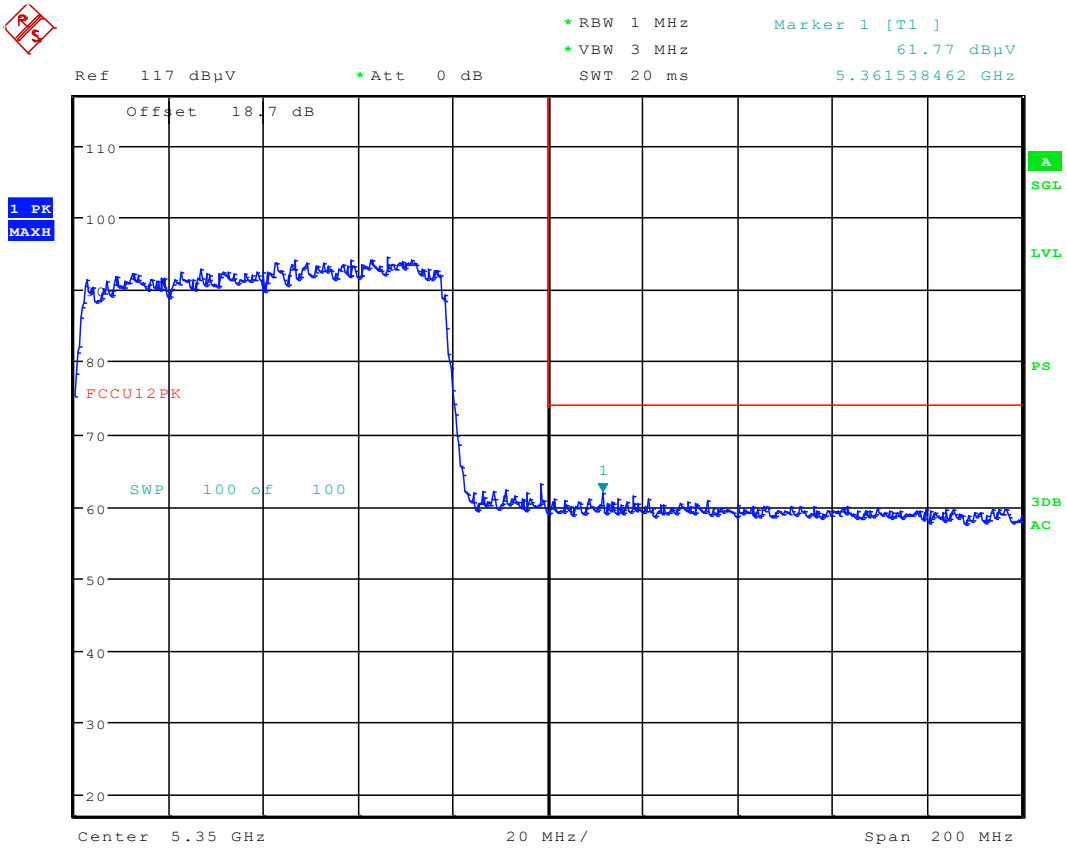
Worst Case Mode:	802.11ac (80MHz)
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5290MHz
Channel:	58



Plot 7-233. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

MIMO Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



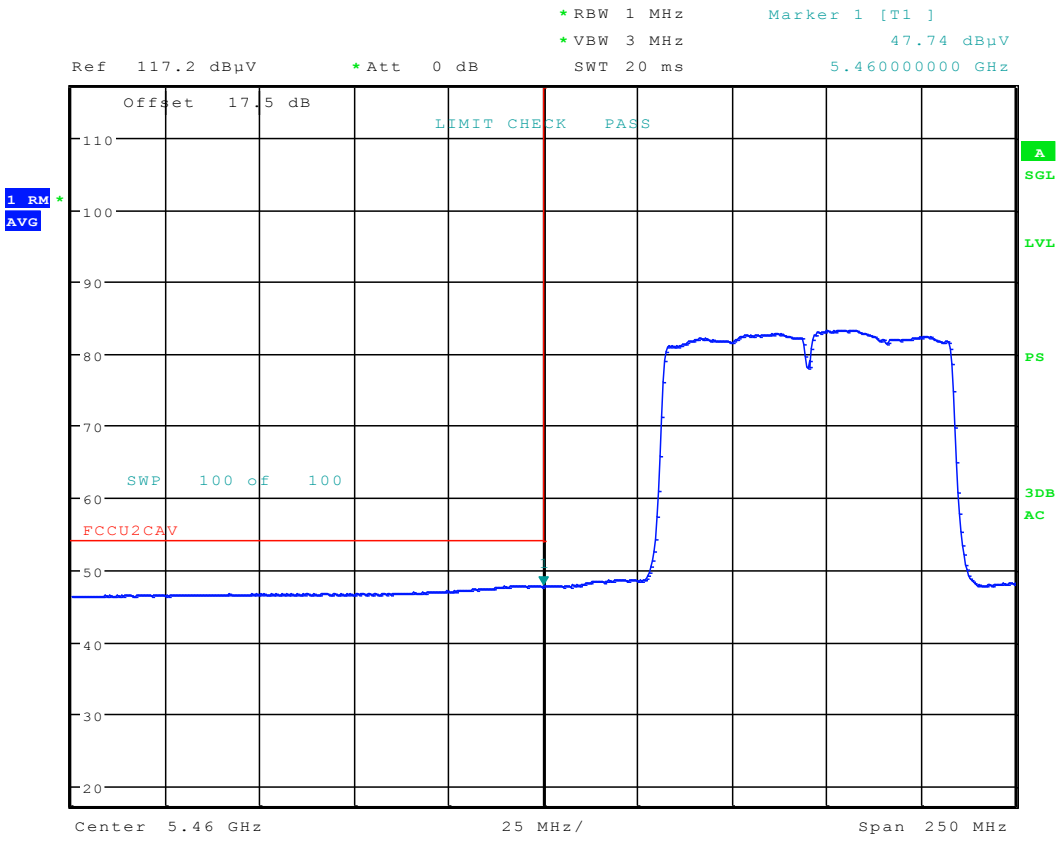
Date: 9.FEB.2016 17:19:36

Plot 7-234. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

MIMO Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

Worst Case Mode:	802.11ac (80MHz)
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5530MHz
Channel:	106

