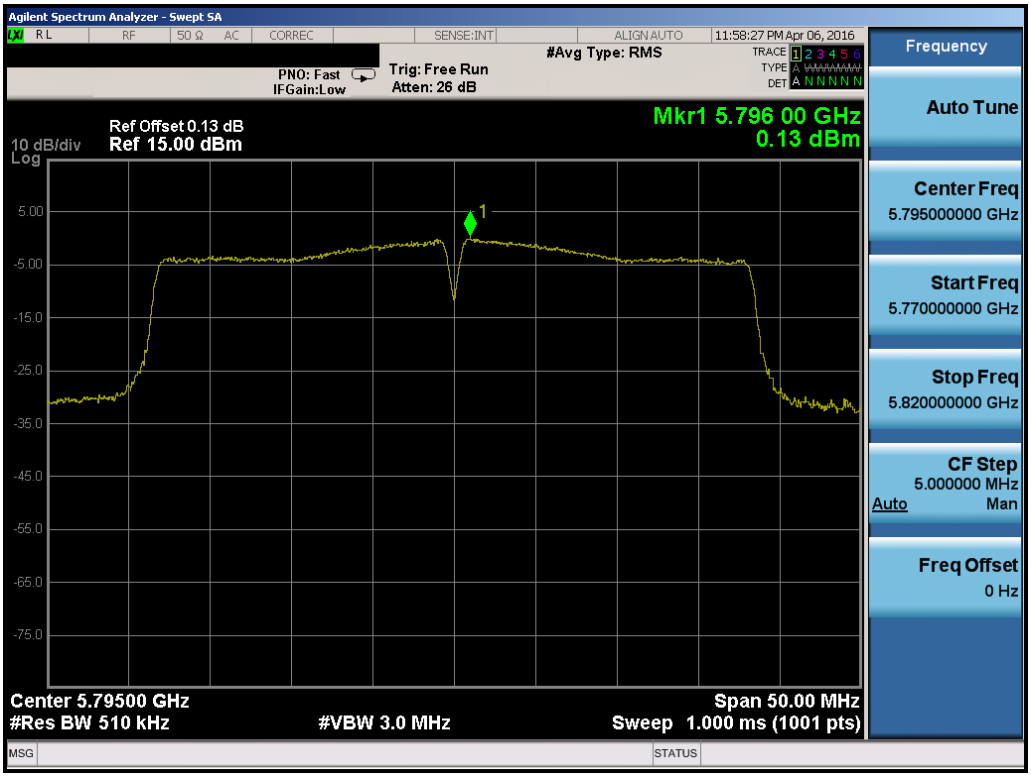
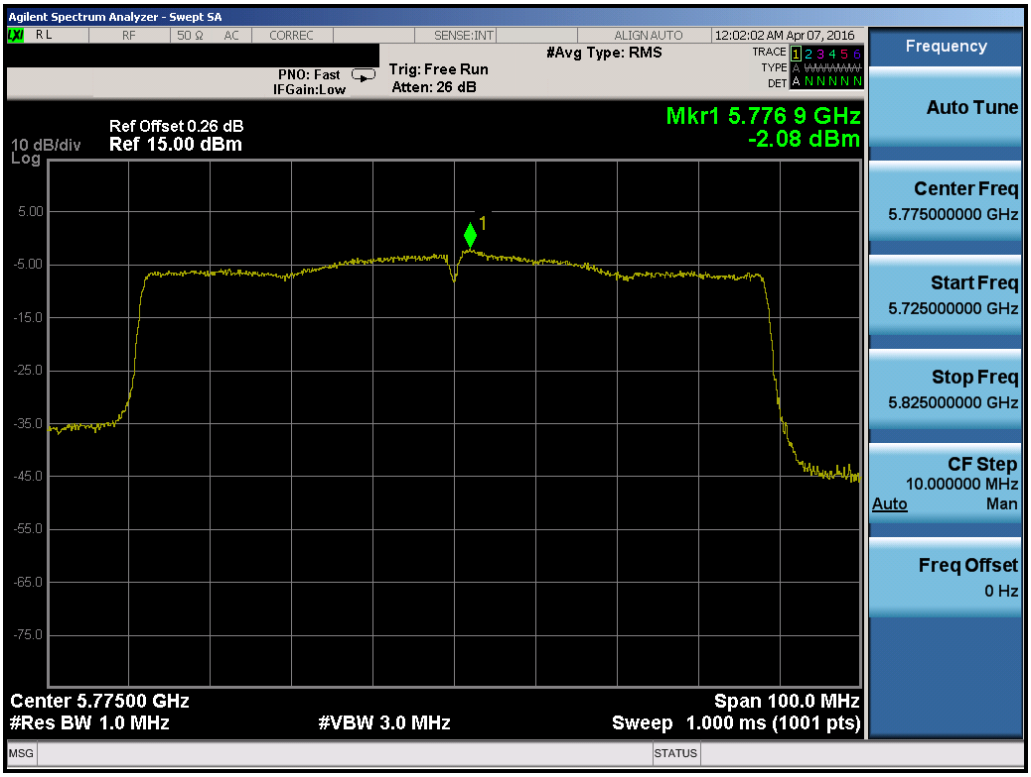


Plot 7-116. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 3) – Ch. 159)



Plot 7-117. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 3) – Ch. 155)

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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	7.17	11.0	-3.83	Pass
	5200	40	a	6	7.50	11.0	-3.50	Pass
	5240	48	a	6	7.06	11.0	-3.94	Pass
	5180	36	n (20MHz)	6.5/7.2 (MCS0)	6.72	11.0	-4.28	Pass
	5200	40	n (20MHz)	6.5/7.2 (MCS0)	7.03	11.0	-3.97	Pass
	5240	48	n (20MHz)	6.5/7.2 (MCS0)	6.87	11.0	-4.13	Pass
	5190	38	n (40MHz)	13.5/15 (MCS0)	2.39	11.0	-8.61	Pass
	5230	46	n (40MHz)	13.5/15 (MCS0)	2.36	11.0	-8.65	Pass
	5210	42	ac (80MHz)	29.3/32.5 (MCS0)	-1.39	11.0	-12.39	Pass
Band 2A	5260	52	a	6	8.03	11.0	-2.97	Pass
	5280	56	a	6	8.09	11.0	-2.91	Pass
	5320	64	a	6	7.88	11.0	-3.12	Pass
	5260	52	n (20MHz)	6.5/7.2 (MCS0)	6.00	11.0	-5.00	Pass
	5280	56	n (20MHz)	6.5/7.2 (MCS0)	5.79	11.0	-5.21	Pass
	5320	64	n (20MHz)	6.5/7.2 (MCS0)	6.06	11.0	-4.94	Pass
	5270	54	n (40MHz)	13.5/15 (MCS0)	2.08	11.0	-8.92	Pass
	5310	62	n (40MHz)	13.5/15 (MCS0)	1.93	11.0	-9.07	Pass
	5290	58	ac (80MHz)	29.3/32.5 (MCS0)	-1.81	11.0	-12.81	Pass
Band 2C	5500	100	a	6	8.16	11.0	-2.84	Pass
	5600	120	a	6	8.46	11.0	-2.54	Pass
	5720	144	a	6	8.47	11.0	-2.53	Pass
	5500	100	n (20MHz)	6.5/7.2 (MCS0)	5.98	11.0	-5.03	Pass
	5600	120	n (20MHz)	6.5/7.2 (MCS0)	5.83	11.0	-5.17	Pass
	5720	144	n (20MHz)	6.5/7.2 (MCS0)	6.19	11.0	-4.81	Pass
	5510	102	n (40MHz)	13.5/15 (MCS0)	2.33	11.0	-8.67	Pass
	5590	118	n (40MHz)	13.5/15 (MCS0)	2.03	11.0	-8.97	Pass
	5710	142	n (40MHz)	13.5/15 (MCS0)	2.90	11.0	-8.10	Pass
	5530	106	ac (80MHz)	29.3/32.5 (MCS0)	-2.04	11.0	-13.04	Pass
	5610	122	ac (80MHz)	29.3/32.5 (MCS0)	-1.33	11.0	-12.33	Pass
	5690	138	ac (80MHz)	29.3/32.5 (MCS0)	-4.47	11.0	-15.47	Pass

Table 7-19. Conducted Power Spectral Density Measurements

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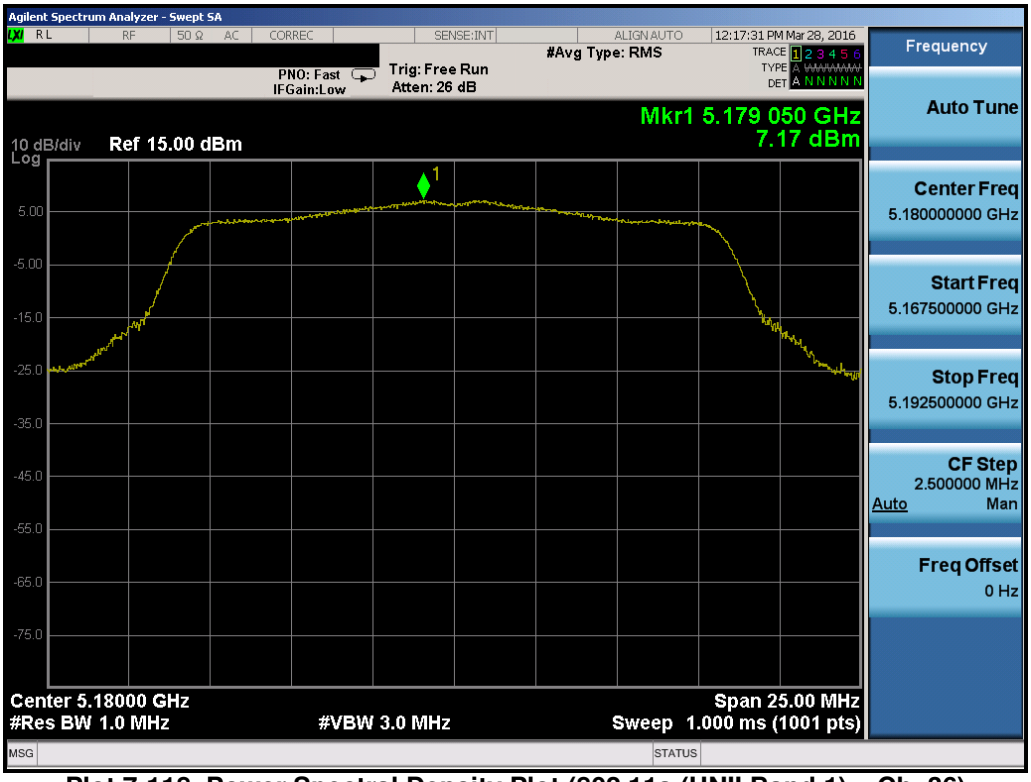
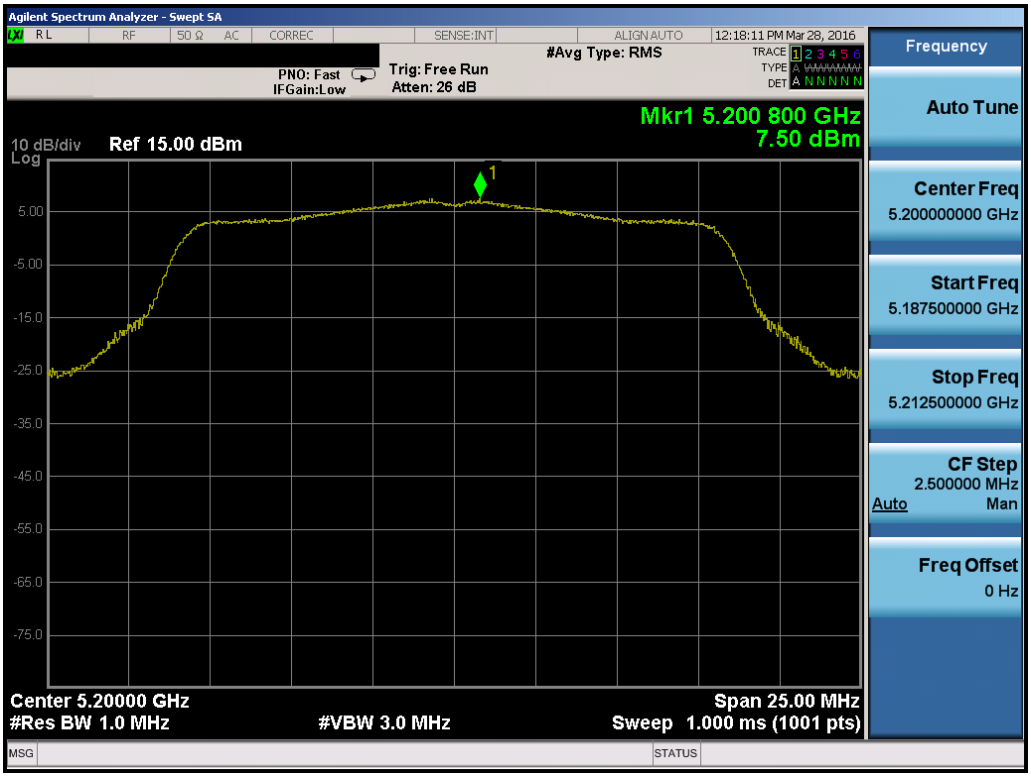


Plot 7-118. Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 36)



Plot 7-119. Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 40)

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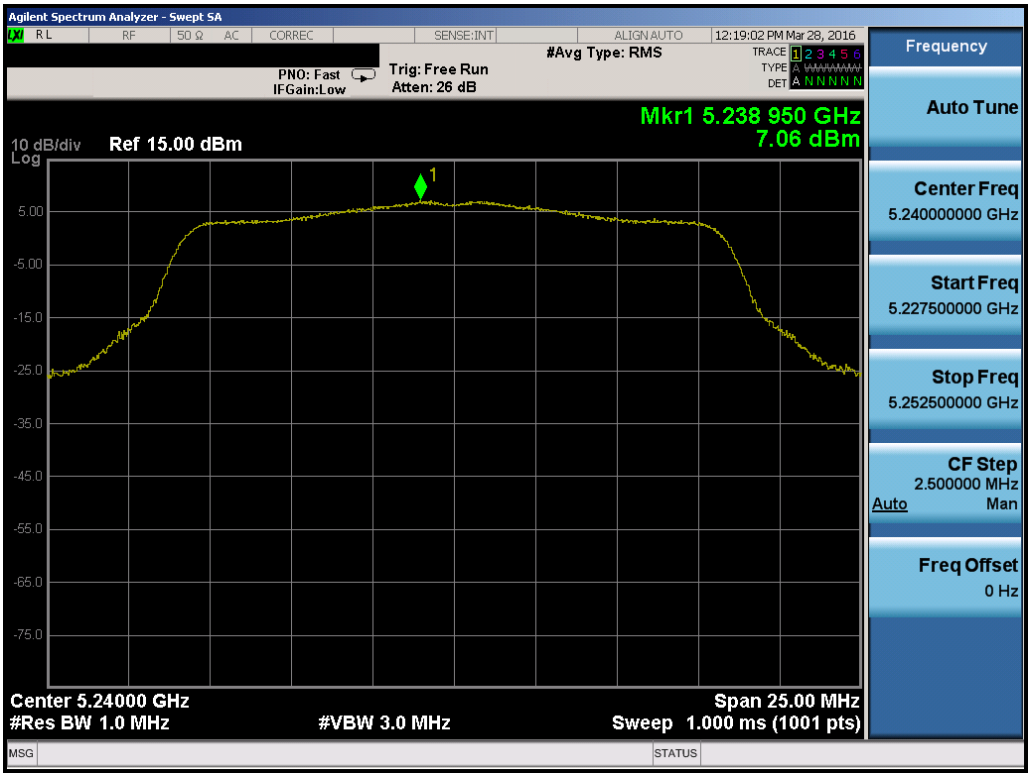
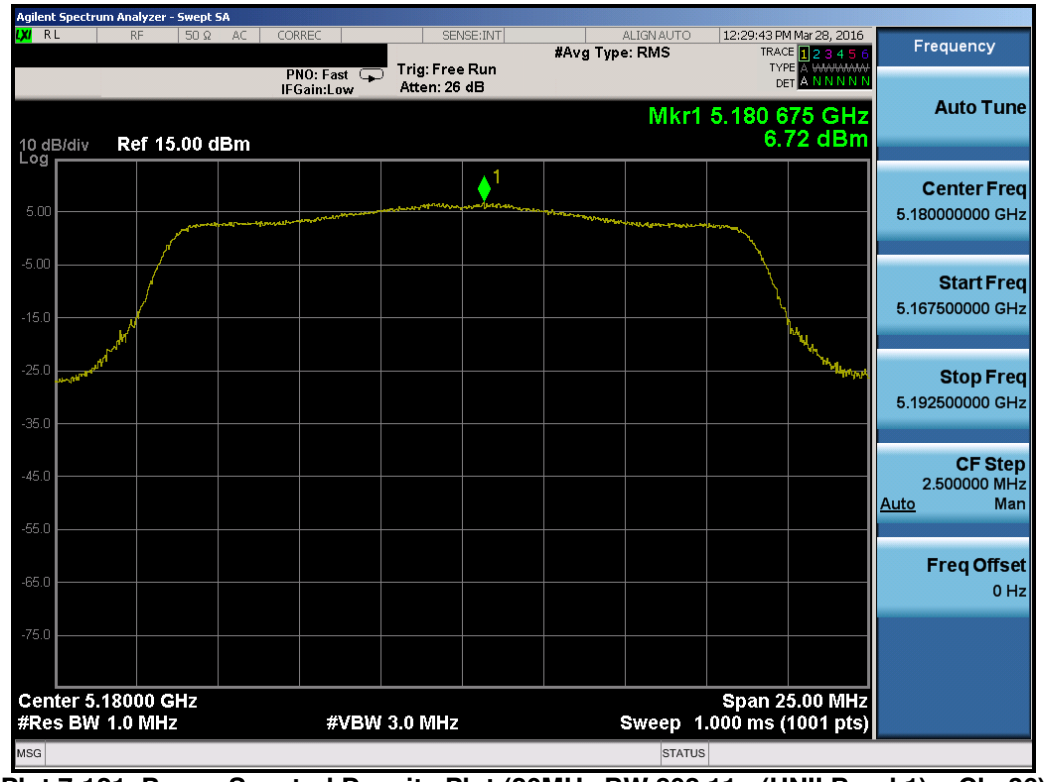


Plot 7-120. Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 48)



Plot 7-121. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 36)

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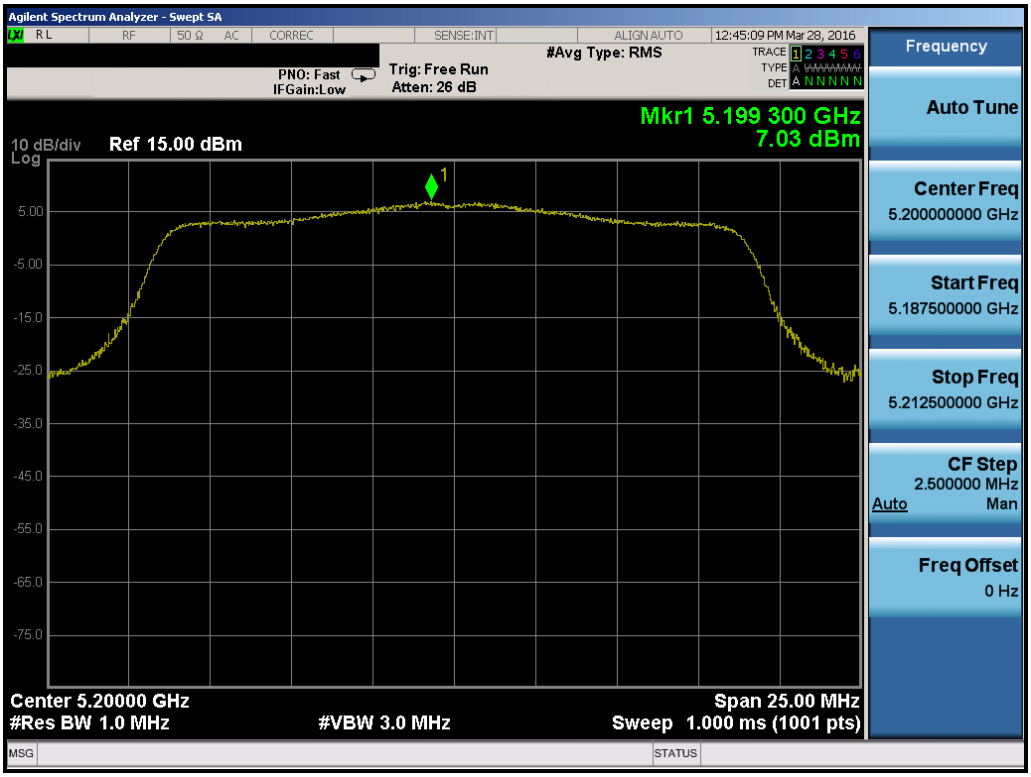
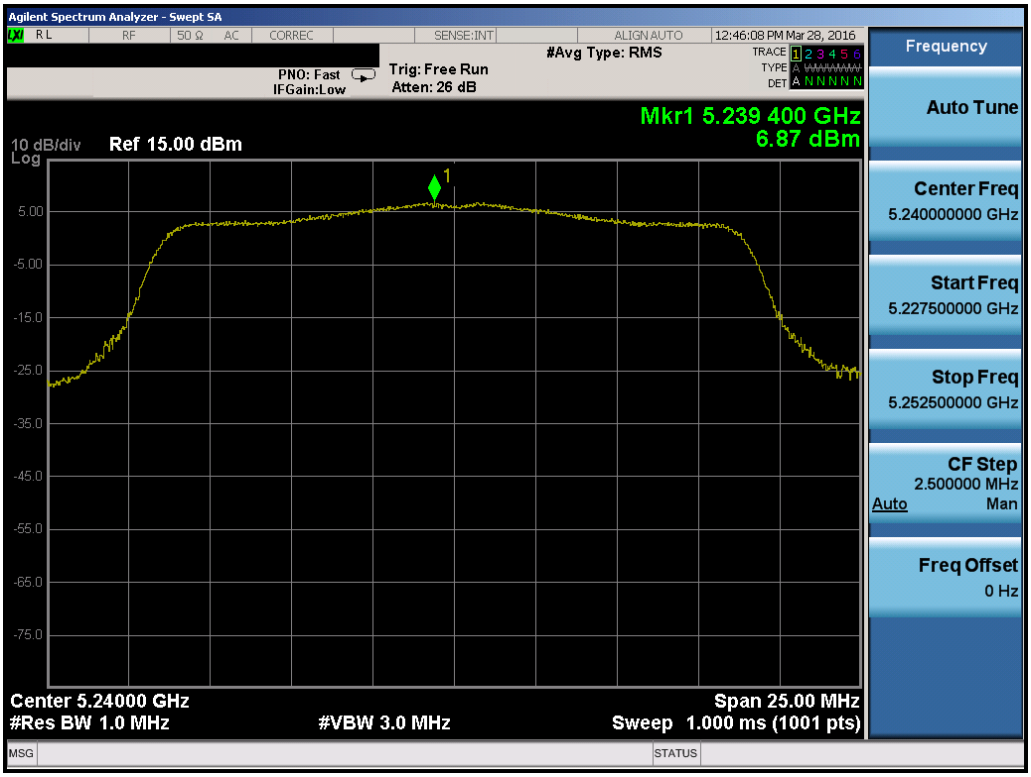


Plot 7-122. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 40)



Plot 7-123. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 48)

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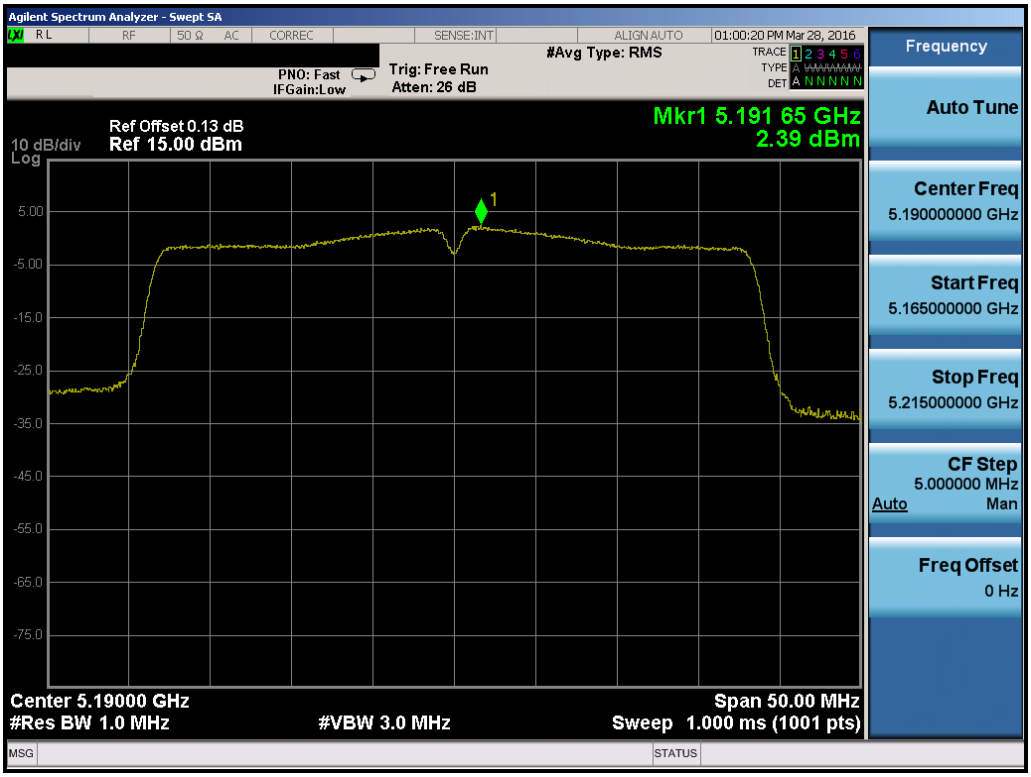
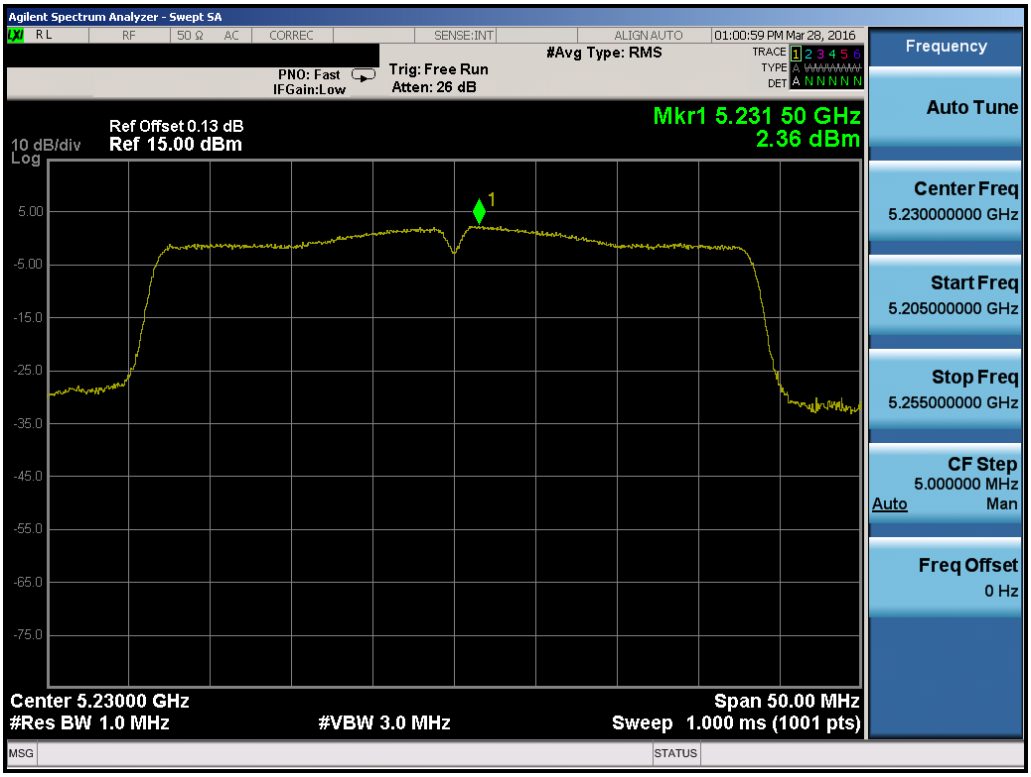


Plot 7-124. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 1) – Ch. 38)



Plot 7-125. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 1) – Ch. 46)

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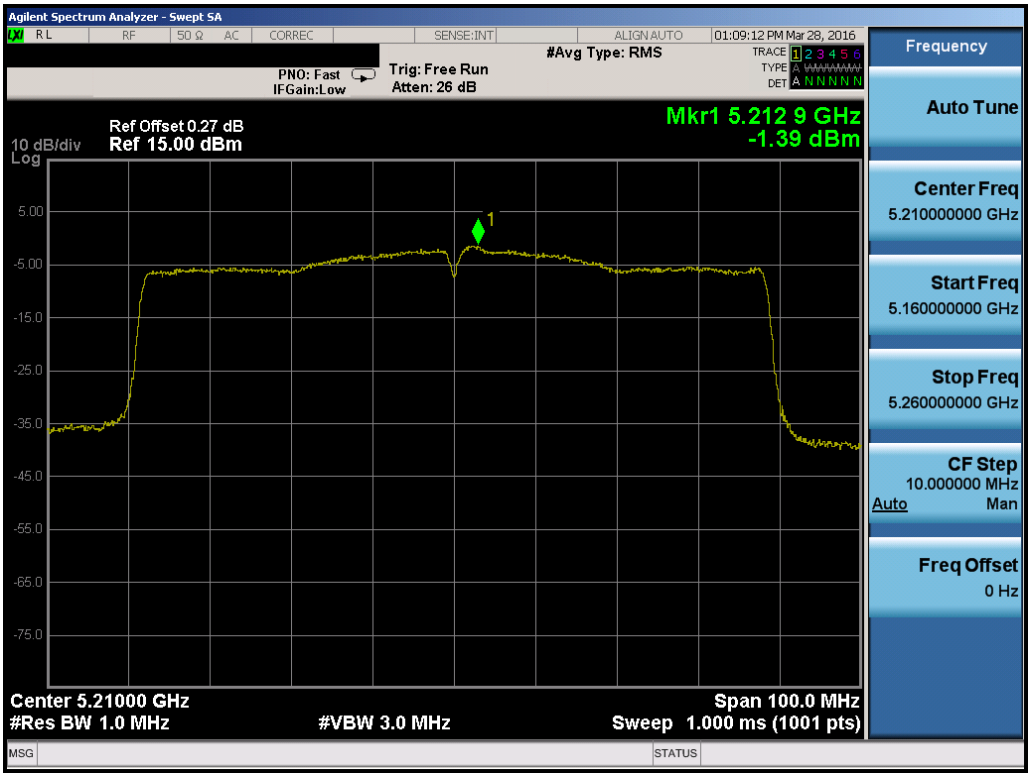
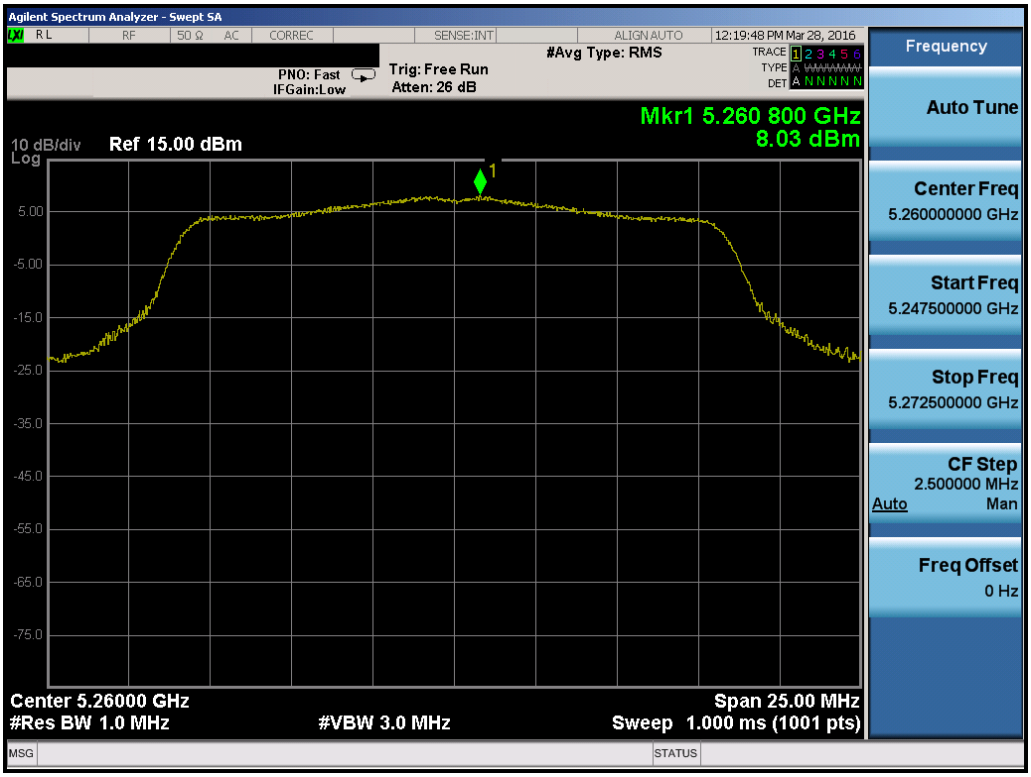


Plot 7-126. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 1) – Ch. 42)



Plot 7-127. Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 52)

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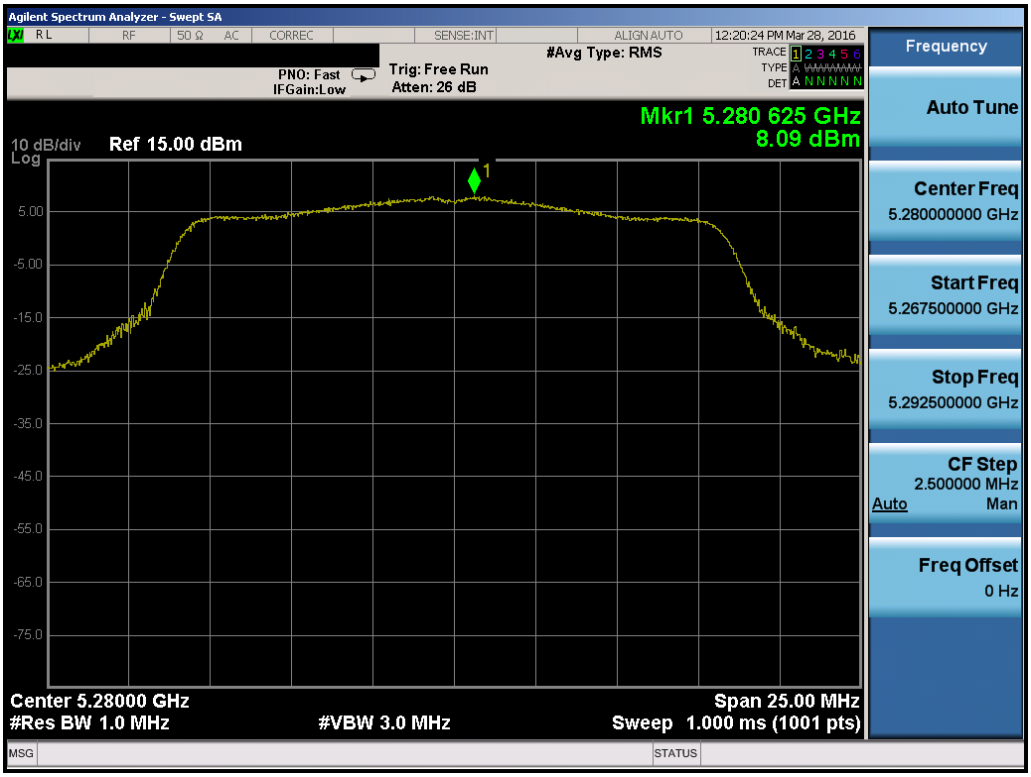
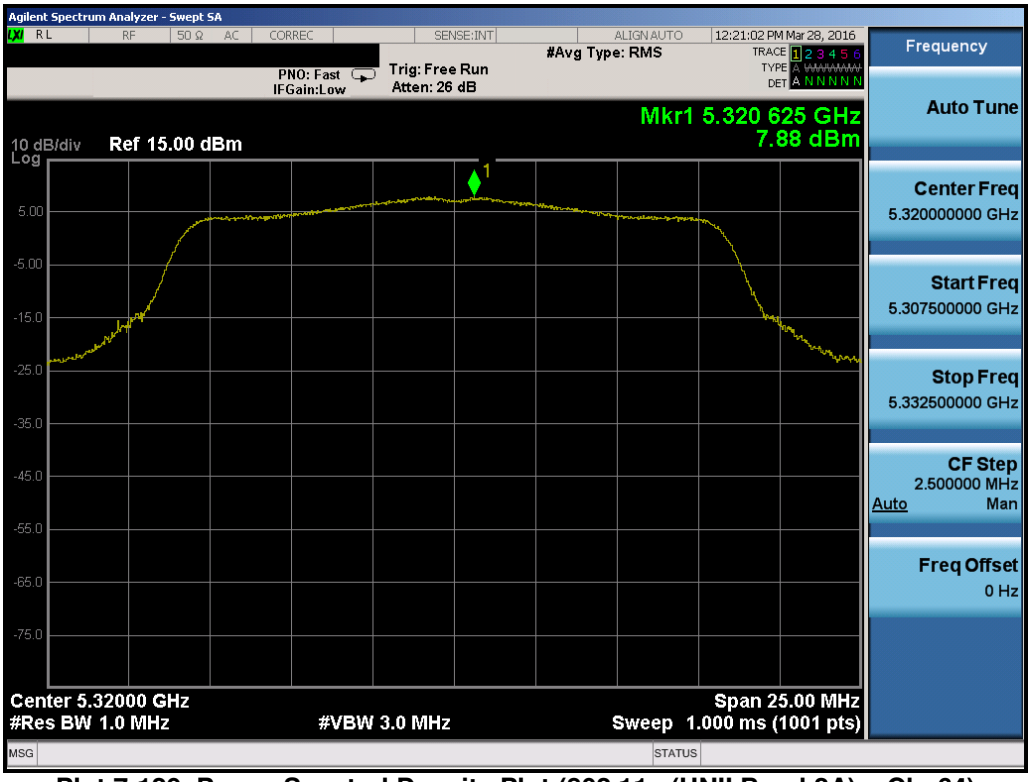


Plot 7-128. Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 56)



Plot 7-129. Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 64)

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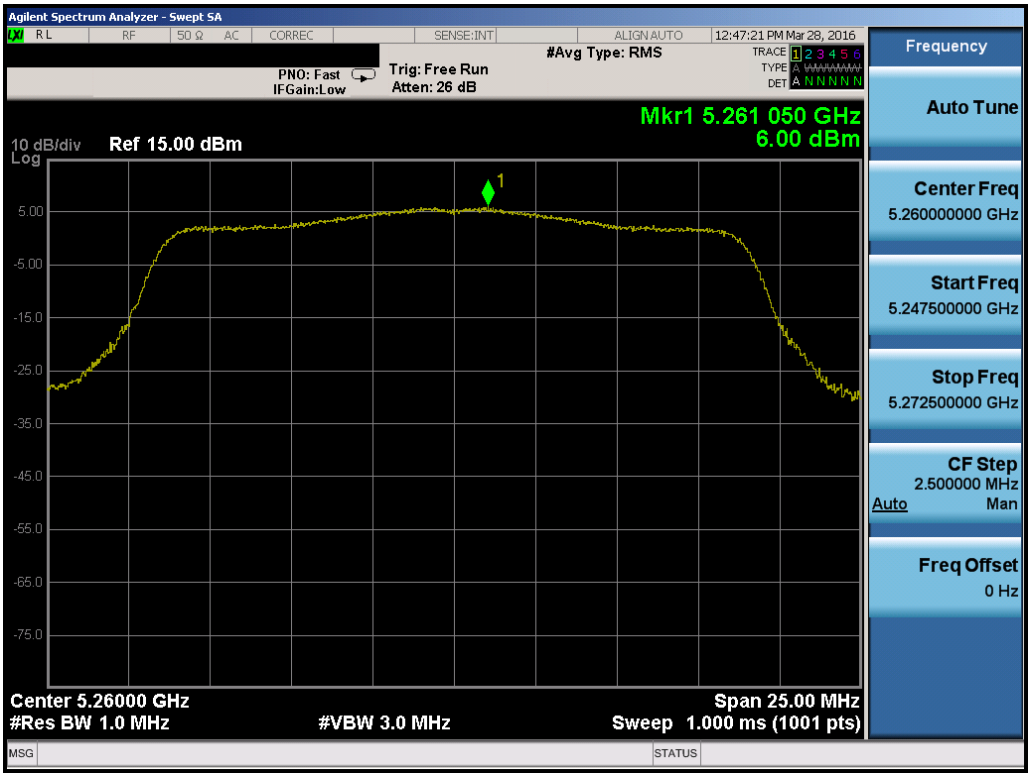
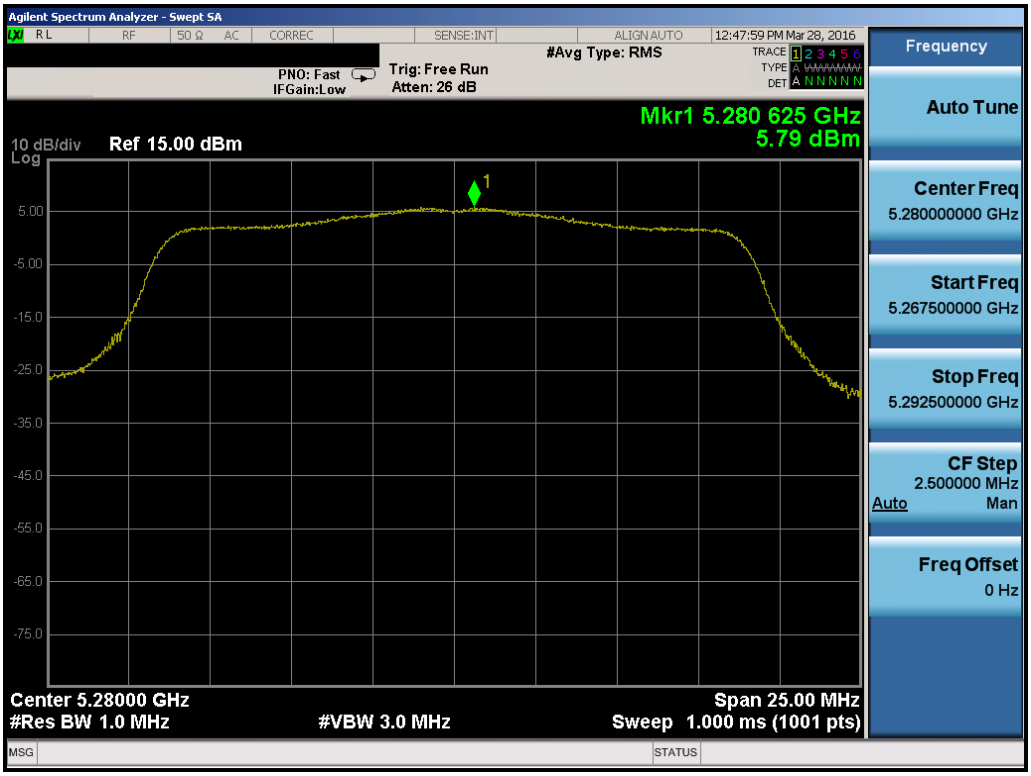


Plot 7-130. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 52)



Plot 7-131. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 56)