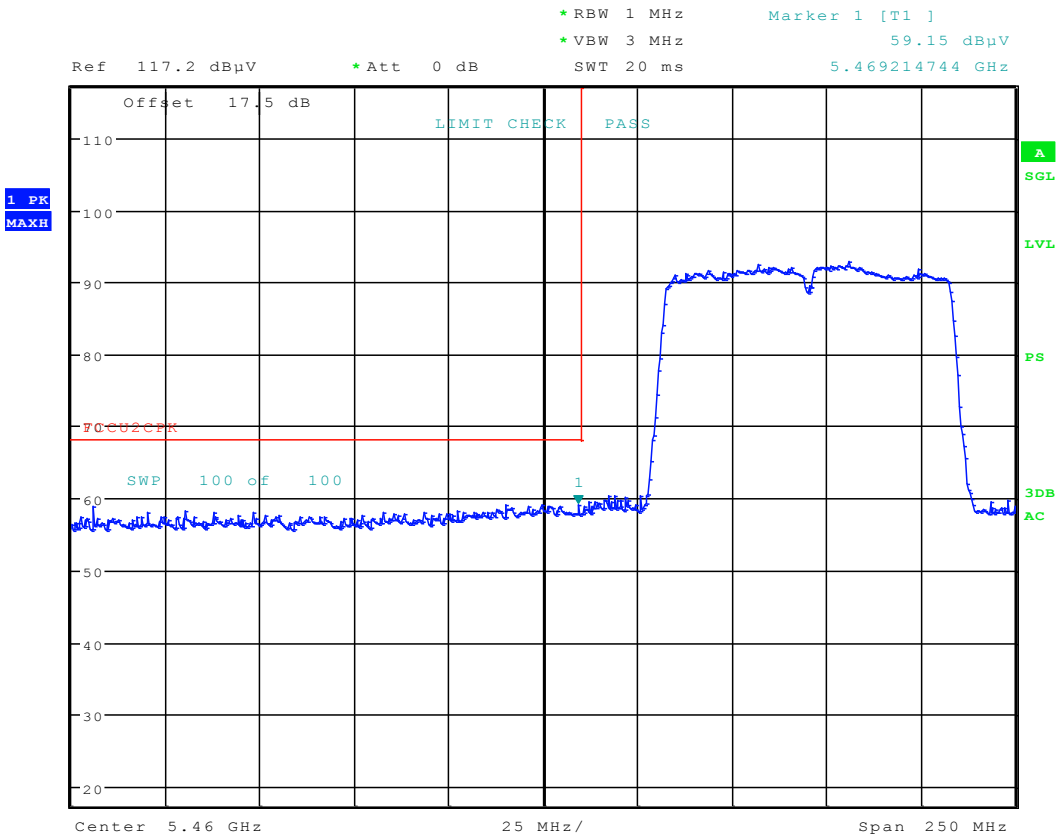


Date: 27.JAN.2016 20:55:31

Plot 7-235. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

MIMO Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



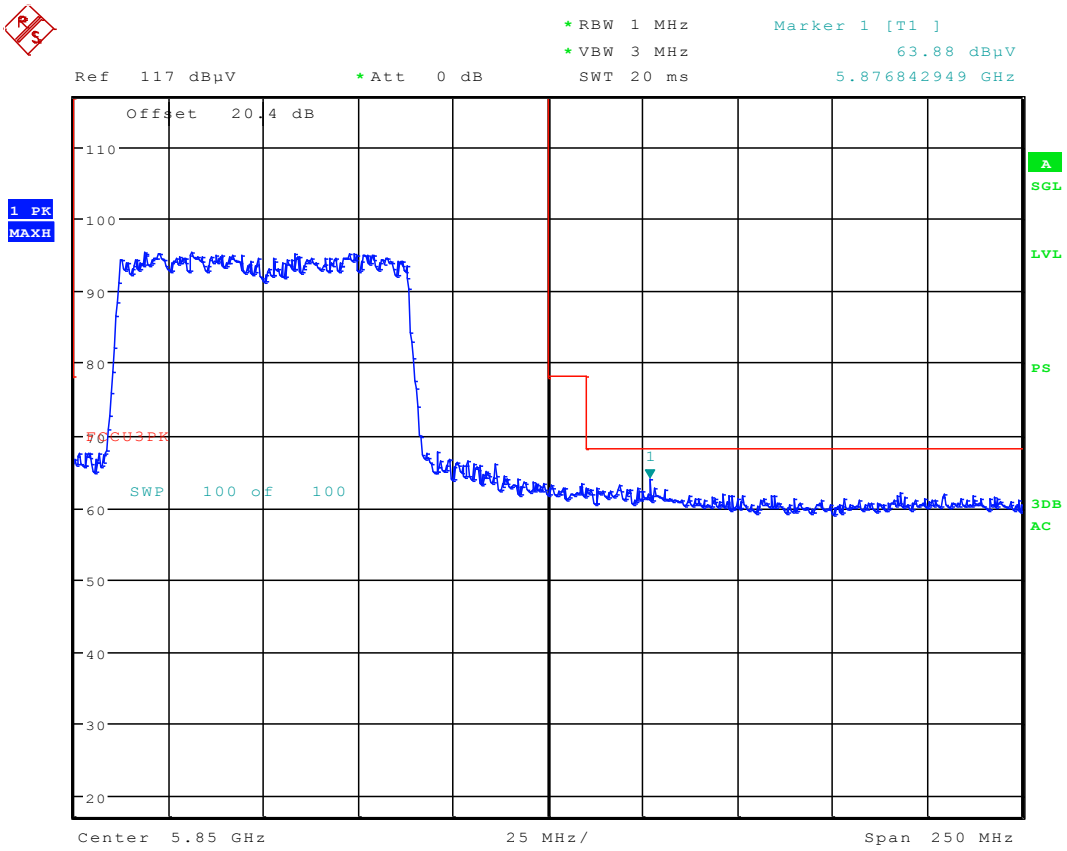
Date: 27.JAN.2016 20:54:55

Plot 7-236. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

MIMO Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

Worst Case Mode:	802.11ac (80MHz)
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5775MHz
Channel:	155



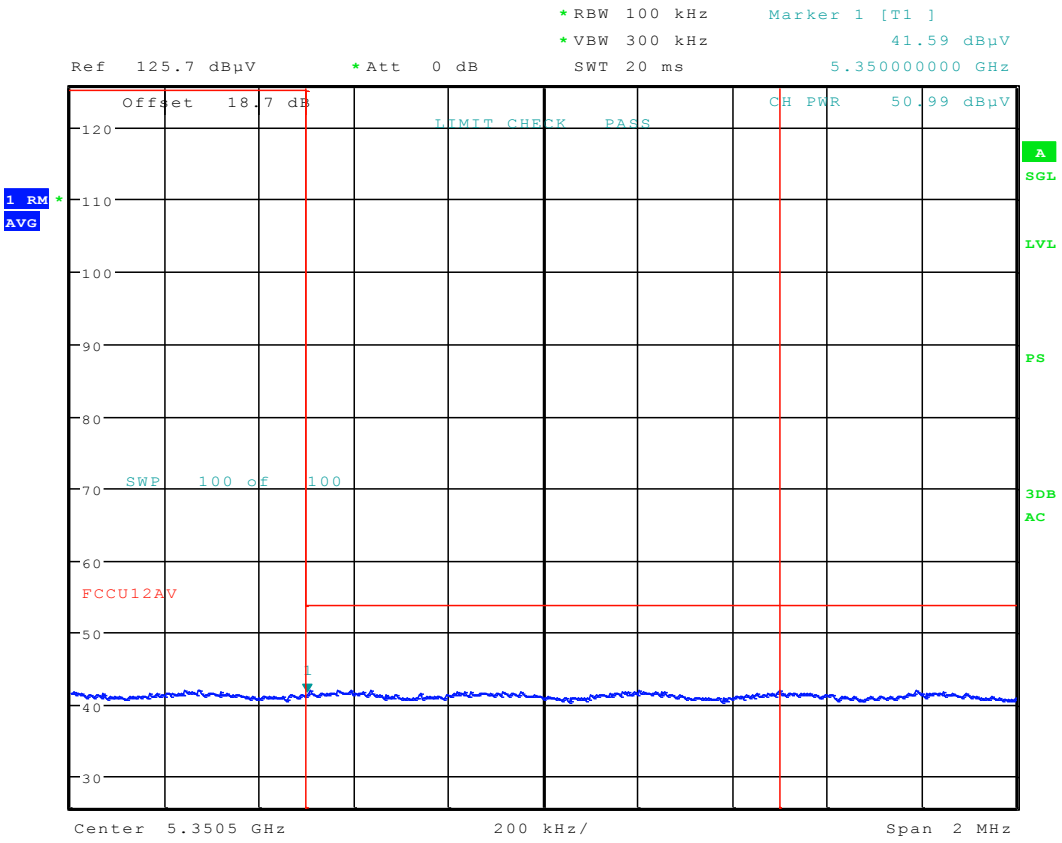
Date: 9.FEB.2016 17:42:28

Plot 7-237. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

MIMO Radiated Band Edge Measurements with CM Accessory (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

Worst Case Mode:	802.11n (40MHz)
Worst Case Transfer Rate:	MCS8
Distance of Measurements:	3 Meters
Operating Frequency:	5310MHz
Channel:	62

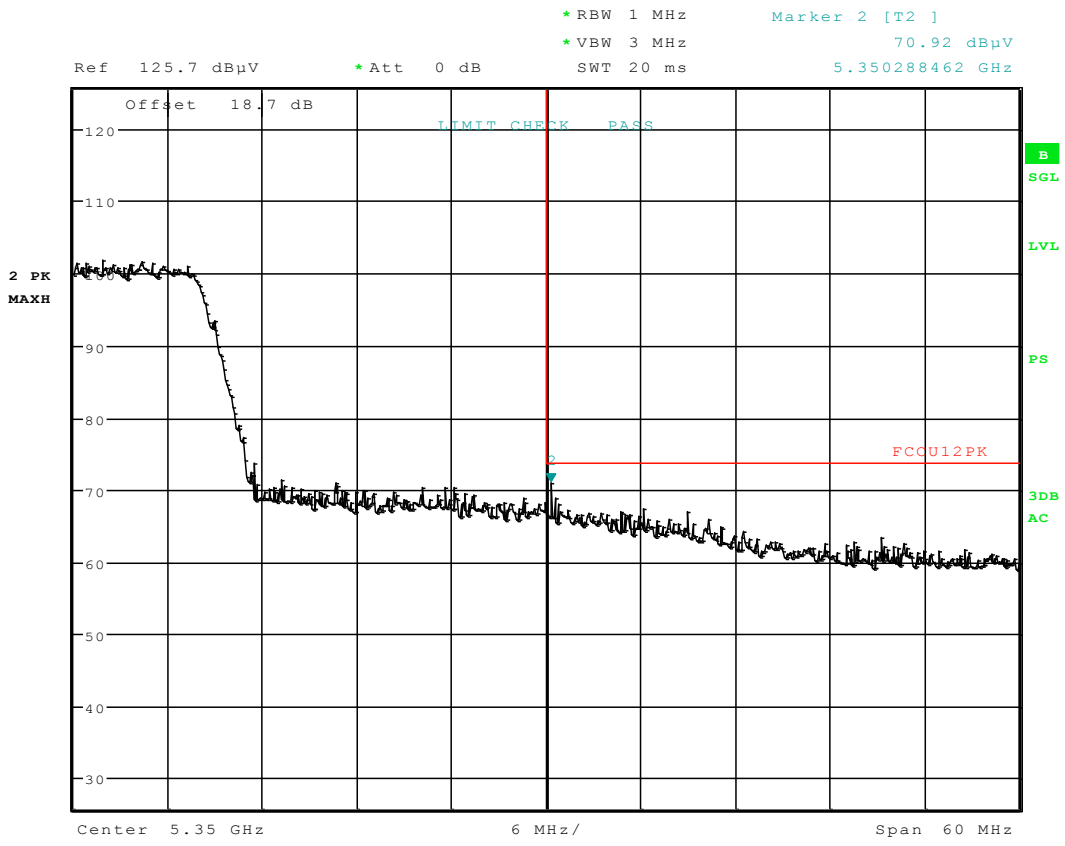


Date: 22.FEB.2016 20:47:28

Plot 7-238. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

MIMO Radiated Band Edge Measurements with CM Accessory (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



Date: 22.FEB.2016 20:46:15

Plot 7-239. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

7.8 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 must not exceed the limits shown in Table 7-54 per Section 15.209.

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 7-54. Radiated Limits

Test Procedures Used

ANSI C63.4-2014

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

Test Setup

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

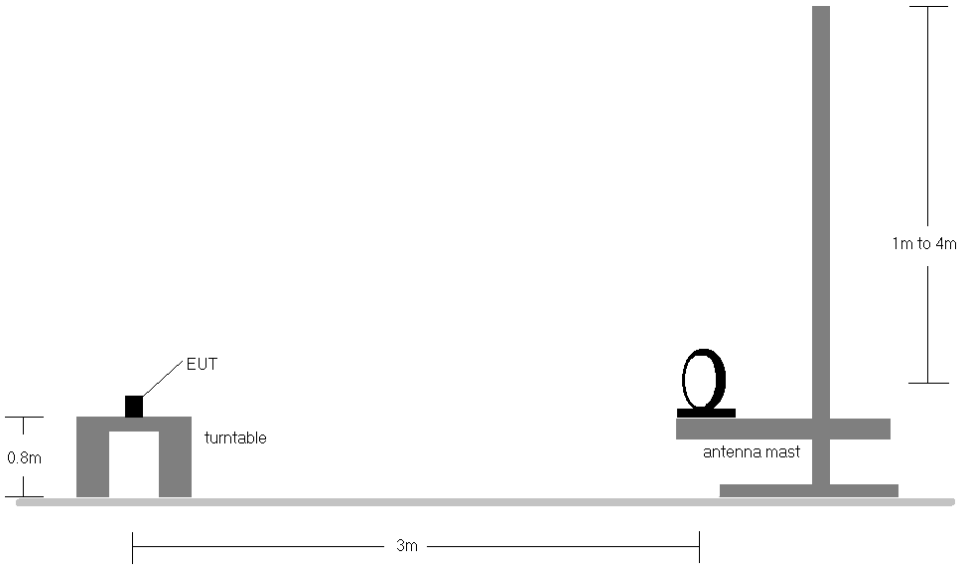


Figure 7-6. Radiated Test Setup < 30MHz

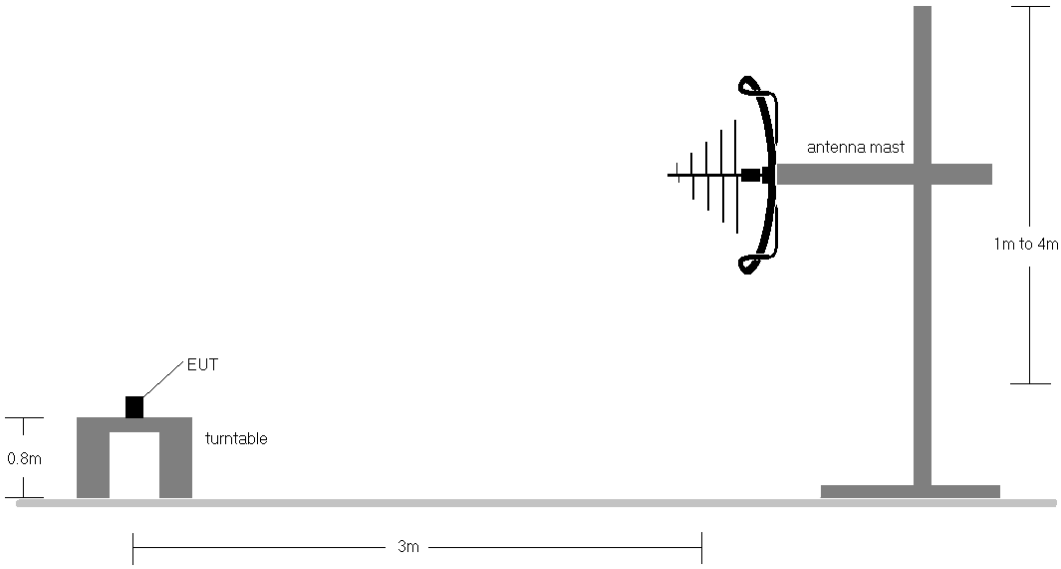


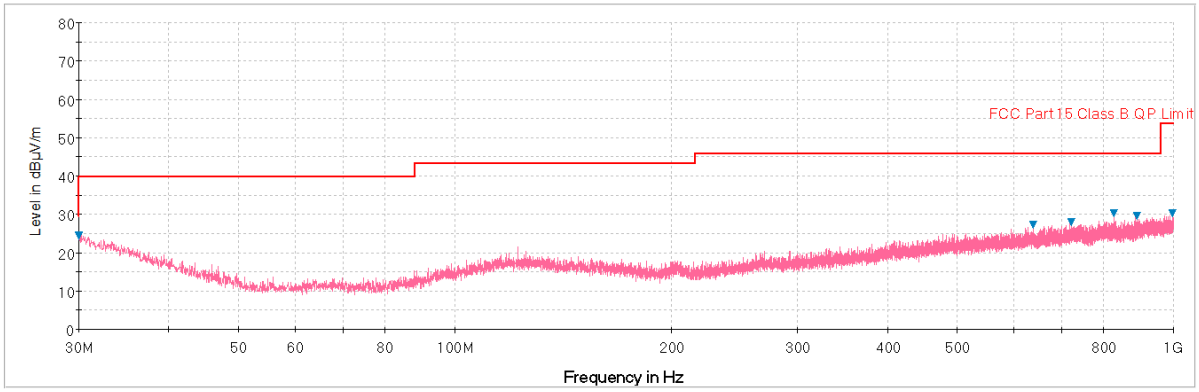
Figure 7-7. Radiated Test Setup < 1GHz

Test Notes

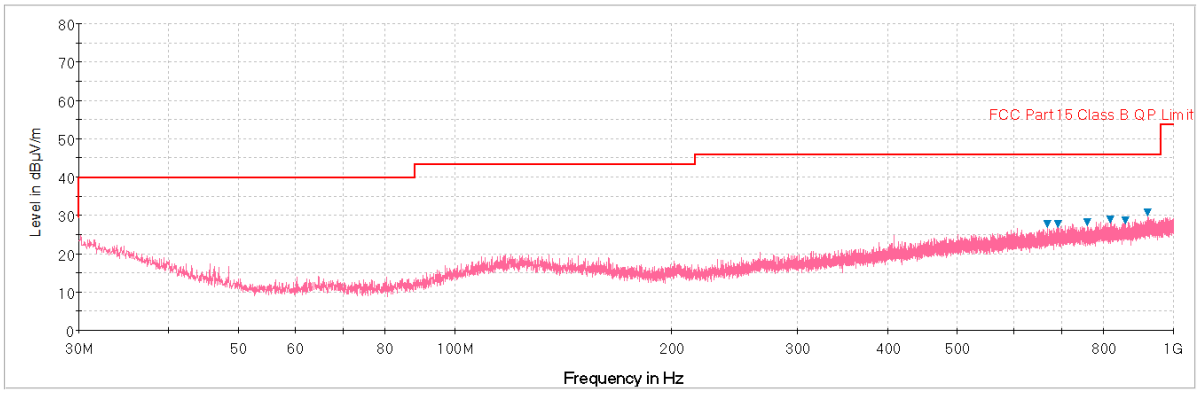
1. All emissions lying in restricted bands specified in §15.205 are below the limit shown in Table 7-27.
2. The broadband receive antenna is manipulated through vertical and horizontal polarizations during the tests. The EUT is manipulated through three orthogonal planes.
3. This unit was tested with 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.