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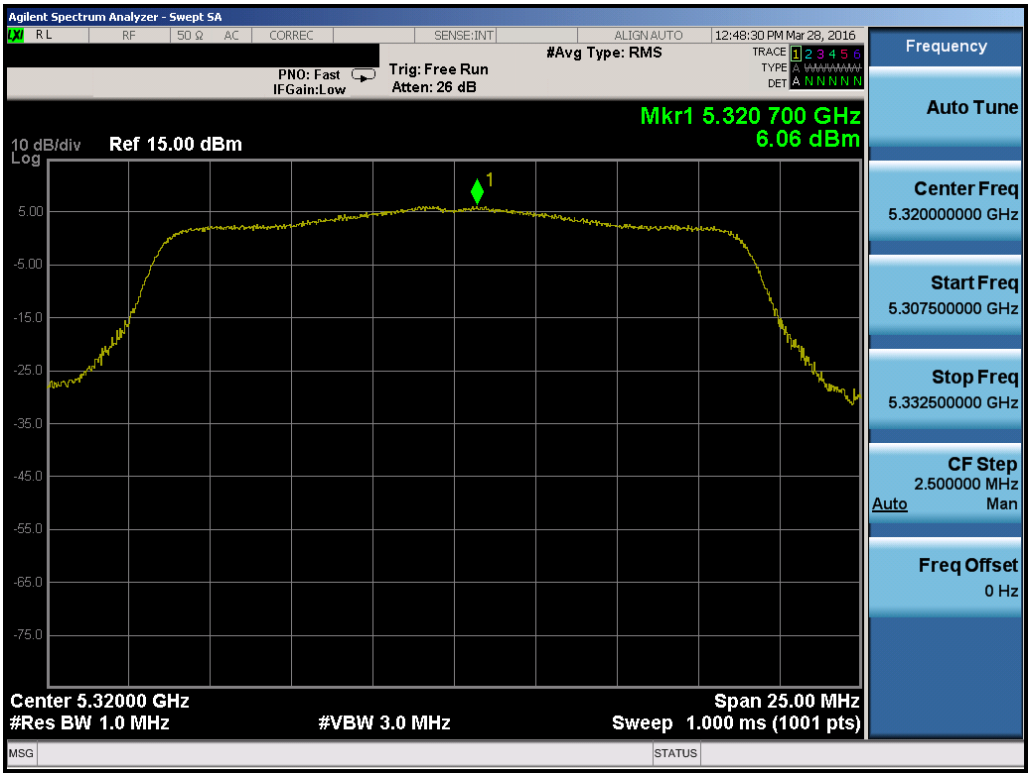
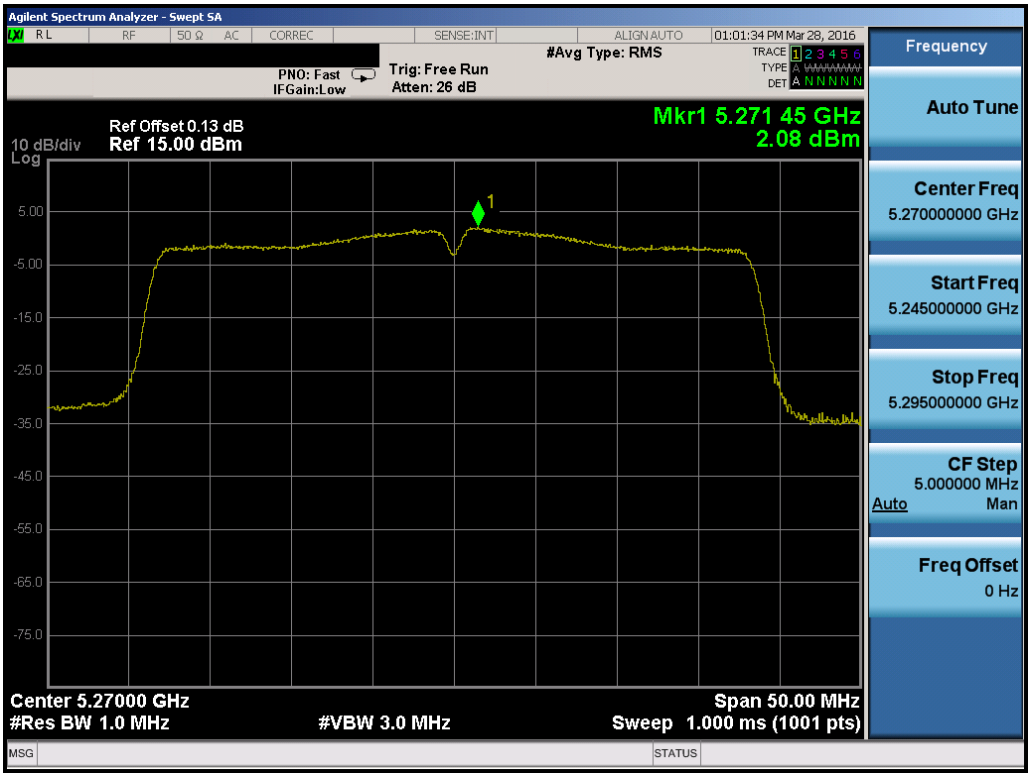


Plot 7-132. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 64)



Plot 7-133. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2A) – Ch. 54)

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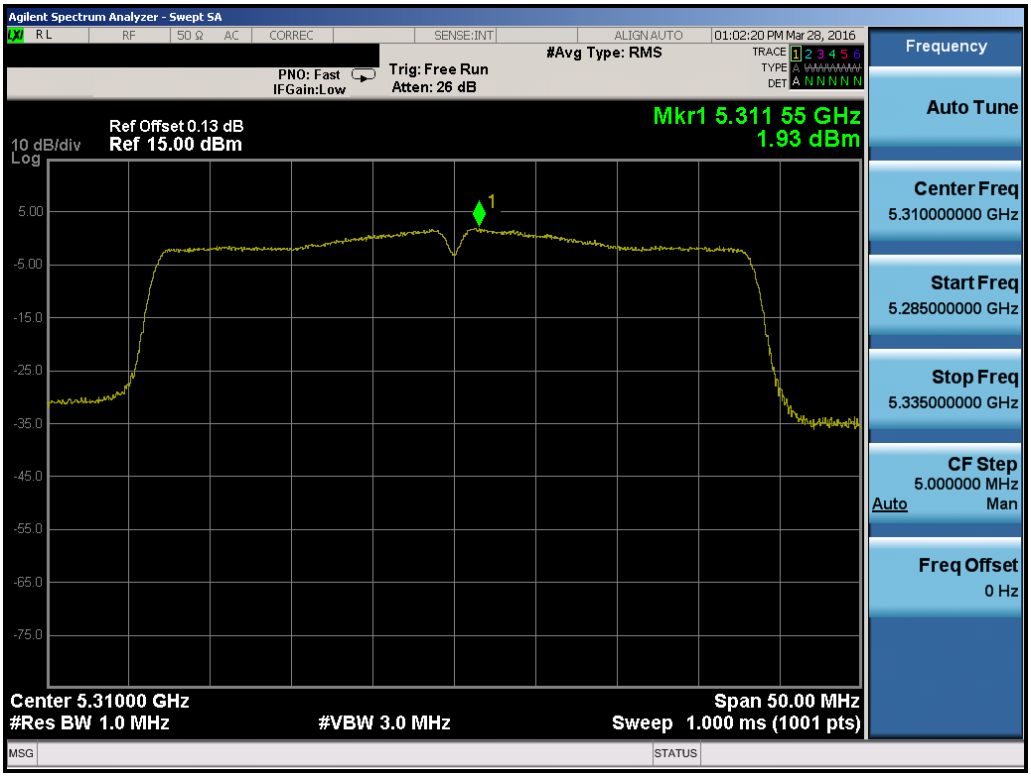
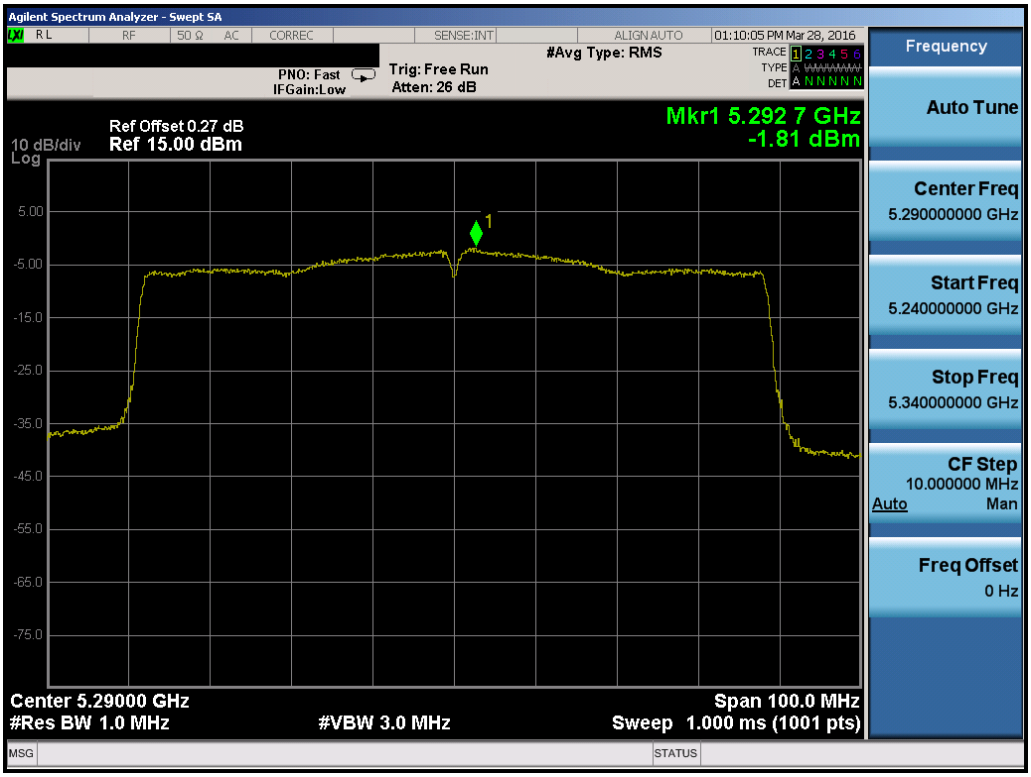


Plot 7-134. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2A) – Ch. 62)



Plot 7-135. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2A) – Ch. 58)

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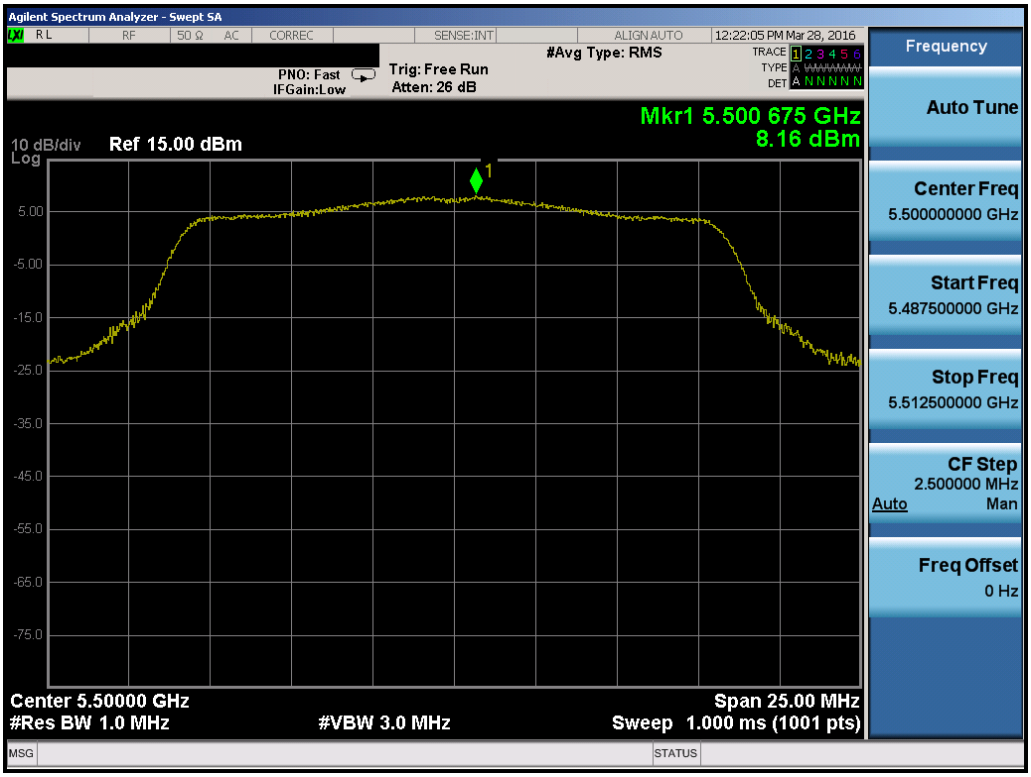
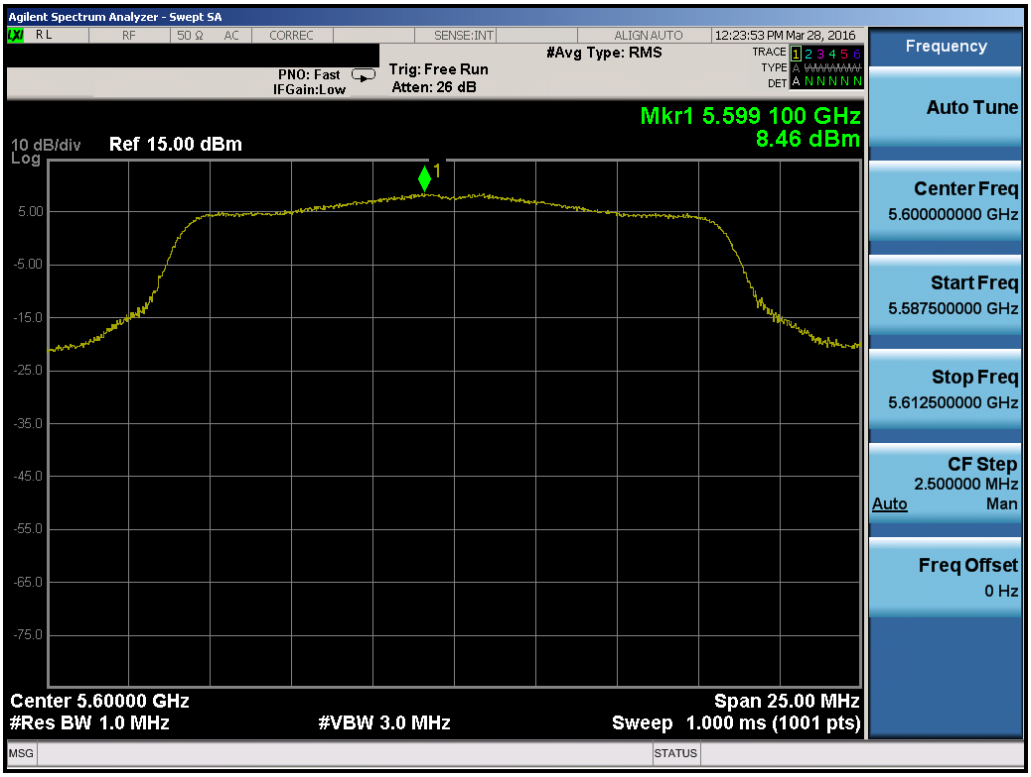


Plot 7-136. Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 100)



Plot 7-137. Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 120)

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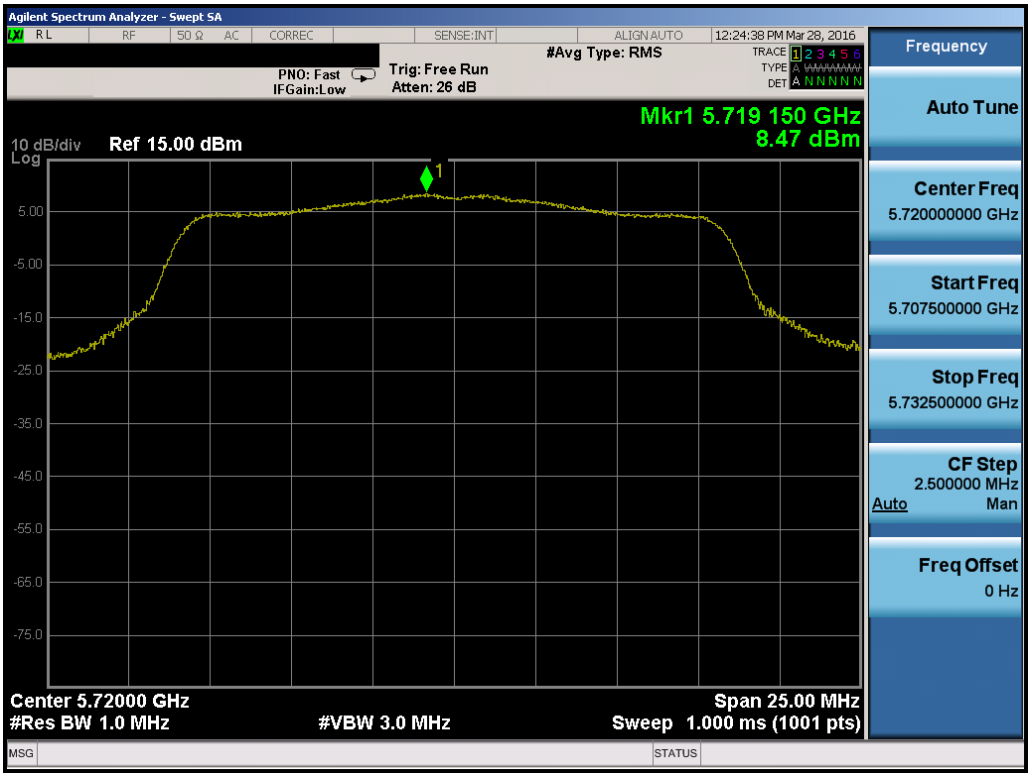
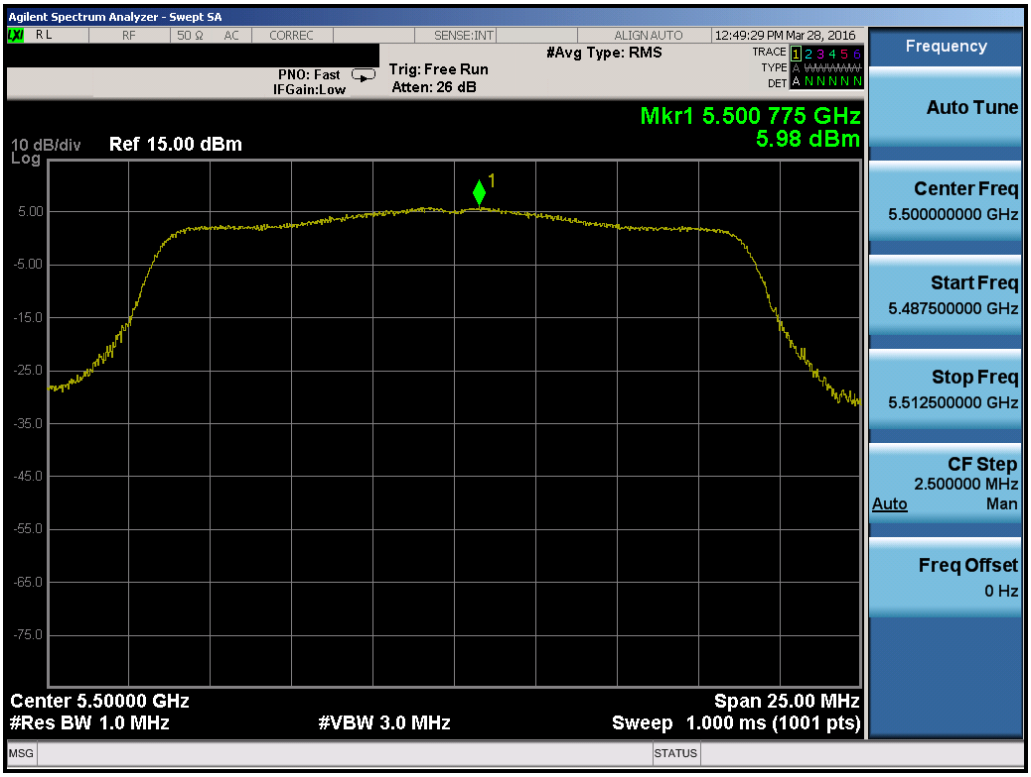


Plot 7-138. Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 144)



Plot 7-139. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 100)

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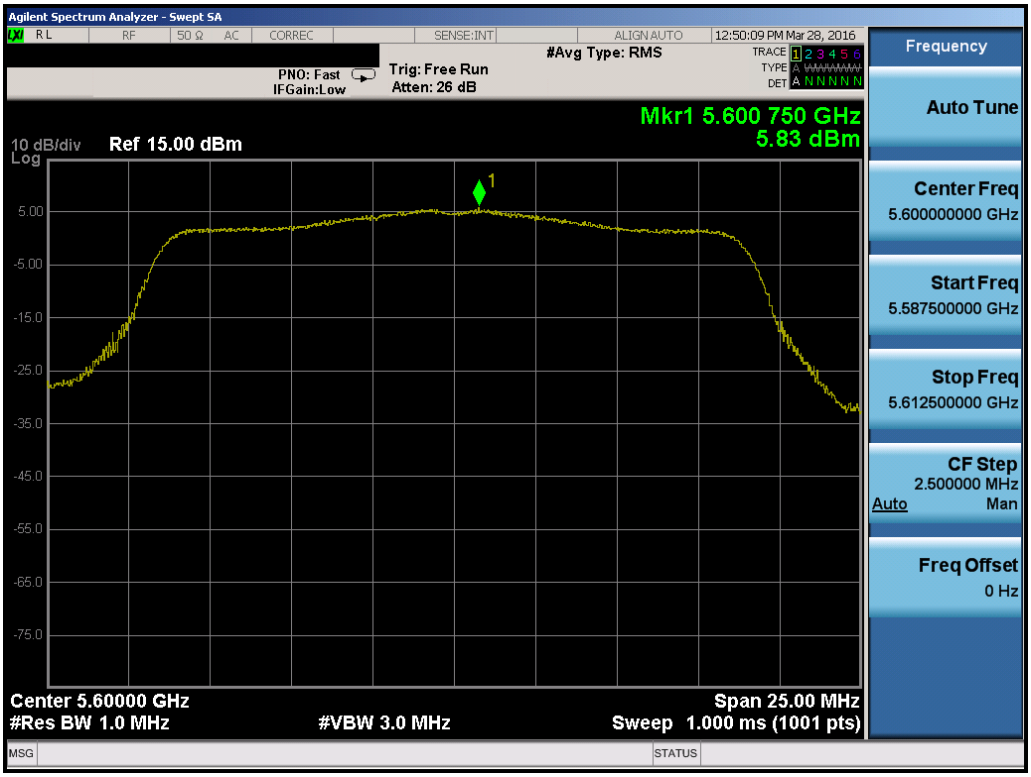
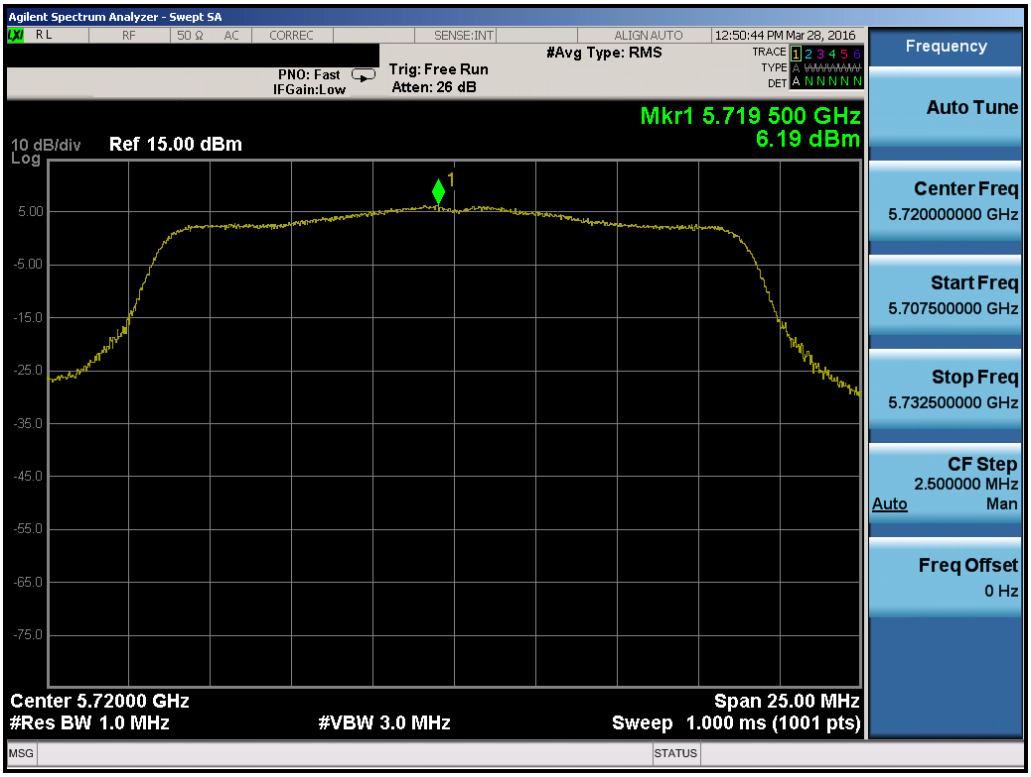


Plot 7-140. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 120)



Plot 7-141. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 144)

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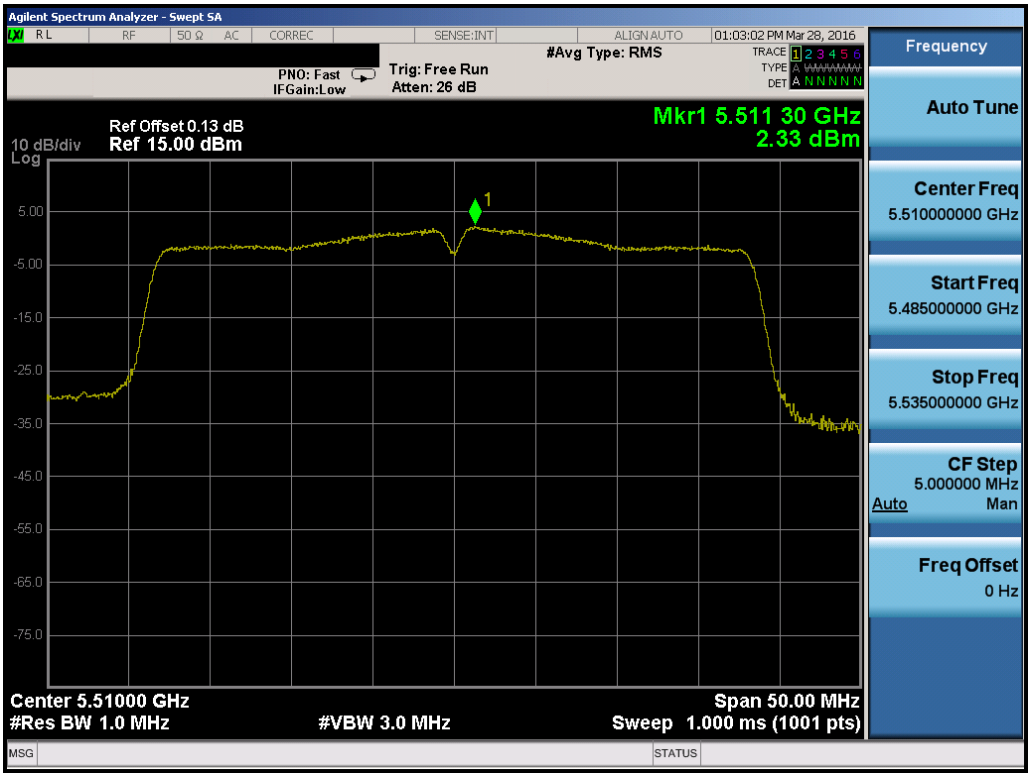
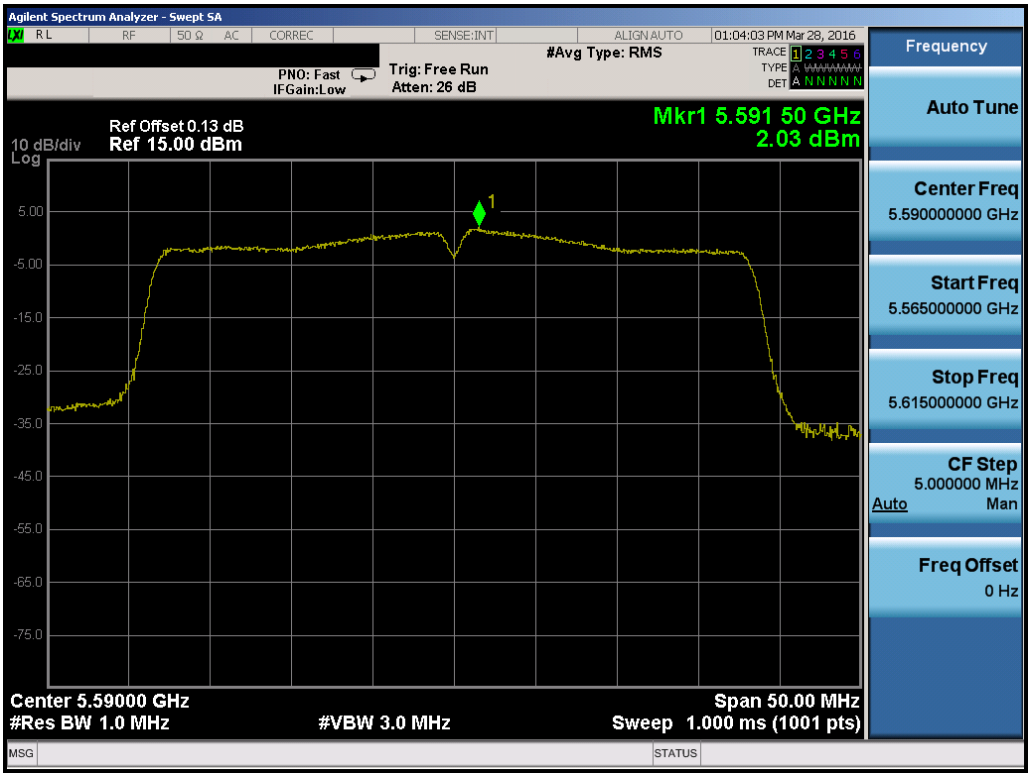


Plot 7-142. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 102)



Plot 7-143. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 118)

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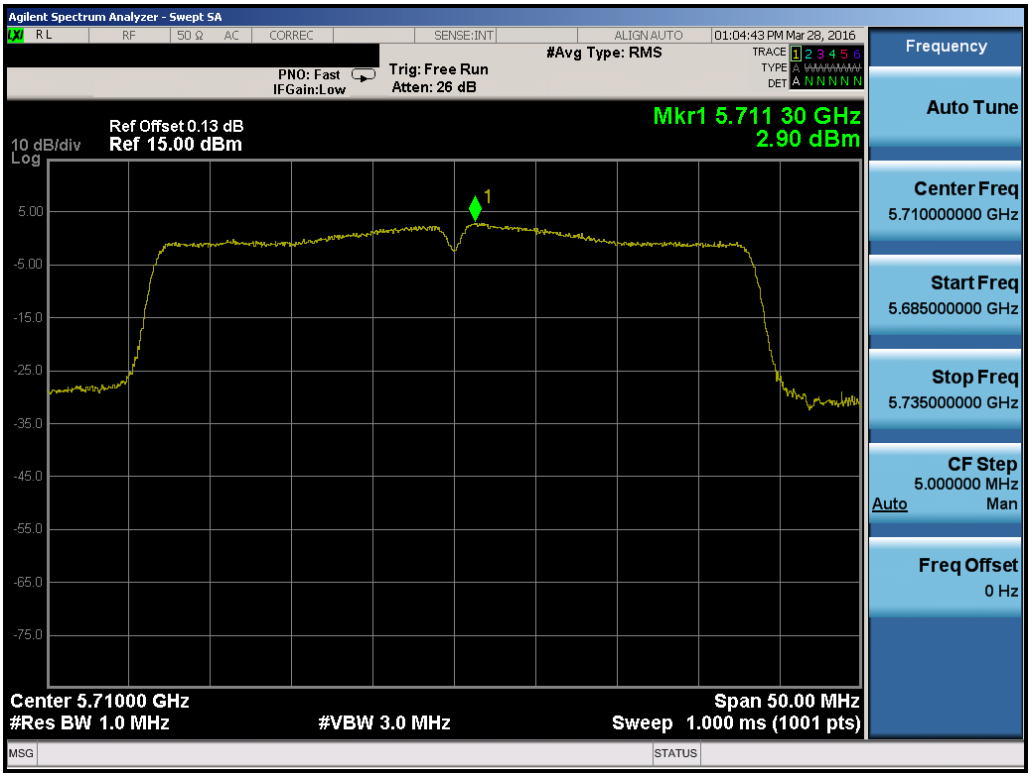
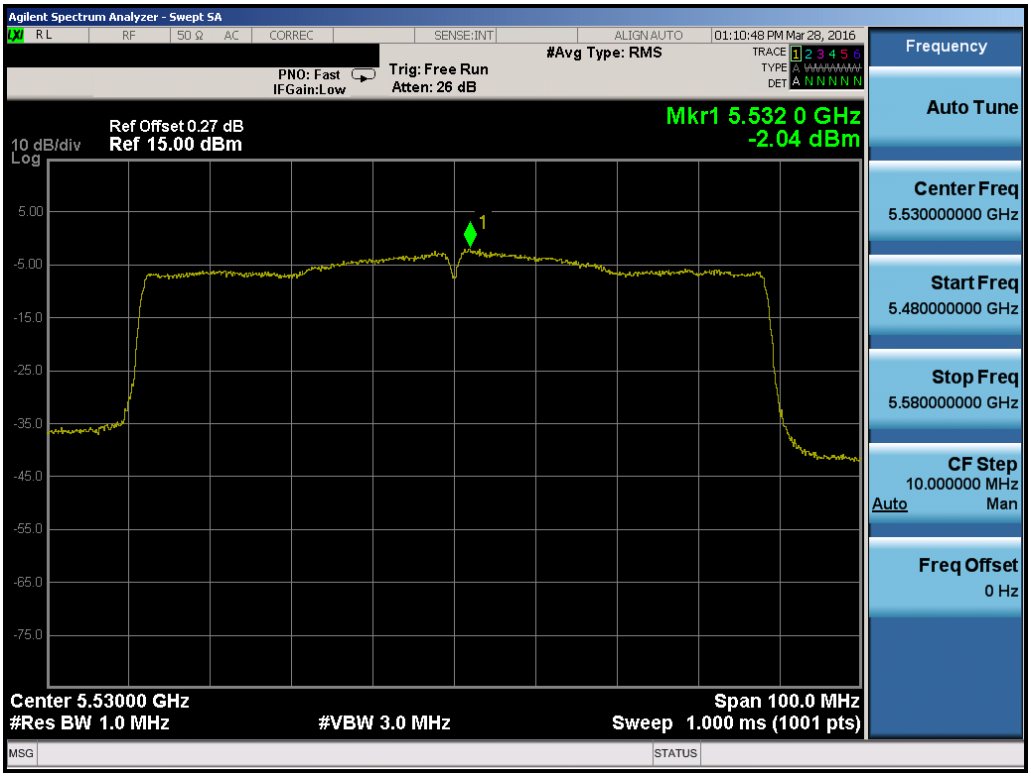


Plot 7-144. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 142)



Plot 7-145. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2C) – Ch. 106)

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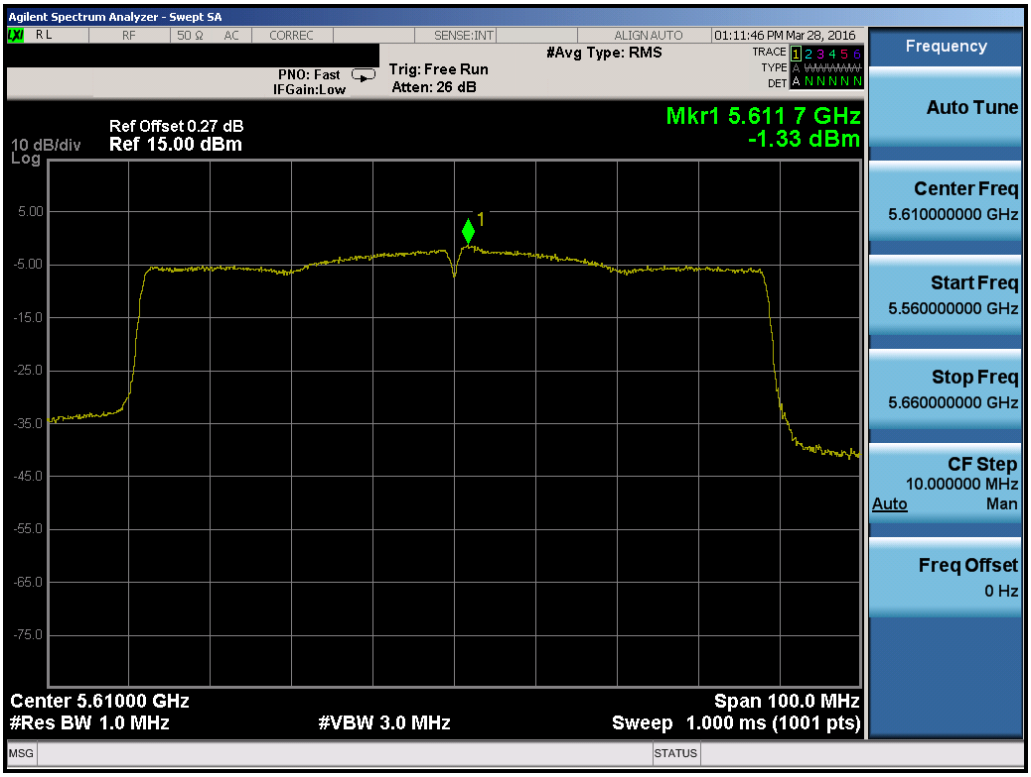
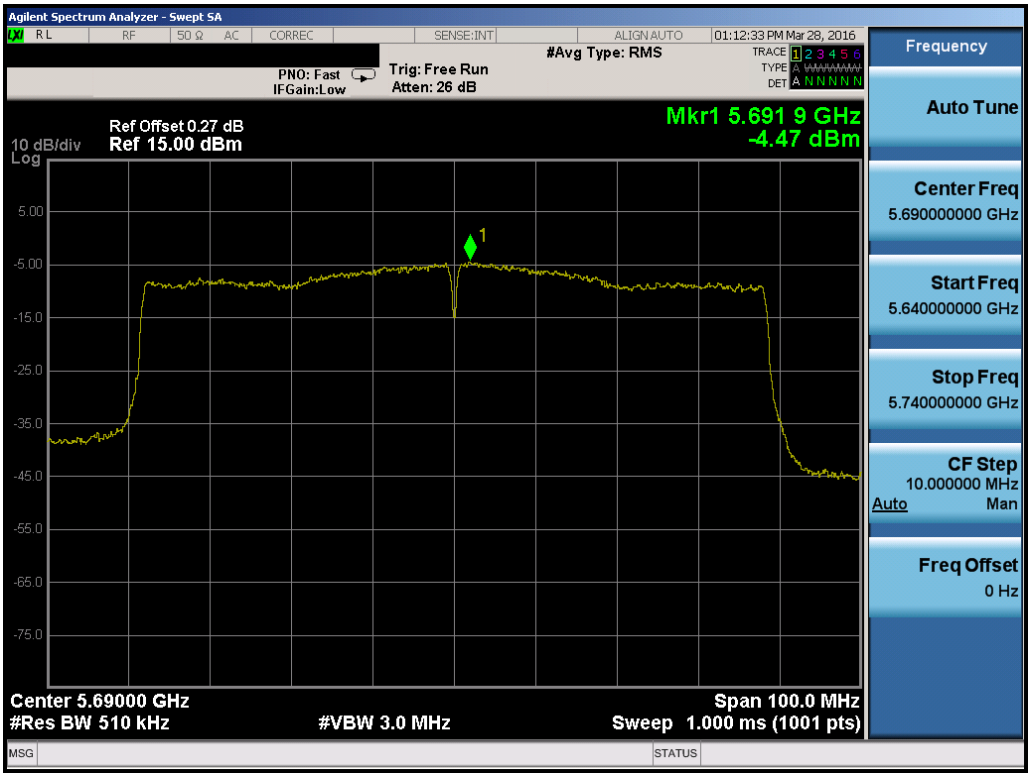


Plot 7-146. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2C) – Ch. 122)



Plot 7-147. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2C) – Ch. 138)

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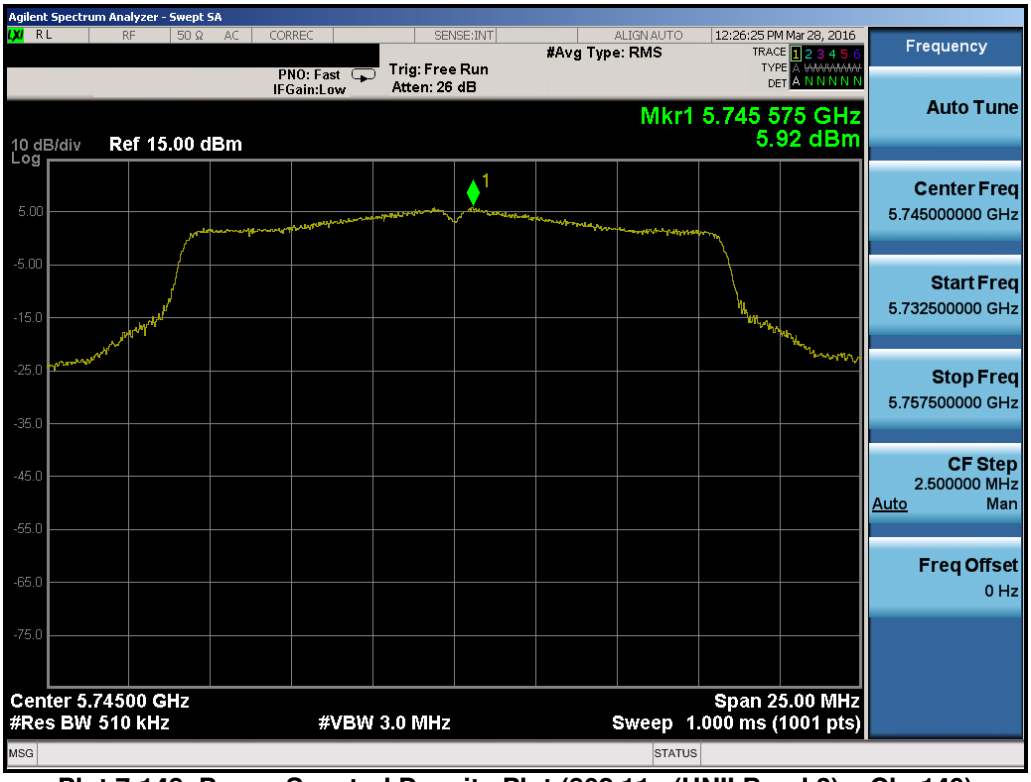
	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured Power Density [dBm]	Max Permissible Power Density [dBm/500kHz]	Margin [dB]	Pass / Fail
Band 3	5745	149	a	6	5.92	30.0	-24.08	Pass
	5785	157	a	6	5.78	30.0	-24.22	Pass
	5825	165	a	6	5.71	30.0	-24.29	Pass
	5745	149	n (20MHz)	6.5/7.2 (MCS0)	3.40	30.0	-26.60	Pass
	5785	157	n (20MHz)	6.5/7.2 (MCS0)	3.43	30.0	-26.57	Pass
	5825	165	n (20MHz)	6.5/7.2 (MCS0)	2.97	30.0	-27.03	Pass
	5755	151	n (40MHz)	13.5/15 (MCS0)	-0.50	30.0	-30.50	Pass
	5795	159	n (40MHz)	13.5/15 (MCS0)	-0.70	30.0	-30.70	Pass
	5775	155	ac (80MHz)	29.3/32.5 (MCS0)	-0.27	30.0	-30.27	Pass

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



Plot 7-148. Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 149)