Antenna-1 Radiated Spurious Emissions Measurements (Below 1GHz)

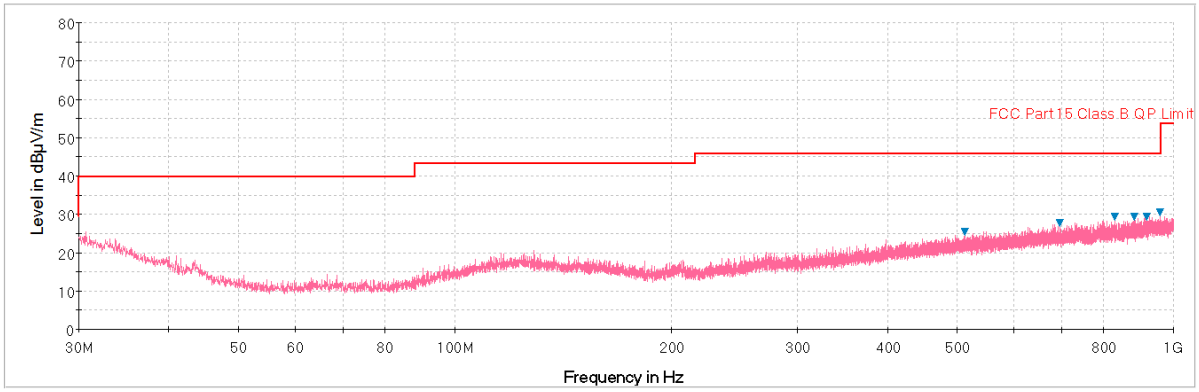
§15.209



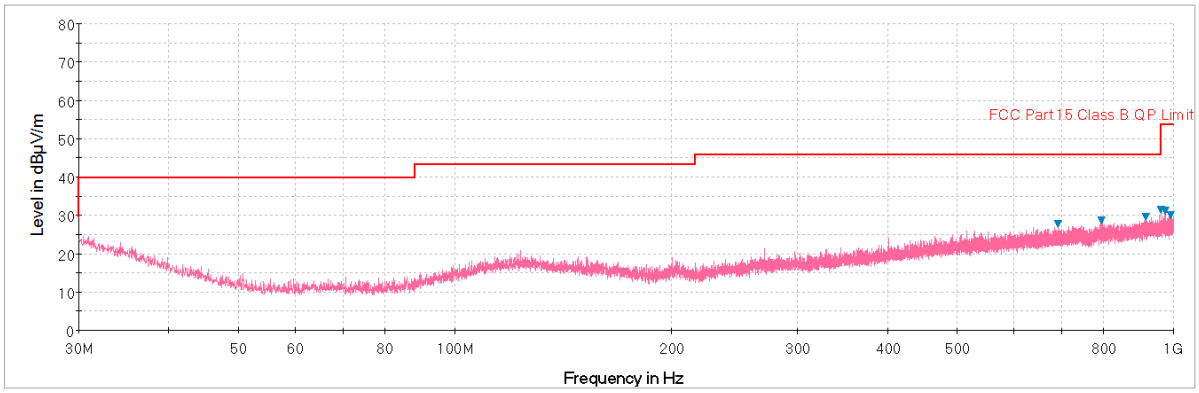
Plot 7-240. Radiated Spurious Plot below 1GHz (802.11a – U3 Ch. 157, Ant. Pol. H)



Plot 7-241. Radiated Spurious Plot below 1GHz (802.11a – U3 Ch. 157, Ant. Pol. V)



Plot 7-242. Radiated Spurious Plot below 1GHz (802.11a – U3 Ch. 157, Ant. Pol. H)



Plot 7-243. Radiated Spurious Plot below 1GHz (802.11a – U3 Ch. 157, Ant. Pol. V)

7.9 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.

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 7-55. 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

Test Setup

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

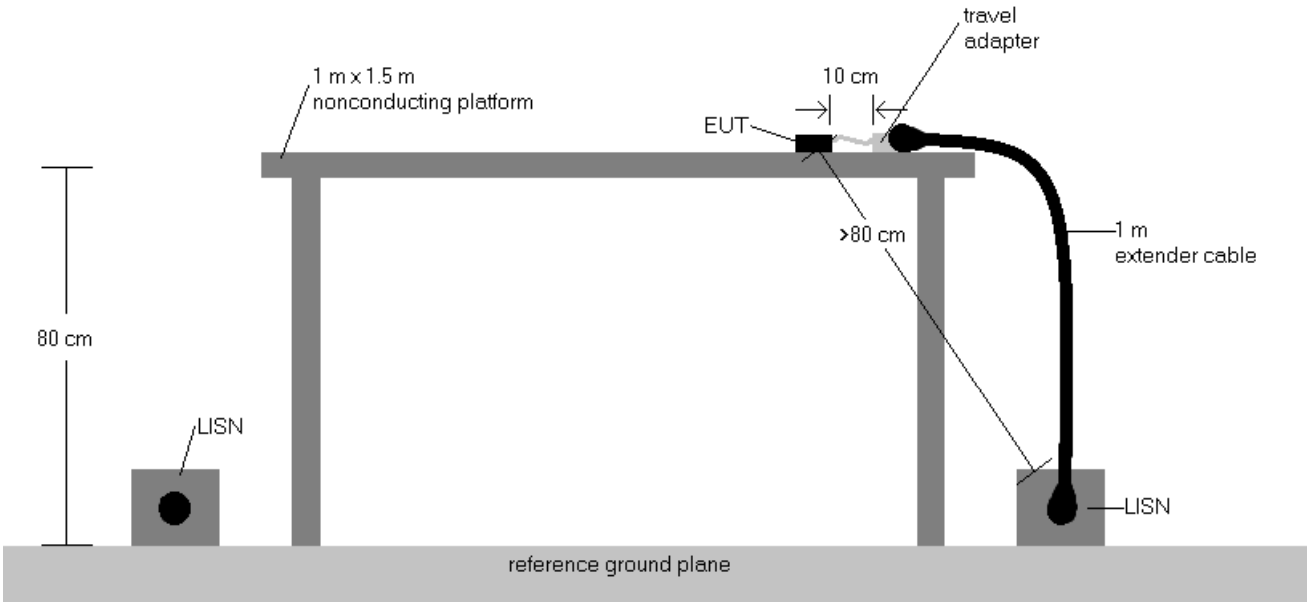


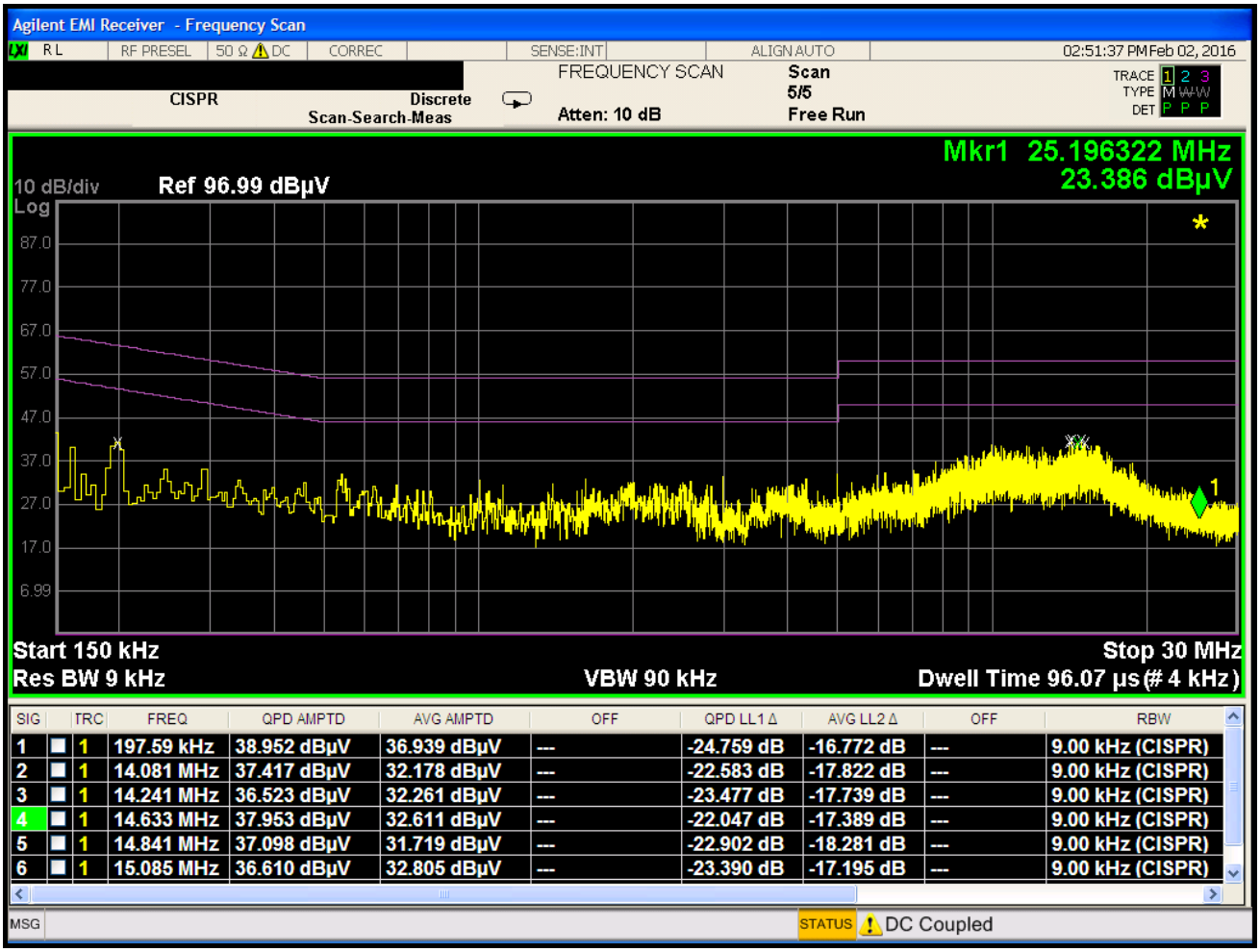
Figure 7-8. Test Instrument & Measurement Setup