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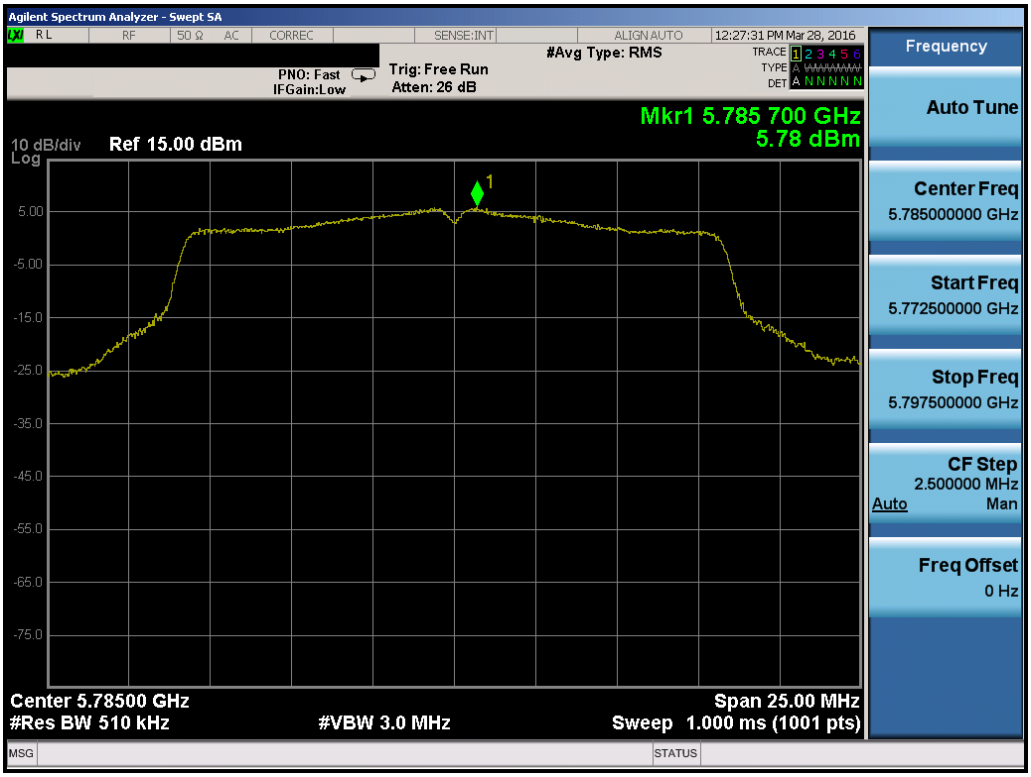
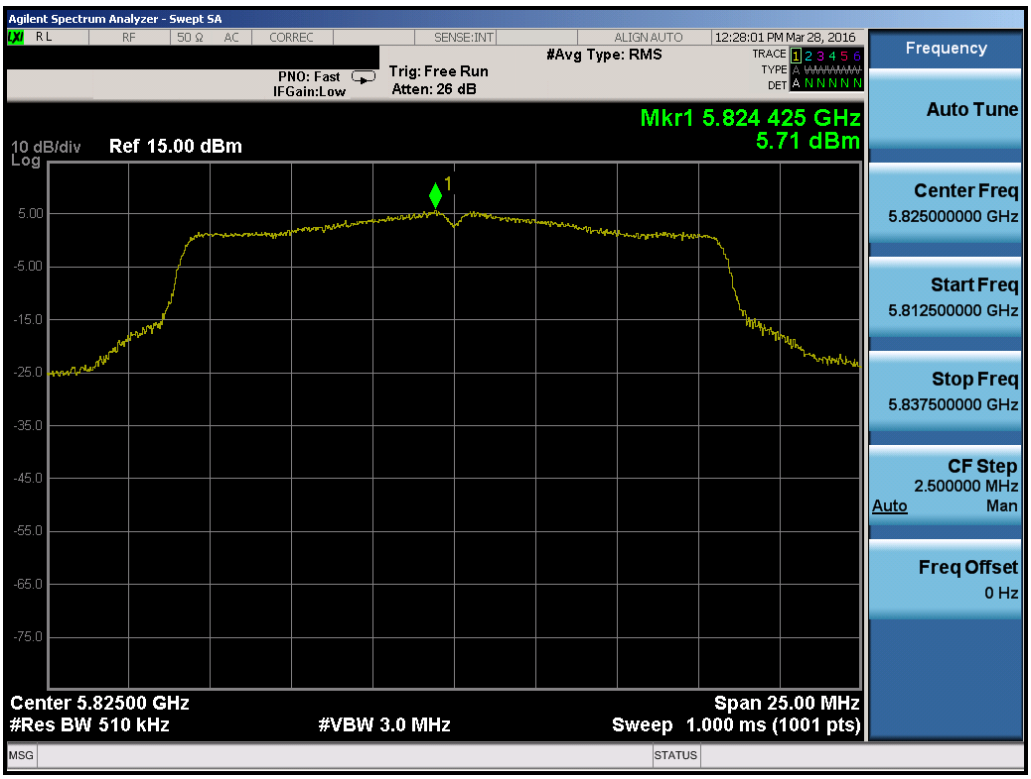


Plot 7-149. Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 157)



Plot 7-150. Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 165)

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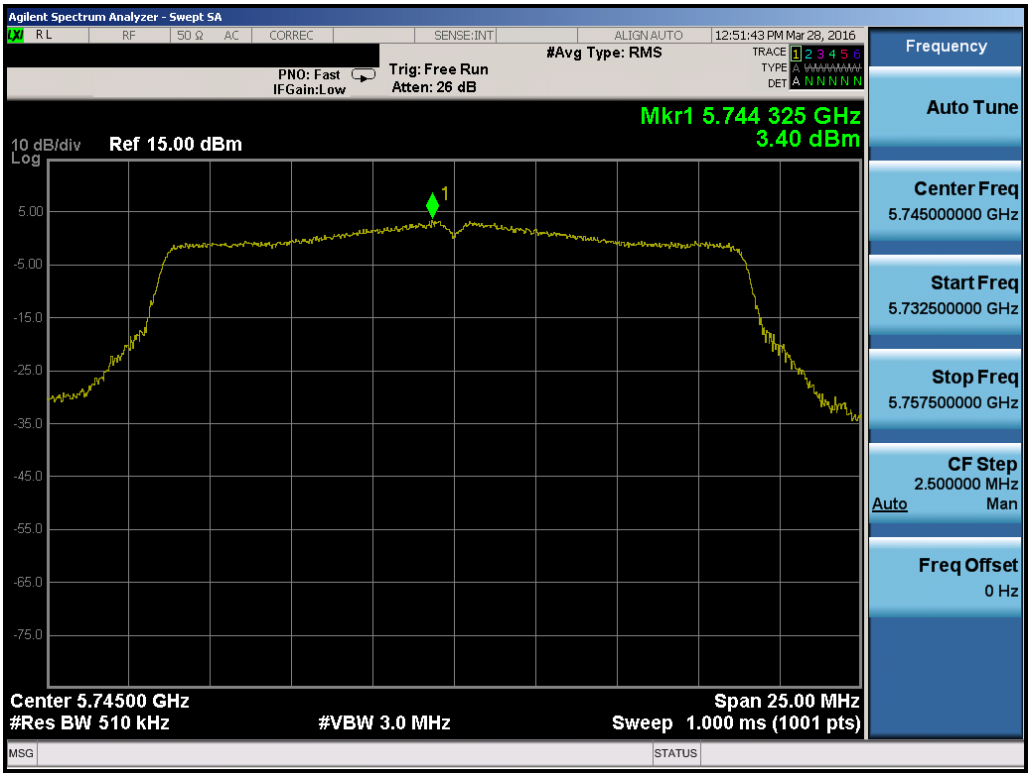
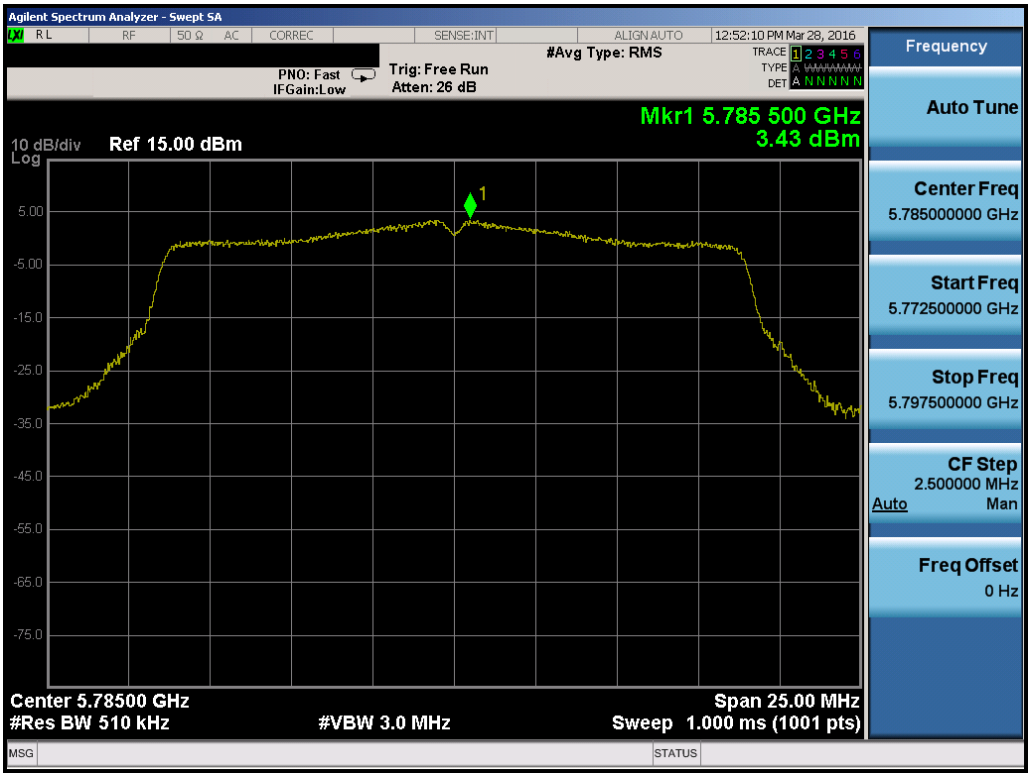


Plot 7-151. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 149)



Plot 7-152. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 157)

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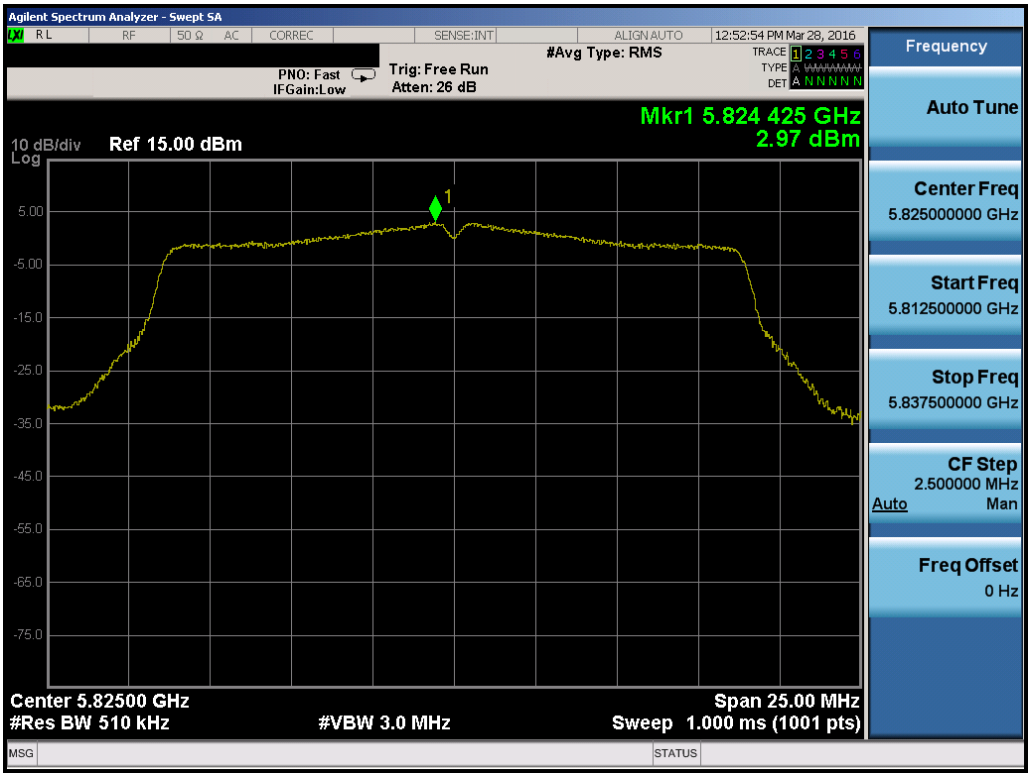
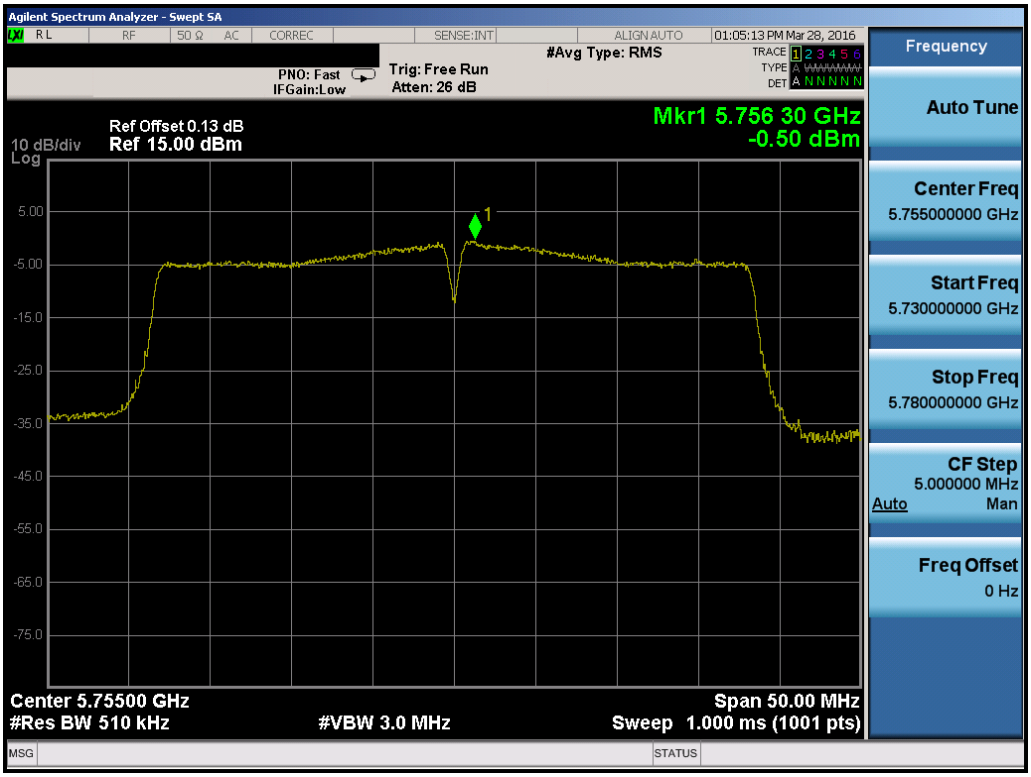


Plot 7-153. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 165)



Plot 7-154. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 3) – Ch. 151)

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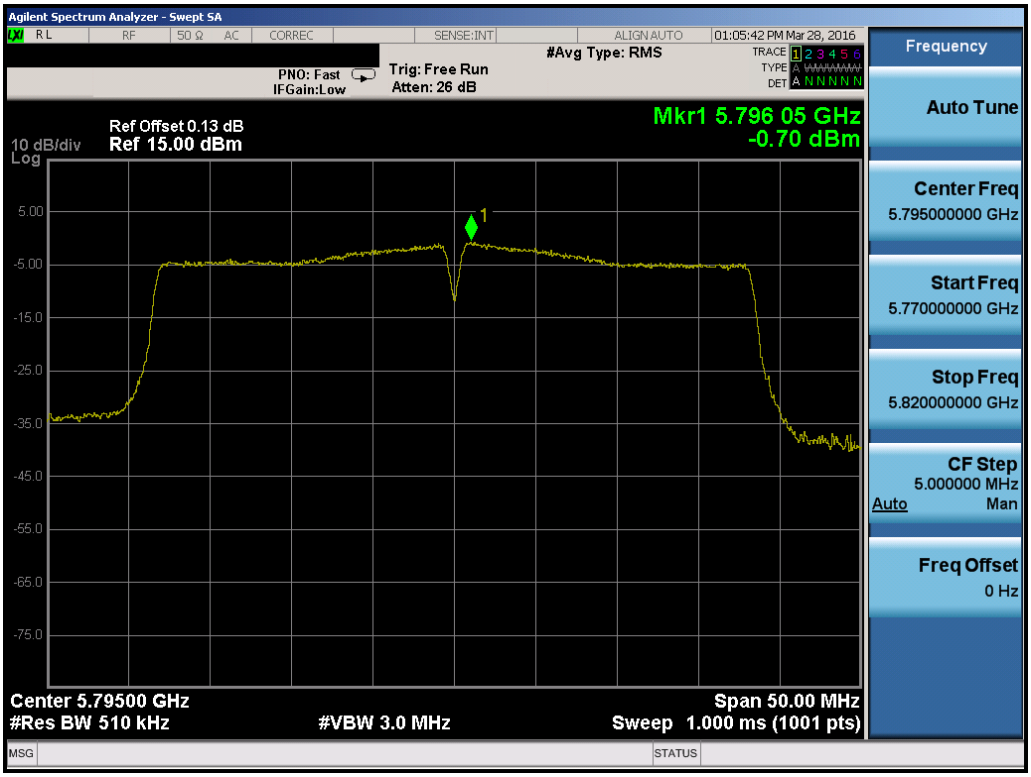
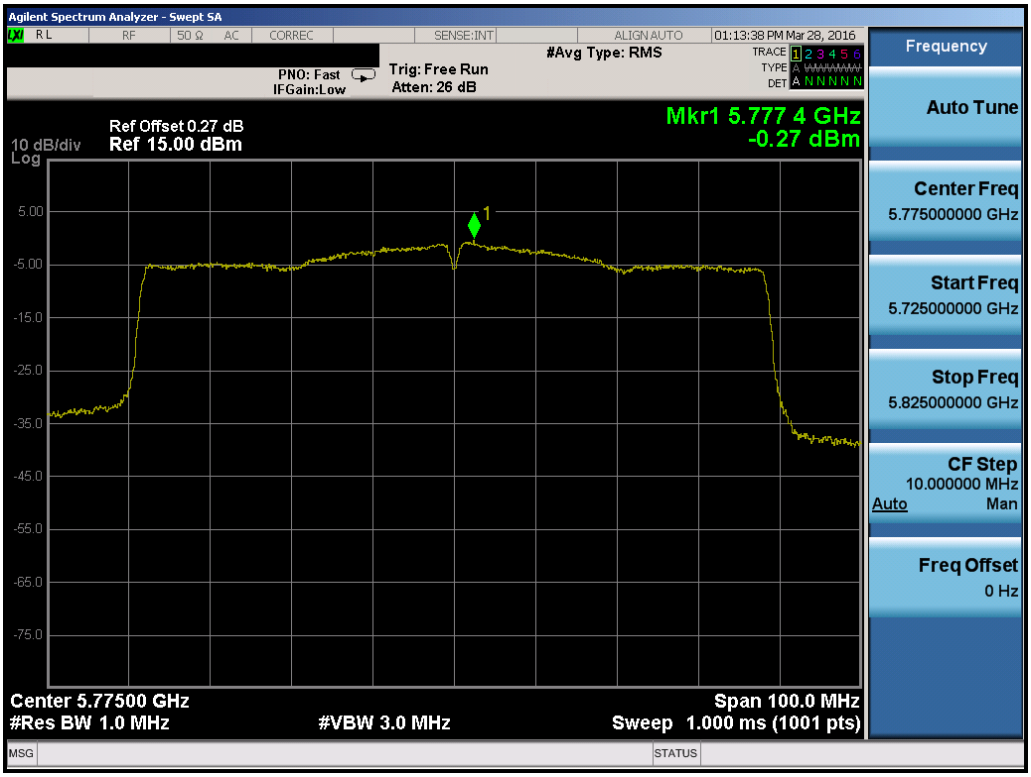


Plot 7-155. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 3) – Ch. 159)



Plot 7-156. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 3) – Ch. 155)

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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)	6.93	6.72	9.84	11.0	-1.16	Pass
	5200	40	n (20MHz)	6.5/7.2 (MCS0)	6.88	7.03	9.97	11.0	-1.03	Pass
	5240	48	n (20MHz)	6.5/7.2 (MCS0)	6.76	6.87	9.83	11.0	-1.17	Pass
	5190	38	n (40MHz)	13.5/15 (MCS0)	6.34	2.39	7.81	11.0	-3.19	Pass
	5230	46	n (40MHz)	13.5/15 (MCS0)	6.49	2.36	7.91	11.0	-3.09	Pass
	5210	42	ac (80MHz)	29.3/32.5 (MCS0)	0.20	-1.39	2.49	11.0	-8.51	Pass
Band 2A	5260	52	n (20MHz)	6.5/7.2 (MCS0)	7.50	6.00	9.83	11.0	-1.17	Pass
	5280	56	n (20MHz)	6.5/7.2 (MCS0)	7.34	5.79	9.64	11.0	-1.36	Pass
	5320	64	n (20MHz)	6.5/7.2 (MCS0)	7.63	6.06	9.93	11.0	-1.07	Pass
	5270	54	n (40MHz)	13.5/15 (MCS0)	5.84	2.08	7.37	11.0	-3.63	Pass
	5310	62	n (40MHz)	13.5/15 (MCS0)	6.24	1.93	7.61	11.0	-3.39	Pass
	5290	58	ac (80MHz)	29.3/32.5 (MCS0)	0.04	-1.81	2.22	11.0	-8.78	Pass
Band 2C	5500	100	n (20MHz)	6.5/7.2 (MCS0)	7.71	5.98	9.94	11.0	-1.06	Pass
	5600	120	n (20MHz)	6.5/7.2 (MCS0)	7.29	5.83	9.63	11.0	-1.37	Pass
	5720	144	n (20MHz)	6.5/7.2 (MCS0)	7.21	6.19	9.74	11.0	-1.26	Pass
	5510	102	n (40MHz)	13.5/15 (MCS0)	4.51	2.33	6.56	11.0	-4.44	Pass
	5590	118	n (40MHz)	13.5/15 (MCS0)	4.43	2.03	6.40	11.0	-4.60	Pass
	5710	142	n (40MHz)	13.5/15 (MCS0)	3.52	2.90	6.23	11.0	-4.77	Pass
	5530	106	ac (80MHz)	29.3/32.5 (MCS0)	-0.73	-2.04	1.68	11.0	-9.32	Pass
	5610	122	ac (80MHz)	29.3/32.5 (MCS0)	-1.44	-1.33	1.63	11.0	-9.37	Pass
	5690	138	ac (80MHz)	29.3/32.5 (MCS0)	-5.02	-4.47	-1.73	11.0	-12.73	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)	4.90	3.40	7.22	30.0	-22.78	Pass
	5785	157	n (20MHz)	6.5/7.2 (MCS0)	4.25	3.43	6.87	30.0	-23.13	Pass
	5825	165	n (20MHz)	6.5/7.2 (MCS0)	3.89	2.97	6.46	30.0	-23.54	Pass
	5755	151	n (40MHz)	13.5/15 (MCS0)	0.41	-0.50	2.99	30.0	-27.01	Pass
	5795	159	n (40MHz)	13.5/15 (MCS0)	0.13	-0.70	2.75	30.0	-27.25	Pass
	5775	155	ac (80MHz)	29.3/32.5 (MCS0)	-2.08	-0.27	1.93	30.0	-28.07	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 6.93 dBm for Antenna-1 and 6.72 dBm for Antenna-2.

Antenna 1 + Antenna 2 = MIMO

(6.93 dBm + 6.72 dBm) = (4.93 mW + 4.69 mW) = 9.63 mW = 9.84 dBm

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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)	5,179,999,883	-117	-0.00000226
100 %		- 30	5,180,000,002	2	0.00000004
100 %		- 20	5,179,999,755	-245	-0.00000473
100 %		- 10	5,179,999,995	-5	-0.00000010
100 %		0	5,179,999,829	-171	-0.00000330
100 %		+ 10	5,180,000,160	160	0.00000309
100 %		+ 20	5,180,000,371	371	0.00000716
100 %		+ 30	5,180,000,020	20	0.00000039
100 %		+ 40	5,180,000,120	120	0.00000232
100 %		+ 50	5,180,000,014	14	0.00000027
BATT. ENDPOINT	3.40	+ 20	5,180,000,063	63	0.00000122

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.

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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)	5,259,999,895	-105	-0.00000200
100 %		- 30	5,260,000,015	15	0.00000029
100 %		- 20	5,260,000,383	383	0.00000728
100 %		- 10	5,259,999,861	-139	-0.00000264
100 %		0	5,259,999,718	-282	-0.00000536
100 %		+ 10	5,260,000,288	288	0.00000548
100 %		+ 20	5,260,000,080	80	0.00000152
100 %		+ 30	5,260,000,358	358	0.00000681
100 %		+ 40	5,259,999,784	-216	-0.00000411
100 %		+ 50	5,260,000,287	287	0.00000546
BATT. ENDPOINT	3.40	+ 20	5,259,999,753	-247	-0.00000470

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.

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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)	5,500,000,130	130	0.00000236
100 %		- 30	5,499,999,701	-299	-0.00000544
100 %		- 20	5,499,999,795	-205	-0.00000373
100 %		- 10	5,499,999,892	-108	-0.00000196
100 %		0	5,500,000,002	2	0.00000004
100 %		+ 10	5,499,999,884	-116	-0.00000211
100 %		+ 20	5,499,999,821	-179	-0.00000325
100 %		+ 30	5,500,000,065	65	0.00000118
100 %		+ 40	5,499,999,893	-107	-0.00000195
100 %		+ 50	5,499,999,703	-297	-0.00000540
BATT. ENDPOINT	3.40	+ 20	5,500,000,050	50	0.00000091

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.

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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)	5,744,999,904	-96	-0.00000167
100 %		- 30	5,744,999,934	-66	-0.00000115
100 %		- 20	5,745,000,087	87	0.00000151
100 %		- 10	5,744,999,806	-194	-0.00000338
100 %		0	5,744,999,995	-5	-0.00000009
100 %		+ 10	5,745,000,121	121	0.00000211
100 %		+ 20	5,744,999,728	-272	-0.00000473
100 %		+ 30	5,744,999,800	-200	-0.00000348
100 %		+ 40	5,745,000,032	32	0.00000056
100 %		+ 50	5,745,000,143	143	0.00000249
BATT. ENDPOINT	3.40	+ 20	5,744,999,943	-57	-0.00000099

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.

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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

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Peak Measurements below 1GHz

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

Test Setup

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

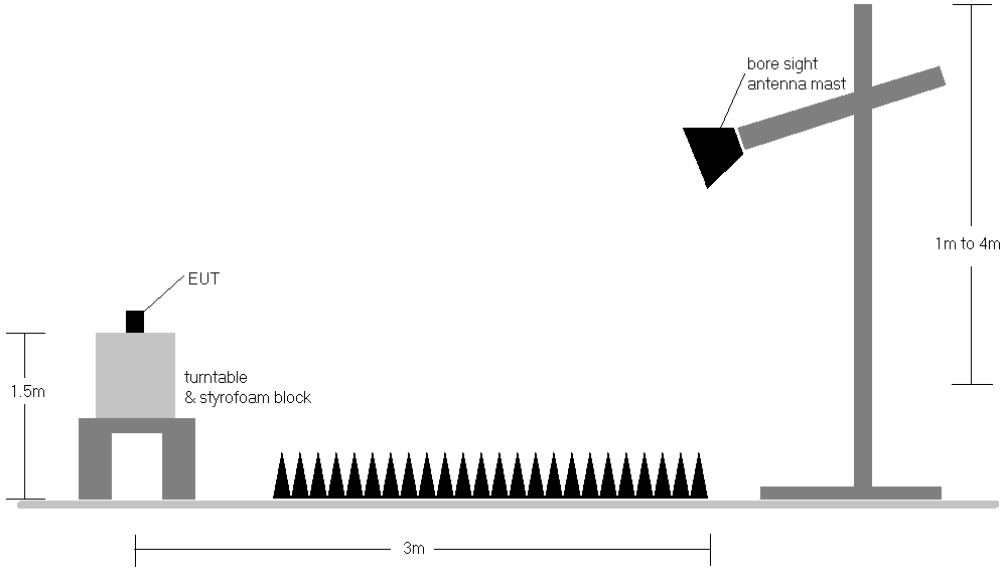

Figure 7-5. Test Instrument & Measurement Setup

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Test Notes

1. All 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.
10. The "-" shown in the following RSE tables are used to denote a noise floor measurement.

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Sample Calculations

Determining Spurious Emissions Levels

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

Radiated Band Edge Measurement Offset

- The amplitude offset shown in the radiated restricted band edge plots in Section 6.8 was calculated using the formula:

  Offset (dB) = (Antenna Factor + Cable Loss + 10 dB Attenuator) – Preamplifier Gain

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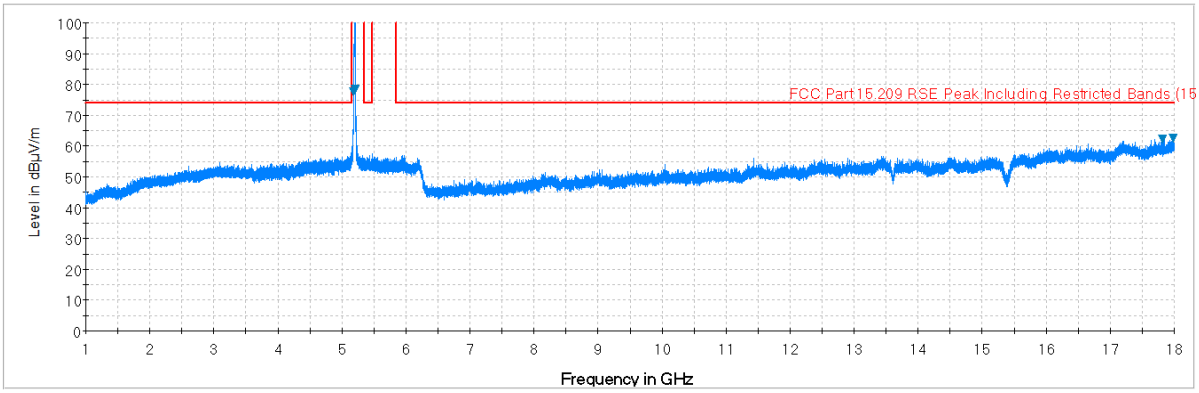
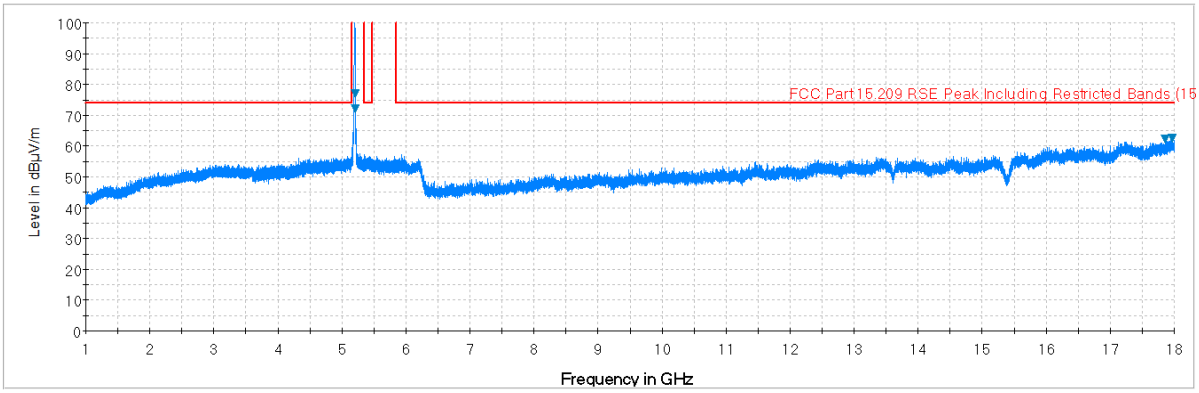
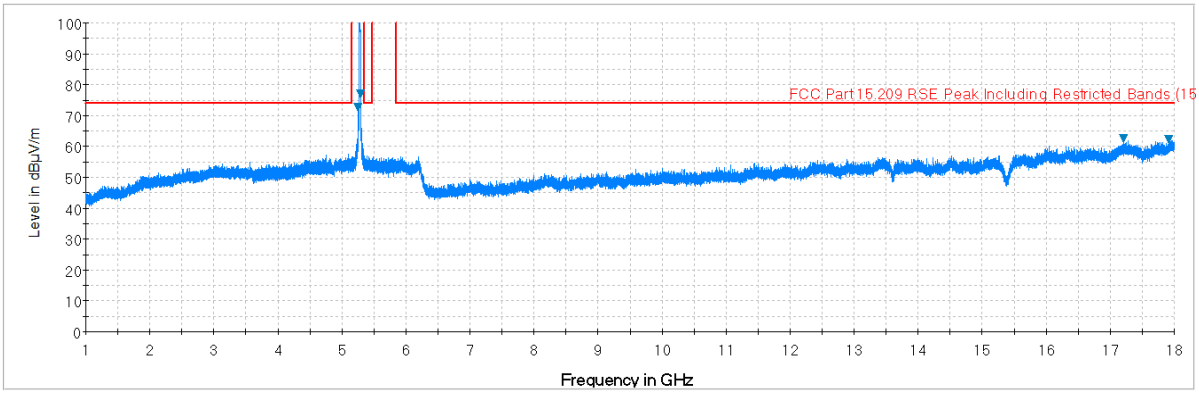
7.7.1 Antenna-1 Radiated Spurious Emission Measurements



Plot 7-157. Radiated Spurious Plot above 1GHz (802.11a – U1 Ch. 40, Ant. Pol. H)



Plot 7-158. Radiated Spurious Plot above 1GHz (802.11a – U1 Ch. 40, Ant. Pol. V)



Plot 7-159. Radiated Spurious Plot above 1GHz (802.11a – U2A Ch. 56, Ant. Pol. H)

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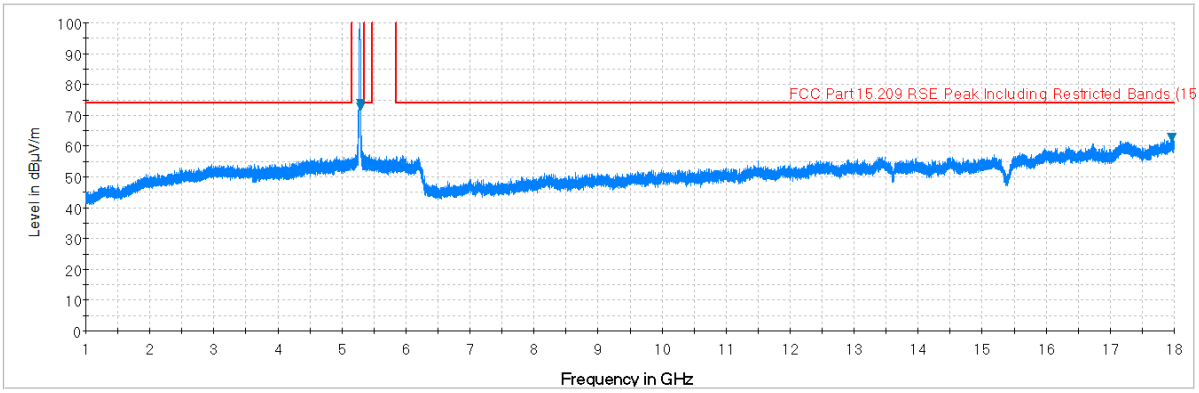
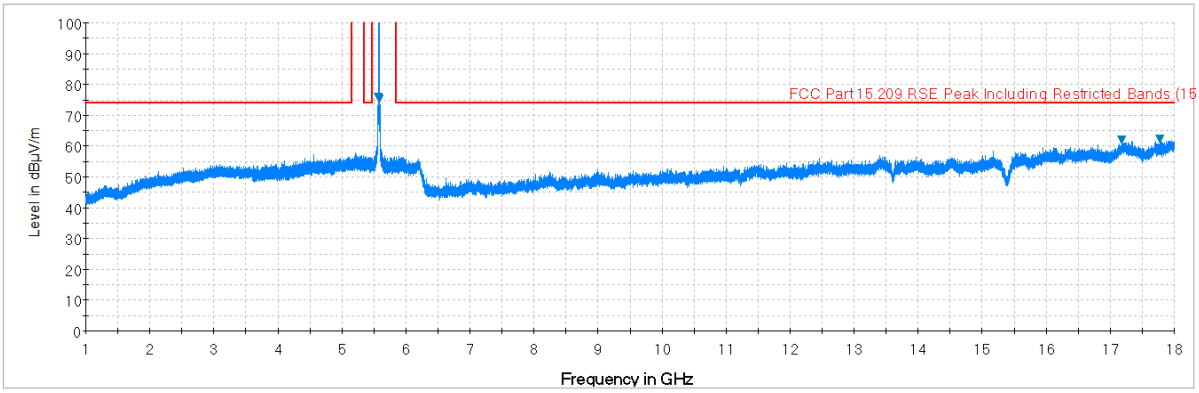
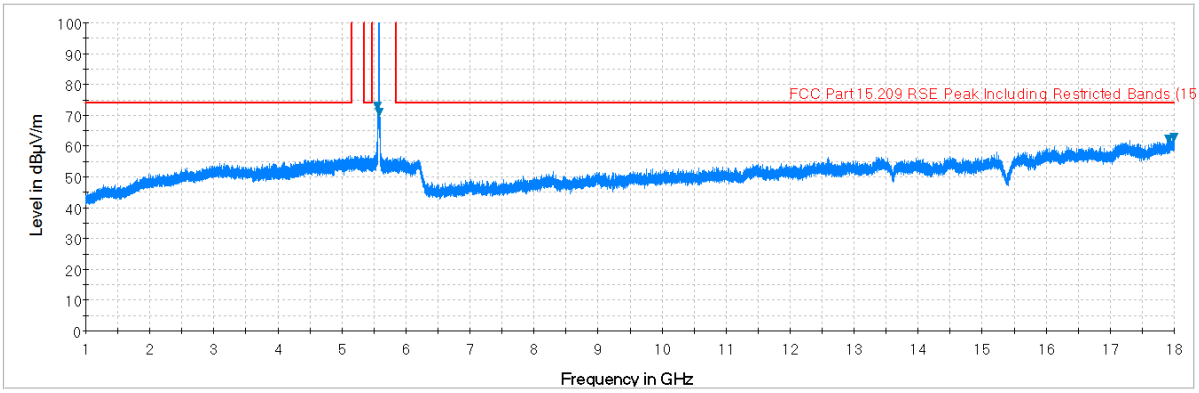


Plot 7-160. Radiated Spurious Plot above 1GHz (802.11a – U2A Ch. 56, Ant. Pol. V)



Plot 7-161. Radiated Spurious Plot above 1GHz (802.11a – U2C Ch. 120, Ant. Pol. H)



Plot 7-162. Radiated Spurious Plot above 1GHz (802.11a – U2C Ch. 120, Ant. Pol. V)

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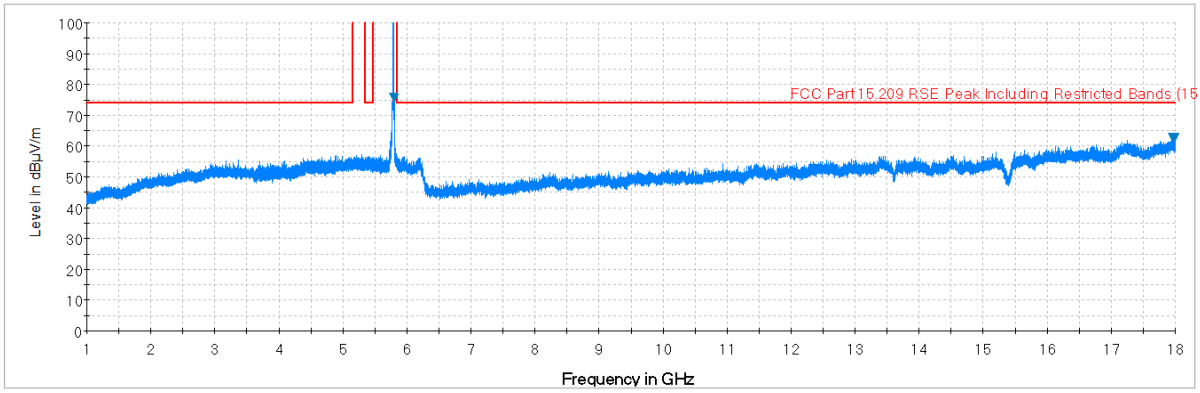
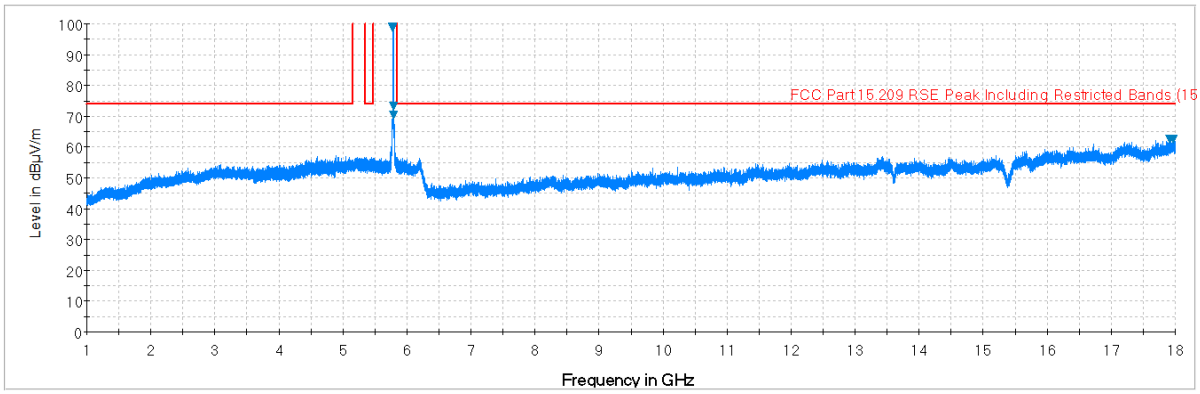


Plot 7-163. Radiated Spurious Plot above 1GHz (802.11a – U3 Ch. 157, Ant. Pol. H)



Plot 7-164. Radiated Spurious Plot above 1GHz (802.11a – U3 Ch. 157, Ant. Pol. V)

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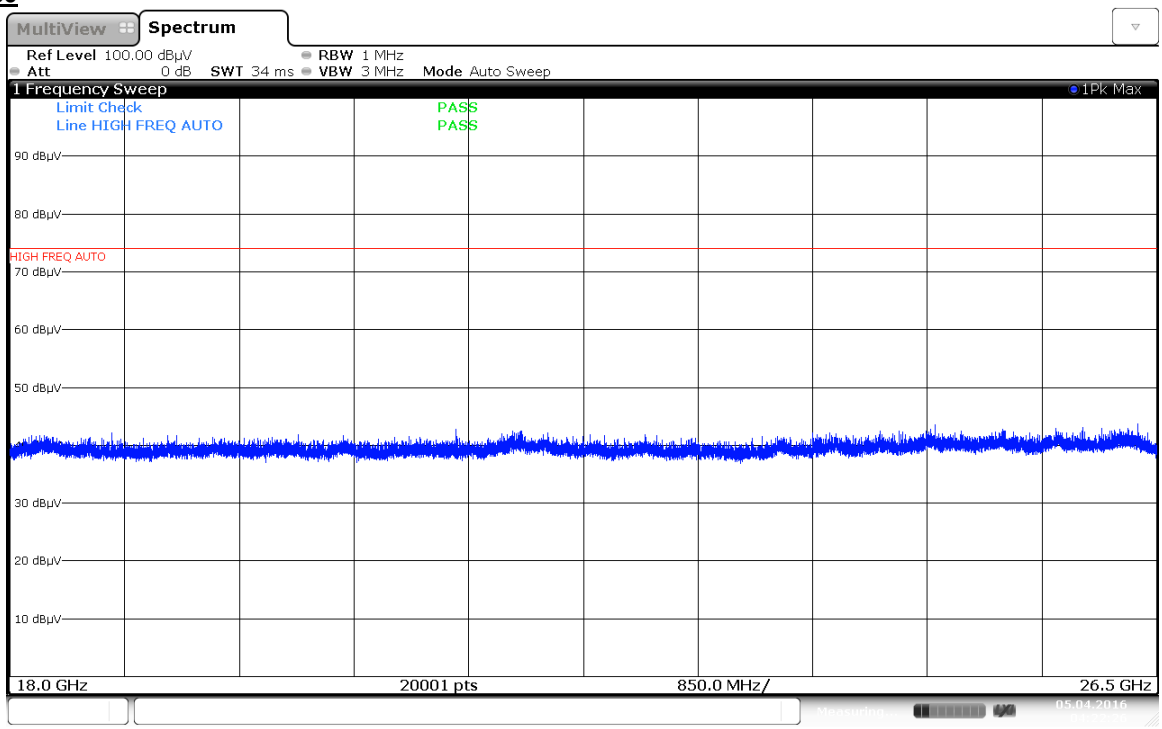
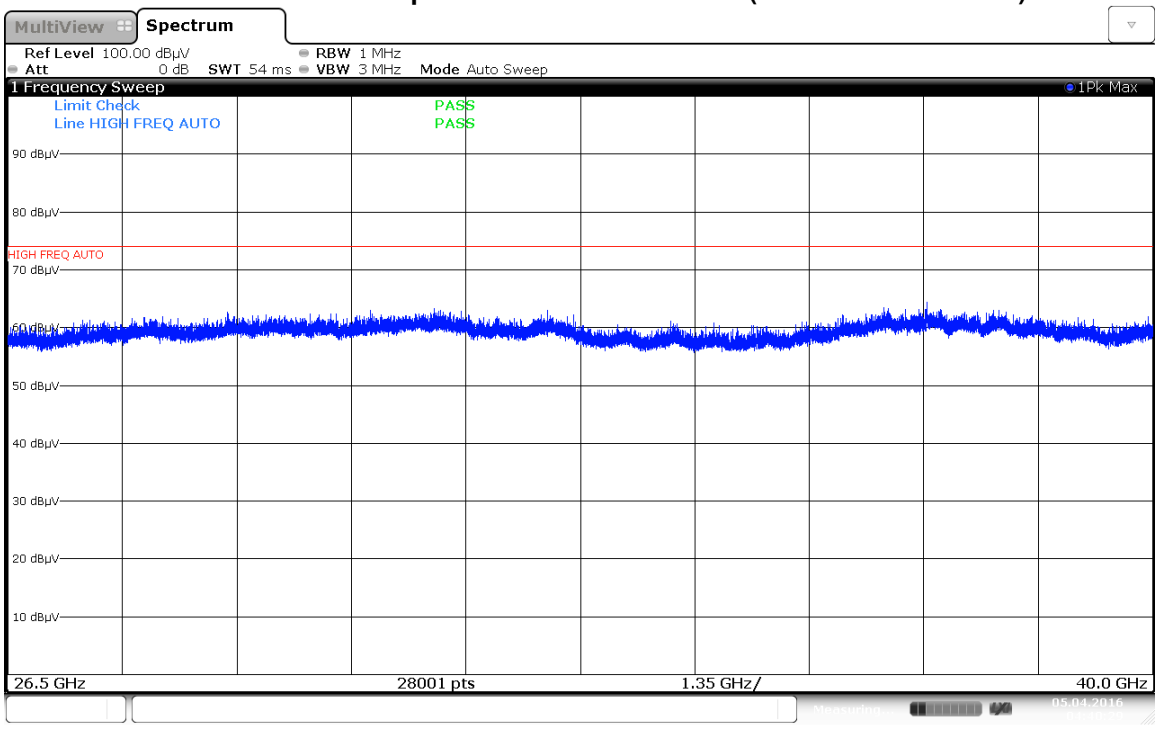
Antenna-1 Radiated Spurious Emissions Measurements (Above 18GHz)