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.
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.

Line-Conducted Test Data

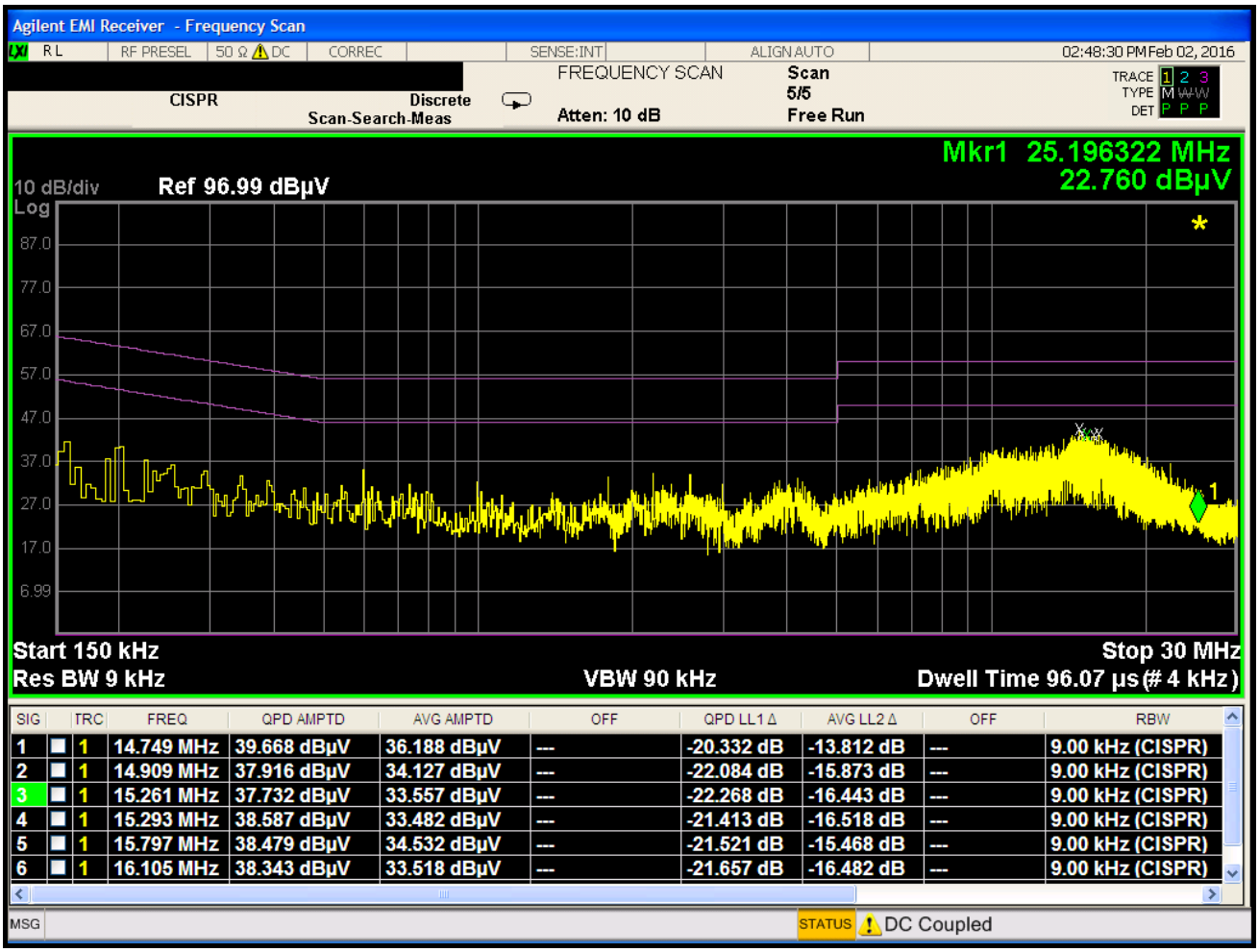
§15.407



Plot 7-244. Line Conducted Plot with 802.11a UNII Band 1 (L1)

Line-Conducted Test Data

§15.407

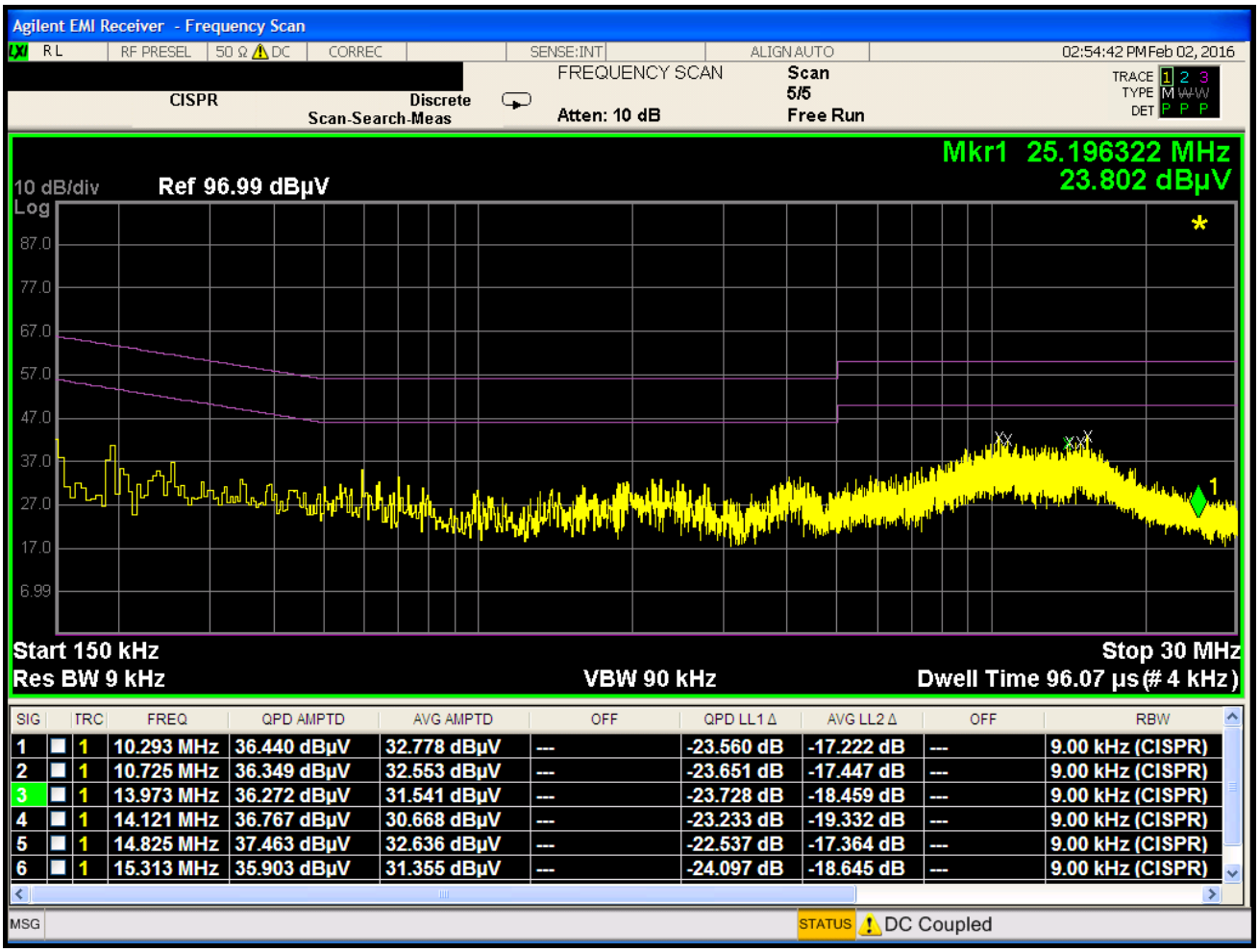


SIG	TRC	FREQ	QPD AMPTD	AVG AMPTD	OFF	QPD LL1 Δ	AVG LL2 Δ	OFF	RBW
1	1	14.749 MHz	39.668 dBµV	36.188 dBµV	---	-20.332 dB	-13.812 dB	---	9.00 kHz (CISPR)
2	1	14.909 MHz	37.916 dBµV	34.127 dBµV	---	-22.084 dB	-15.873 dB	---	9.00 kHz (CISPR)
3	1	15.261 MHz	37.732 dBµV	33.557 dBµV	---	-22.268 dB	-16.443 dB	---	9.00 kHz (CISPR)
4	1	15.293 MHz	38.587 dBµV	33.482 dBµV	---	-21.413 dB	-16.518 dB	---	9.00 kHz (CISPR)
5	1	15.797 MHz	38.479 dBµV	34.532 dBµV	---	-21.521 dB	-15.468 dB	---	9.00 kHz (CISPR)
6	1	16.105 MHz	38.343 dBµV	33.518 dBµV	---	-21.657 dB	-16.482 dB	---	9.00 kHz (CISPR)

Plot 7-245. Line Conducted Plot with 802.11a UNII Band 1 (N)

Line-Conducted Test Data

§15.407

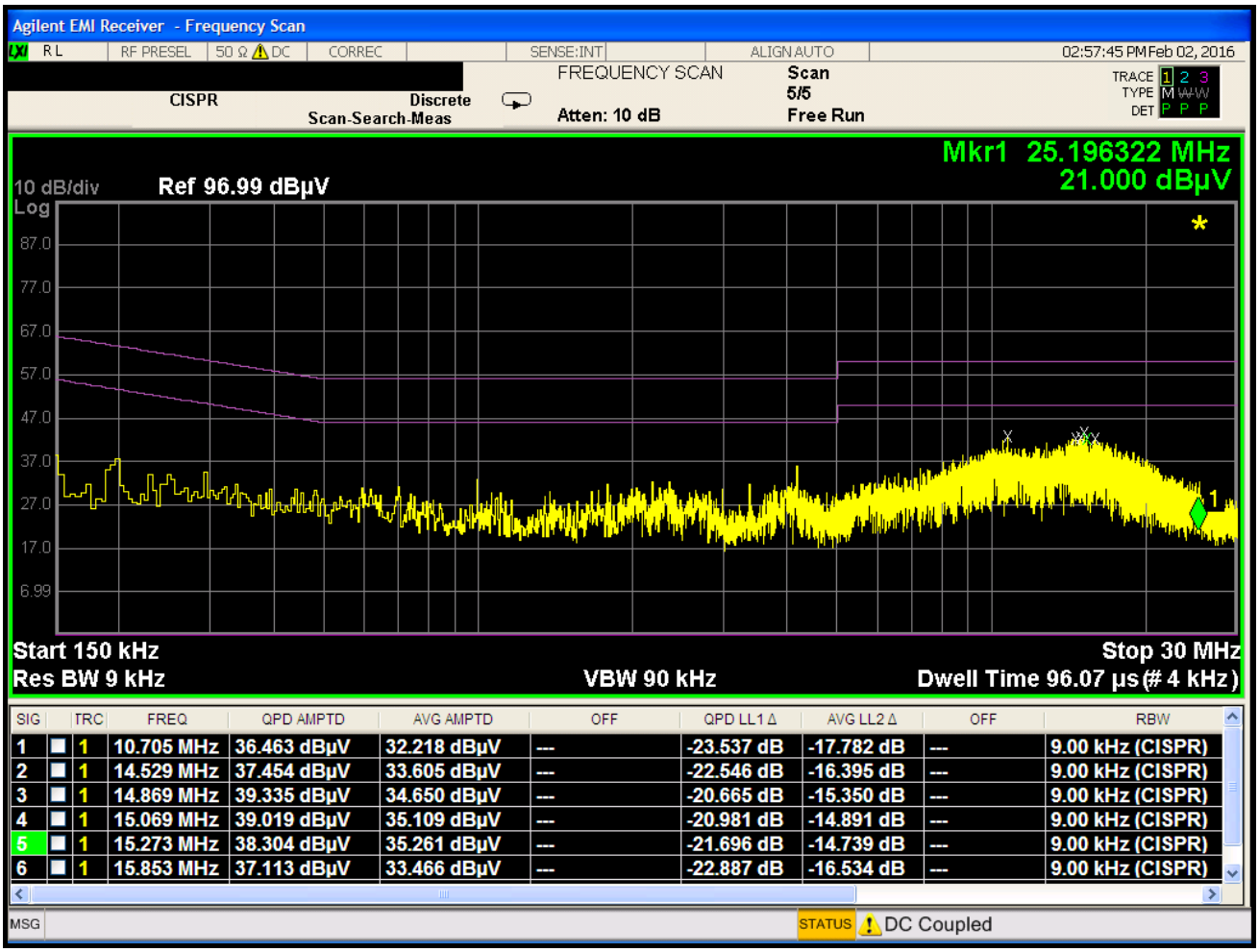


SIG	TRC	FREQ	QPD AMPTD	AVG AMPTD	OFF	QPD LL1 Δ	AVG LL2 Δ	OFF	RBW
1	1	10.293 MHz	36.440 dBµV	32.778 dBµV	---	-23.560 dB	-17.222 dB	---	9.00 kHz (CISPR)
2	1	10.725 MHz	36.349 dBµV	32.553 dBµV	---	-23.651 dB	-17.447 dB	---	9.00 kHz (CISPR)
3	1	13.973 MHz	36.272 dBµV	31.541 dBµV	---	-23.728 dB	-18.459 dB	---	9.00 kHz (CISPR)
4	1	14.121 MHz	36.767 dBµV	30.668 dBµV	---	-23.233 dB	-19.332 dB	---	9.00 kHz (CISPR)
5	1	14.825 MHz	37.463 dBµV	32.636 dBµV	---	-22.537 dB	-17.364 dB	---	9.00 kHz (CISPR)
6	1	15.313 MHz	35.903 dBµV	31.355 dBµV	---	-24.097 dB	-18.645 dB	---	9.00 kHz (CISPR)

Plot 7-246. Line Conducted Plot with 802.11a UNII Band 2A (L1)