§15.209



Date: 5.APR.2016 04:22:27

Plot 7-165. Radiated Spurious Plot above 18GHz (802.11a – Ant. Pol. H)



Date: 5.APR.2016 04:40:28

Plot 7-166. Radiated Spurious Plot above 26.5GHz (802.11a – Ant. Pol. H)

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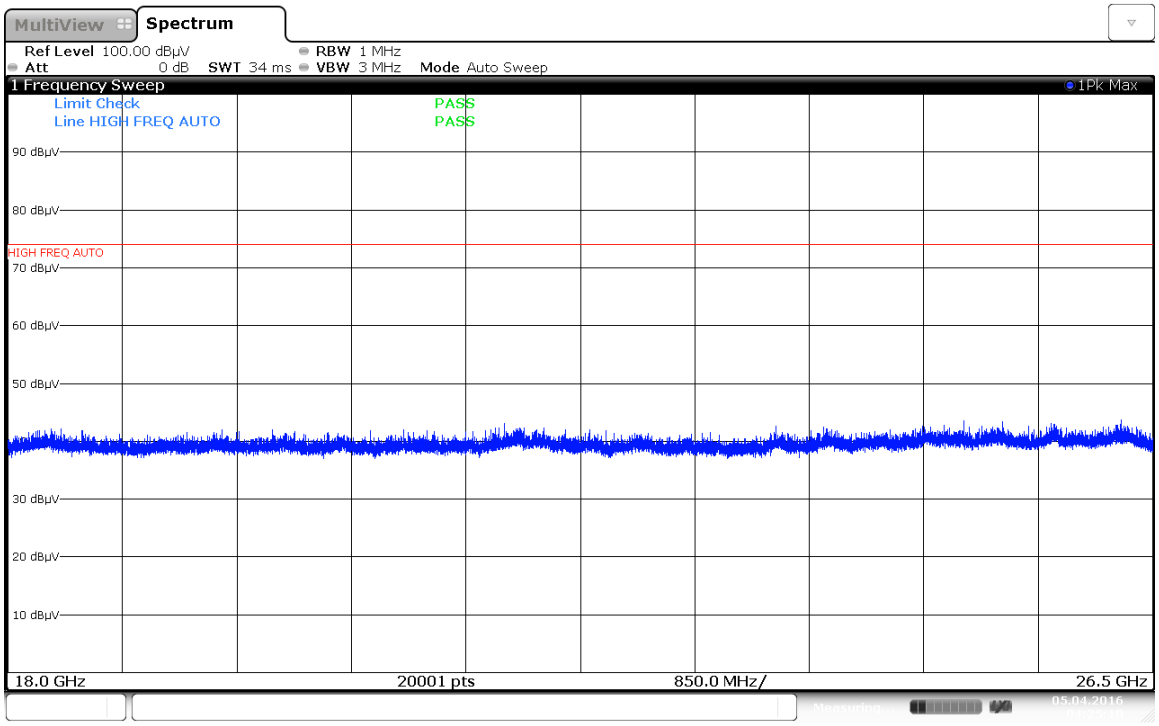
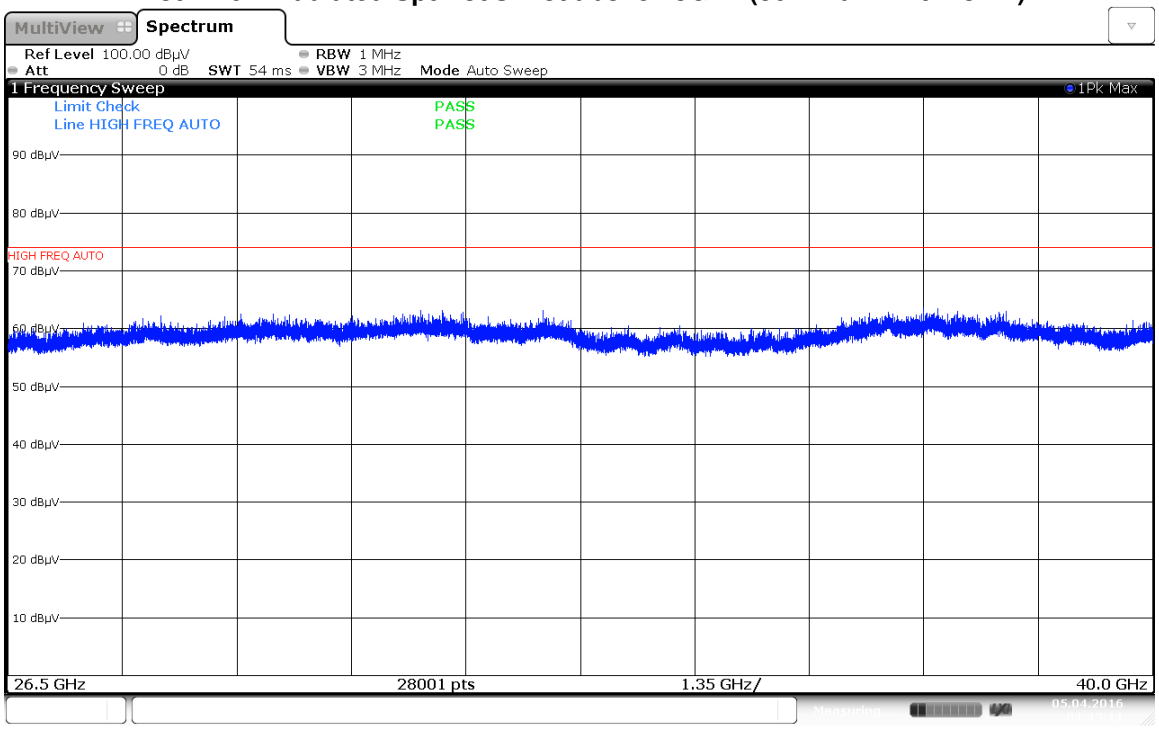


Date: 5.APR.2016 04:25:10

Plot 7-167. Radiated Spurious Plot above 18GHz (802.11a – Ant. Pol. V)



Date: 5.APR.2016 04:43:11

Plot 7-168. Radiated Spurious Plot above 18GHz (802.11a – Ant. Pol. V)

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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	1.00	0	-100.41	48.86	0.00	55.45	68.20	-12.75
*	15540.00	Average	H	-	-	-111.94	52.93	0.00	47.99	53.98	-5.99
*	15540.00	Peak	H	-	-	-100.75	52.93	0.00	59.18	73.98	-14.80
*	20720.00	Average	H	-	-	-101.50	44.39	-9.54	40.34	53.98	-13.64
*	20720.00	Peak	H	-	-	-96.47	44.39	-9.54	45.37	73.98	-28.61
	25900.00	Peak	H	-	-	-94.09	45.11	-9.54	48.48	68.20	-19.72

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	1.00	12	-99.65	48.82	0.00	56.17	68.20	-12.03
*	15600.00	Average	H	-	-	-111.17	53.00	0.00	48.82	53.98	-5.16
*	15600.00	Peak	H	-	-	-99.95	53.00	0.00	60.04	73.98	-13.94
*	20800.00	Average	H	-	-	-101.29	44.39	-9.54	40.56	53.98	-13.42
*	20800.00	Peak	H	-	-	-96.30	44.39	-9.54	45.55	73.98	-28.43
	26000.00	Peak	H	-	-	-94.68	45.12	-9.54	47.89	68.20	-20.31

Table 7-29. Radiated Measurements

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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	1.00	5	-99.78	48.76	0.00	55.99	68.20	-12.21
*	15720.00	Average	H	-	-	-110.58	53.28	0.00	49.70	53.98	-4.28
*	15720.00	Peak	H	-	-	-98.98	53.28	0.00	61.30	73.98	-12.68
*	20960.00	Average	H	-	-	-101.17	44.31	-9.54	40.60	53.98	-13.38
*	20960.00	Peak	H	-	-	-96.95	44.31	-9.54	44.82	73.98	-29.16
	26200.00	Peak	H	-	-	-94.08	45.01	-9.54	48.39	68.20	-19.81

Table 7-30. 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	-	-	-105.15	48.76	0.00	50.62	68.20	-17.58
*	15720.00	Average	H	-	-	-114.26	53.28	0.00	46.02	53.98	-7.96
*	15720.00	Peak	H	-	-	-102.79	53.28	0.00	57.49	73.98	-16.49
*	20960.00	Average	H	-	-	-107.93	44.31	-9.54	33.84	53.98	-20.14
*	20960.00	Peak	H	-	-	-97.55	44.31	-9.54	44.22	73.98	-29.76
	26200.00	Peak	H	-	-	-93.11	45.01	-9.54	49.36	68.20	-18.84

Table 7-31. Radiated Measurements with WCP

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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	1.00	25	-100.30	48.80	0.00	55.51	68.20	-12.69
*	15780.00	Average	H	-	-	-111.60	53.28	0.00	48.68	53.98	-5.30
*	15780.00	Peak	H	-	-	-99.70	53.28	0.00	60.58	73.98	-13.40
*	21040.00	Average	H	-	-	-101.60	44.29	-9.54	40.15	53.98	-13.83
*	21040.00	Peak	H	-	-	-96.94	44.29	-9.54	44.81	73.98	-29.17
	26300.00	Peak	H	-	-	-92.47	45.00	-9.54	49.98	68.20	-18.22

Table 7-32. 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	1.00	14	-100.10	48.92	0.00	55.82	68.20	-12.38
*	15840.00	Average	H	-	-	-110.88	53.47	0.00	49.58	53.98	-4.40
*	15840.00	Peak	H	-	-	-99.41	53.47	0.00	61.05	73.98	-12.93
*	21120.00	Average	H	-	-	-100.38	44.28	-9.54	41.35	53.98	-12.63
*	21120.00	Peak	H	-	-	-96.01	44.28	-9.54	45.72	73.98	-28.26
	26400.00	Peak	H	-	-	-92.37	45.02	-9.54	50.11	68.20	-18.09

Table 7-33. Radiated Measurements

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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	1.00	36	-110.73	49.02	0.00	45.29	53.98	-8.69
*	10640.00	Peak	H	1.00	36	-99.43	49.02	0.00	56.59	73.98	-17.39
*	15960.00	Average	H	-	-	-111.29	54.49	0.00	50.20	53.98	-3.78
*	15960.00	Peak	H	-	-	-99.01	54.49	0.00	62.48	73.98	-11.50
*	21280.00	Average	H	-	-	-106.85	44.26	-9.54	34.87	53.98	-19.10
*	21280.00	Peak	H	-	-	-96.08	44.26	-9.54	45.64	73.98	-28.33
	26600.00	Peak	H	-	-	-102.70	47.61	-9.54	42.36	68.20	-25.84

Table 7-34. 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	-	-	-114.65	49.02	0.00	41.37	53.98	-12.61
*	10640.00	Peak	H	-	-	-103.55	49.02	0.00	52.47	73.98	-21.51
*	15960.00	Average	H	-	-	-114.07	54.49	0.00	47.42	53.98	-6.56
*	15960.00	Peak	H	-	-	-103.25	54.49	0.00	58.24	73.98	-15.74
*	21280.00	Average	H	-	-	-106.63	44.26	-9.54	35.09	53.98	-18.88
	21280.00	Peak	H	-	-	-95.69	44.26	-9.54	46.03	73.98	-27.94
	26600.00	Peak	H	-	-	-104.54	47.61	-9.54	40.52	68.20	-27.68

Table 7-35. Radiated Measurements with WCP

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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	1.00	24	-109.39	50.11	0.00	47.71	53.98	-6.27
*	11000.00	Peak	H	1.00	24	-97.75	50.11	0.00	59.35	73.98	-14.63
	16500.00	Peak	H	-	-	-97.89	54.60	0.00	63.71	68.20	-4.49
	22000.00	Peak	H	-	-	-95.01	44.50	-9.54	46.95	68.20	-21.25
	27500.00	Peak	H	-	-	-103.22	47.97	-9.54	42.21	68.20	-25.99

Table 7-36. Radiated Measurements

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

	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]
*	11200.00	Average	H	1.00	18	-110.99	50.18	0.00	46.19	53.98	-7.79
*	11200.00	Peak	H	1.00	18	-98.91	50.18	0.00	58.27	73.98	-15.71
	16800.00	Peak	H	-	-	-99.35	56.88	0.00	64.53	68.20	-3.67
*	22400.00	Average	H	-	-	-100.72	44.57	-9.54	41.31	53.98	-12.67
*	22400.00	Peak	H	-	-	-95.95	44.57	-9.54	46.08	73.98	-27.90
	28000.00	Peak	H	-	-	-104.03	48.11	-9.54	41.54	68.20	-26.66

Table 7-37. Radiated Measurements

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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	1.00	21	-111.37	50.81	0.00	46.44	53.98	-7.54
*	11440.00	Peak	H	1.00	21	-99.78	50.81	0.00	58.03	73.98	-15.95
	17160.00	Peak	H	-	-	-103.26	57.01	0.00	60.74	68.20	-7.46
*	22880.00	Average	H	-	-	-101.48	44.61	-9.54	40.59	53.98	-13.39
*	22880.00	Peak	H	-	-	-97.28	44.61	-9.54	44.79	73.98	-29.19
	28600.00	Peak	H	-	-	-103.55	48.29	-9.54	42.20	68.20	-26.00

Table 7-38. 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	-	-	-115.85	50.81	0.00	41.96	53.98	-12.02
*	11440.00	Peak	H	-	-	-104.98	50.81	0.00	52.83	73.98	-21.15
	17160.00	Peak	H	-	-	-103.73	57.01	0.00	60.27	68.20	-7.93
	22880.00	Average	H	-	-	-107.78	44.61	-9.54	34.29	53.98	-19.69
	22880.00	Peak	H	-	-	-97.28	44.61	-9.54	44.79	73.98	-29.19
	28600.00	Peak	H	-	-	-103.42	48.29	-9.54	42.33	68.20	-25.87

Table 7-39. Radiated Measurements with WCP

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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	1.00	9	-111.24	50.95	0.00	46.72	53.98	-7.26
*	11490.00	Peak	H	1.00	9	-99.82	50.95	0.00	58.14	73.98	-15.84
	17235.00	Peak	H	-	-	-103.37	57.52	0.00	61.15	68.20	-7.05
*	22980.00	Average	H	-	-	-101.92	44.68	-9.54	40.22	53.98	-13.76
*	22980.00	Peak	H	-	-	-96.63	44.68	-9.54	45.51	73.98	-28.47
	28725.00	Peak	H	-	-	-102.87	48.26	-9.54	42.85	68.20	-25.35

Table 7-40. 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	1.00	9	-111.07	50.92	0.00	46.84	53.98	-7.14
*	11570.00	Peak	H	1.00	9	-98.75	50.92	0.00	59.16	73.98	-14.82
	17355.00	Peak	H	-	-	-103.51	58.05	0.00	61.54	68.20	-6.66
	23140.00	Peak	H	-	-	-95.69	44.75	-9.54	46.52	68.20	-21.68
	28925.00	Peak	H	-	-	-102.16	48.29	-9.54	43.59	68.20	-24.61

Table 7-41. Radiated Measurements

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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	1.00	10	-111.18	50.90	0.00	46.72	53.98	-7.26
*	11650.00	Peak	H	1.00	10	-99.45	50.90	0.00	58.45	73.98	-15.53
	17475.00	Peak	H	-	-	-102.30	58.55	0.00	63.26	68.20	-4.94
	23300.00	Peak	H	-	-	-96.42	44.75	-9.54	45.79	68.20	-22.41
	29125.00	Peak	H	-	-	-103.17	48.28	-9.54	42.57	68.20	-25.63

Table 7-42. 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	-	-	-115.73	50.90	0.00	42.17	53.98	-11.81
*	11650.00	Peak	H	-	-	-104.32	50.90	0.00	53.58	73.98	-20.40
	17475.00	Peak	H	-	-	-102.76	58.55	0.00	62.80	68.20	-5.40
	23300.00	Average	H	-	-	-103.02	58.55	-9.54	53.00	68.20	-15.20
	23300.00	Peak	H	-	-	-97.16	44.75	-9.54	45.05	68.20	-23.15
	29125.00	Peak	H	-	-	-103.25	48.28	-9.54	42.49	68.20	-25.71

Table 7-43. Radiated Measurements with WCP

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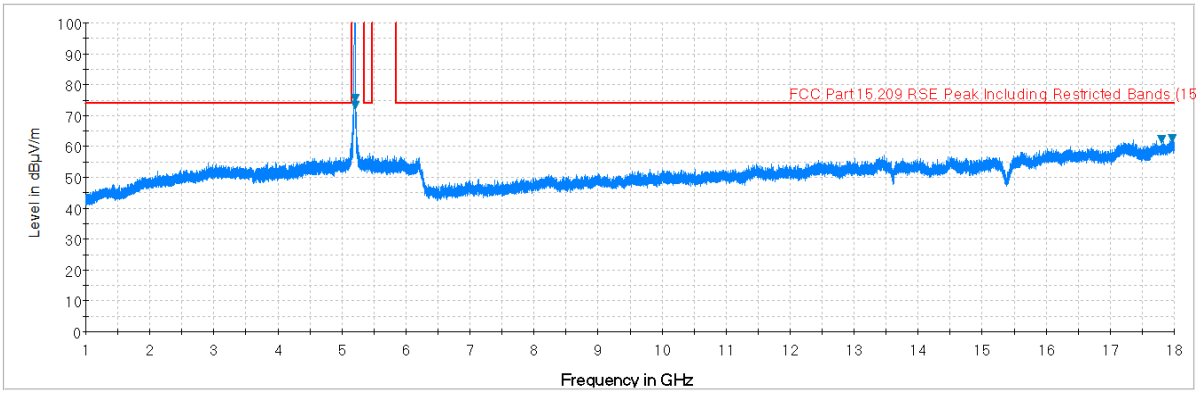
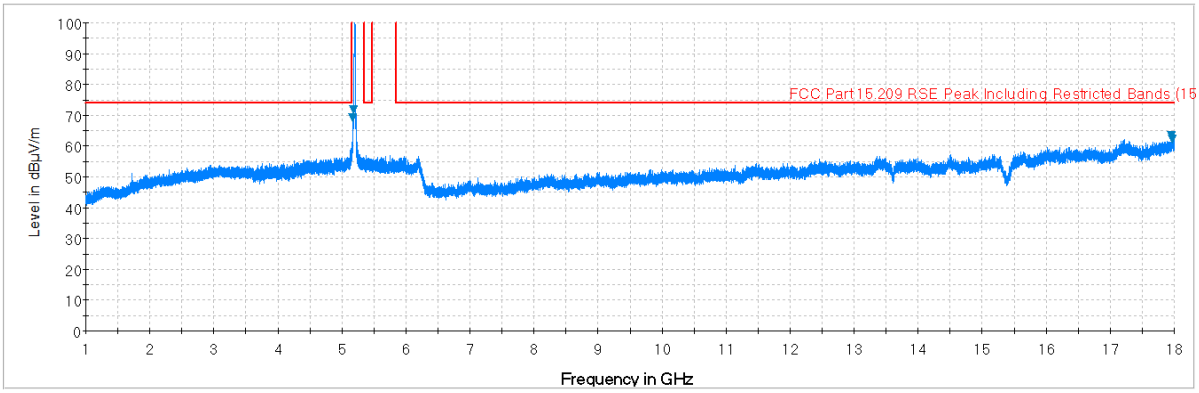
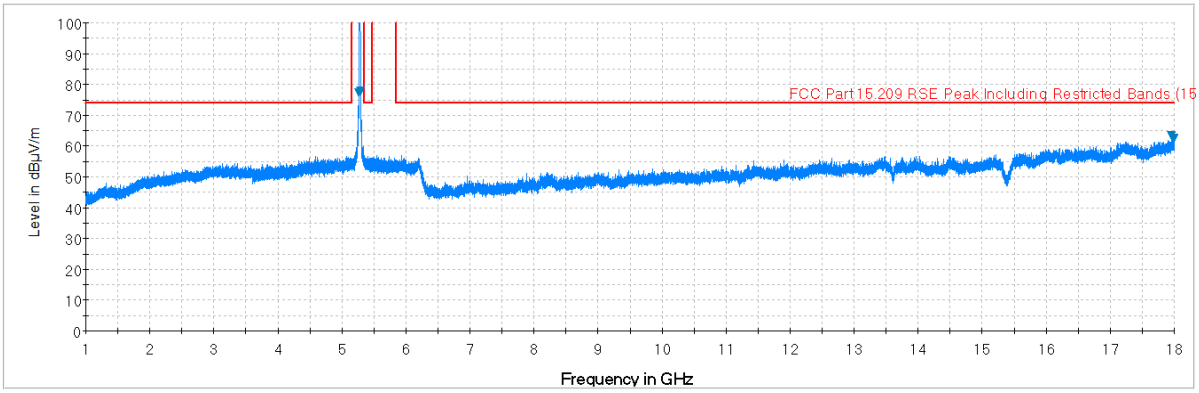
7.7.2 Antenna-2 Radiated Spurious Emission Measurements



Plot 7-169. Radiated Spurious Plot above 1GHz (802.11a – U1 Ch. 40, Ant. Pol. H)



Plot 7-170. Radiated Spurious Plot above 1GHz (802.11a – U1 Ch. 40, Ant. Pol. V)



Plot 7-171. Radiated Spurious Plot above 1GHz (802.11a – U2A Ch. 56, Ant. Pol. H)

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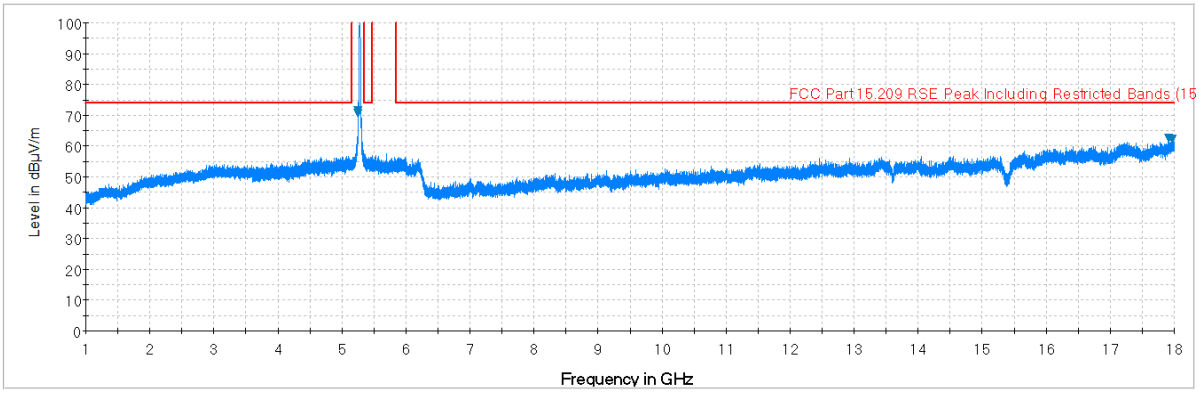
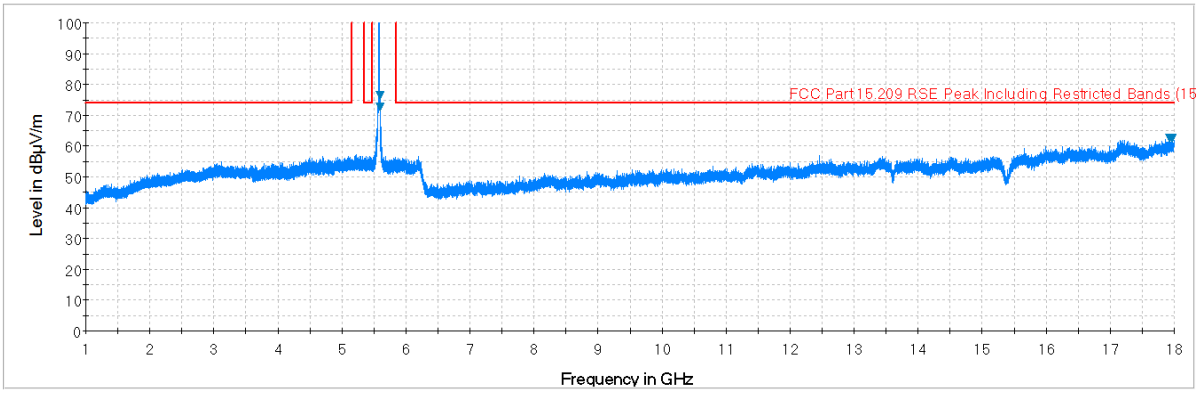
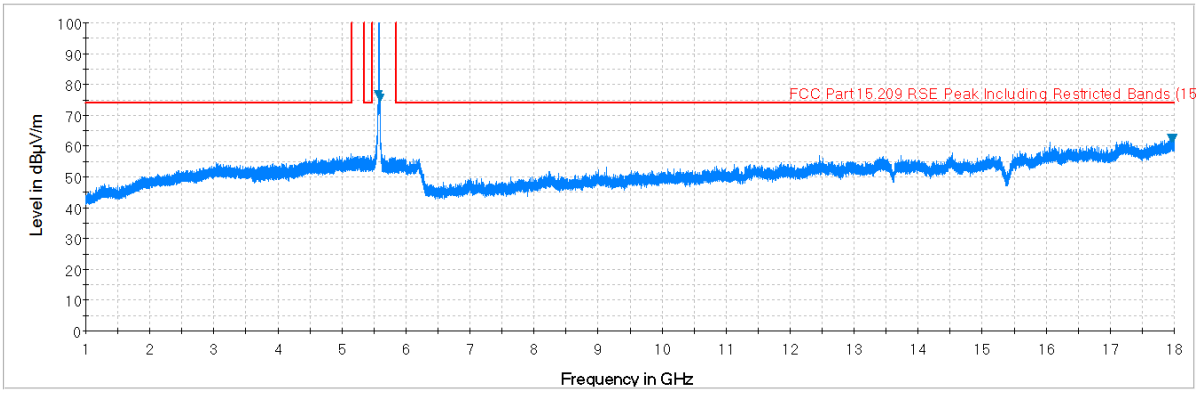


Plot 7-172. Radiated Spurious Plot above 1GHz (802.11a – U2A Ch. 56, Ant. Pol. V)



Plot 7-173. Radiated Spurious Plot above 1GHz (802.11a – U2C Ch. 120, Ant. Pol. H)



Plot 7-174. Radiated Spurious Plot above 1GHz (802.11a – U2C Ch. 120, Ant. Pol. V)

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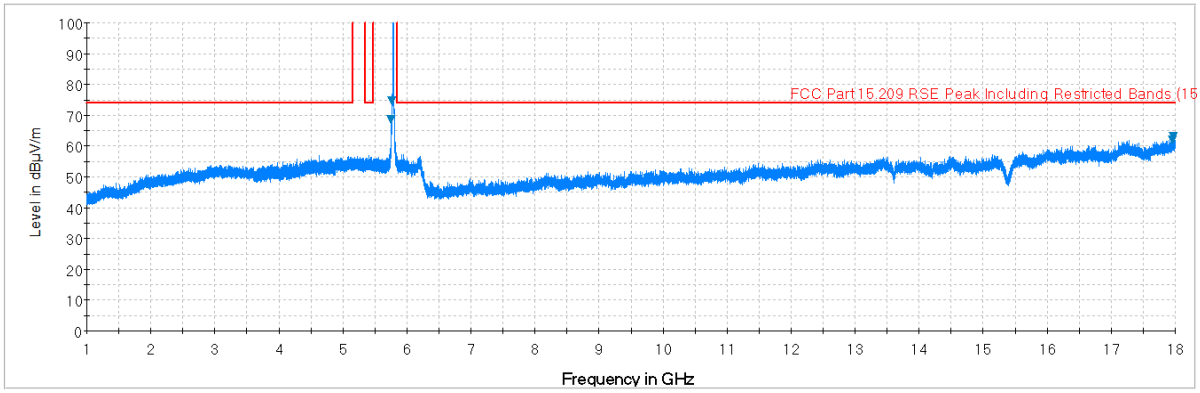
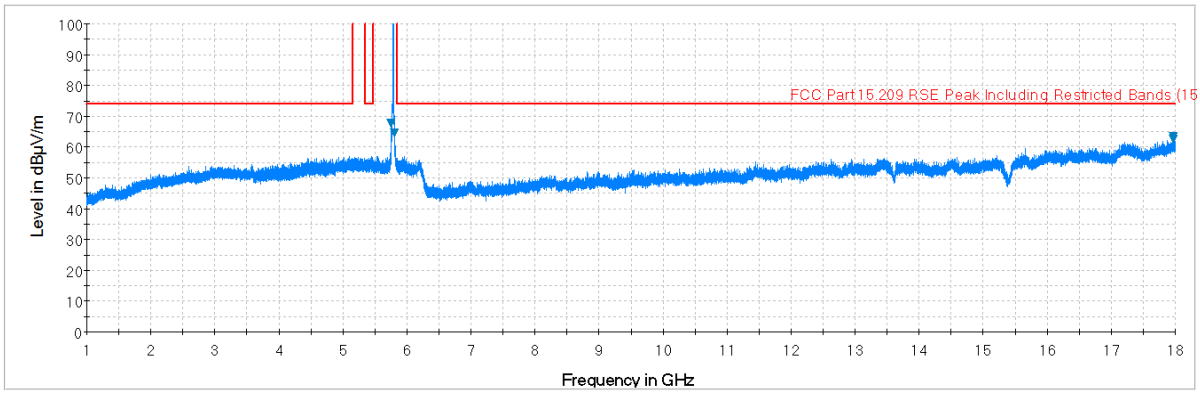


Plot 7-175. Radiated Spurious Plot above 1GHz (802.11a – U3 Ch. 157, Ant. Pol. H)



Plot 7-176. Radiated Spurious Plot above 1GHz (802.11a – U3 Ch. 157, Ant. Pol. V)

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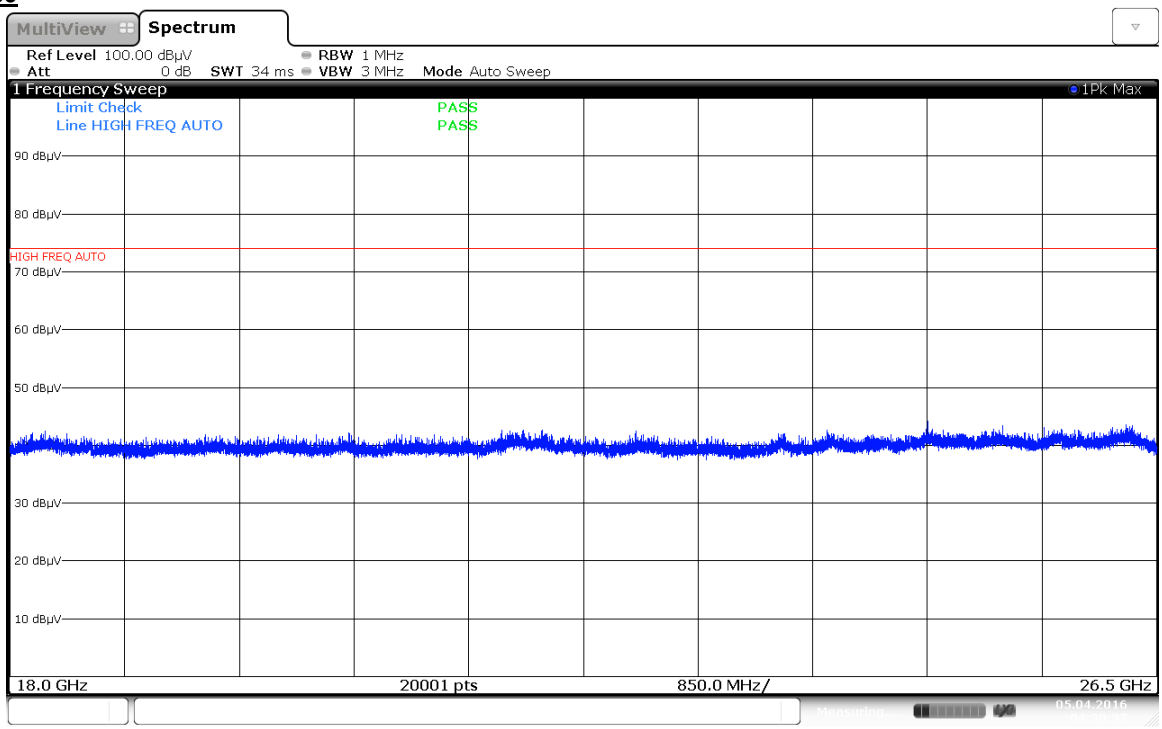
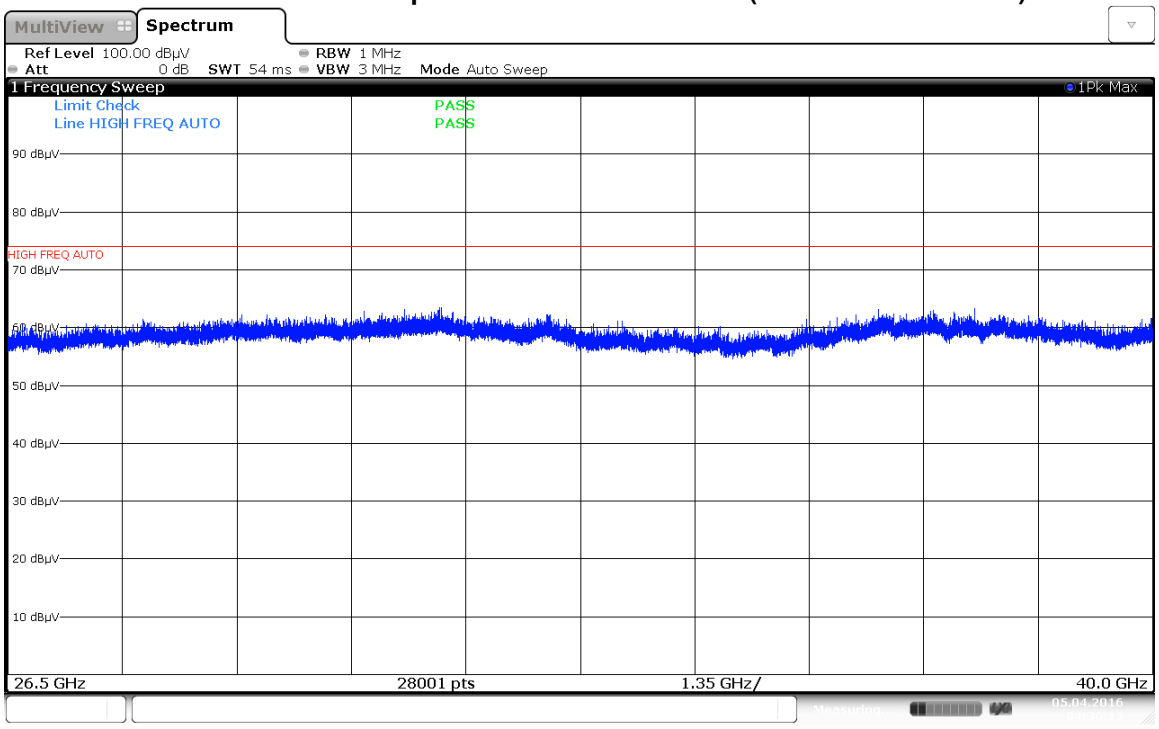
Antenna-2 Radiated Spurious Emissions Measurements (Above 18GHz)

§15.209



Date: 5.APR.2016 04:30:37

Plot 7-177. Radiated Spurious Plot above 18GHz (802.11a – Ant. Pol. H)



Date: 5.APR.2016 04:36:13

Plot 7-178. Radiated Spurious Plot above 26.5GHz (802.11a – Ant. Pol. V)

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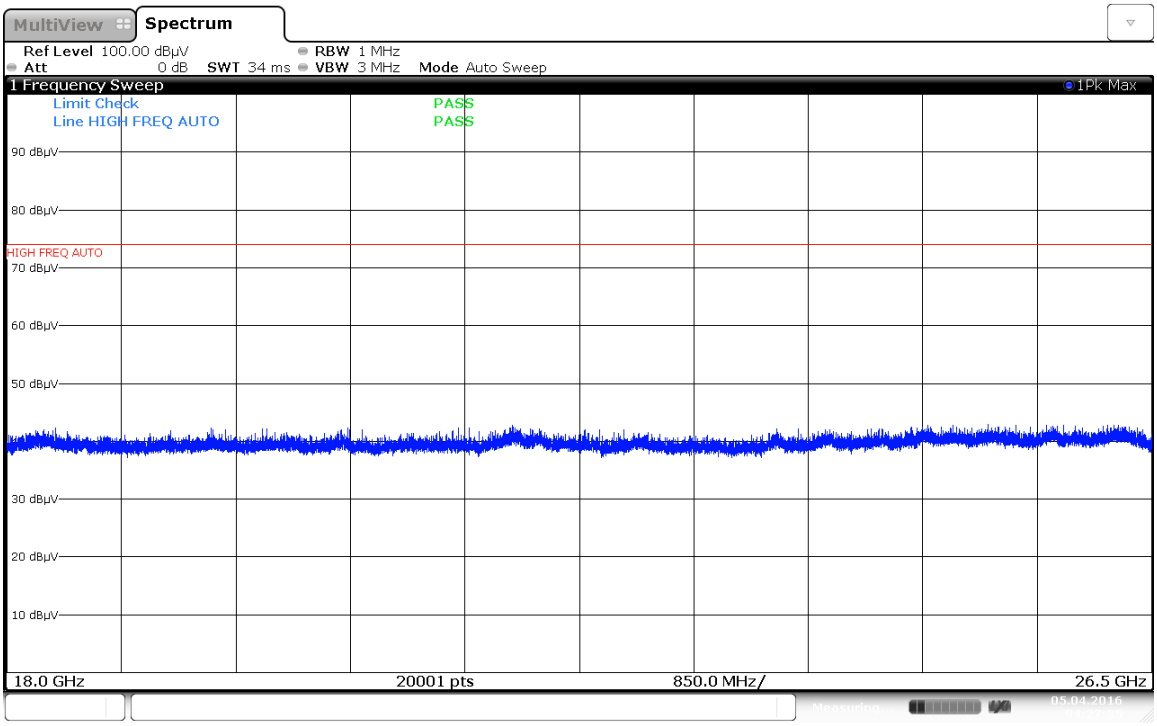
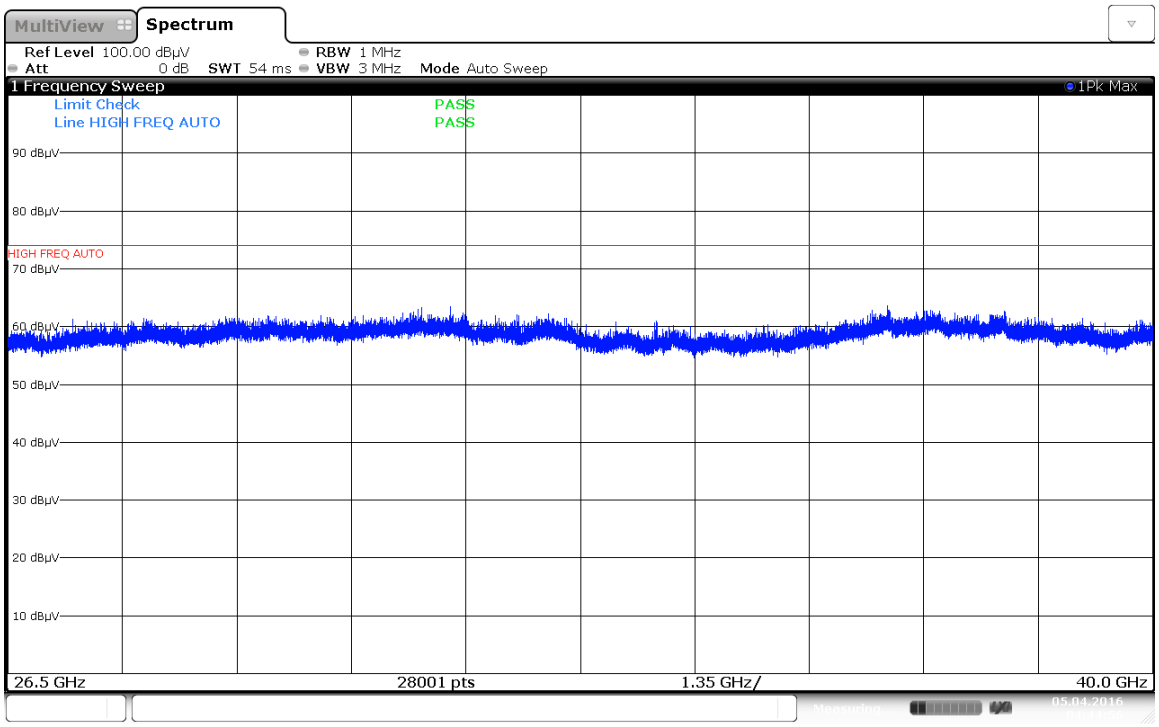


Date: 5.APR.2016 04:27:35

Plot 7-179. Radiated Spurious Plot above 18GHz (802.11a – Ant. Pol. H)



Date: 5.APR.2016 04:44:56

Plot 7-180. Radiated Spurious Plot above 26.5GHz (802.11a – Ant. Pol. V)

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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	1.45	25	-100.32	48.86	0.00	55.54	68.20	-12.66
*	15540.00	Average	H	1.45	25	-111.83	52.93	0.00	48.10	53.98	-5.88
*	15540.00	Peak	H	-	-	-100.88	52.93	0.00	59.05	73.98	-14.93
*	20720.00	Average	H	-	-	-100.74	44.39	-9.54	41.10	53.98	-12.88
*	20720.00	Peak	H	-	-	-96.65	44.39	-9.54	45.19	73.98	-28.79
	25900.00	Peak	H	-	-	-94.48	45.11	-9.54	48.09	68.20	-20.11

Table 7-44. 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	1.20	15	-99.83	48.82	0.00	55.99	68.20	-12.21
*	15600.00	Average	H	-	-	-111.13	53.00	0.00	48.86	53.98	-5.12
*	15600.00	Peak	H	-	-	-100.09	53.00	0.00	59.90	73.98	-14.08
*	20800.00	Average	H	-	-	-104.98	44.39	-9.54	36.87	53.98	-17.11
*	20800.00	Peak	H	-	-	-96.72	44.39	-9.54	45.13	73.98	-28.85
	26000.00	Peak	H	-	-	-94.31	45.12	-9.54	48.26	68.20	-19.94

Table 7-45. Radiated Measurements

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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	1.35	17	-100.15	48.76	0.00	55.62	68.20	-12.58
*	15720.00	Average	H	-	-	-110.61	53.28	0.00	49.67	53.98	-4.31
*	15720.00	Peak	H	-	-	-99.46	53.28	0.00	60.82	73.98	-13.16
*	20960.00	Average	H	-	-	-108.51	44.31	-9.54	33.26	53.98	-20.72
*	20960.00	Peak	H	-	-	-96.45	44.31	-9.54	45.32	73.98	-28.66
	26200.00	Peak	H	-	-	-93.69	45.01	-9.54	48.78	68.20	-19.42

Table 7-46. 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	-	-	-105.07	48.76	0.00	50.70	68.20	-17.50
*	15720.00	Average	H	-	-	-114.14	53.28	0.00	46.14	53.98	-7.84
*	15720.00	Peak	H	-	-	-103.31	53.28	0.00	56.97	73.98	-17.01
*	20960.00	Average	H	-	-	-107.87	44.31	-9.54	33.90	53.98	-20.08
*	20960.00	Peak	H	-	-	-97.65	44.31	-9.54	44.12	73.98	-29.86
	26200.00	Peak	H	-	-	-94.65	45.01	-9.54	47.82	68.20	-20.38

Table 7-47. Radiated Measurements with WCP

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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	1.22	21	-100.35	48.80	0.00	55.46	68.20	-12.74
*	15780.00	Average	H	-	-	-111.50	53.28	0.00	48.78	53.98	-5.20
*	15780.00	Peak	H	-	-	-99.44	53.28	0.00	60.84	73.98	-13.14
*	21040.00	Average	H	-	-	-106.87	44.29	-9.54	34.88	53.98	-19.10
*	21040.00	Peak	H	-	-	-96.68	44.29	-9.54	45.07	73.98	-28.91
	26300.00	Peak	H	-	-	-92.61	45.00	-9.54	49.84	68.20	-18.36