Line-Conducted Test Data

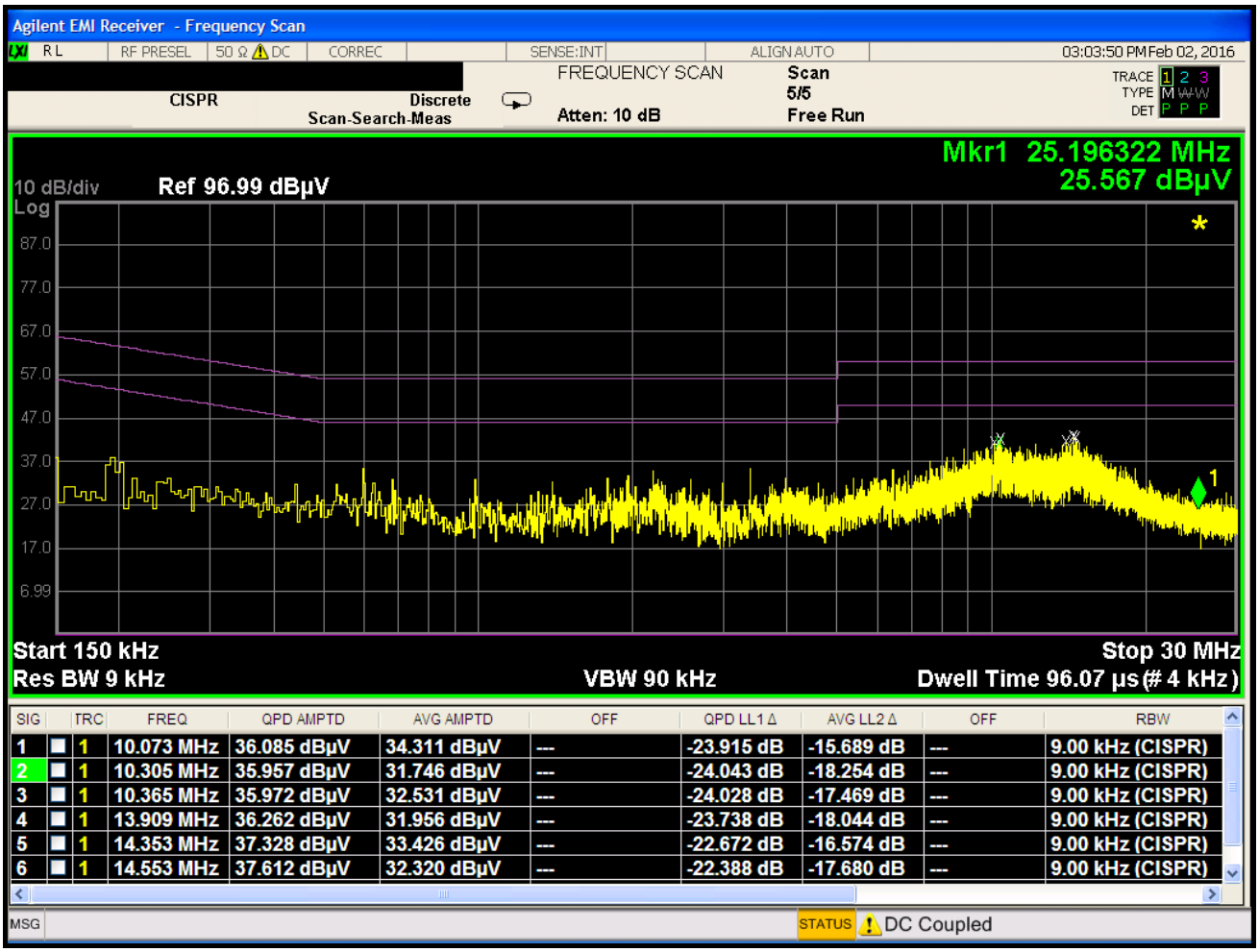
§15.407



Plot 7-247. Line Conducted Plot with 802.11a UNII Band 2A (N)

Line-Conducted Test Data

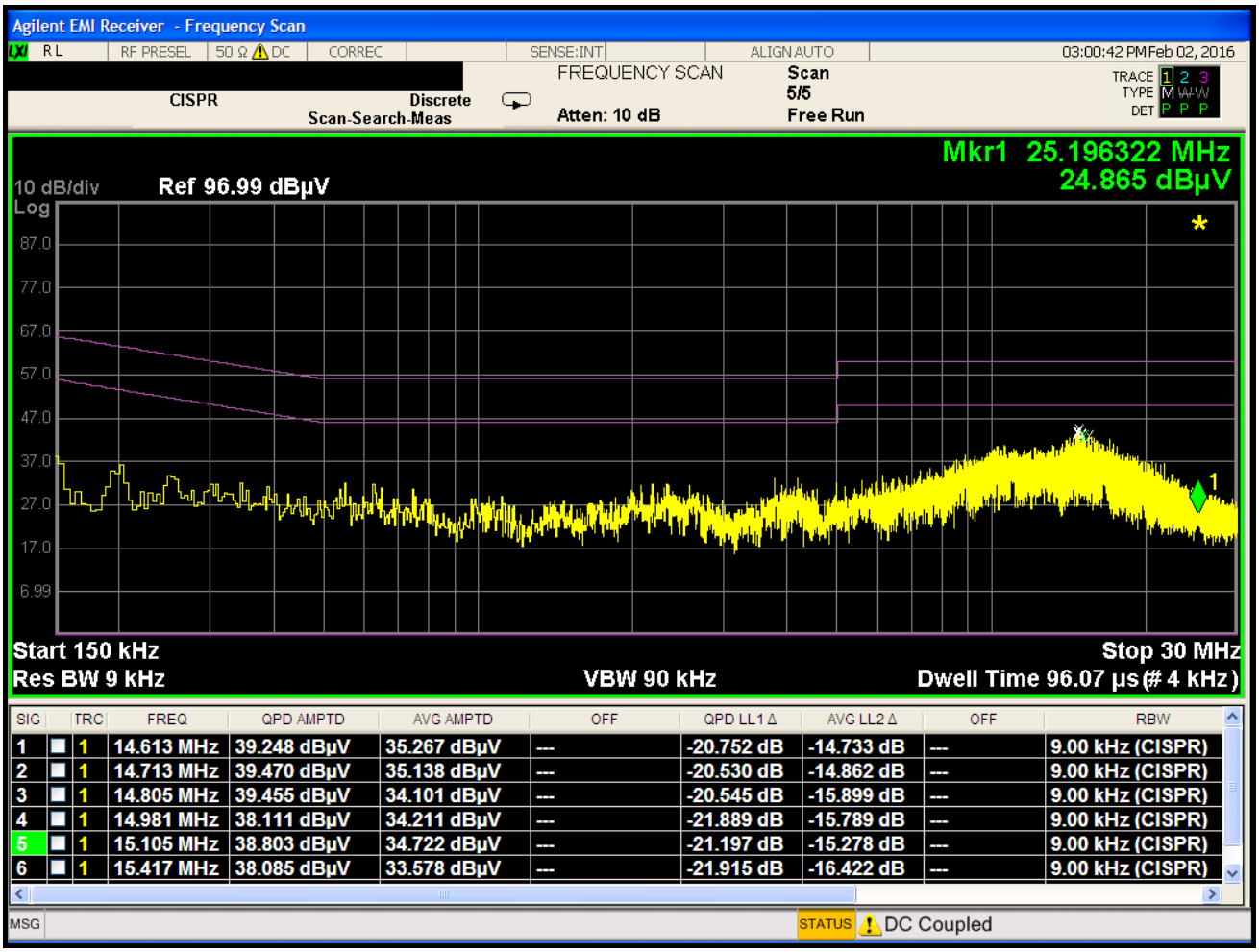
§15.407



Plot 7-248. Line Conducted Plot with 802.11a UNII Band 2C (L1)

Line-Conducted Test Data

§15.407

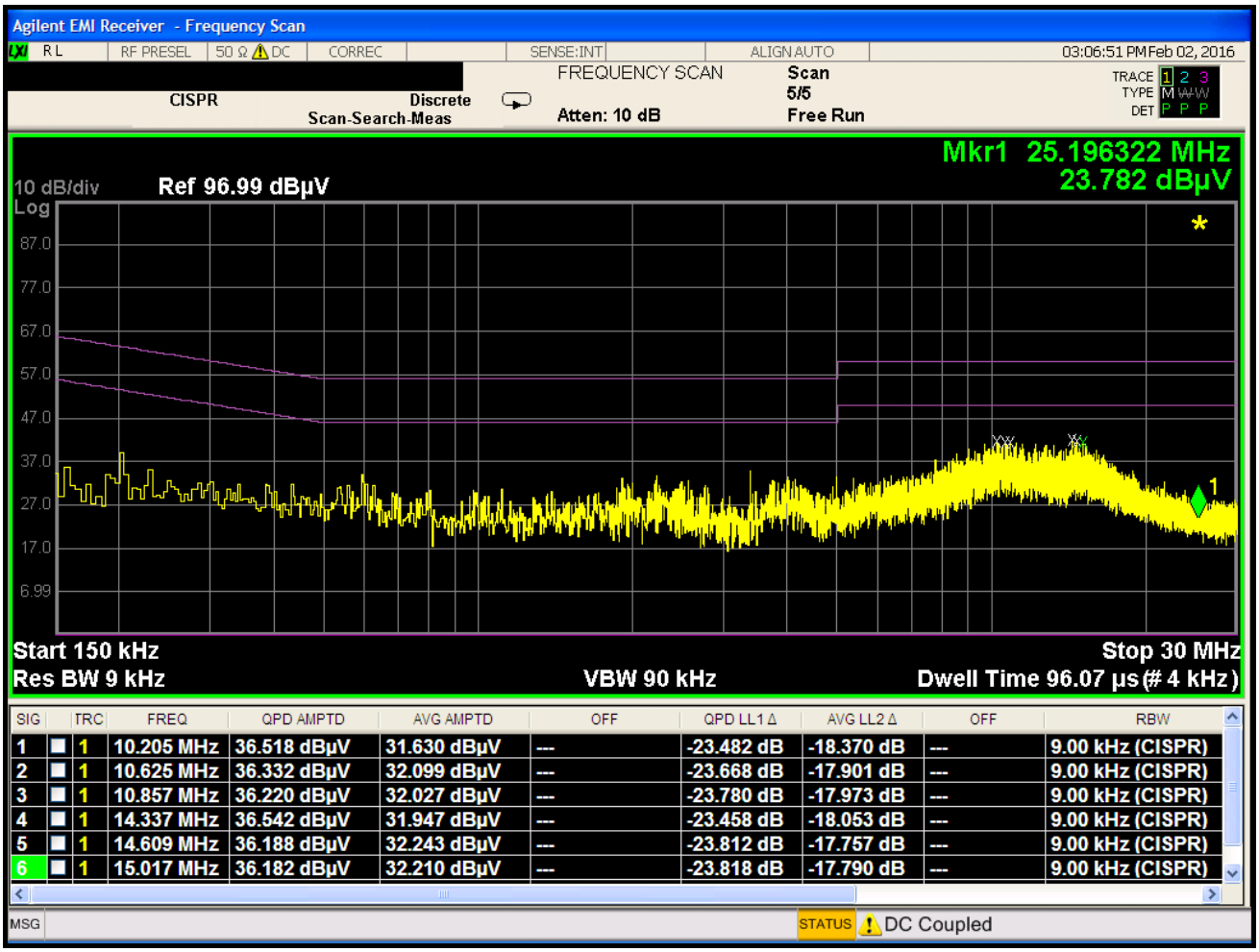


SIG	TRC	FREQ	QPD AMPTD	AVG AMPTD	OFF	QPD LL1 Δ	AVG LL2 Δ	OFF	RBW
1	1	14.613 MHz	39.248 dBµV	35.267 dBµV	---	-20.752 dB	-14.733 dB	---	9.00 kHz (CISPR)
2	1	14.713 MHz	39.470 dBµV	35.138 dBµV	---	-20.530 dB	-14.862 dB	---	9.00 kHz (CISPR)
3	1	14.805 MHz	39.455 dBµV	34.101 dBµV	---	-20.545 dB	-15.899 dB	---	9.00 kHz (CISPR)
4	1	14.981 MHz	38.111 dBµV	34.211 dBµV	---	-21.889 dB	-15.789 dB	---	9.00 kHz (CISPR)
5	1	15.105 MHz	38.803 dBµV	34.722 dBµV	---	-21.197 dB	-15.278 dB	---	9.00 kHz (CISPR)
6	1	15.417 MHz	38.085 dBµV	33.578 dBµV	---	-21.915 dB	-16.422 dB	---	9.00 kHz (CISPR)

Plot 7-249. Line Conducted Plot with 802.11a UNII Band 2C (N)

Line-Conducted Test Data

§15.407

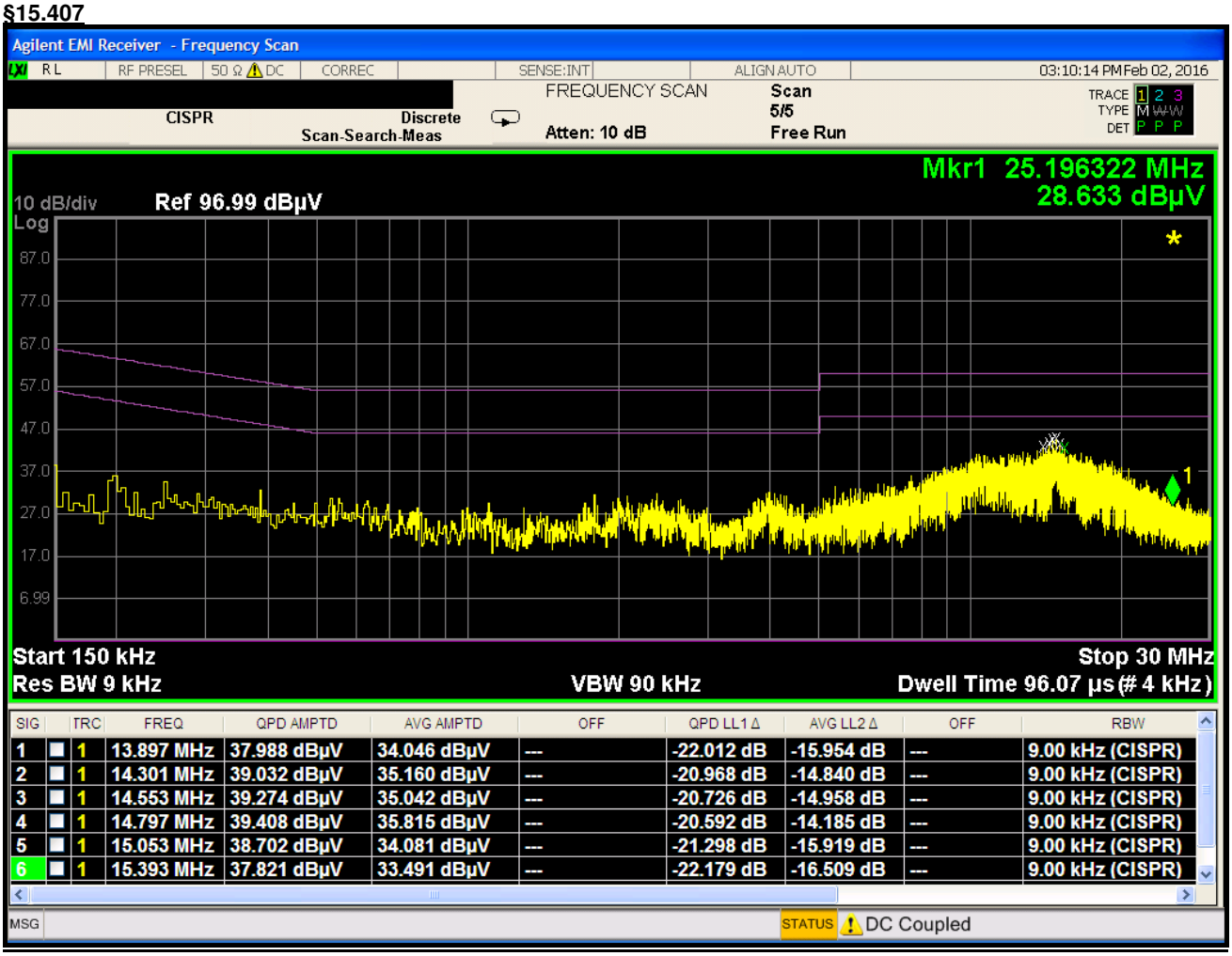


SIG	TRC	FREQ	QPD AMPTD	AVG AMPTD	OFF	QPD LL1 Δ	AVG LL2 Δ	OFF	RBW
1	1	10.205 MHz	36.518 dBµV	31.630 dBµV	---	-23.482 dB	-18.370 dB	---	9.00 kHz (CISPR)
2	1	10.625 MHz	36.332 dBµV	32.099 dBµV	---	-23.668 dB	-17.901 dB	---	9.00 kHz (CISPR)
3	1	10.857 MHz	36.220 dBµV	32.027 dBµV	---	-23.780 dB	-17.973 dB	---	9.00 kHz (CISPR)
4	1	14.337 MHz	36.542 dBµV	31.947 dBµV	---	-23.458 dB	-18.053 dB	---	9.00 kHz (CISPR)
5	1	14.609 MHz	36.188 dBµV	32.243 dBµV	---	-23.812 dB	-17.757 dB	---	9.00 kHz (CISPR)
6	1	15.017 MHz	36.182 dBµV	32.210 dBµV	---	-23.818 dB	-17.790 dB	---	9.00 kHz (CISPR)

Plot 7-250. Line Conducted Plot with 802.11a UNII Band 3 (L1)

Line-Conducted Test Data

§15.407



SIG		TRC	FREQ	QPD AMPTD	AVG AMPTD	OFF	QPD LL1 Δ	AVG LL2 Δ	OFF	RBW
1		1	13.897 MHz	37.988 dBµV	34.046 dBµV	---	-22.012 dB	-15.954 dB	---	9.00 kHz (CISPR)
2		1	14.301 MHz	39.032 dBµV	35.160 dBµV	---	-20.968 dB	-14.840 dB	---	9.00 kHz (CISPR)
3		1	14.553 MHz	39.274 dBµV	35.042 dBµV	---	-20.726 dB	-14.958 dB	---	9.00 kHz (CISPR)
4		1	14.797 MHz	39.408 dBµV	35.815 dBµV	---	-20.592 dB	-14.185 dB	---	9.00 kHz (CISPR)
5		1	15.053 MHz	38.702 dBµV	34.081 dBµV	---	-21.298 dB	-15.919 dB	---	9.00 kHz (CISPR)
6		1	15.393 MHz	37.821 dBµV	33.491 dBµV	---	-22.179 dB	-16.509 dB	---	9.00 kHz (CISPR)

Plot 7-251. Line Conducted Plot with 802.11a UNII Band 3 (N)

8.0 CONCLUSION

The data collected relate only the item(s) tested and show that the **LG Portable Handset FCC ID: ZNFH830** is in compliance with Part 15E of the FCC Rules.