Table 7-48. Radiated Measurements

Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6 Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 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	1.28	32	-100.05	48.92	0.00	55.87	68.20	-12.33
*	15840.00	Average	H	-	-	-110.83	53.47	0.00	49.63	53.98	-4.35
*	15840.00	Peak	H	-	-	-99.64	53.47	0.00	60.82	73.98	-13.16
*	21120.00	Average	H	-	-	-101.30	44.28	-9.54	40.43	53.98	-13.55
*	21120.00	Peak	H	-	-	-96.41	44.28	-9.54	45.32	73.98	-28.66
	26400.00	Peak	H	-	-	-93.39	45.02	-9.54	49.09	68.20	-19.11

Table 7-49. Radiated Measurements

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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	1.31	30	-110.74	49.02	0.00	45.28	53.98	-8.70
*	10640.00	Peak	H	1.31	30	-99.30	49.02	0.00	56.72	73.98	-17.26
*	15960.00	Average	H	-	-	-111.05	54.49	0.00	50.44	53.98	-3.54
*	15960.00	Peak	H	-	-	-98.73	54.49	0.00	62.76	73.98	-11.22
*	21280.00	Average	H	-	-	-101.35	44.26	-9.54	40.37	53.98	-13.60
*	21280.00	Peak	H	-	-	-96.10	44.26	-9.54	45.62	73.98	-28.35
	26600.00	Peak	H	-	-	-102.37	47.61	-9.54	42.69	68.20	-25.51

Table 7-50. 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	-	-	-114.84	49.02	0.00	41.18	53.98	-12.80
*	10640.00	Peak	H	-	-	-102.76	49.02	0.00	53.26	73.98	-20.72
*	15960.00	Average	H	-	-	-114.28	54.49	0.00	47.21	53.98	-6.77
*	15960.00	Peak	H	-	-	-103.44	54.49	0.00	58.05	73.98	-15.93
*	21280.00	Average	H	-	-	-106.73	44.26	-9.54	34.99	53.98	-18.98
	21280.00	Peak	H	-	-	-95.99	44.26	-9.54	45.73	73.98	-28.24
	26600.00	Peak	H	-	-	-104.27	47.61	-9.54	40.79	68.20	-27.41

Table 7-51. Radiated Measurements with WCP

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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	1.15	18	-109.19	50.11	0.00	47.91	53.98	-6.07
*	11000.00	Peak	H	1.15	18	-97.97	50.11	0.00	59.13	73.98	-14.85
	16500.00	Peak	H	-	-	-98.60	54.60	0.00	63.00	68.20	-5.20
	22000.00	Peak	H	-	-	-95.15	44.50	-9.54	46.81	68.20	-21.39
	27500.00	Peak	H	-	-	-103.62	47.97	-9.54	41.81	68.20	-26.39

Table 7-52. Radiated Measurements

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

	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]
*	11200.00	Average	H	1.20	37	-110.81	50.18	0.00	46.37	53.98	-7.61
*	11200.00	Peak	H	1.20	37	-99.43	50.18	0.00	57.75	73.98	-16.23
	16800.00	Peak	H	-	-	-99.14	56.88	0.00	64.74	68.20	-3.46
*	22400.00	Average	H	-	-	-99.32	44.57	-9.54	42.71	53.98	-11.27
*	22400.00	Peak	H	-	-	-95.17	44.57	-9.54	46.86	73.98	-27.12
	28000.00	Peak	H	-	-	-104.01	48.11	-9.54	41.56	68.20	-26.64

Table 7-53. Radiated Measurements

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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	1.18	22	-111.37	50.81	0.00	46.44	53.98	-7.54
*	11440.00	Peak	H	1.18	22	-100.06	50.81	0.00	57.75	73.98	-16.23
	17160.00	Peak	H	-	-	-103.00	57.01	0.00	61.00	68.20	-7.20
*	22880.00	Average	H	-	-	-101.31	44.61	-9.54	40.76	53.98	-13.22
*	22880.00	Peak	H	-	-	-96.90	44.61	-9.54	45.17	73.98	-28.81
	28600.00	Peak	H	-	-	-103.98	48.29	-9.54	41.77	68.20	-26.43

Table 7-54. 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	-	-	-115.83	50.81	0.00	41.98	53.98	-12.00
*	11440.00	Peak	H	-	-	-104.95	50.81	0.00	52.86	73.98	-21.12
	17160.00	Peak	H	-	-	-104.00	57.01	0.00	60.00	68.20	-8.20
	22880.00	Average	H	-	-	-107.96	44.61	-9.54	34.11	53.98	-19.87
	22880.00	Peak	H	-	-	-97.61	44.61	-9.54	44.46	73.98	-29.52
	28600.00	Peak	H	-	-	-103.53	48.29	-9.54	42.22	68.20	-25.98

Table 7-55. Radiated Measurements with WCP

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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	1.10	7	-111.09	50.95	0.00	46.87	53.98	-7.11
*	11490.00	Peak	H	1.10	7	-100.08	50.95	0.00	57.88	73.98	-16.10
	17235.00	Peak	H	-	-	-104.09	57.52	0.00	60.43	68.20	-7.77
*	22980.00	Average	H	-	-	-107.76	44.68	-9.54	34.38	53.98	-19.60
*	22980.00	Peak	H	-	-	-97.15	44.68	-9.54	44.99	73.98	-28.99
	28725.00	Peak	H	-	-	-102.80	48.26	-9.54	42.92	68.20	-25.28

Table 7-56. 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	1.05	12	-111.00	50.92	0.00	46.91	53.98	-7.07
*	11570.00	Peak	H	1.05	12	-100.23	50.92	0.00	57.68	73.98	-16.30
	17355.00	Peak	H	-	-	-103.05	58.05	0.00	62.00	68.20	-6.20
	23140.00	Peak	H	-	-	-96.48	44.75	-9.54	45.73	68.20	-22.47
	28925.00	Peak	H	-	-	-103.04	48.29	-9.54	42.71	68.20	-25.49

Table 7-57. Radiated Measurements

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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	1.12	15	-109.80	50.90	0.00	48.10	53.98	-5.88
*	11650.00	Peak	H	1.12	15	-99.34	50.90	0.00	58.56	73.98	-15.42
	17475.00	Peak	H	-	-	-101.60	58.55	0.00	63.96	68.20	-4.24
	23300.00	Peak	H	-	-	-97.23	44.75	-9.54	44.98	68.20	-23.22
	29125.00	Peak	H	-	-	-102.44	48.28	-9.54	43.30	68.20	-24.90

Table 7-58. 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	-	-	-115.60	50.90	0.00	42.30	53.98	-11.68
*	11650.00	Peak	H	-	-	-102.89	50.90	0.00	55.01	73.98	-18.97
	17475.00	Peak	H	-	-	-103.36	58.55	0.00	62.20	68.20	-6.00
	23300.00	Average	H	-	-	-102.82	58.55	-9.54	53.20	68.20	-15.00
	29125.00	Peak	H	-	-	-96.65	44.75	-9.54	45.56	68.20	-22.64

Table 7-59. Radiated Measurements with WCP

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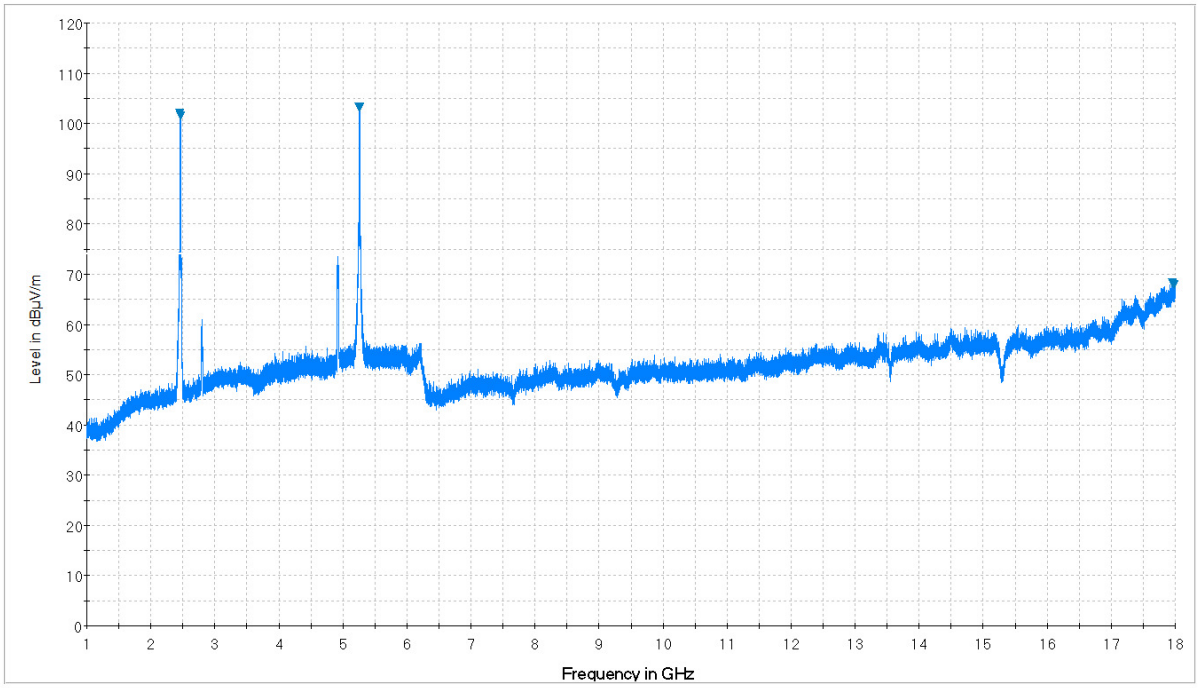
7.7.3 Simultaneous Transmission Radiated Spurious Emissions Measurements (Above 1GHz)

§15.209

Description	2.4 GHz Emission	5 GHz Emisison
Antenna	1	2
Channel	11	100
Operating Frequency(MHz)	2462	5500
Data Rate (Mbps)	1	6
Mode	802.11b	802.11a

Table 7-60. Simultaneous Transmission Config-1



Plot 7-181. Radiated Spurious Plot above 1GHz (2.4GHz – 5GHz, Ant. Pol. H)

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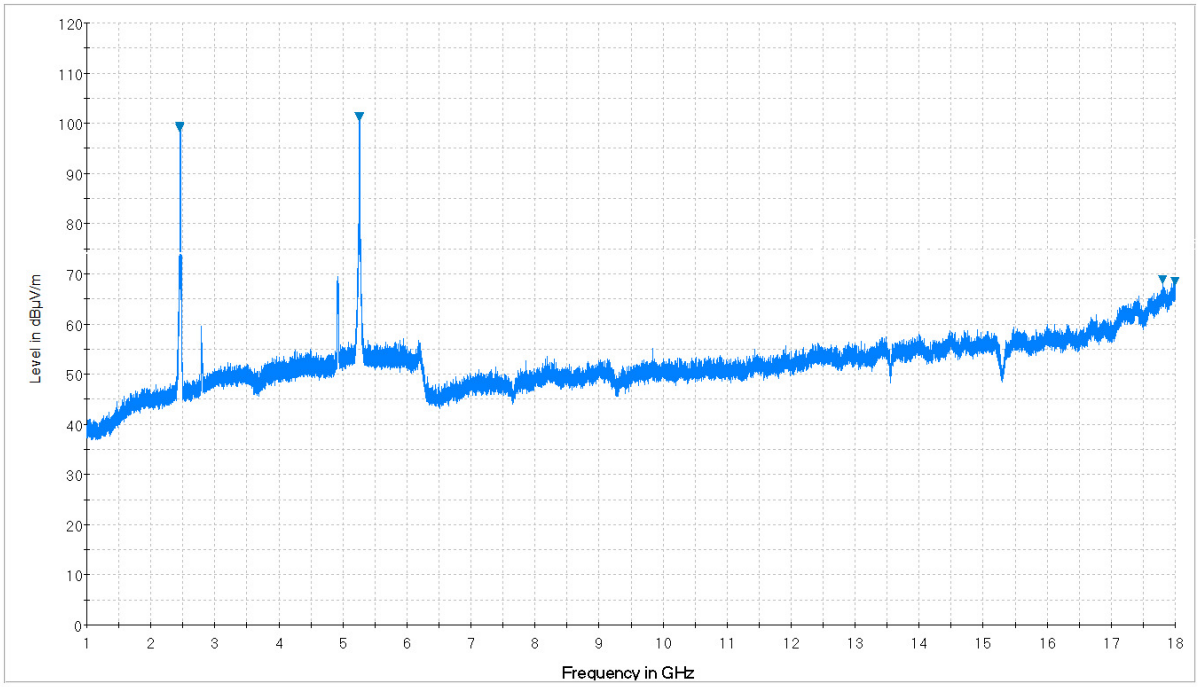
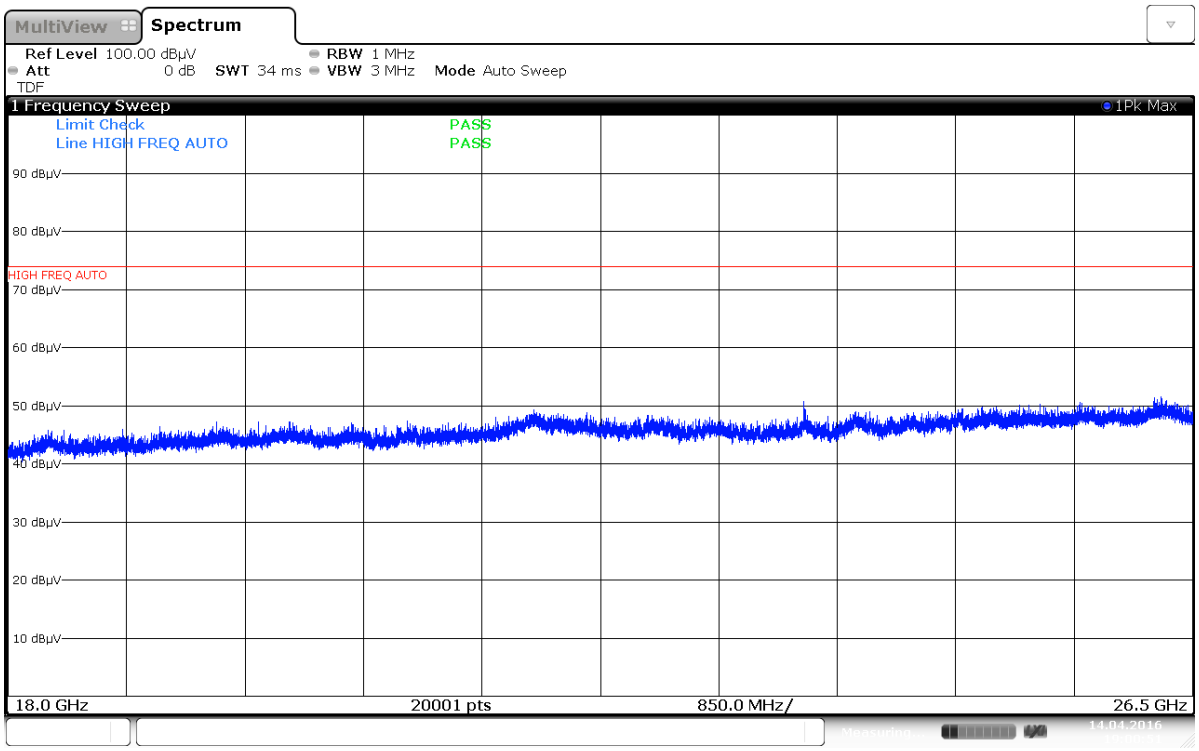
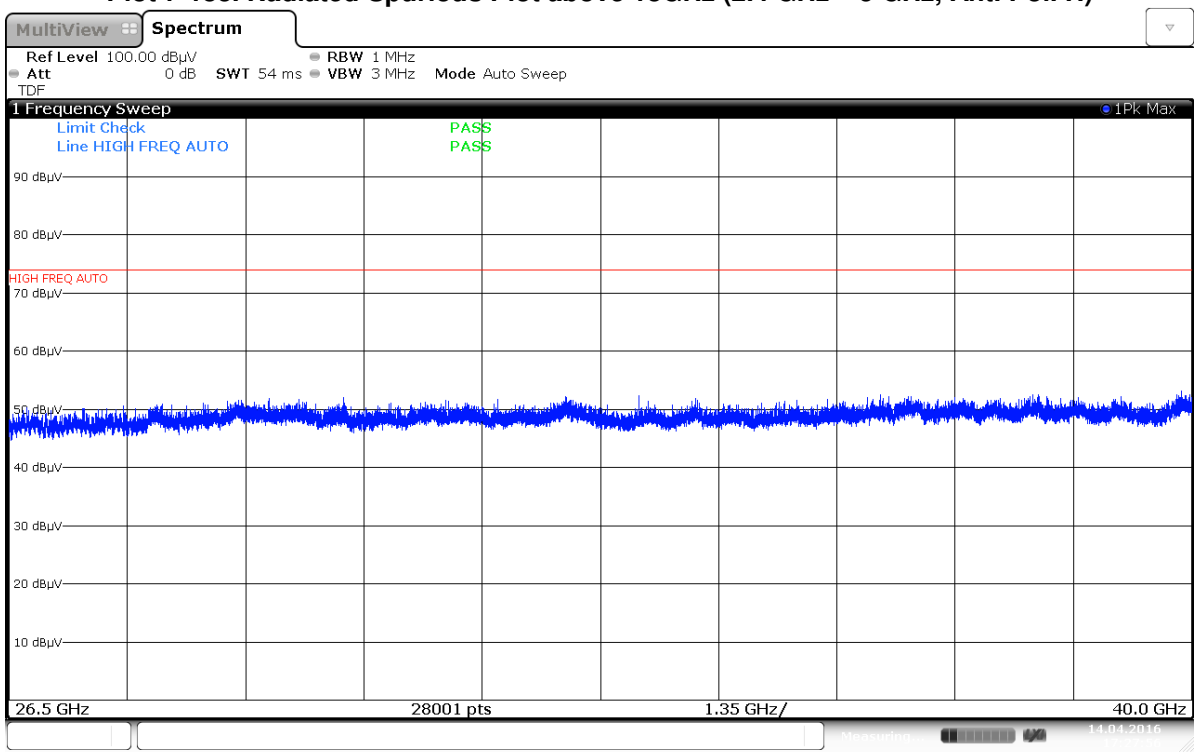


Plot 7-182. Radiated Spurious Plot above 1GHz (2.4GHz – 5GHz, Ant. Pol. V)

© 2016 PCTEST Engineering Laboratory, Inc.

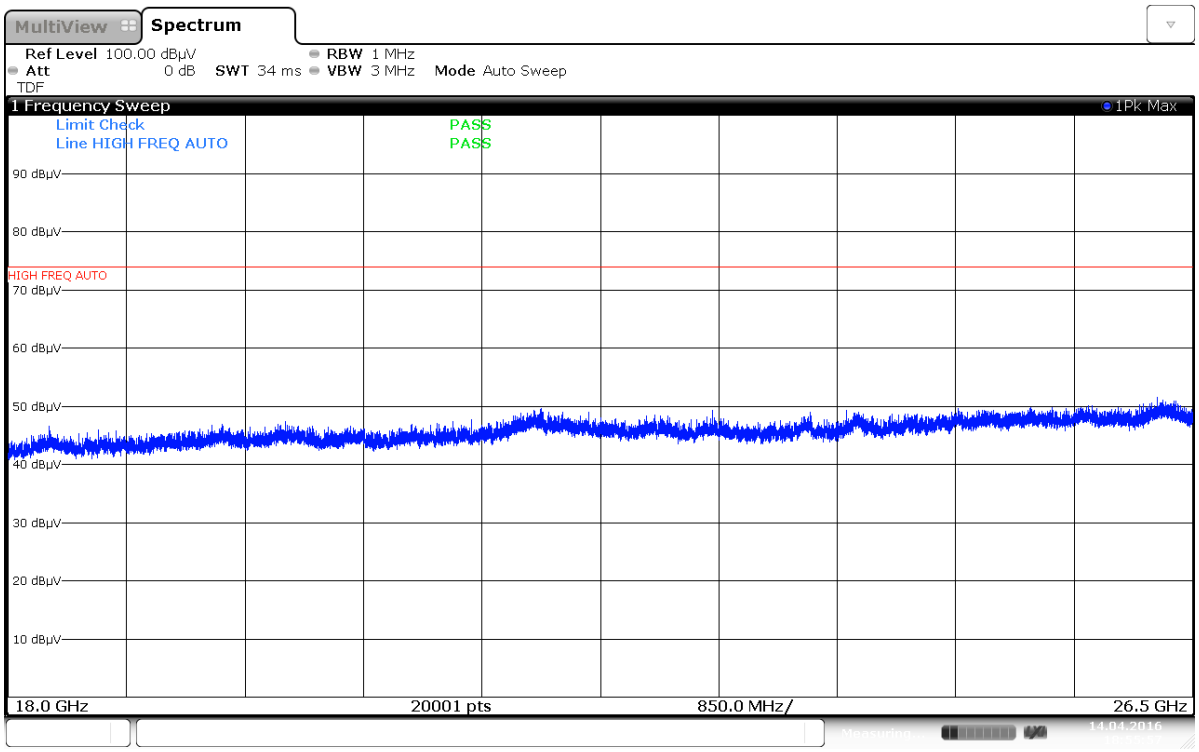


Plot 7-183. Radiated Spurious Plot above 18GHz (2.4 GHz – 5 GHz, Ant. Pol. H)

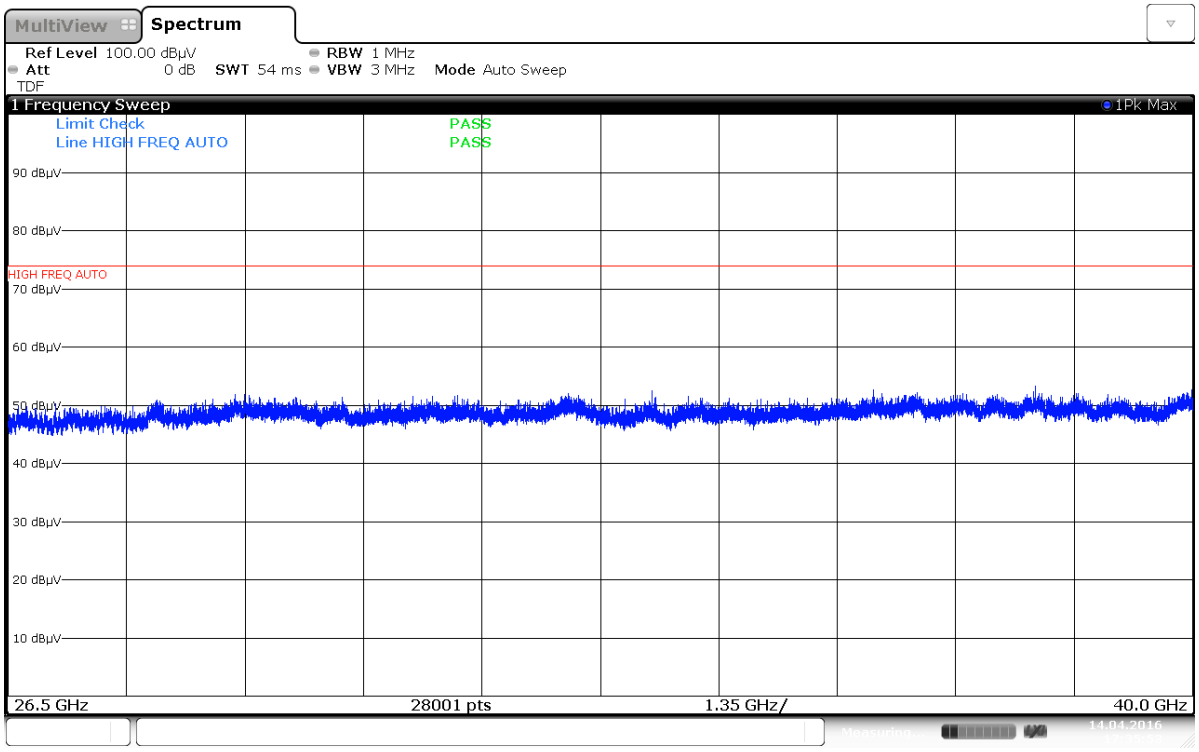


Plot 7-184. Radiated Spurious Plot above 18GHz (2.4 GHz – 5 GHz, Ant. Pol. H)

© 2016 PCTEST Engineering Laboratory, Inc.



Plot 7-185. Radiated Spurious Plot above 18GHz (2.4 GHz – 5 GHz, Ant. Pol. V)



Plot 7-186. Radiated Spurious Plot above 18GHz (2.4 GHz – 5 GHz, Ant. Pol. V)

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Simultaneous Tx Radiated Spurious Emission Measurements
§15.247(d) §15.205 & §15.209

Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
2798.00	-99.86	Avg	H	43.10	0.00	50.23	53.98	-3.75
2798.00	-87.43	Peak	H	43.10	0.00	62.66	73.98	-11.32
4924.00	-112.33	Avg	H	39.90	0.00	34.57	53.98	-19.41
4924.00	-100.33	Peak	H	39.90	0.00	46.57	73.98	-27.41
7722.00	-112.59	Avg	H	43.80	0.00	38.21	53.98	-15.77
7722.00	-101.08	Peak	H	43.80	0.00	49.72	73.98	-24.26
8058.00	-112.51	Avg	H	45.31	0.00	39.80	53.98	-14.18
8058.00	-100.83	Peak	H	45.31	0.00	51.48	73.98	-22.50
10184.00	-100.55	Peak	H	48.28	0.00	54.74	73.98	-19.24
12982.00	-100.79	Peak	H	51.59	0.00	57.79	73.98	-16.19

Table 7-61. Radiated Measurements (ANT1 2.4GHz – ANT2 5GHz)

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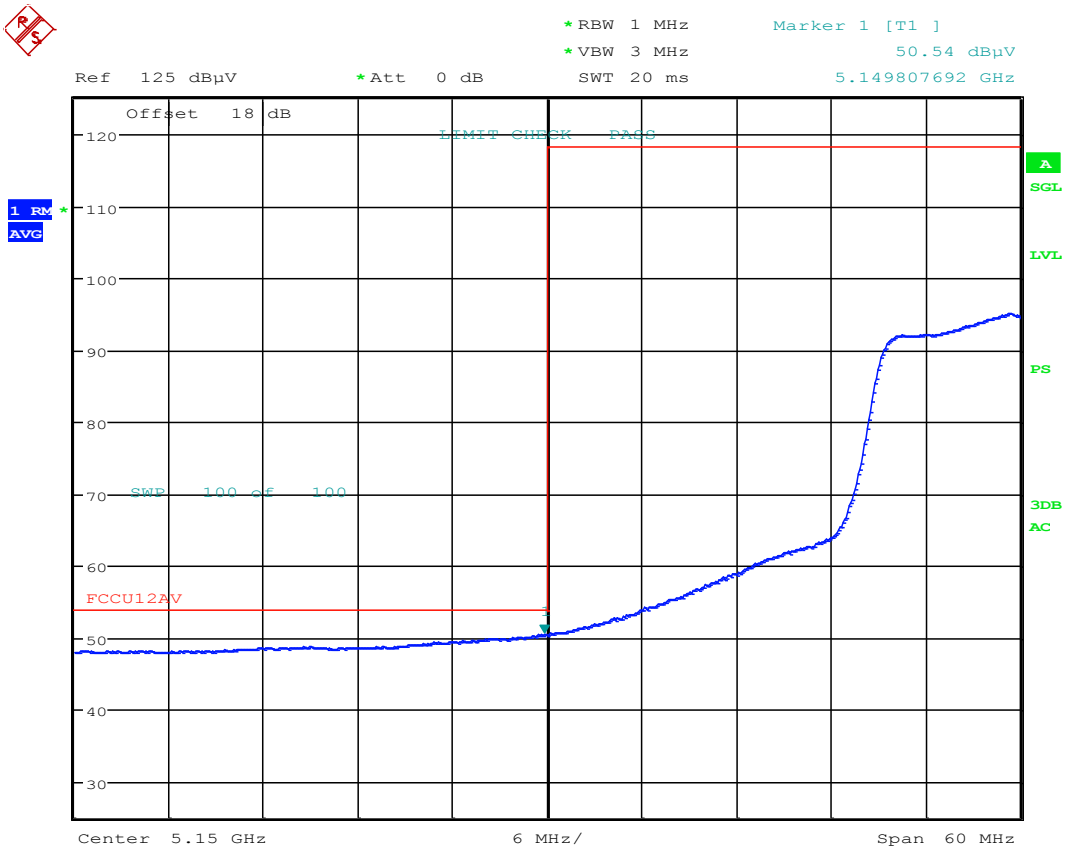
7.7.4 Antenna-1 Radiated Band Edge Measurements (20MHz BW)

§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



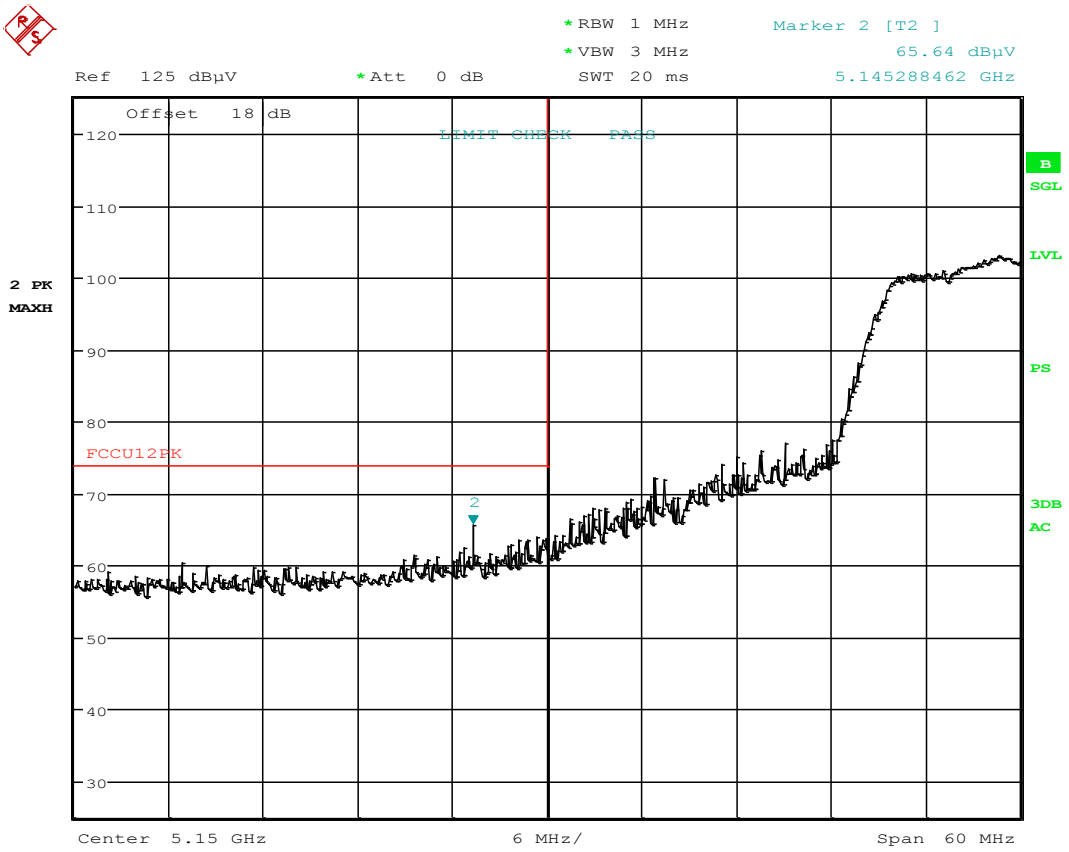
Date: 25.MAR.2016 01:37:39

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

© 2016 PCTEST Engineering Laboratory, Inc.

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

§15.407(b.1)(b.2) §15.205 §15.209



Date: 25.MAR.2016 01:37:19

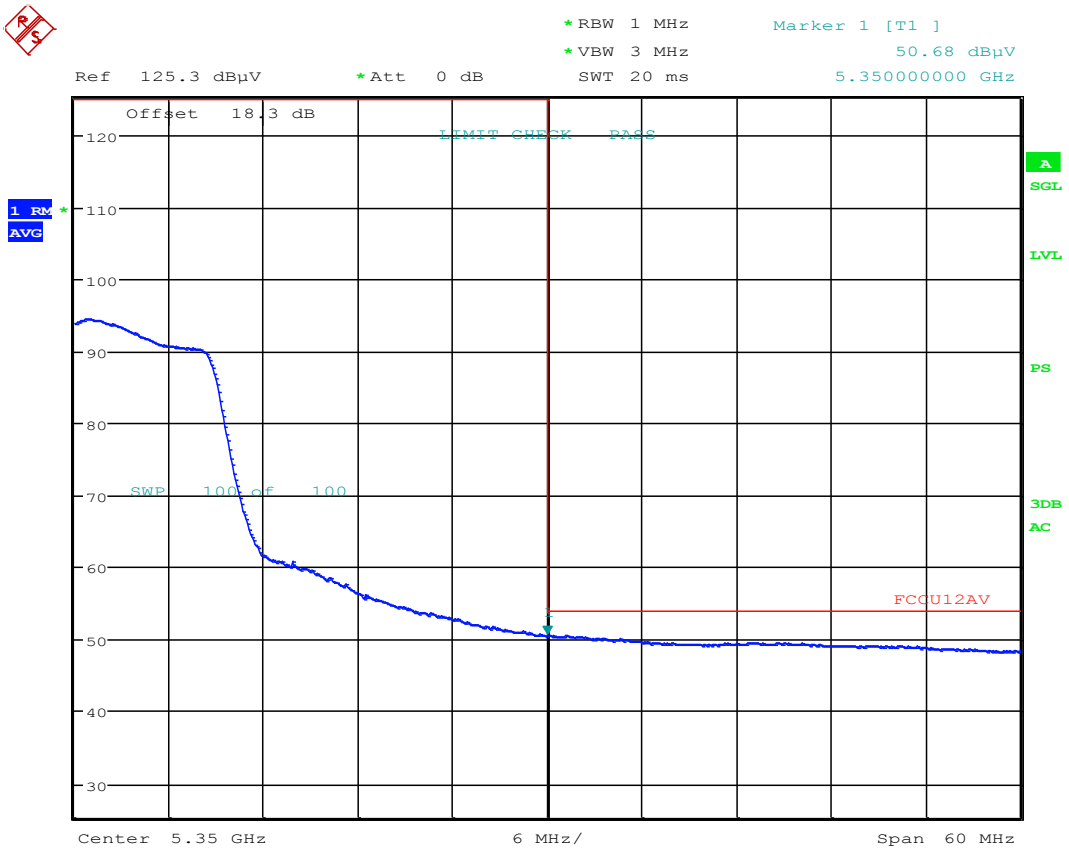
Plot 7-188. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)

© 2016 PCTEST Engineering Laboratory, Inc.

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: 25.MAR.2016 02:01:52

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

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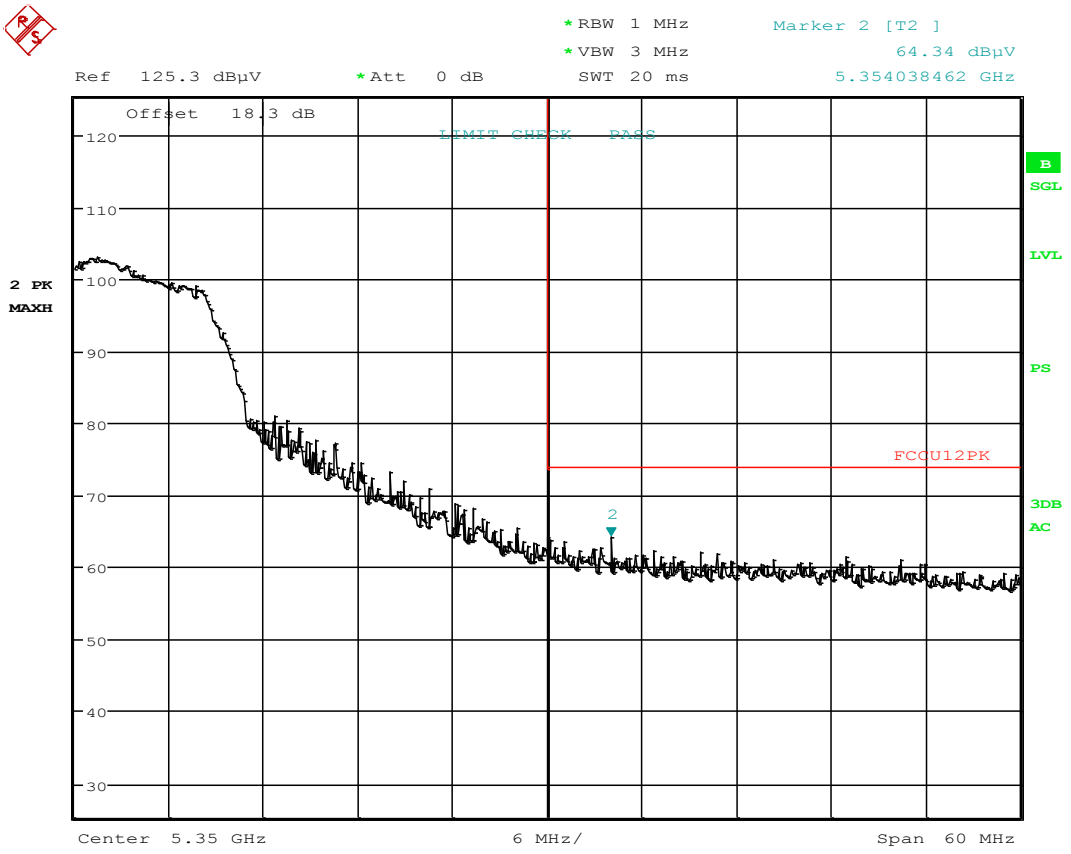
Antenna-1 Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



Date: 25.MAR.2016 02:02:16

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

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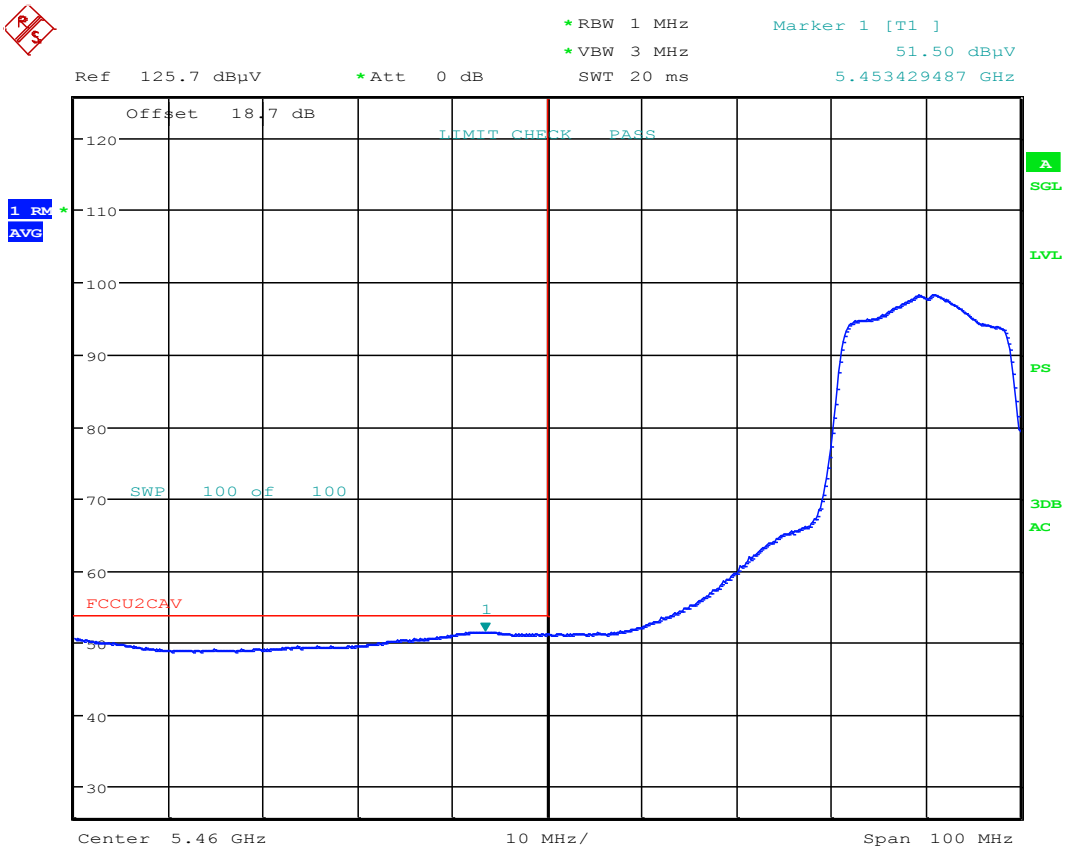
Antenna-1 Radiated Band Edge Measurements (20MHz BW)

§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: 25.MAR.2016 02:05:44

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

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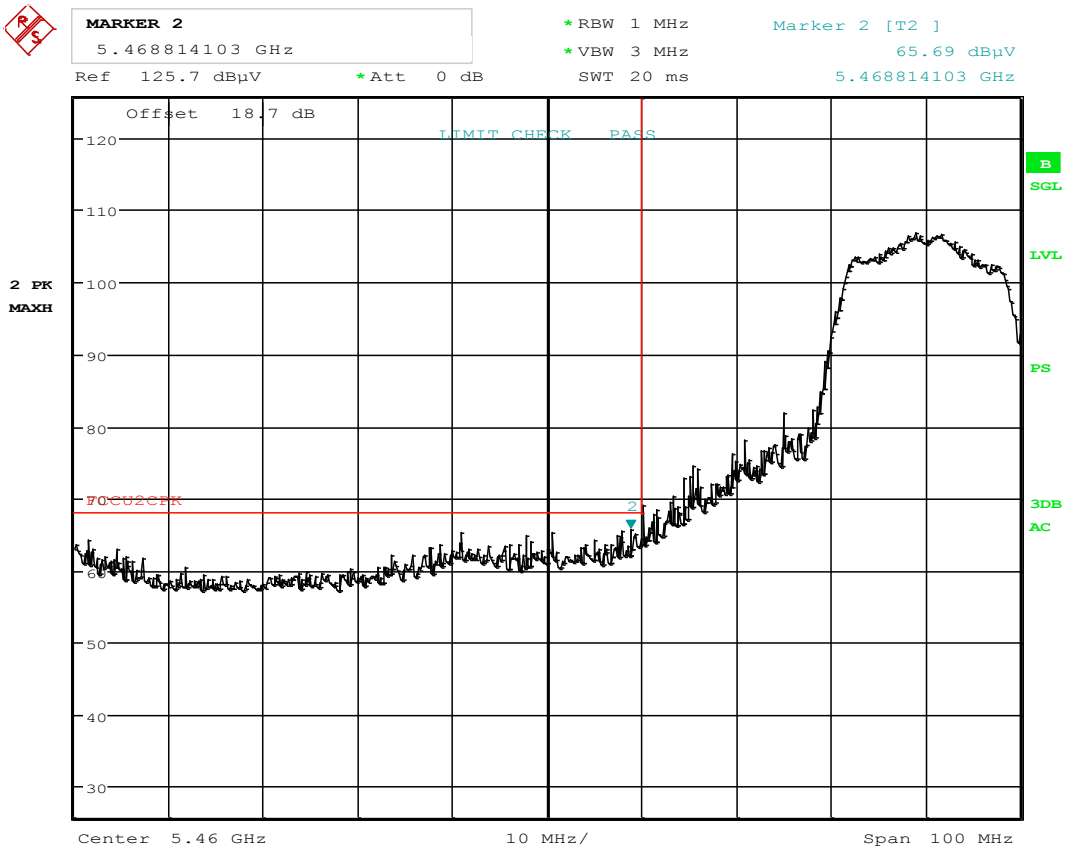
Antenna-1 Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



Date: 25.MAR.2016 02:06:45

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

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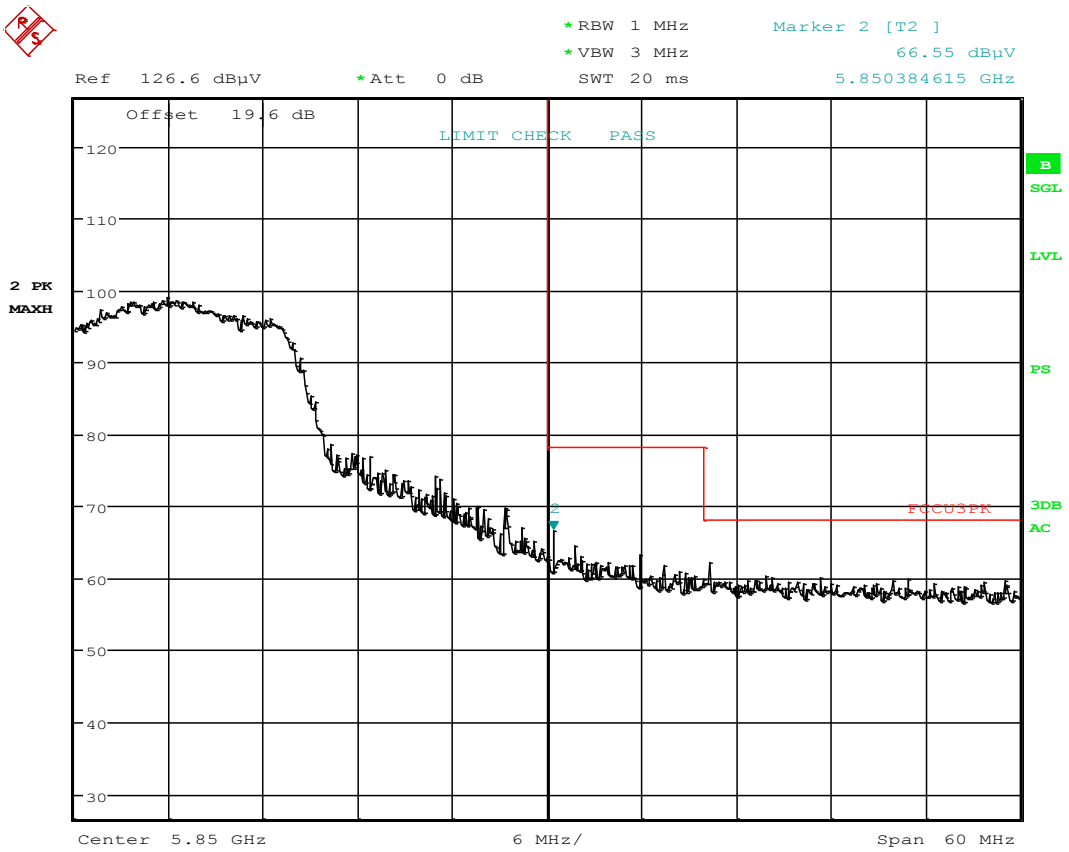
Antenna-1 Radiated Band Edge Measurements (20MHz BW)

§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: 25.MAR.2016 02:16:54

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

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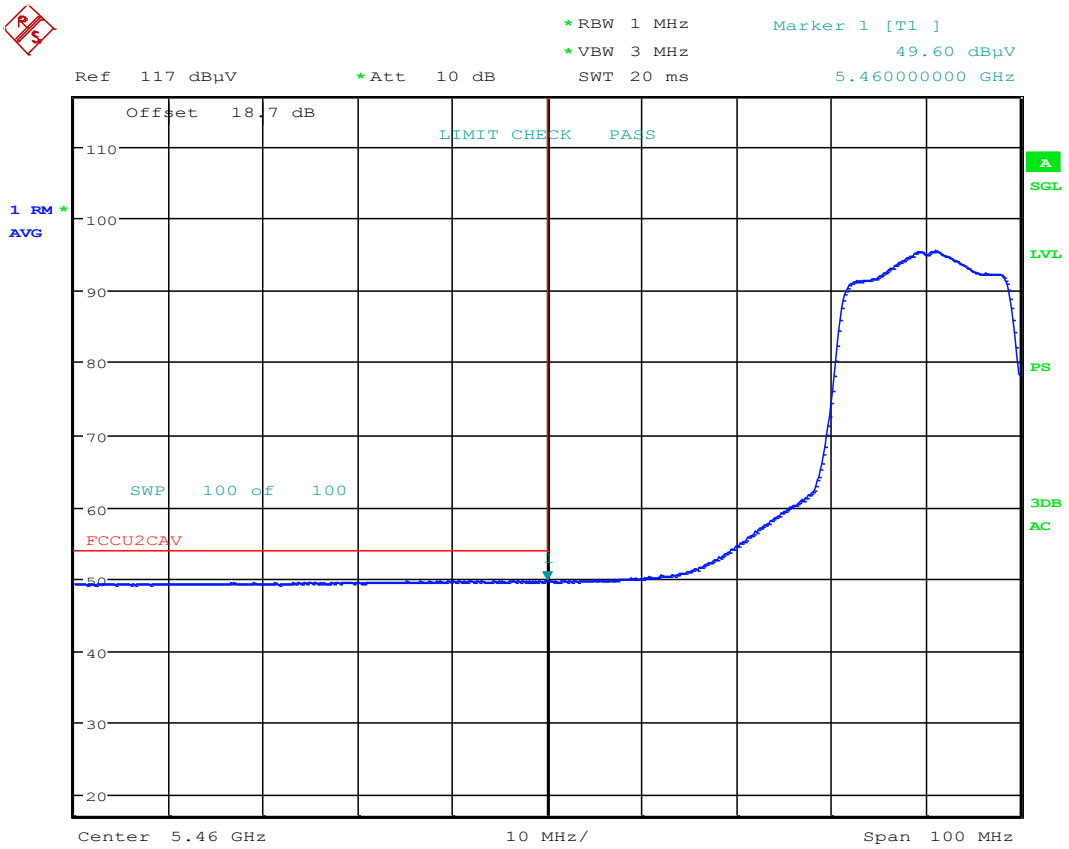
Antenna-1 WCP Radiated Band Edge Measurements (20MHz BW)

§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



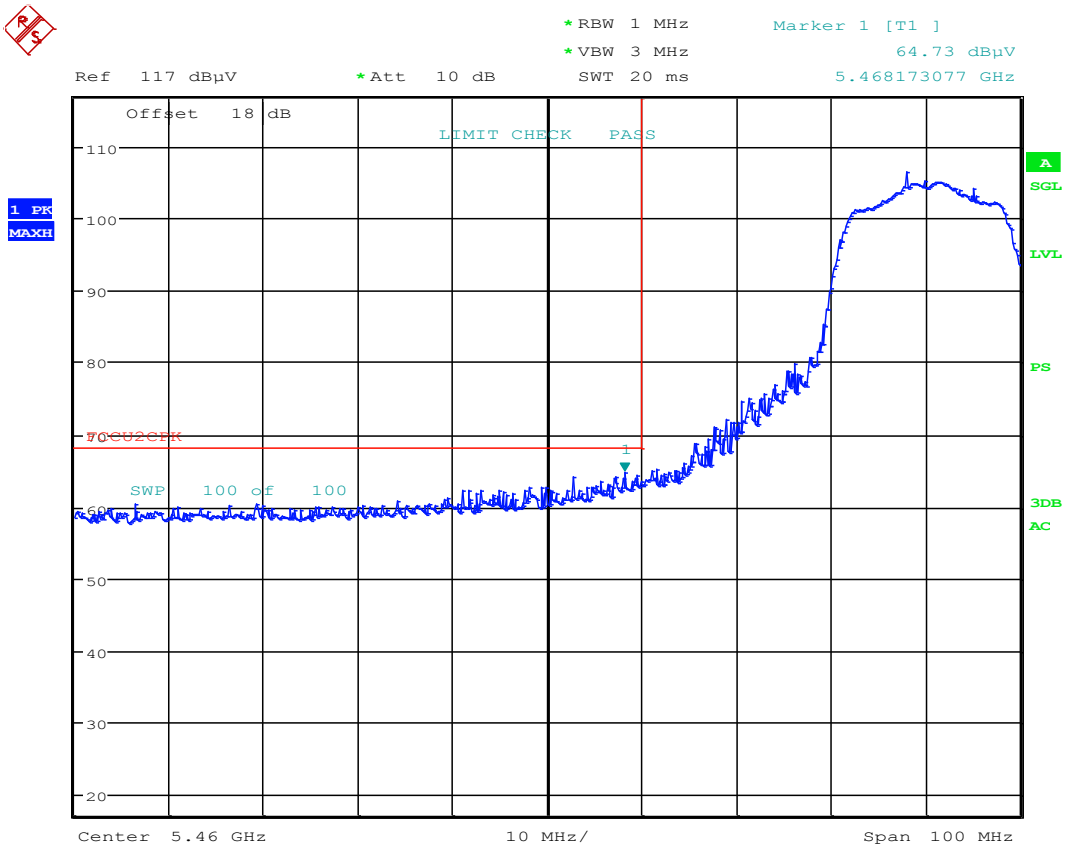
Date: 10.APR.2016 23:21:09

Plot 7-194. Radiated Restricted Band Edge Plot with WCP

© 2016 PCTEST Engineering Laboratory, Inc.

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

§15.407(b.1)(b.2) §15.205 §15.209



Date: 10.APR.2016 23:14:42

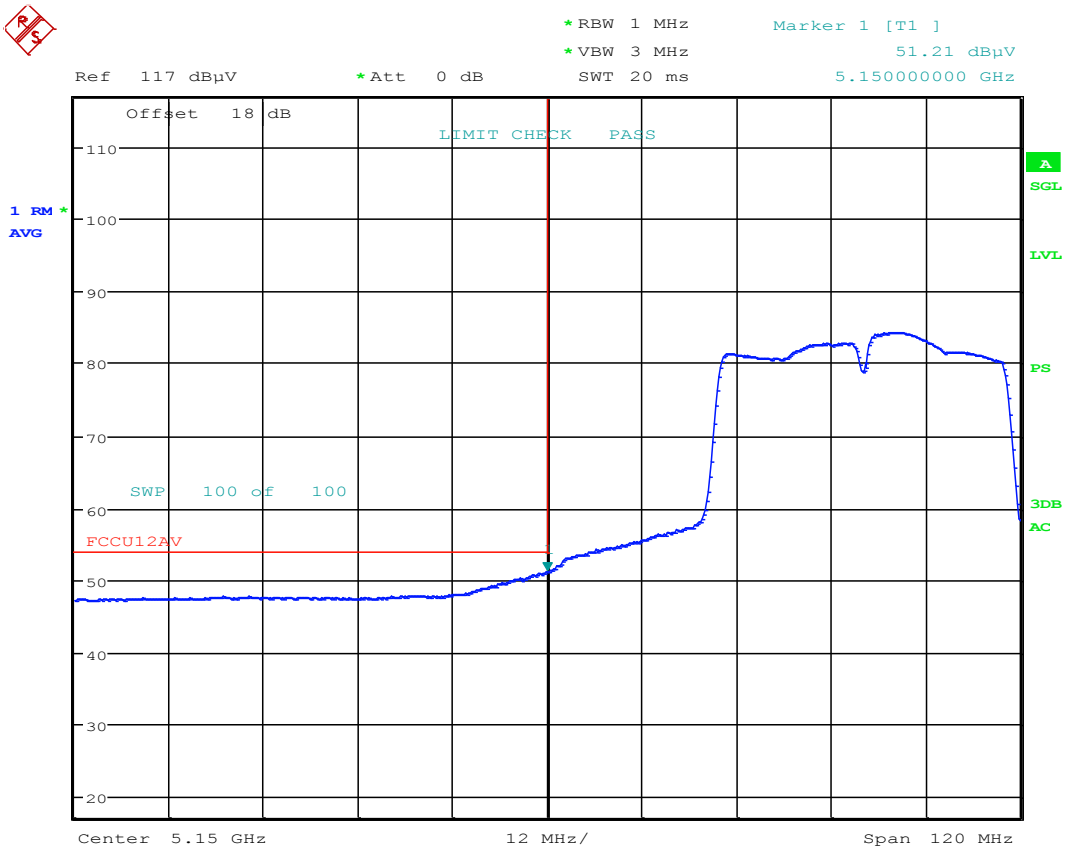
Plot 7-195. Radiated Restricted Band Edge Plot with WCP

© 2016 PCTEST Engineering Laboratory, Inc.

7.7.5 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



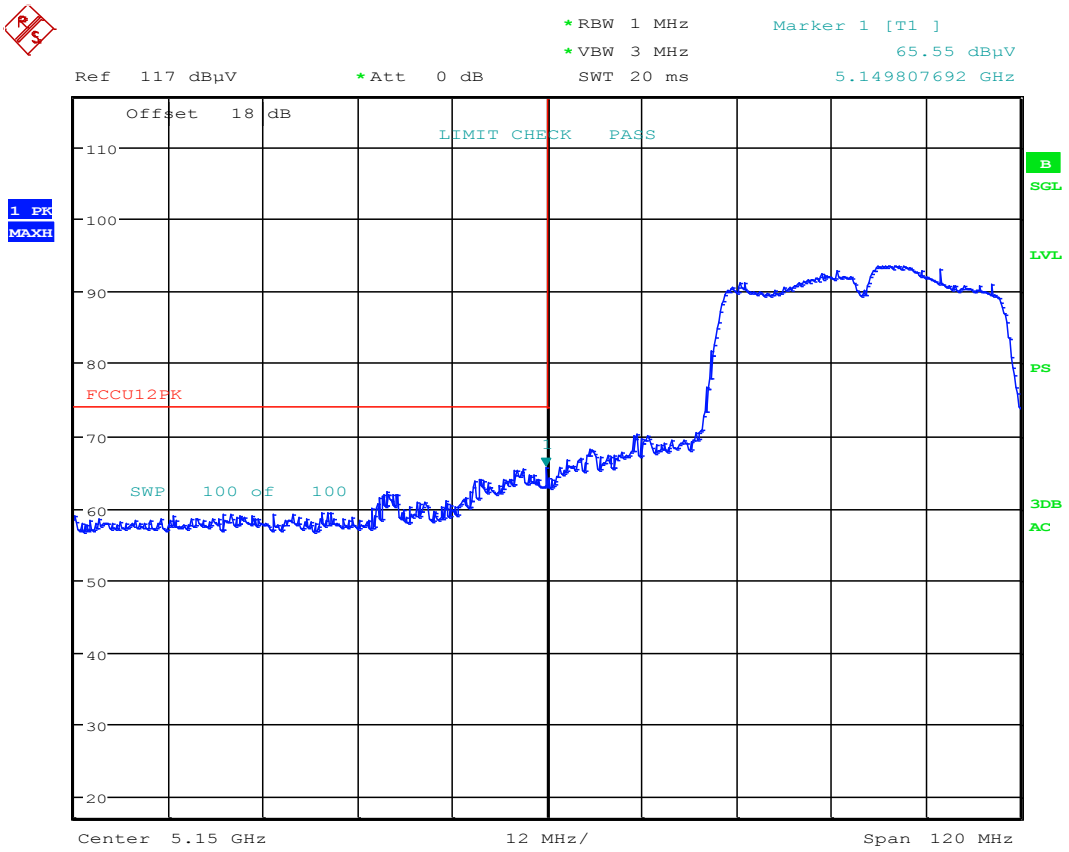
Date: 25.MAR.2016 17:27:16

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

© 2016 PCTEST Engineering Laboratory, Inc.

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

§15.407(b.1)(b.2) §15.205 §15.209



Date: 25.MAR.2016 17:28:39

Plot 7-197. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)

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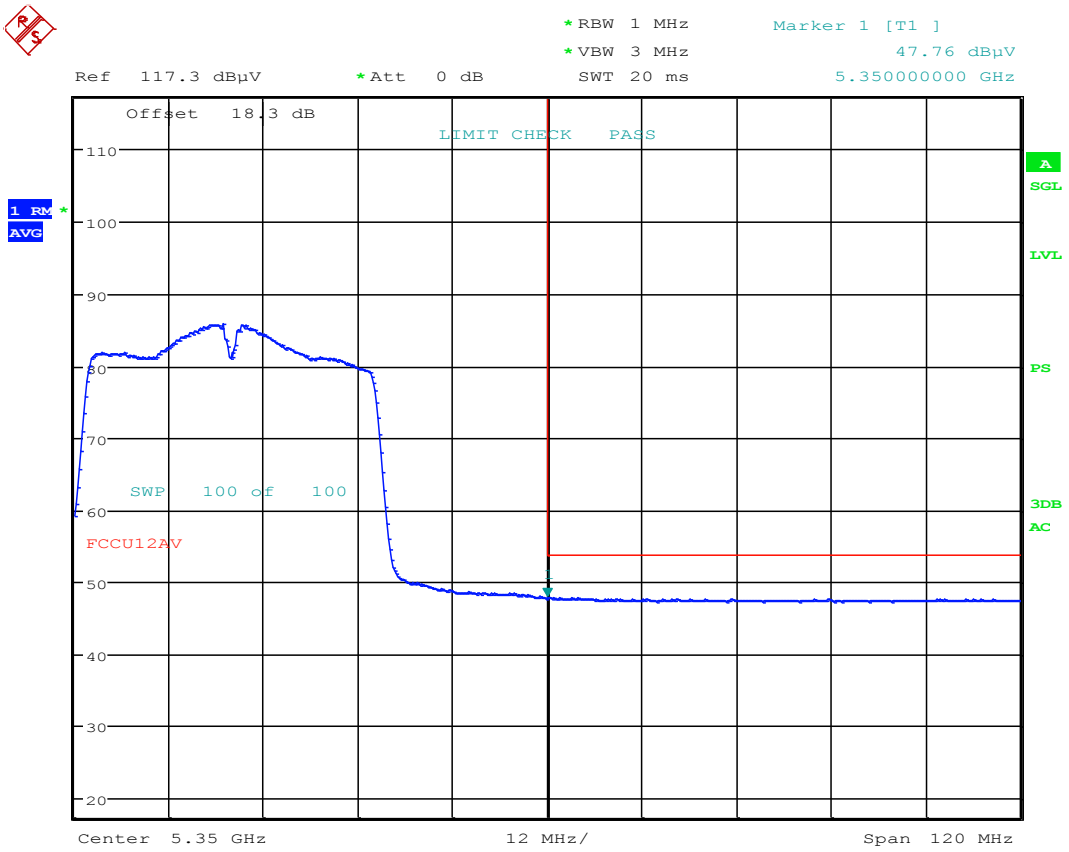
Antenna-1 Radiated Band Edge Measurements (40MHz BW)

§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



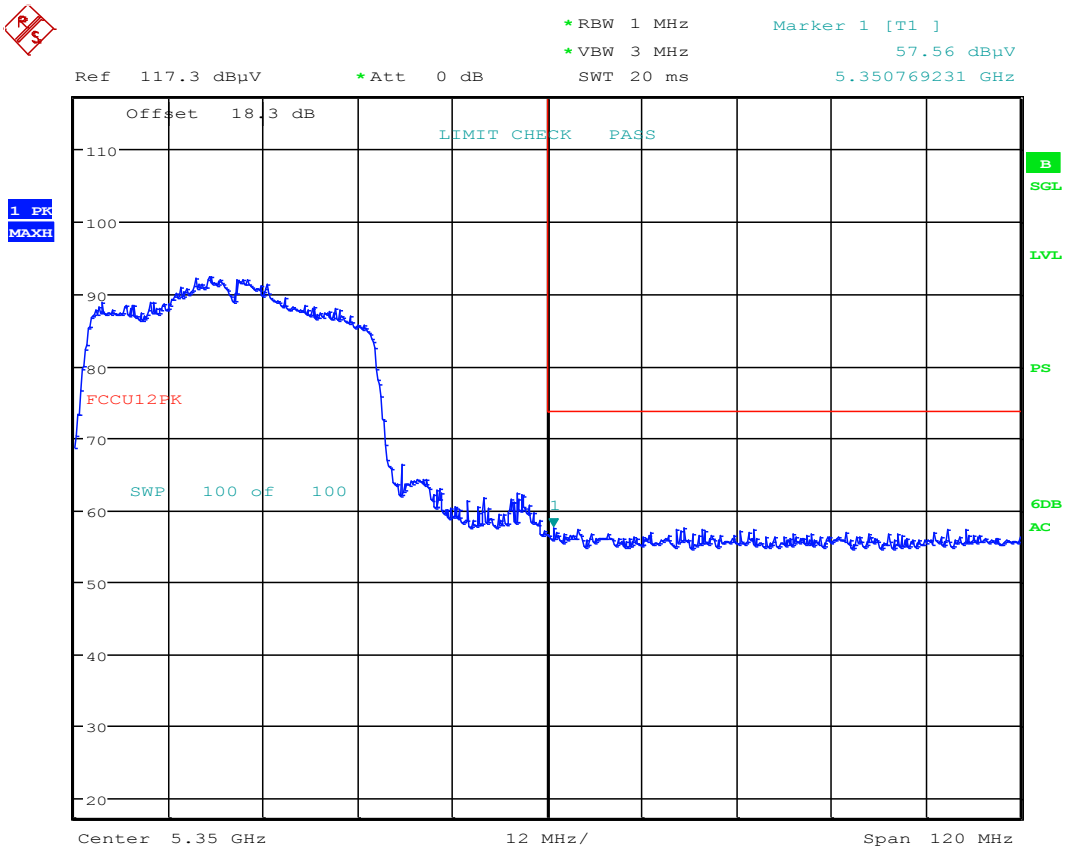
Date: 25.MAR.2016 17:44:18

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

© 2016 PCTEST Engineering Laboratory, Inc.

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

§15.407(b.1)(b.2) §15.205 §15.209



Date: 25.MAR.2016 17:44:50

Plot 7-199. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

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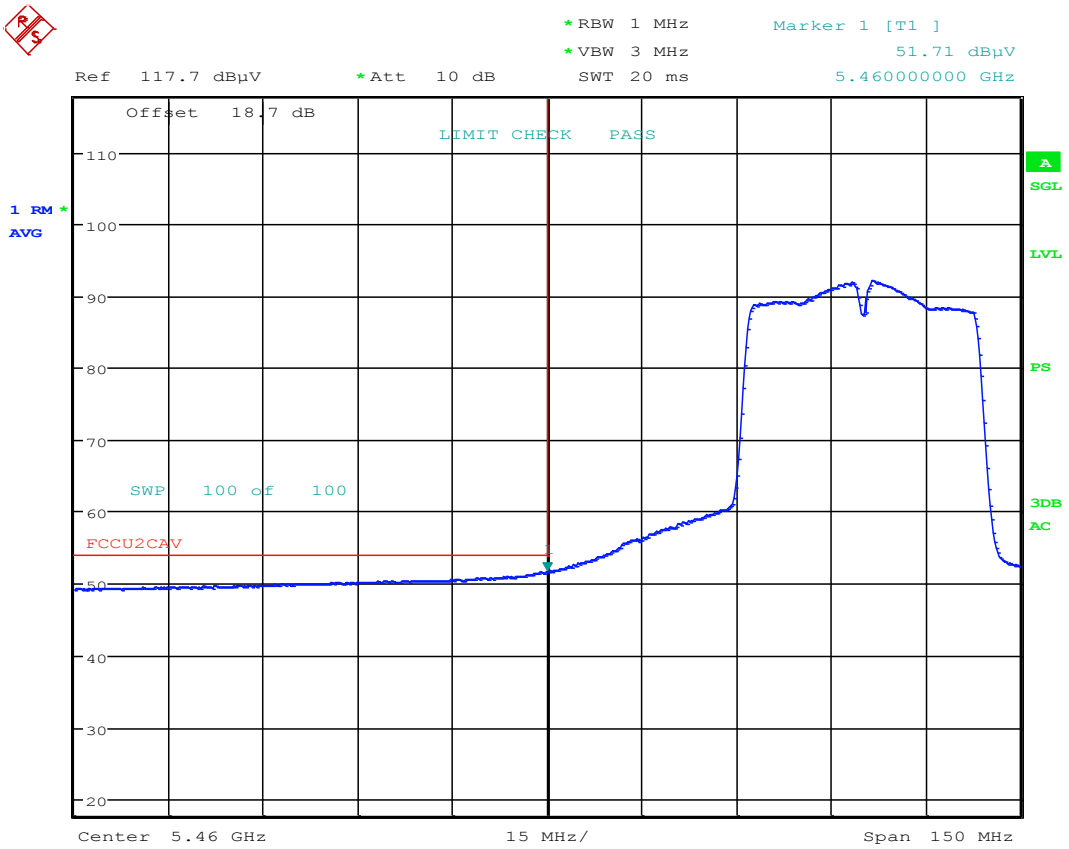
Antenna-1 Radiated Band Edge Measurements (40MHz BW)

§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



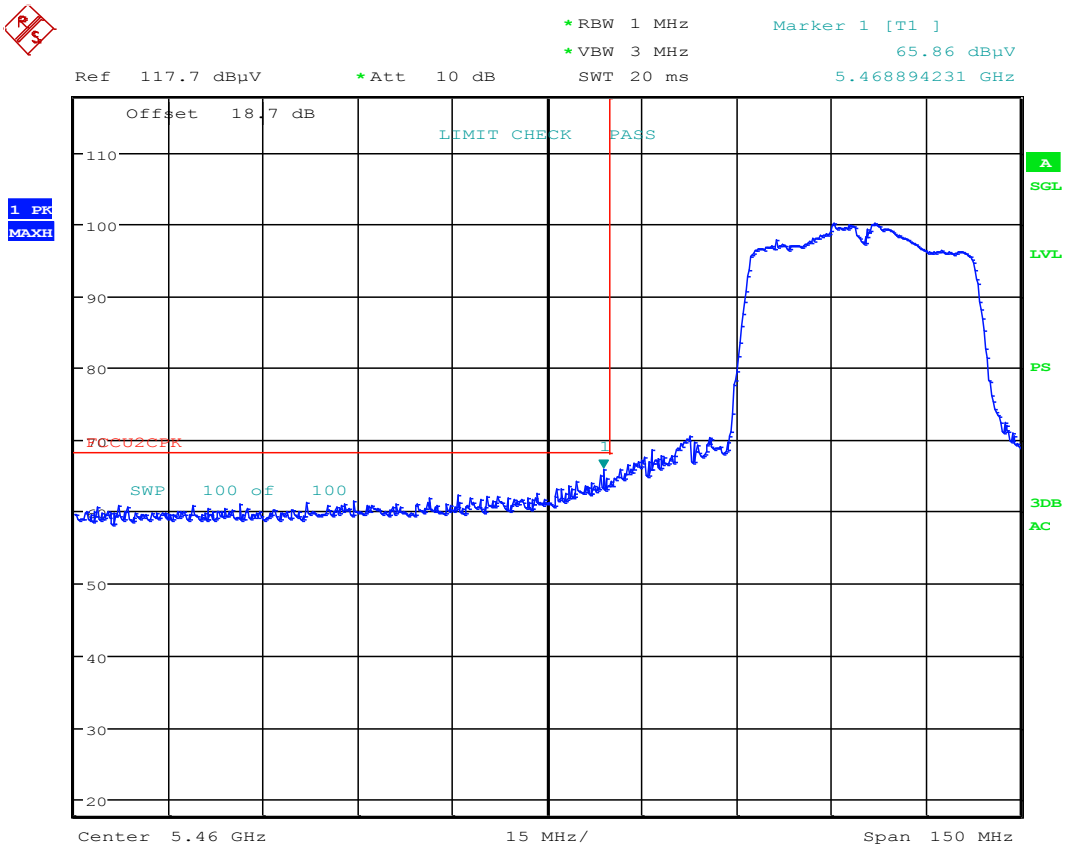
Date: 11.APR.2016 00:24:38

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

© 2016 PCTEST Engineering Laboratory, Inc.

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

§15.407(b.1)(b.2) §15.205 §15.209



Date: 11.APR.2016 00:25:51

Plot 7-201. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

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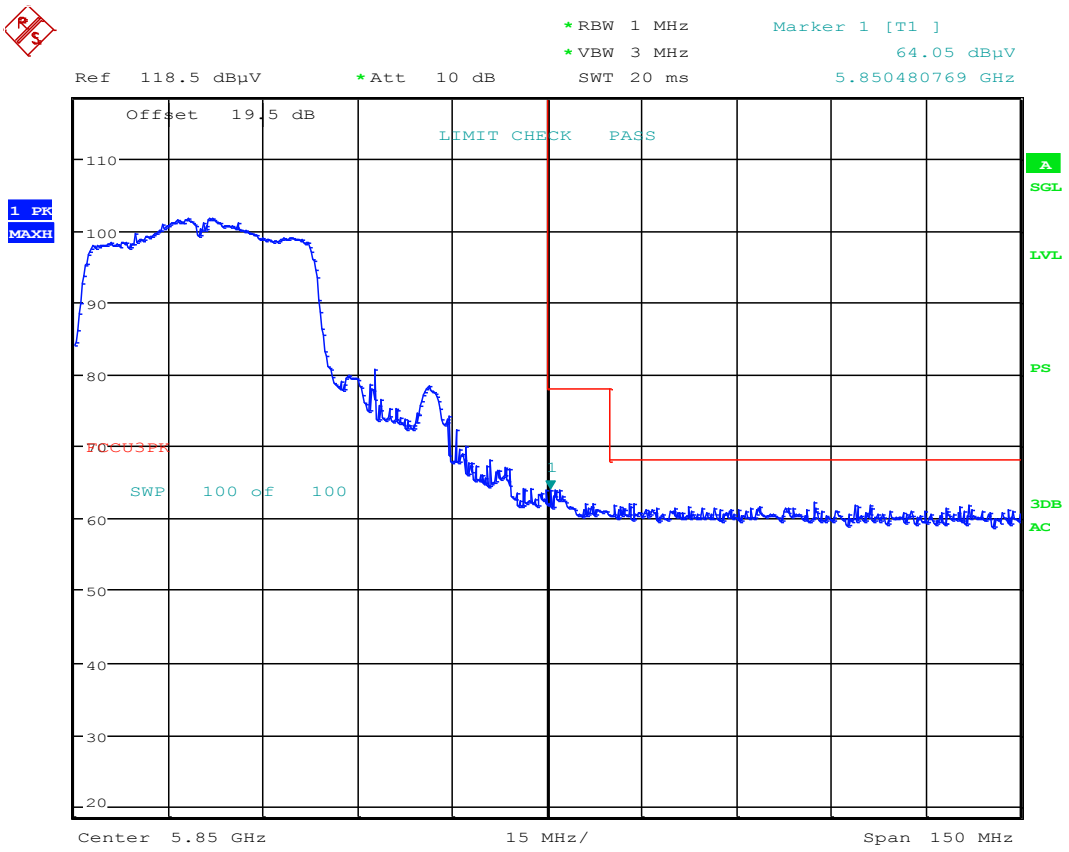
Antenna-1 Radiated Band Edge Measurements (40MHz BW)

§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: 11.APR.2016 00:27:21

Plot 7-202. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

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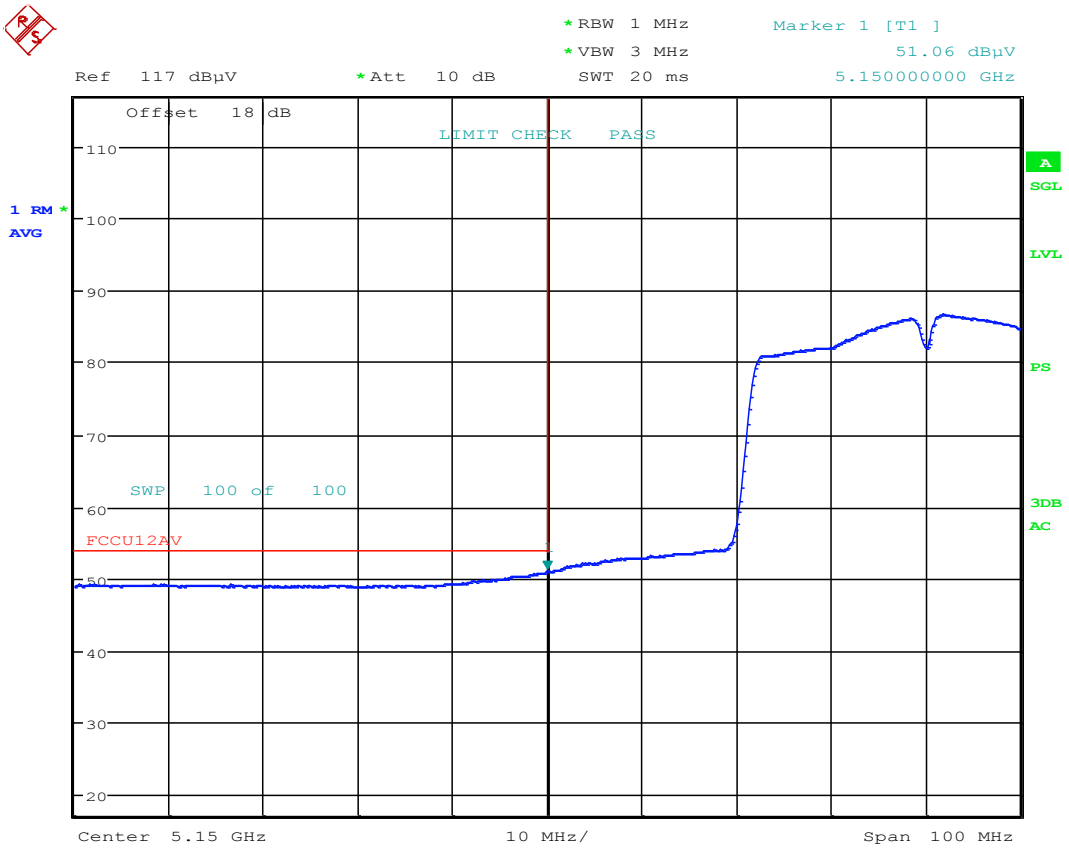
Antenna-1 WCP Radiated Band Edge Measurements (40MHz BW)

§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



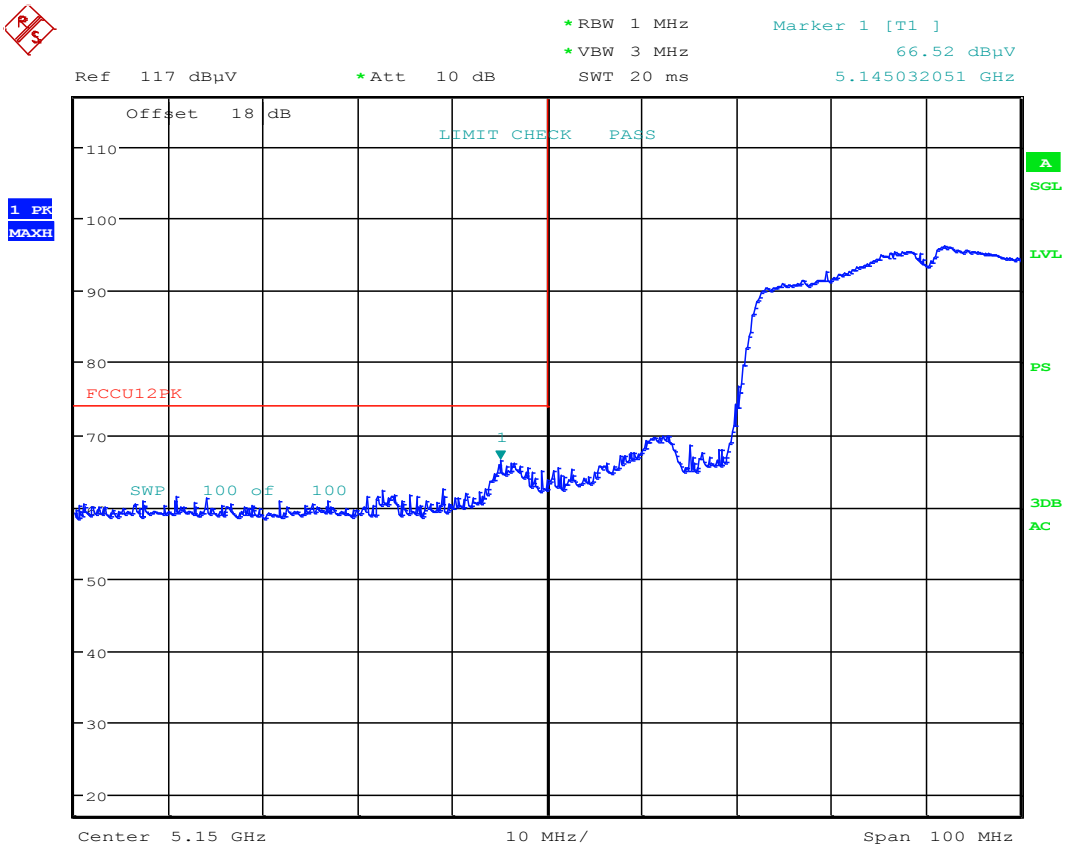
Date: 10.APR.2016 23:41:08

Plot 7-203. Radiated Restricted Band Edge Plot with WCP

© 2016 PCTEST Engineering Laboratory, Inc.

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

§15.407(b.1)(b.2) §15.205 §15.209



Date: 10.APR.2016 23:41:43

Plot 7-204. Radiated Restricted Band Edge Plot with WCP

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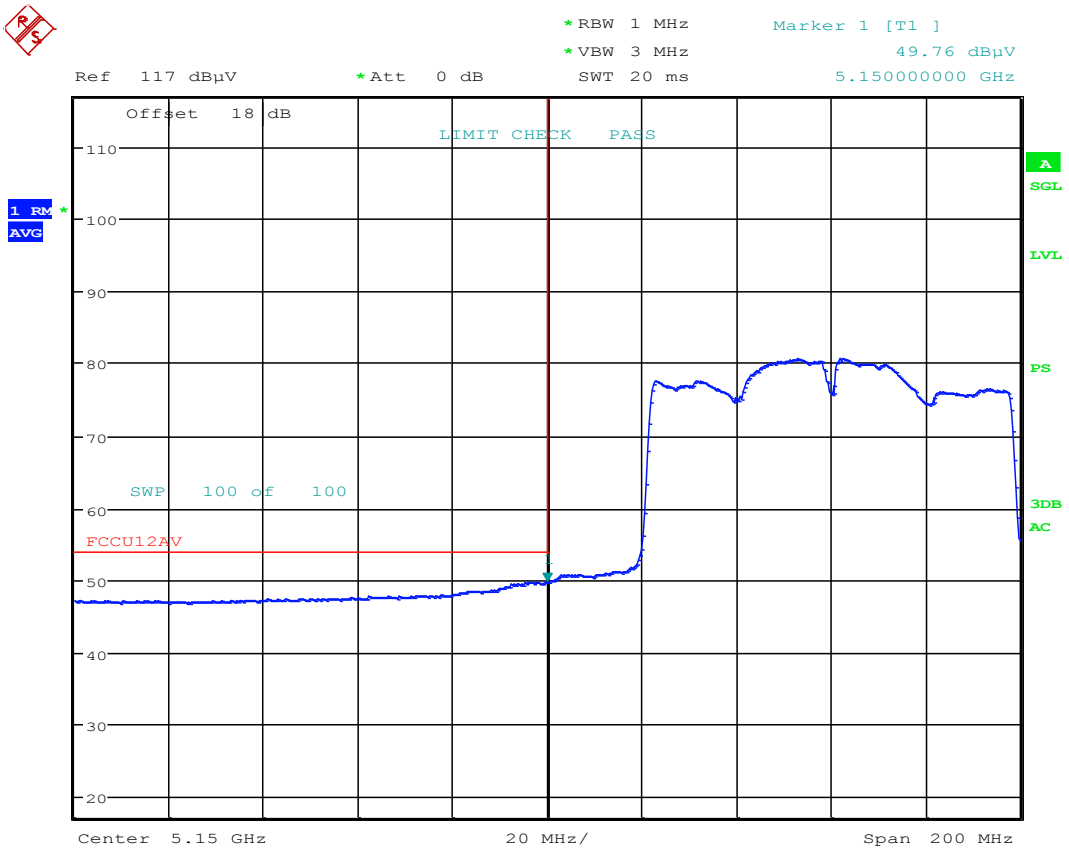
7.7.6 Antenna-1 Radiated Band Edge Measurements (80MHz BW)

§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:	5210MHz
Channel:	42



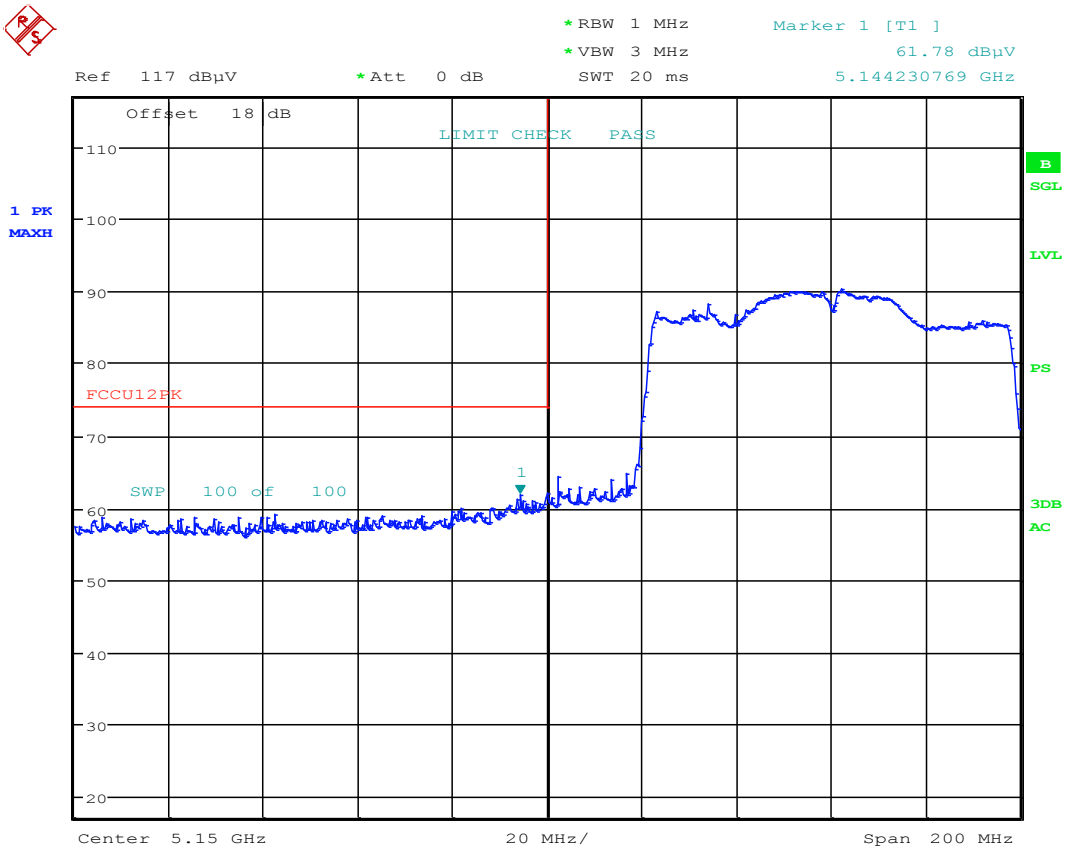
Date: 25.MAR.2016 17:35:35

Plot 7-205. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

© 2016 PCTEST Engineering Laboratory, Inc.

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

§15.407(b.1)(b.2) §15.205 §15.209



Date: 25.MAR.2016 17:36:38

Plot 7-206. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)

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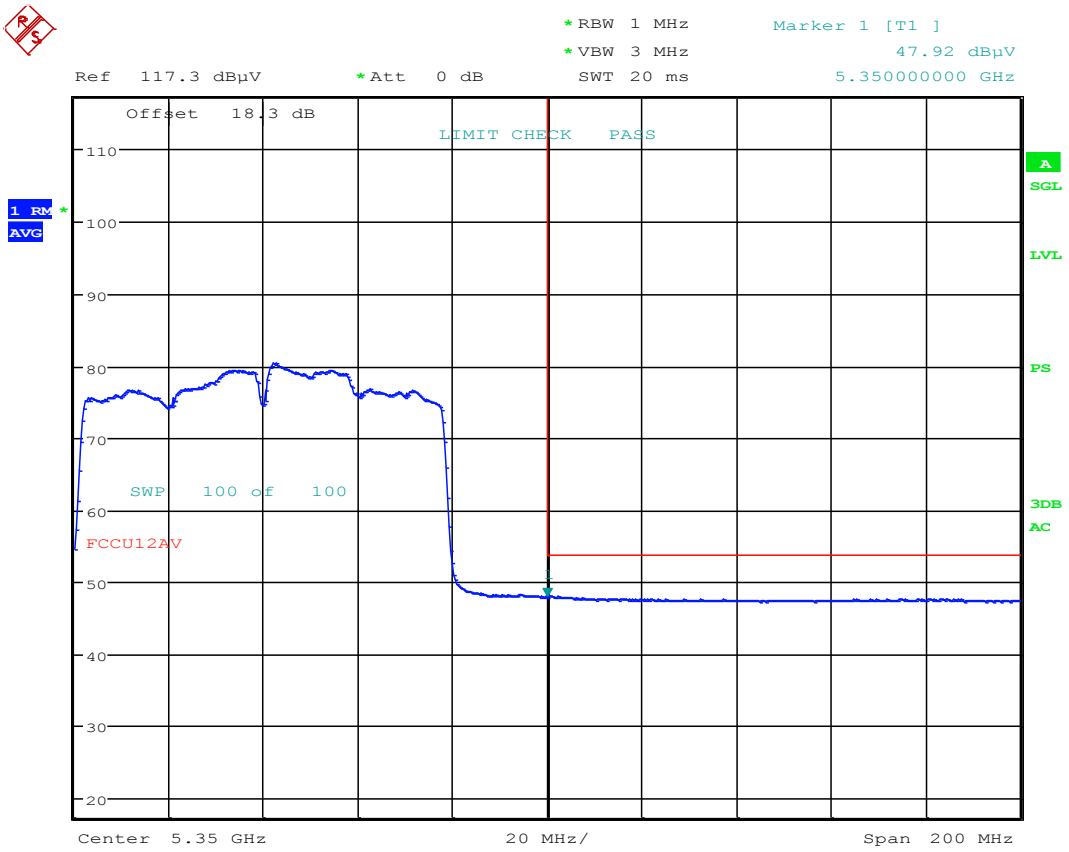
Antenna-1 Radiated Band Edge Measurements (80MHz BW)

§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



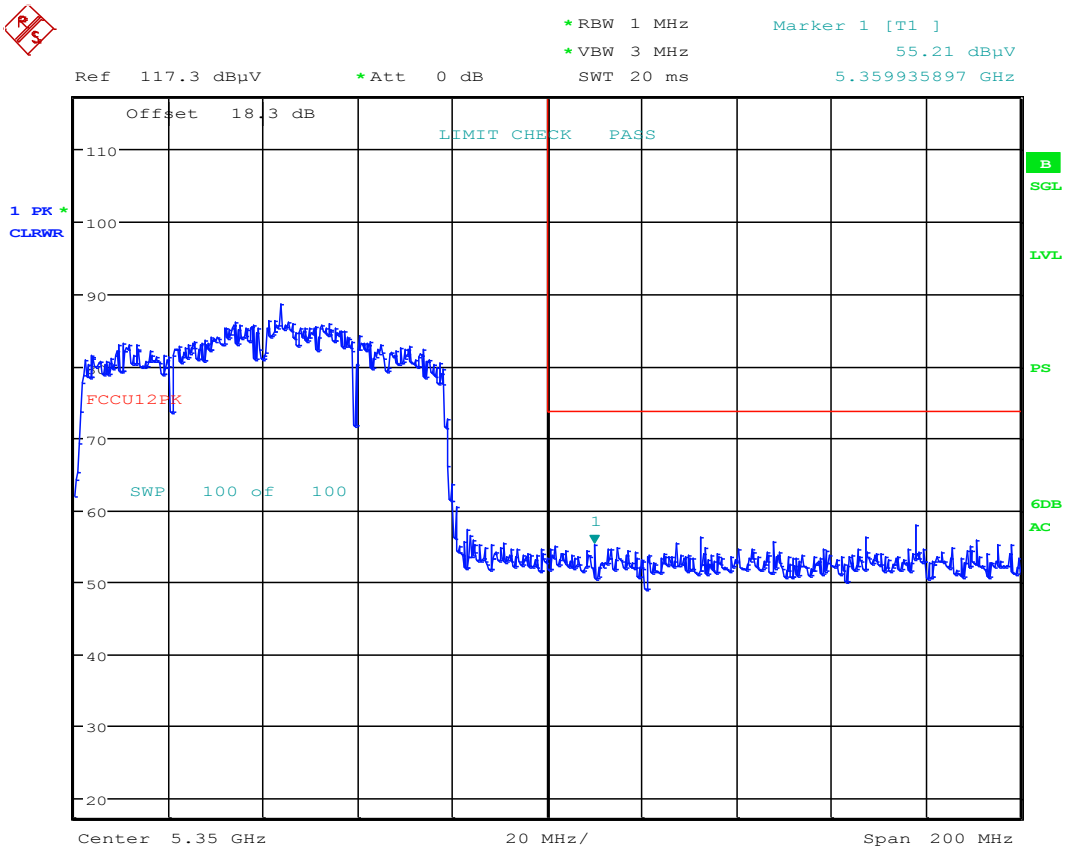
Date: 25.MAR.2016 17:50:03

Plot 7-207. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

© 2016 PCTEST Engineering Laboratory, Inc.

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

§15.407(b.1)(b.2) §15.205 §15.209



Date: 25.MAR.2016 17:50:41

Plot 7-208. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

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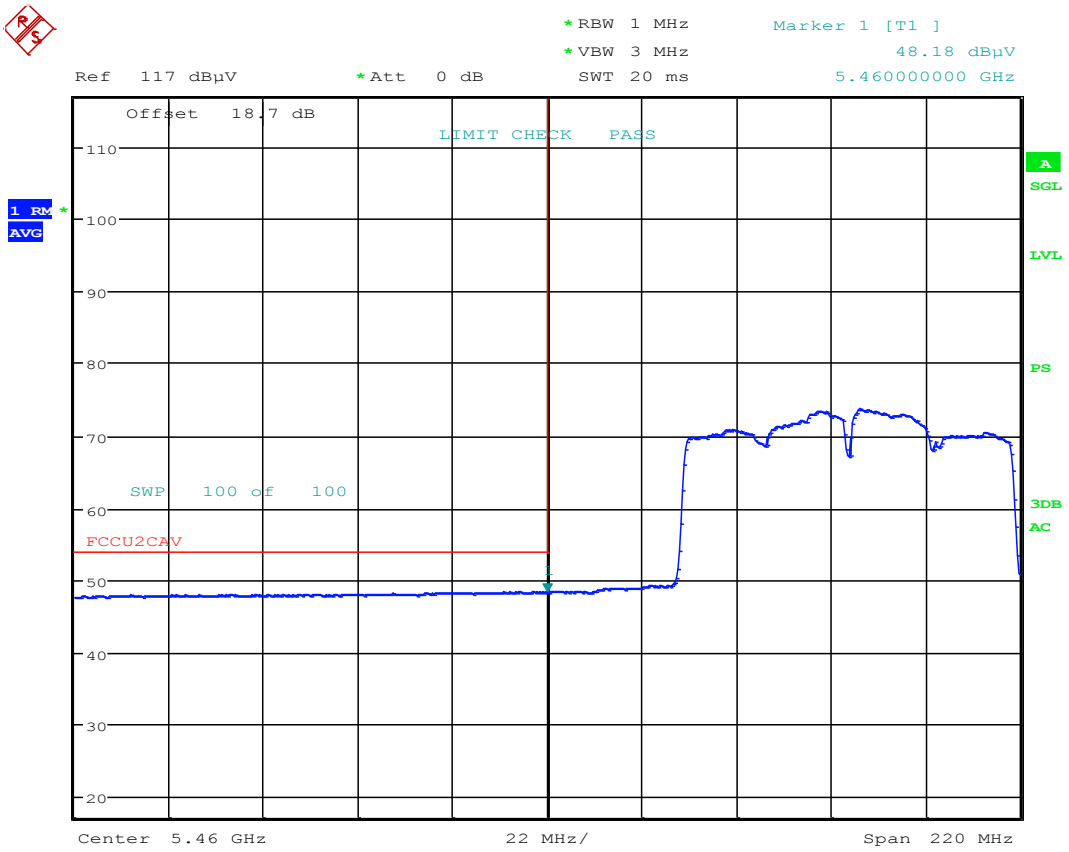
Antenna-1 Radiated Band Edge Measurements (80MHz BW)

§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



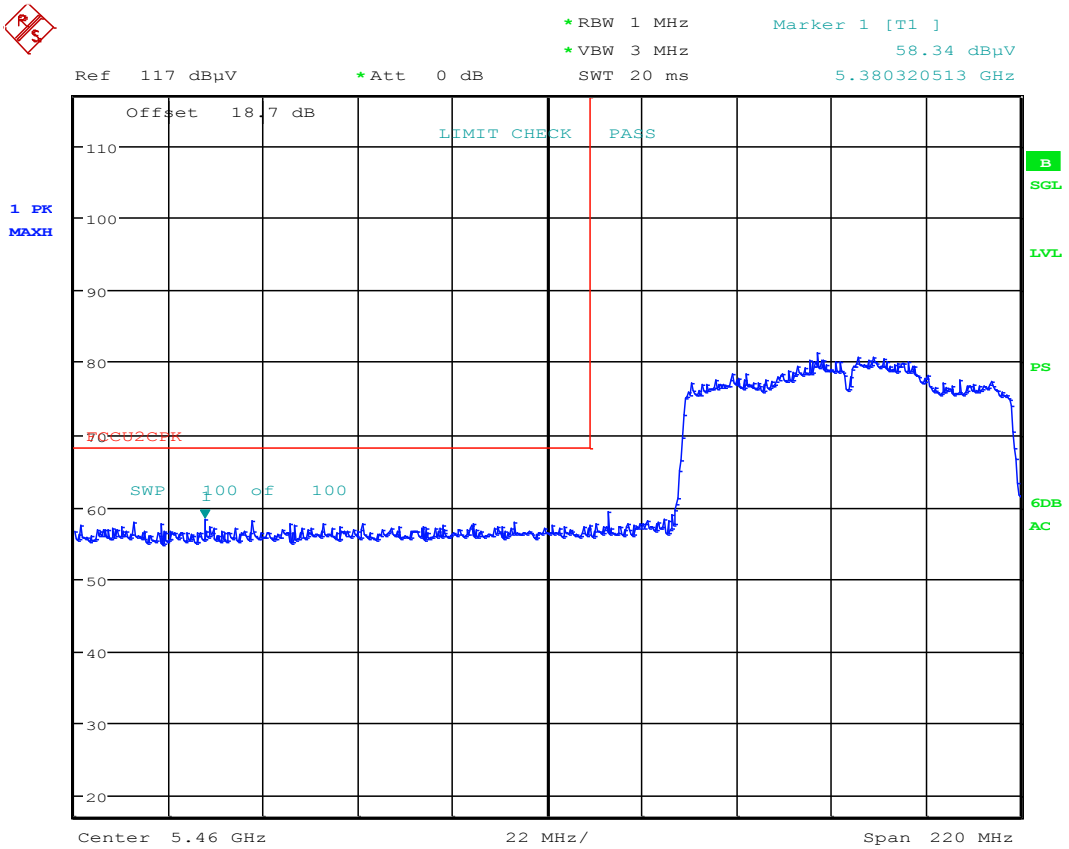
Date: 25.MAR.2016 18:10:23

Plot 7-209. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

© 2016 PCTEST Engineering Laboratory, Inc.

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

§15.407(b.1)(b.2) §15.205 §15.209



Date: 25.MAR.2016 18:10:59

Plot 7-210. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

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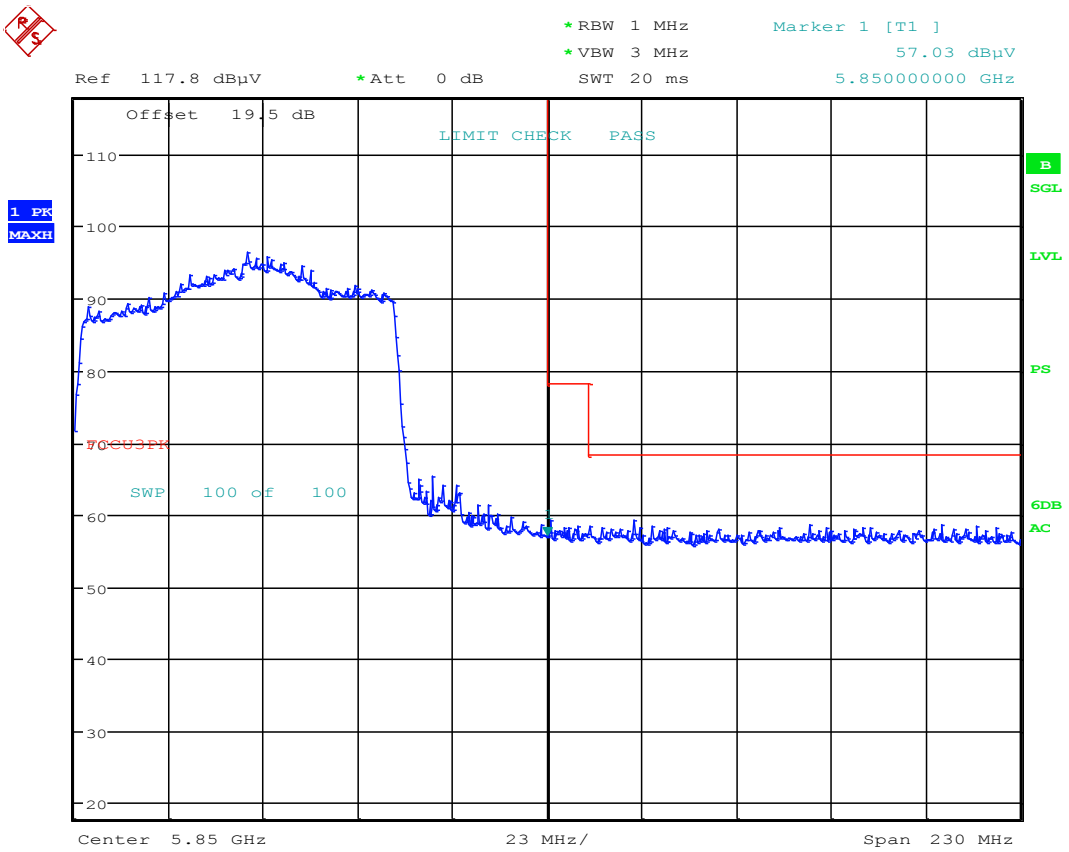
Antenna-1 Radiated Band Edge Measurements (80MHz BW)

§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: 25.MAR.2016 18:47:02

Plot 7-211. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

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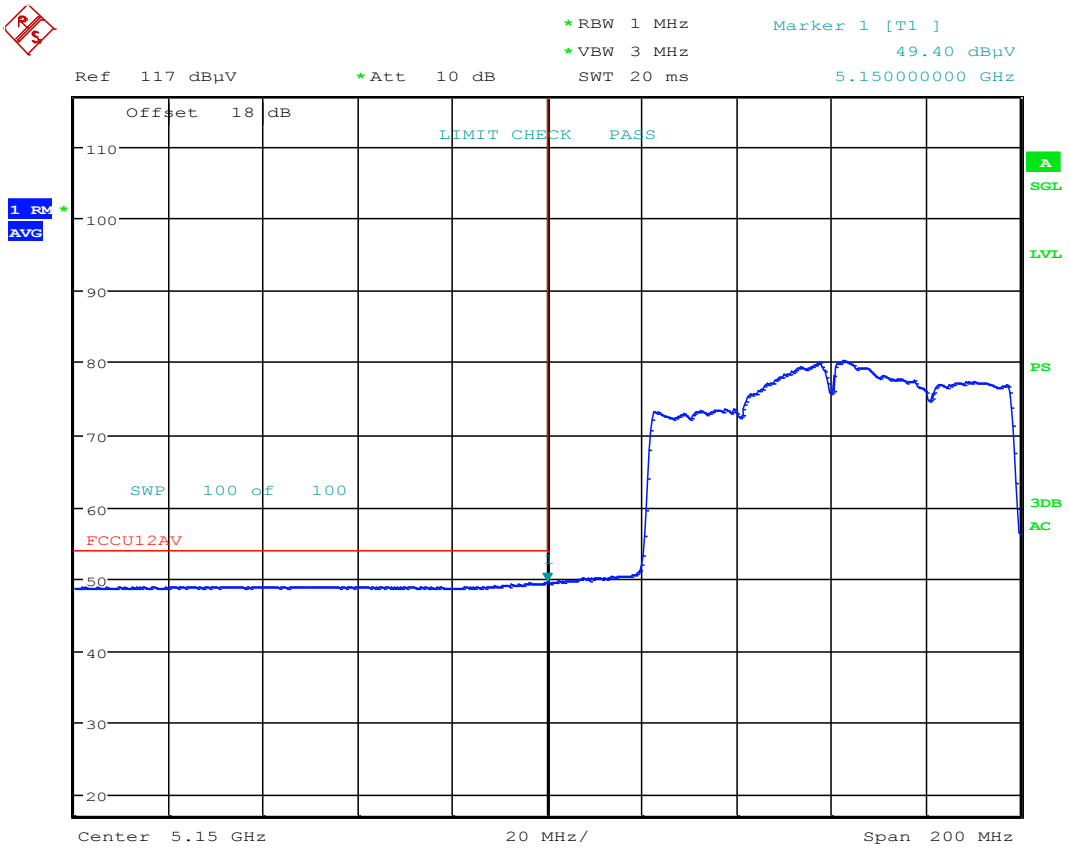
Antenna-1 WCP Radiated Band Edge Measurements (80MHz BW)

§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



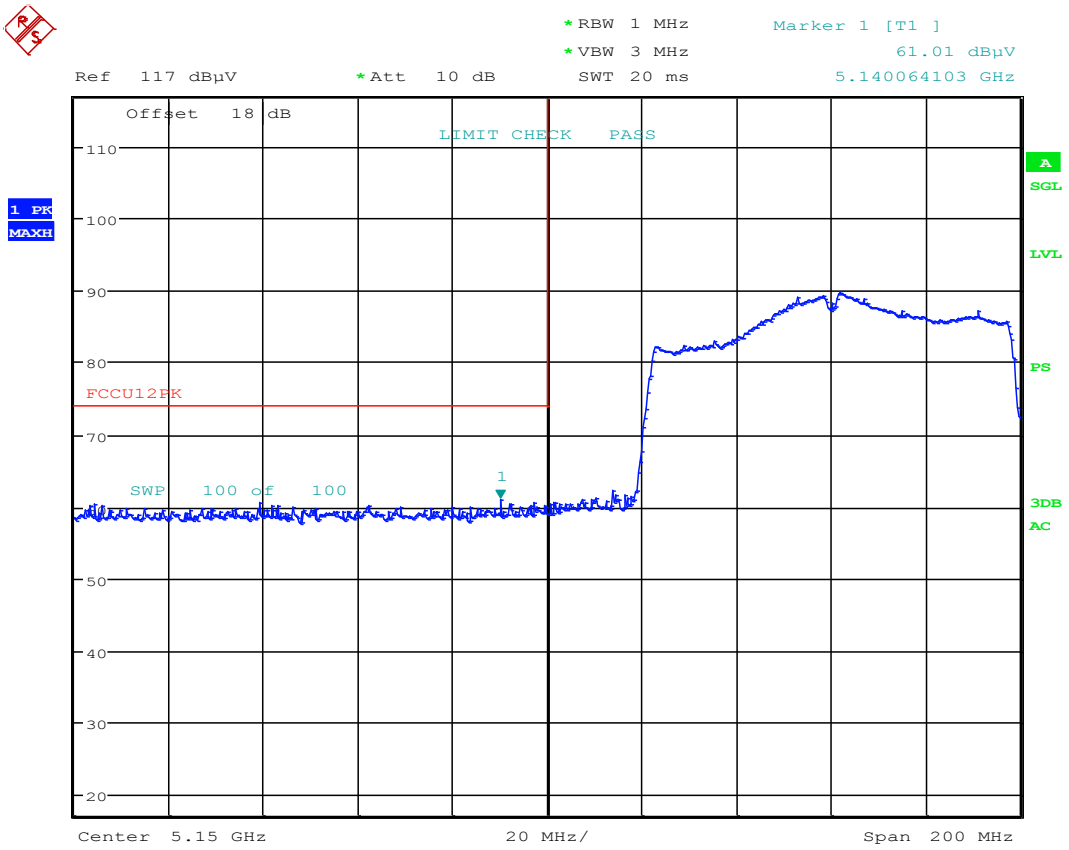
Date: 10.APR.2016 23:54:10

Plot 7-212. Radiated Restricted Band Edge Plot with WCP

© 2016 PCTEST Engineering Laboratory, Inc.

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

§15.407(b.1)(b.2) §15.205 §15.209



Date: 10.APR.2016 23:55:04

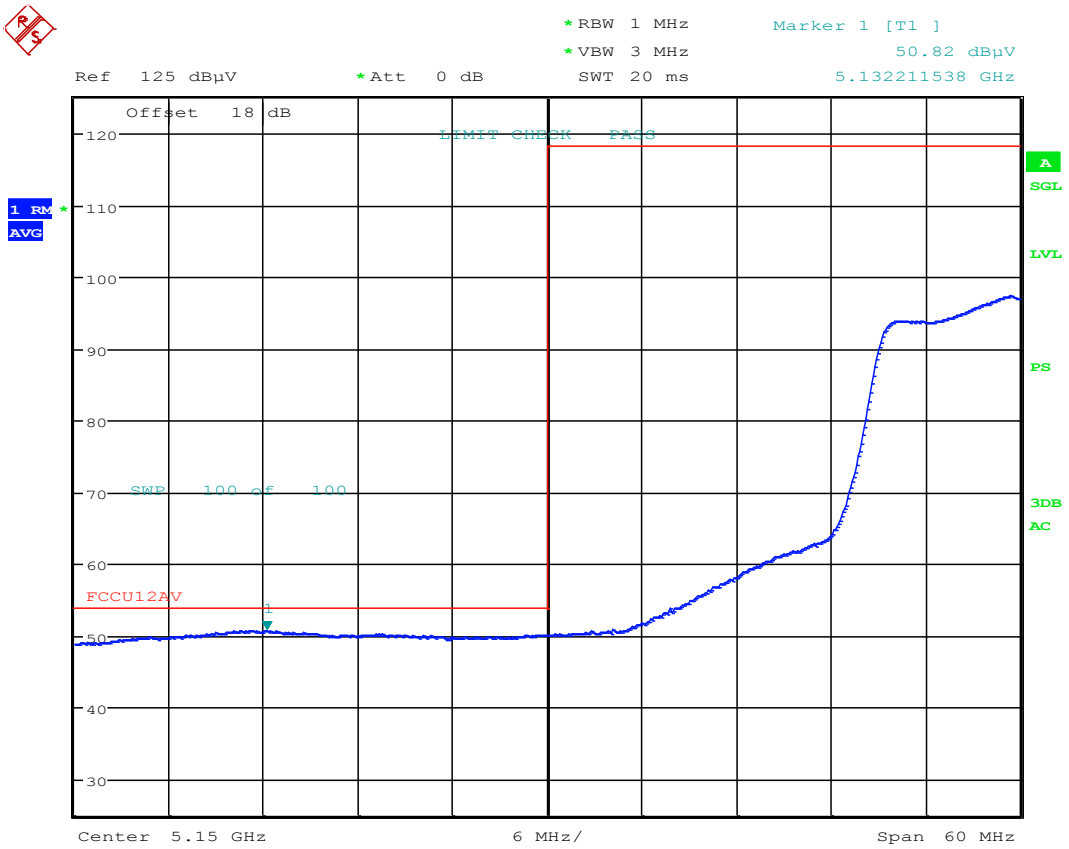
Plot 7-213. Radiated Restricted Band Edge Plot with WCP

© 2016 PCTEST Engineering Laboratory, Inc.

7.7.7 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



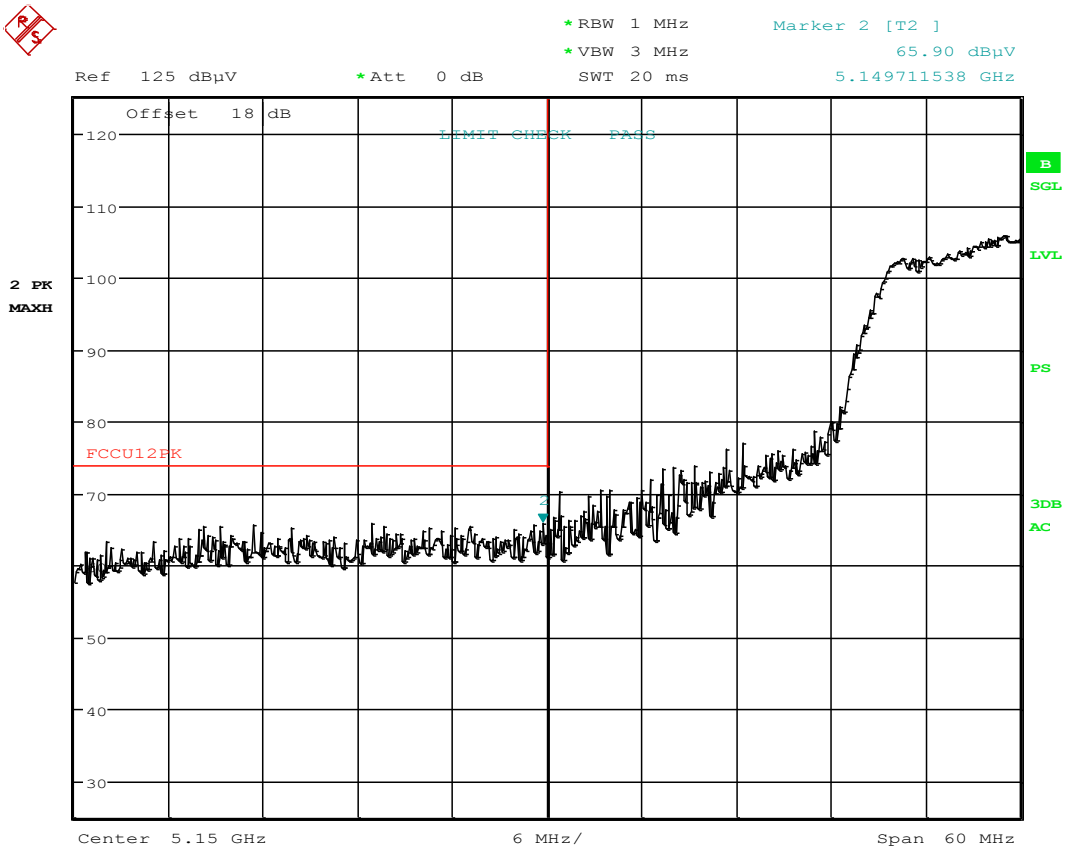
Date: 25.MAR.2016 02:44:45

Plot 7-214. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

© 2016 PCTEST Engineering Laboratory, Inc.

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

§15.407(b.1)(b.2) §15.205 §15.209



Date: 25.MAR.2016 02:46:29

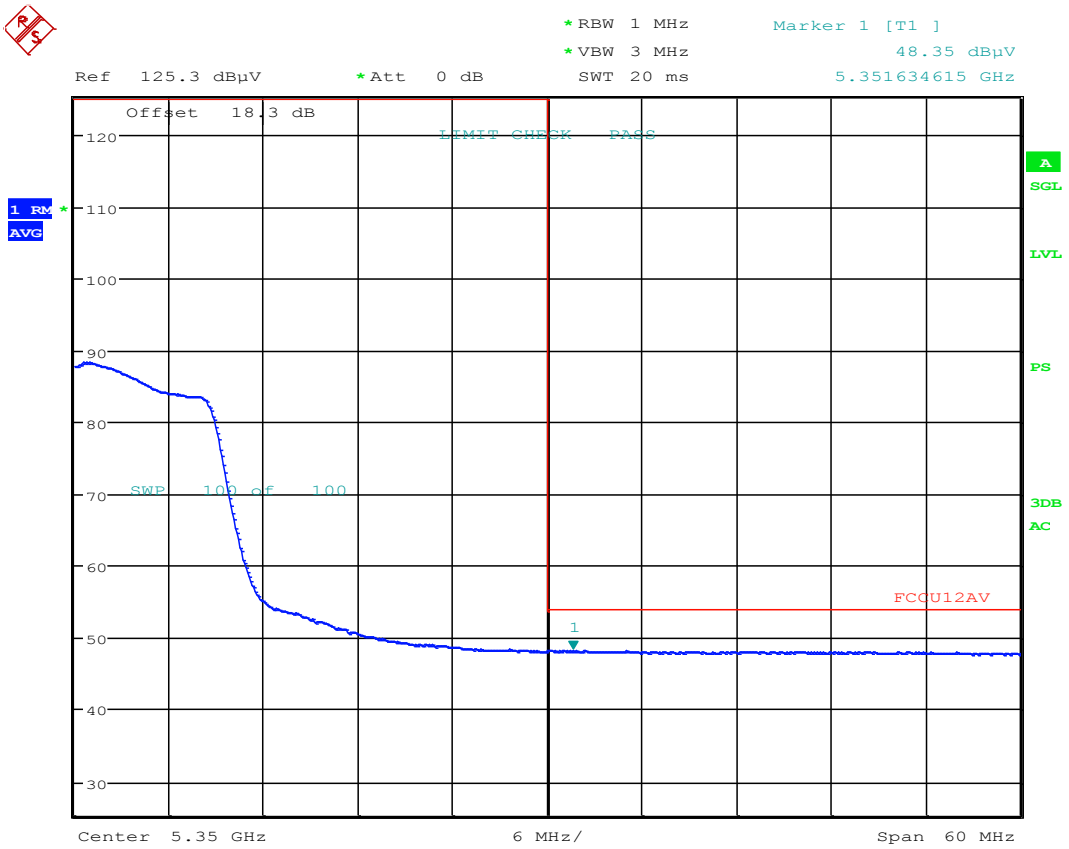
Plot 7-215. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)

© 2016 PCTEST Engineering Laboratory, Inc.

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



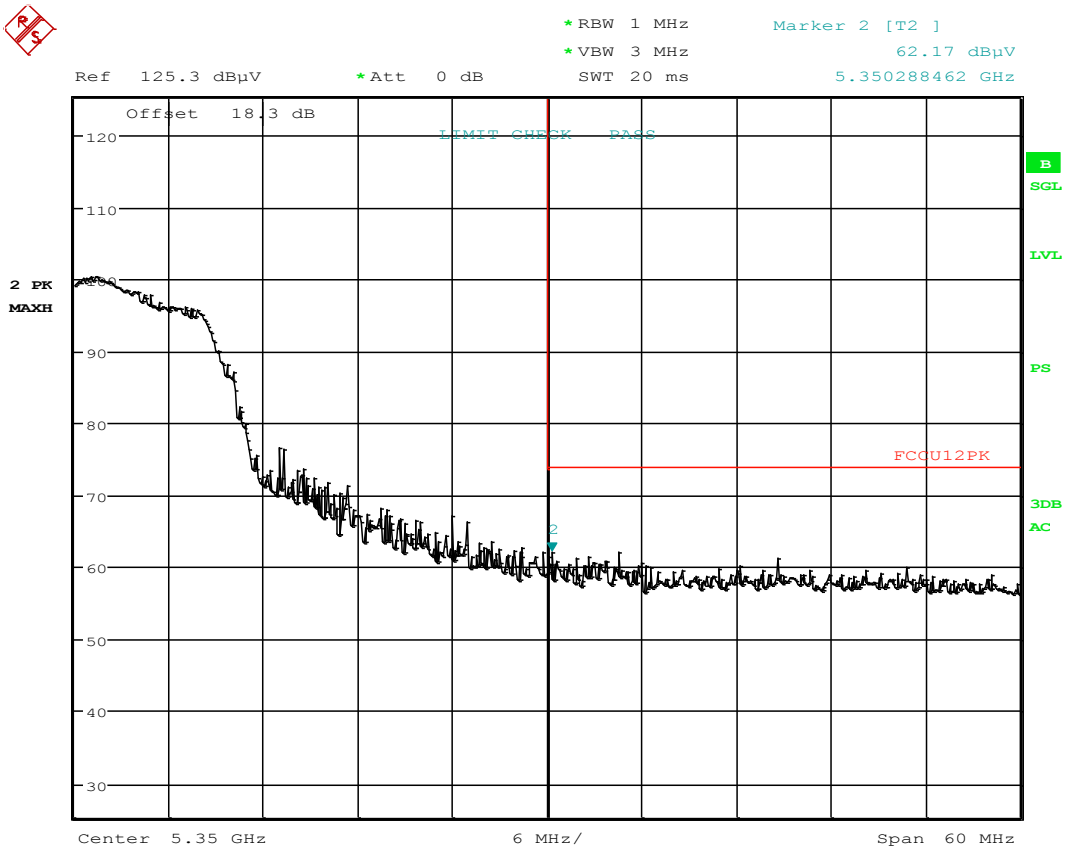
Date: 25.MAR.2016 03:12:24

Plot 7-216. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

© 2016 PCTEST Engineering Laboratory, Inc.

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

§15.407(b.1)(b.2) §15.205 §15.209



Date: 25.MAR.2016 03:12:50

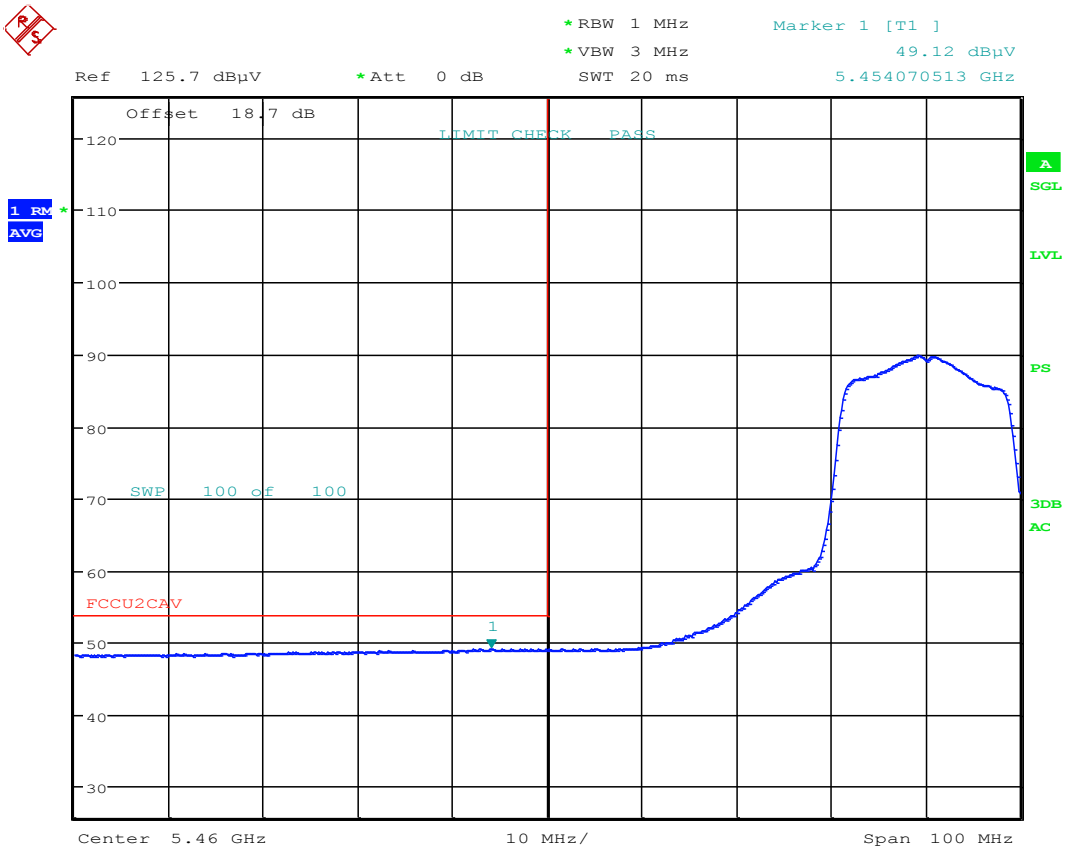
Plot 7-217. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

© 2016 PCTEST Engineering Laboratory, Inc.

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



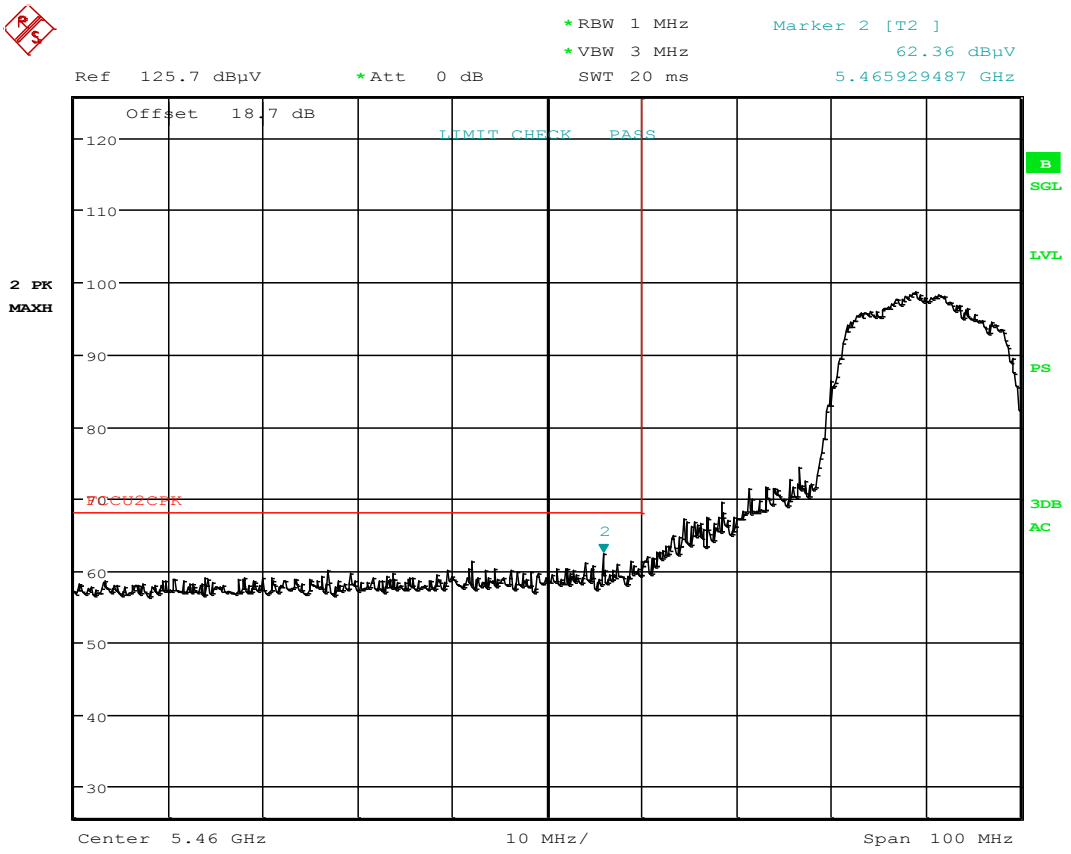
Date: 25.MAR.2016 03:24:44

Plot 7-218. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

© 2016 PCTEST Engineering Laboratory, Inc.

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

§15.407(b.1)(b.2) §15.205 §15.209



Date: 25.MAR.2016 03:25:06

Plot 7-219. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

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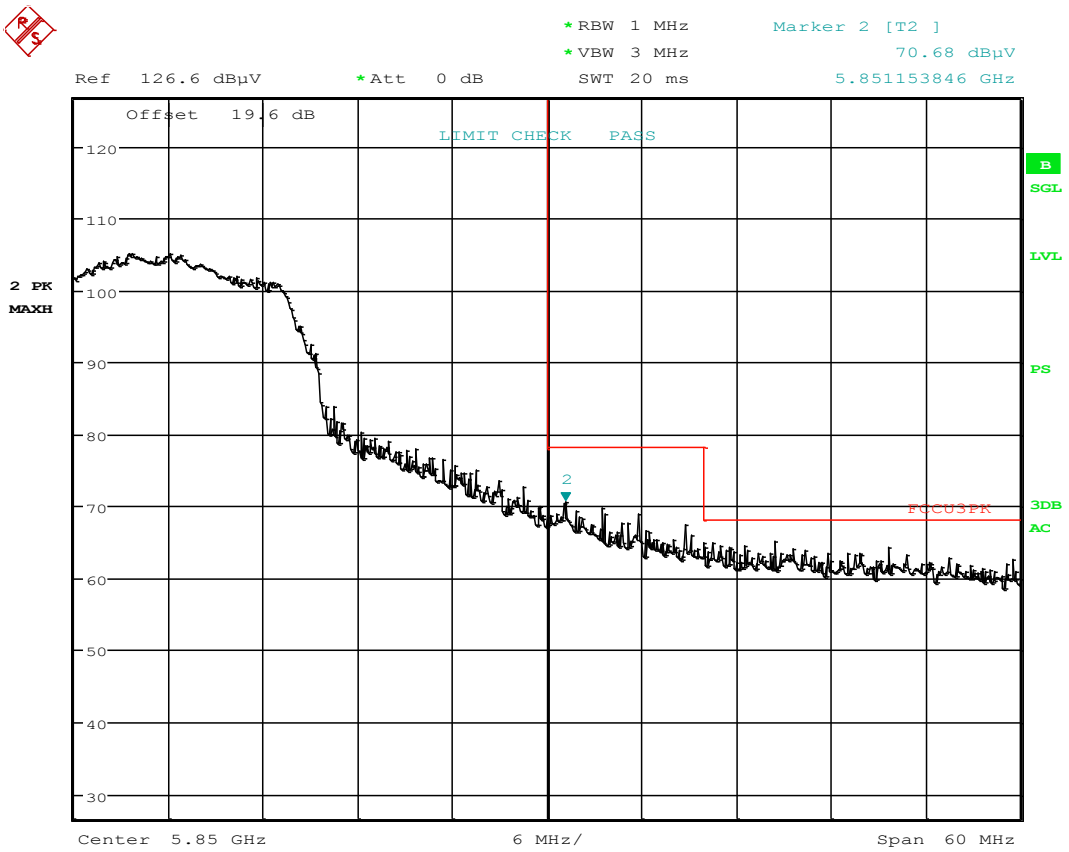
Antenna-2 Radiated Band Edge Measurements (20MHz BW)

§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: 25.MAR.2016 03:38:18

Plot 7-220. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

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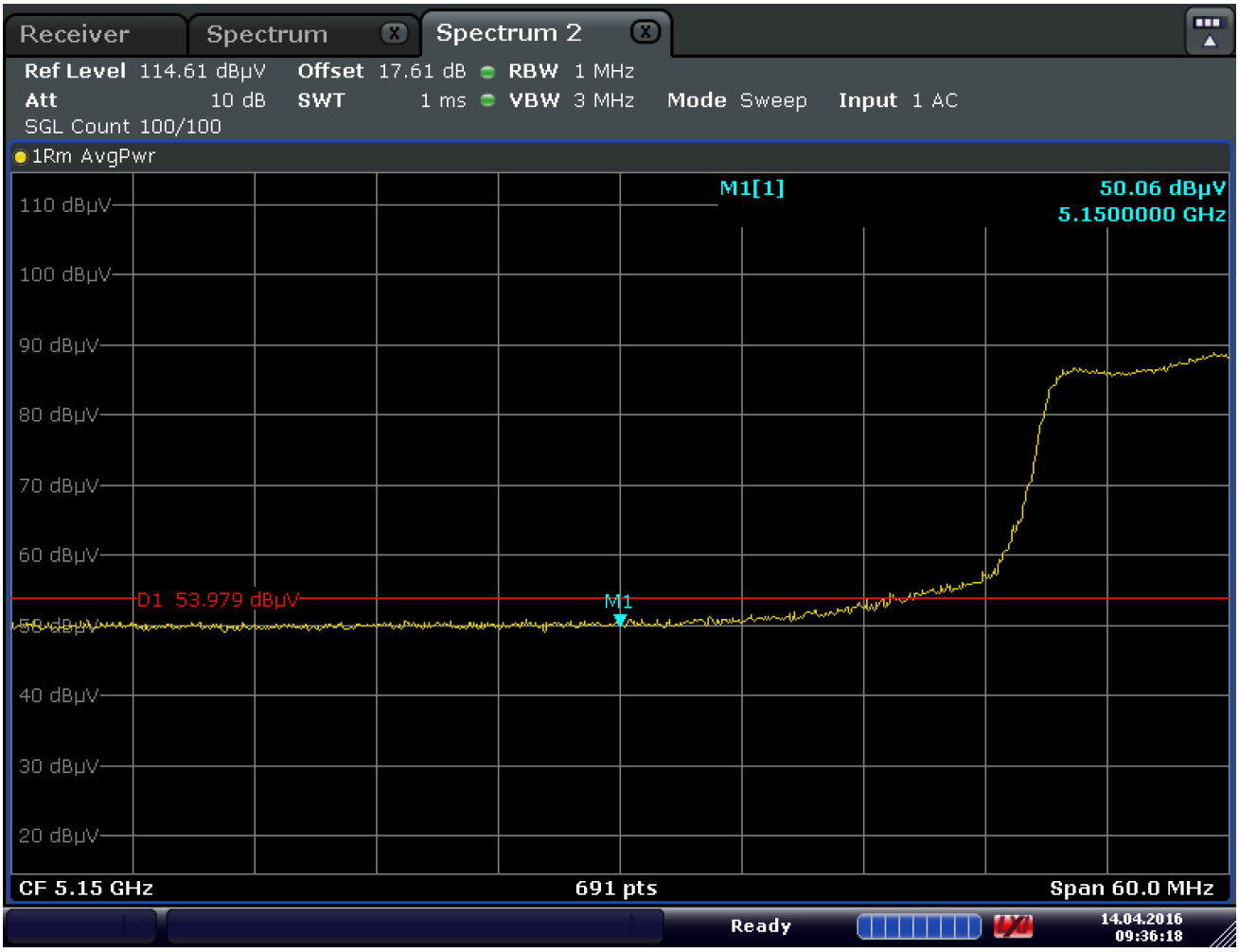
Antenna-2 WCP Radiated Band Edge Measurements (20MHz BW)

§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



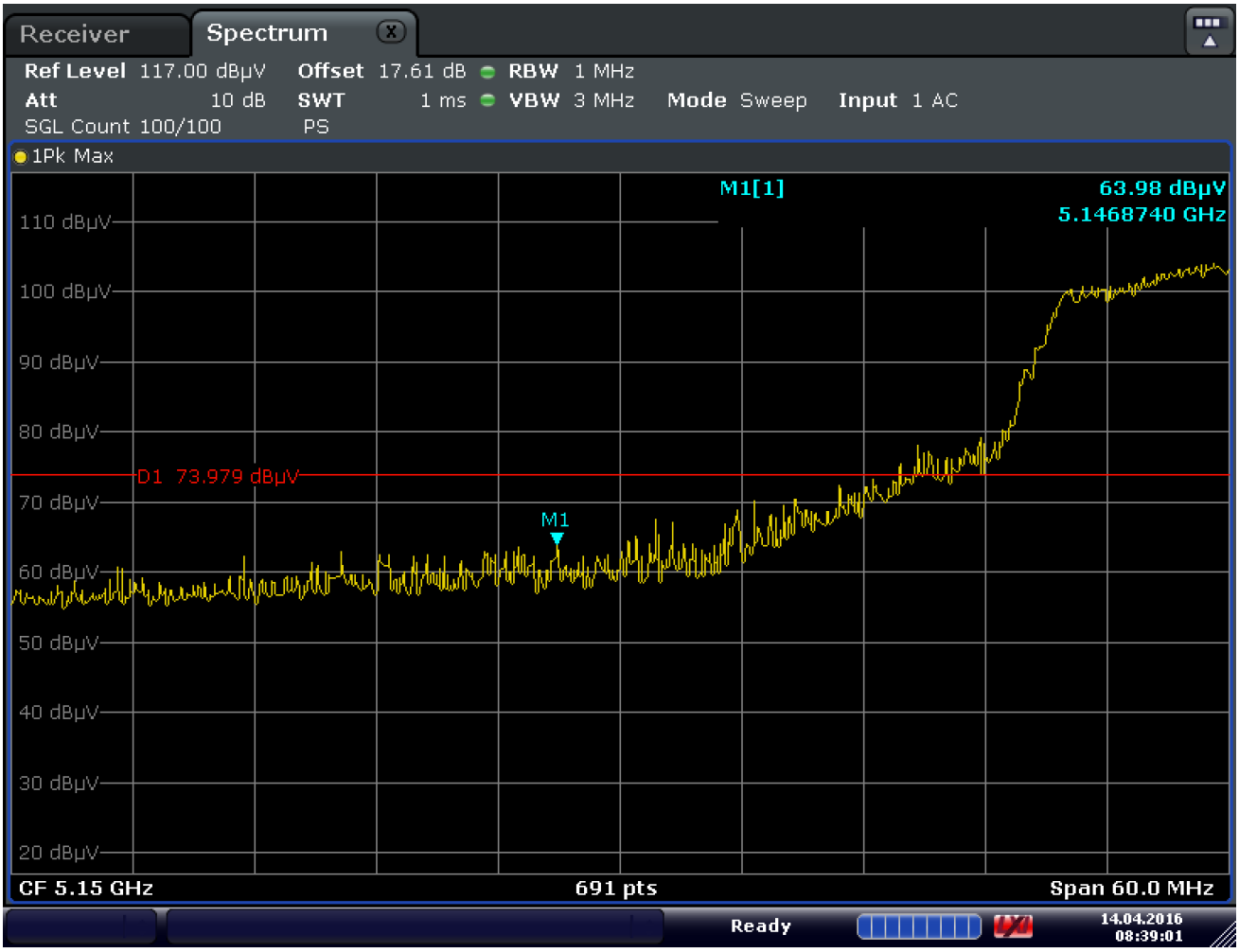
Date: 14.APR.2016 09:36:18

Plot 7-221. Radiated Restricted Band Edge Plot with WCP

© 2016 PCTEST Engineering Laboratory, Inc.

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

§15.407(b.1)(b.2) §15.205 §15.209



Date: 14.APR.2016 08:39:01

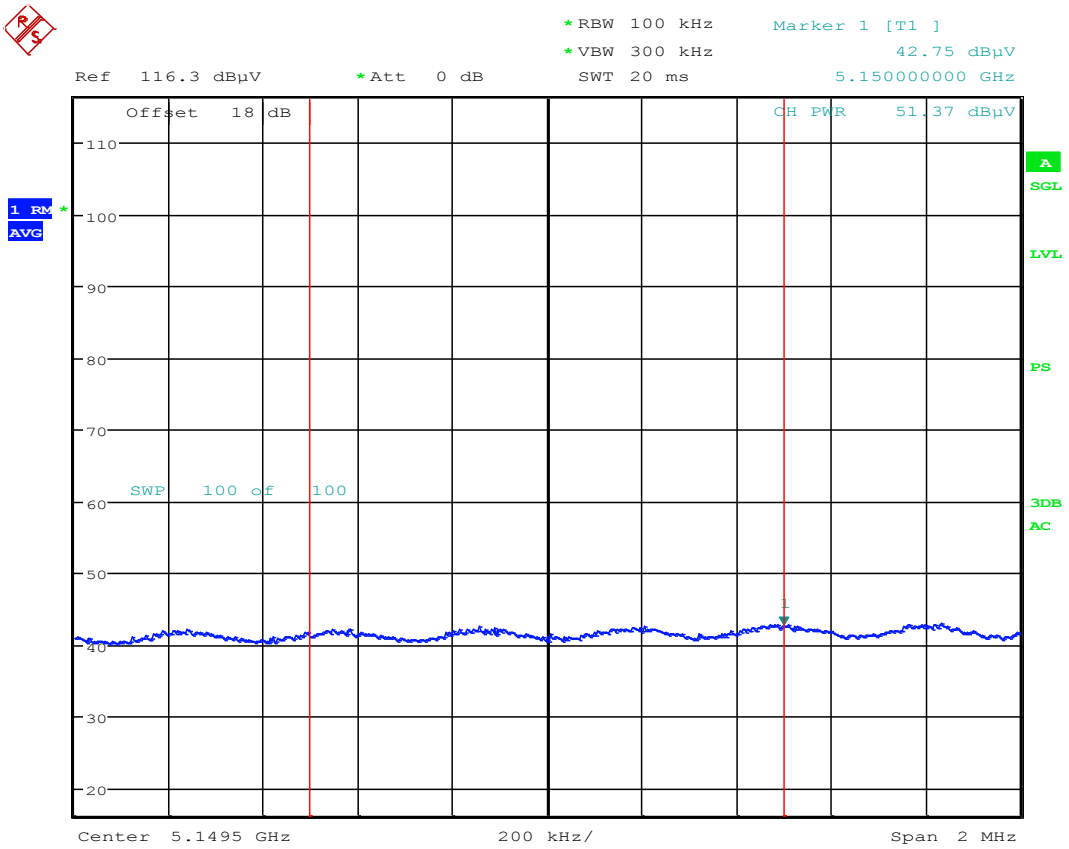
Plot 7-222. Radiated Restricted Band Edge Plot with WCP

© 2016 PCTEST Engineering Laboratory, Inc.

7.7.8 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



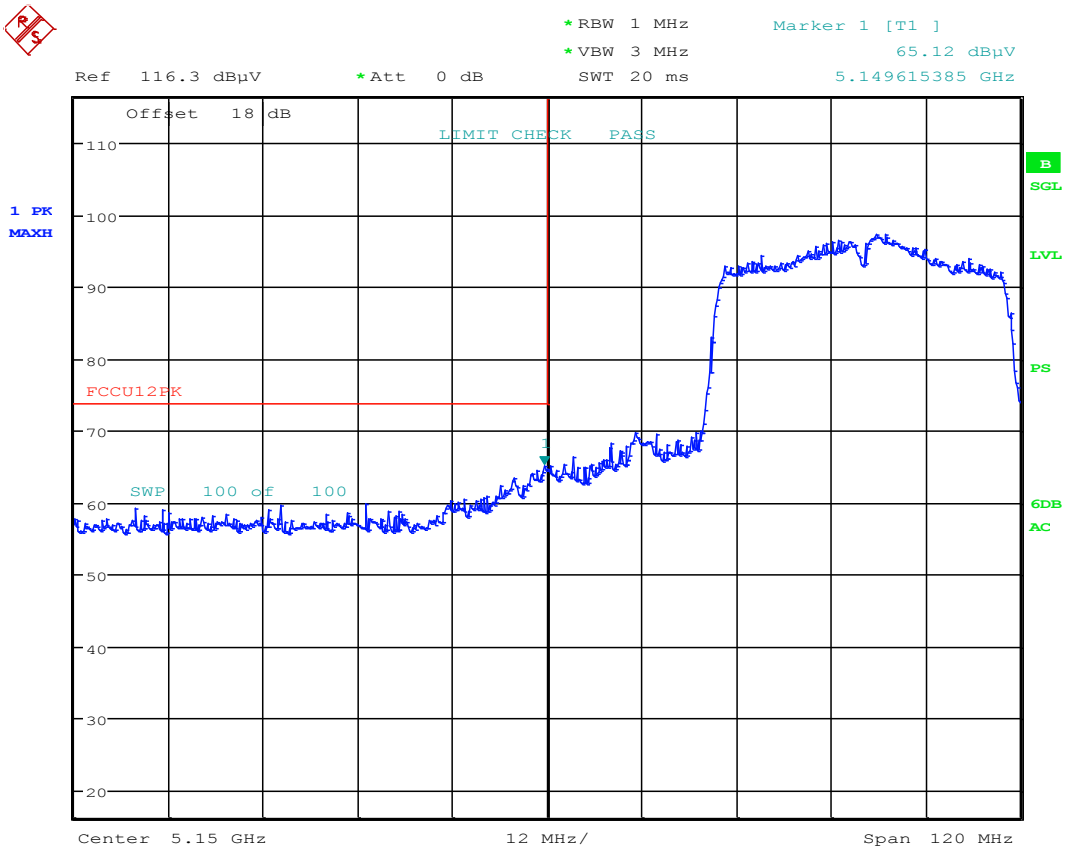
Date: 25.MAR.2016 19:03:47

Plot 7-223. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

© 2016 PCTEST Engineering Laboratory, Inc.

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

§15.407(b.1)(b.2) §15.205 §15.209



Date: 25.MAR.2016 19:04:28

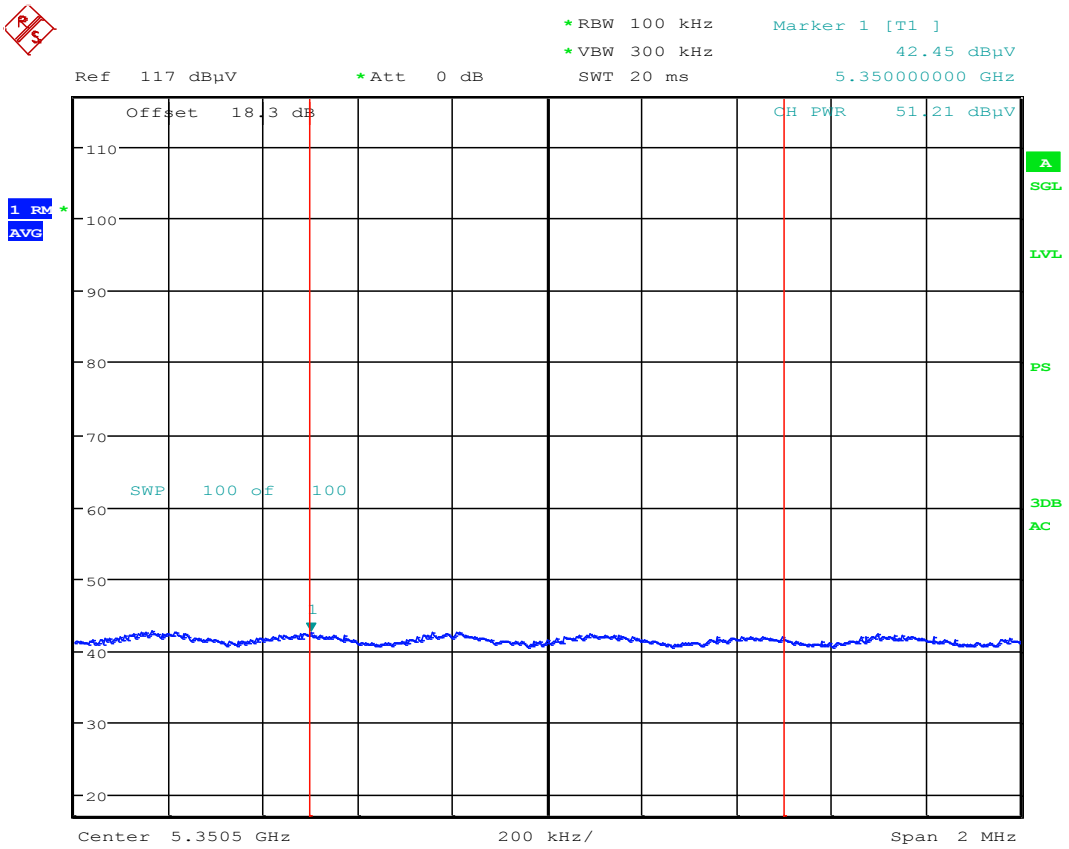
Plot 7-224. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)

© 2016 PCTEST Engineering Laboratory, Inc.

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



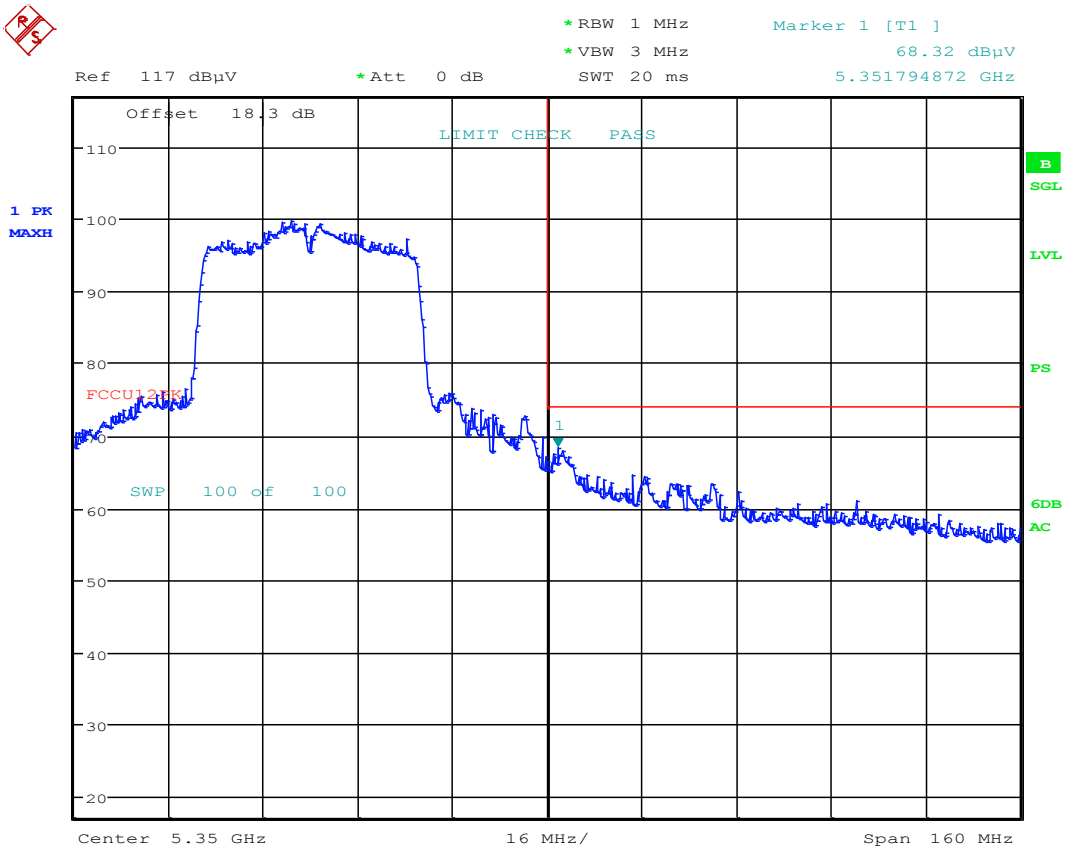
Date: 25.MAR.2016 19:22:32

Plot 7-225. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

© 2016 PCTEST Engineering Laboratory, Inc.

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

§15.407(b.1)(b.2) §15.205 §15.209



Date: 25.MAR.2016 19:20:14

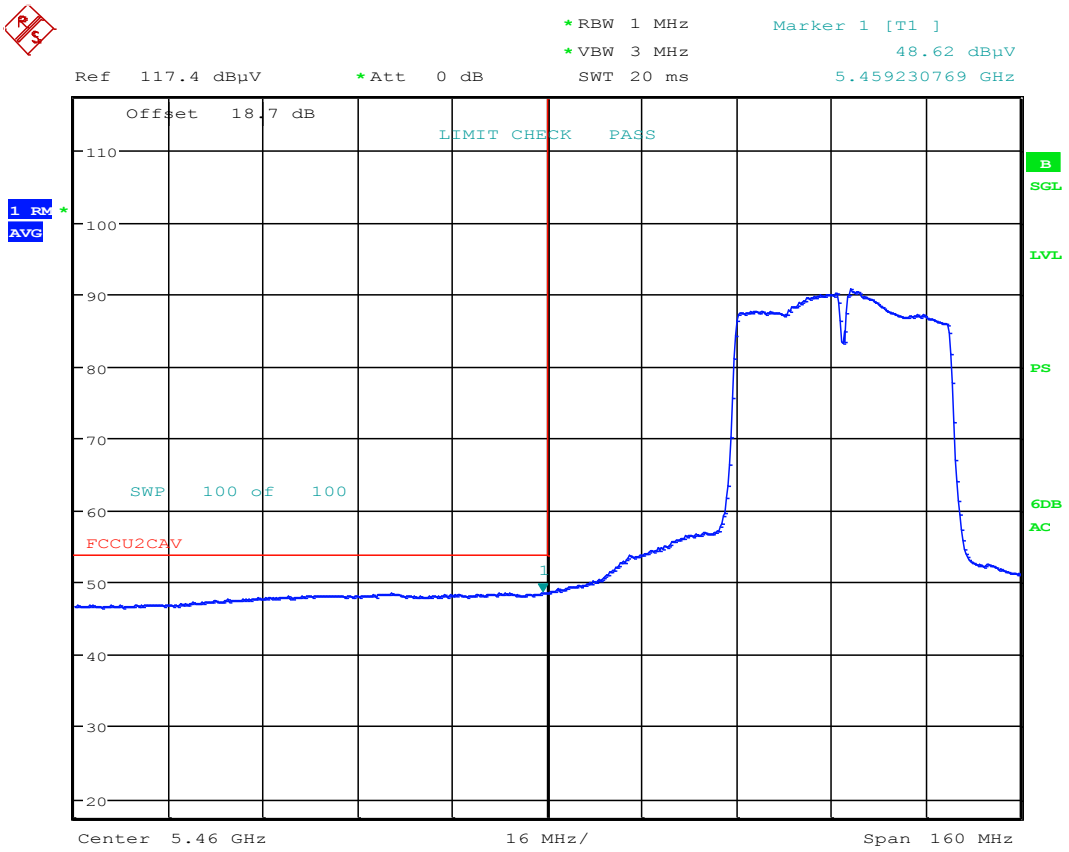
Plot 7-226. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

© 2016 PCTEST Engineering Laboratory, Inc.

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



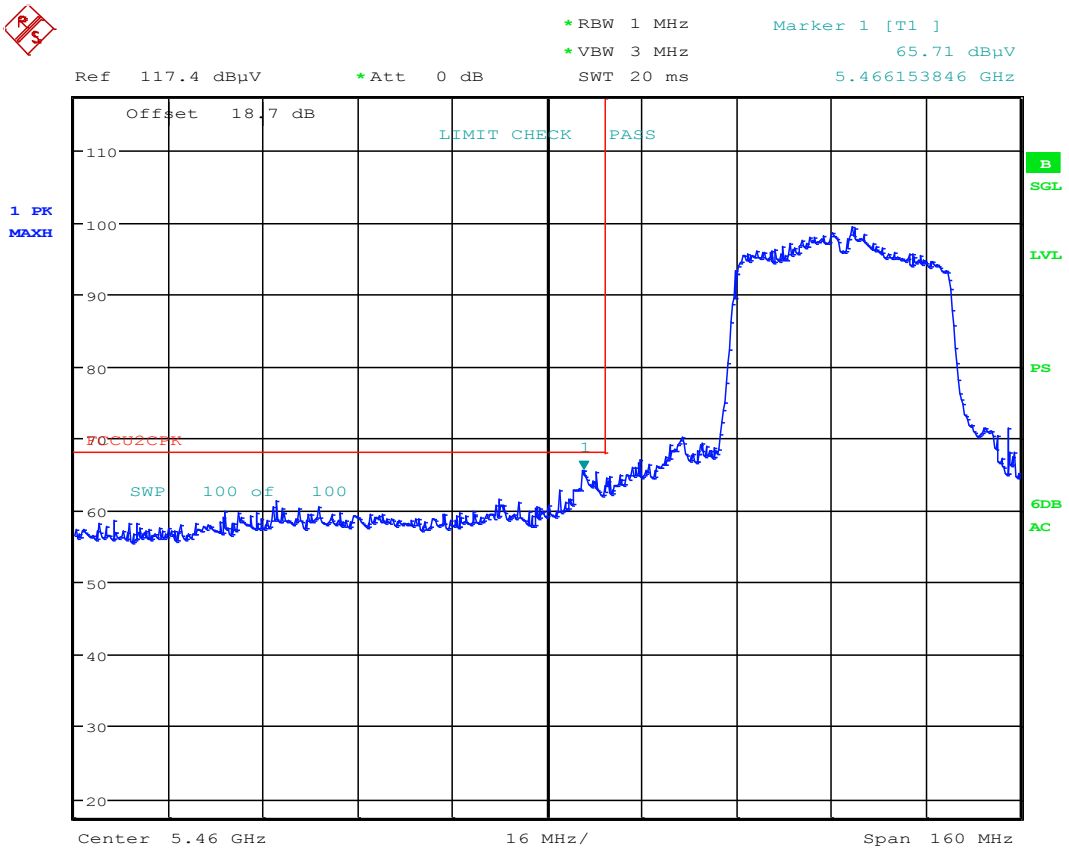
Date: 25.MAR.2016 19:41:15

Plot 7-227. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

© 2016 PCTEST Engineering Laboratory, Inc.

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

§15.407(b.1)(b.2) §15.205 §15.209



Date: 25.MAR.2016 19:39:33

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

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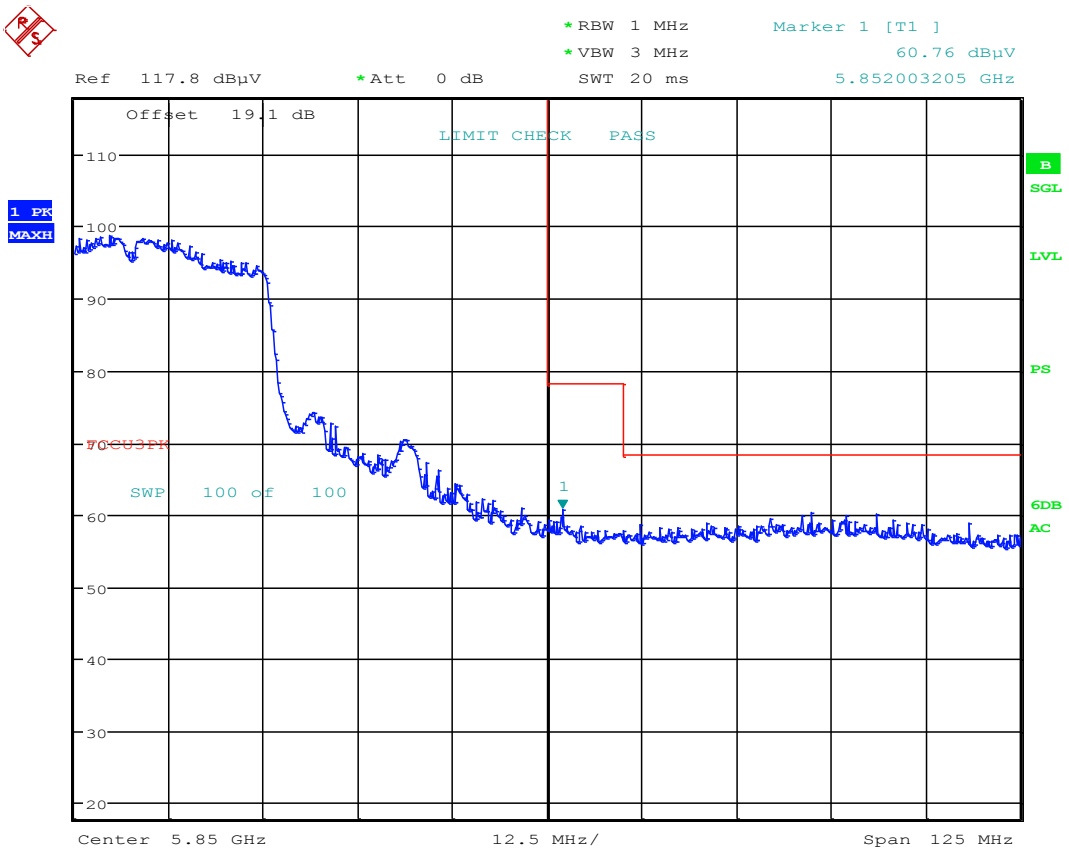
Antenna-2 Radiated Band Edge Measurements (40MHz BW)

§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



Date: 25.MAR.2016 19:58:59

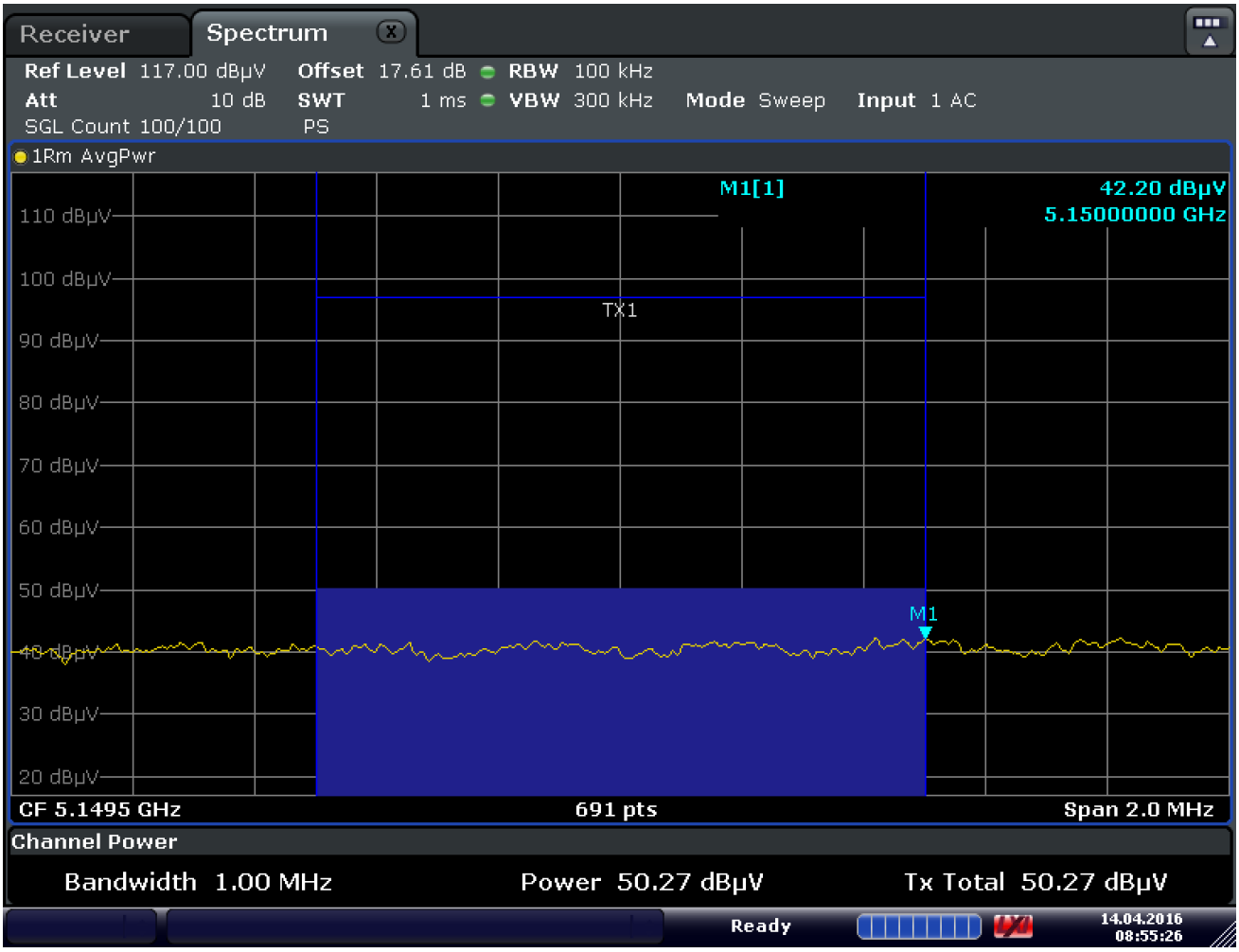
Plot 7-229. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

© 2016 PCTEST Engineering Laboratory, Inc.

Antenna-2 WCP 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



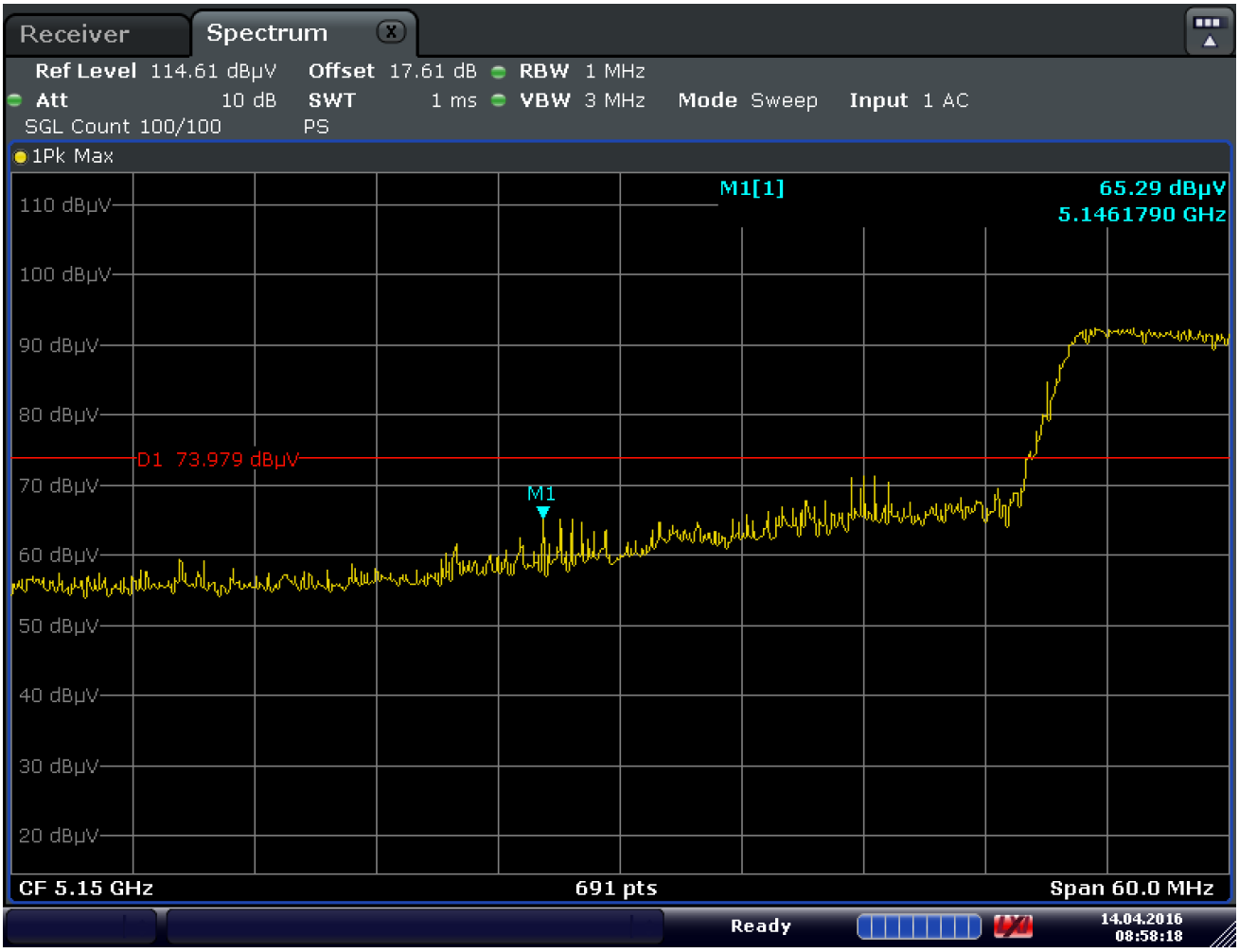
Date: 14.APR.2016 08:55:26

Plot 7-230. Radiated Restricted Band Edge Plot with WCP

© 2016 PCTEST Engineering Laboratory, Inc.

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

§15.407(b.1)(b.2) §15.205 §15.209



Date: 14.APR.2016 08:58:18

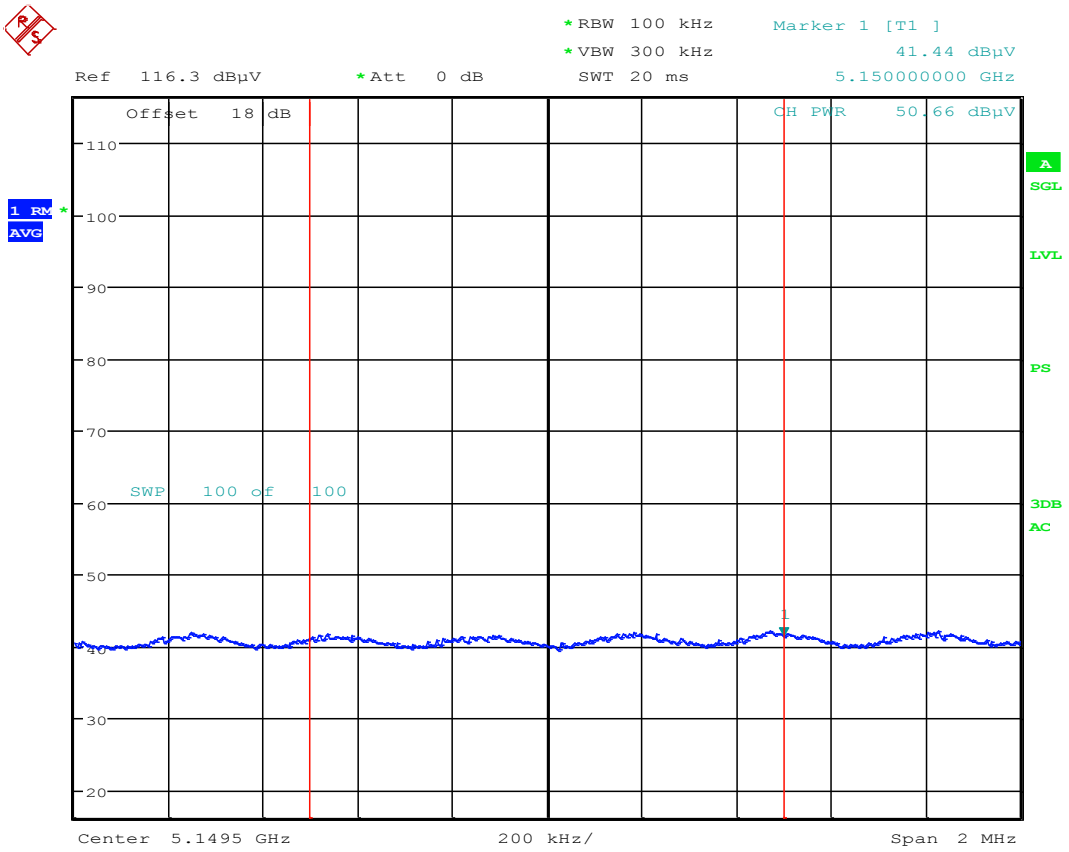
Plot 7-231. Radiated Restricted Band Edge Plot with WCP

© 2016 PCTEST Engineering Laboratory, Inc.

7.7.9 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:	5210MHz
Channel:	42



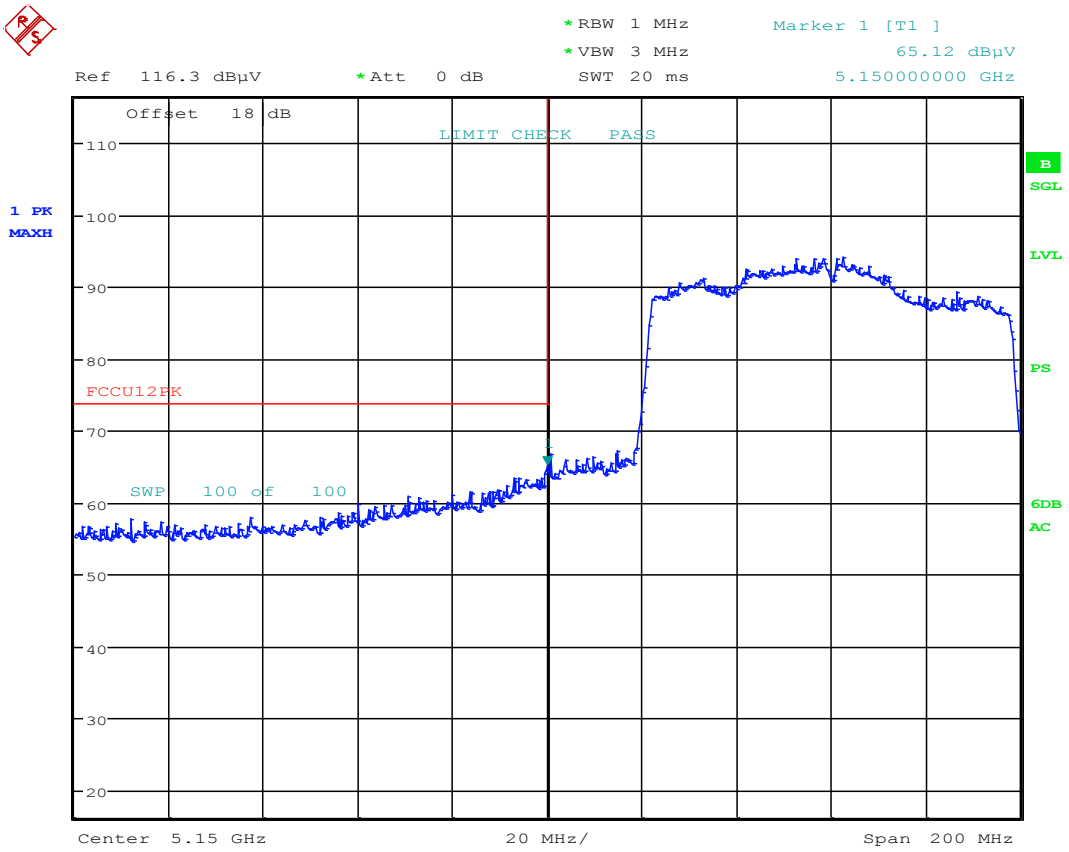
Date: 25.MAR.2016 19:07:45

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

© 2016 PCTEST Engineering Laboratory, Inc.

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

§15.407(b.1)(b.2) §15.205 §15.209



Date: 25.MAR.2016 19:06:20

Plot 7-233. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)

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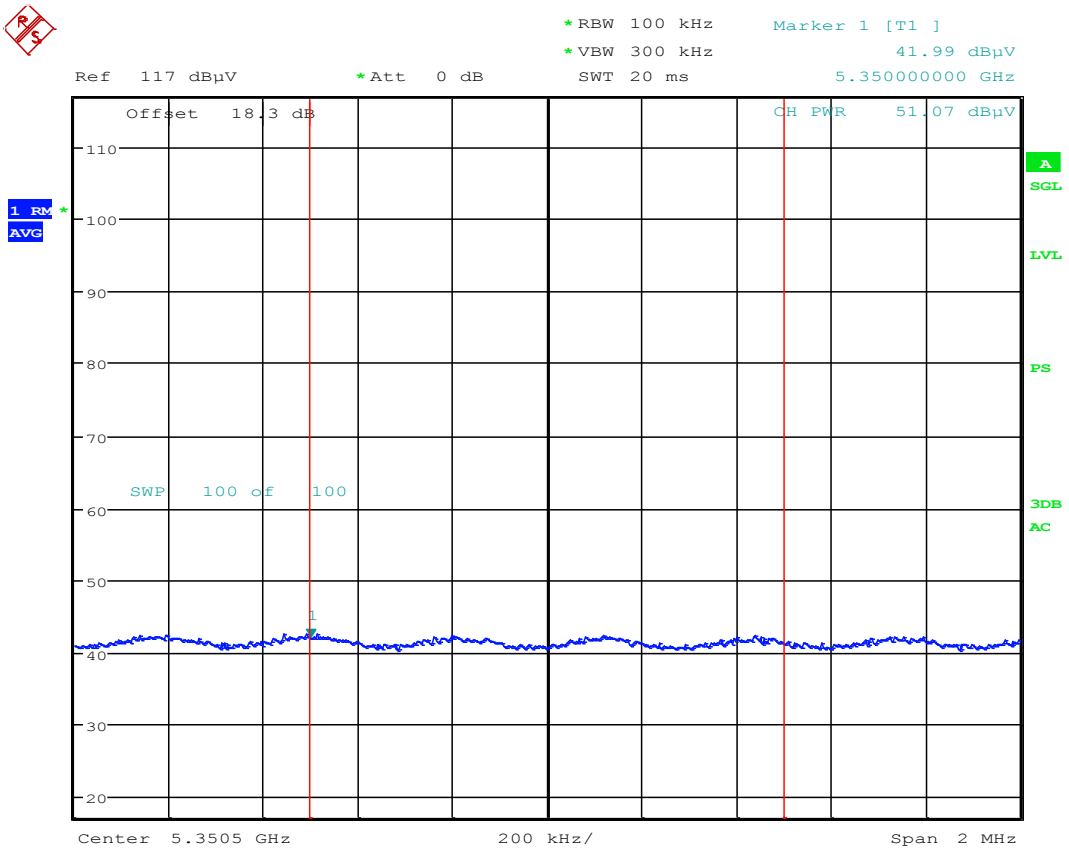
Antenna-2 Radiated Band Edge Measurements (80MHz BW)

§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



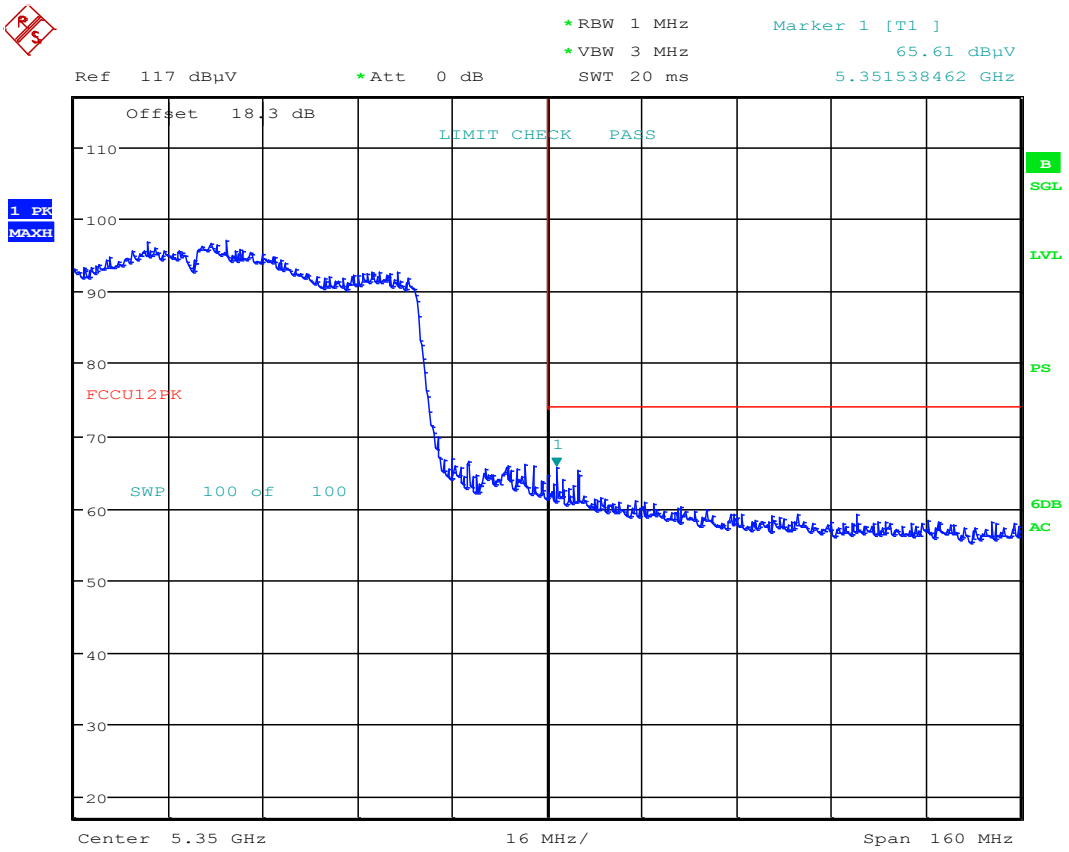
Date: 25.MAR.2016 19:30:54

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

© 2016 PCTEST Engineering Laboratory, Inc.

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

§15.407(b.1)(b.2) §15.205 §15.209



Date: 25.MAR.2016 19:30:33

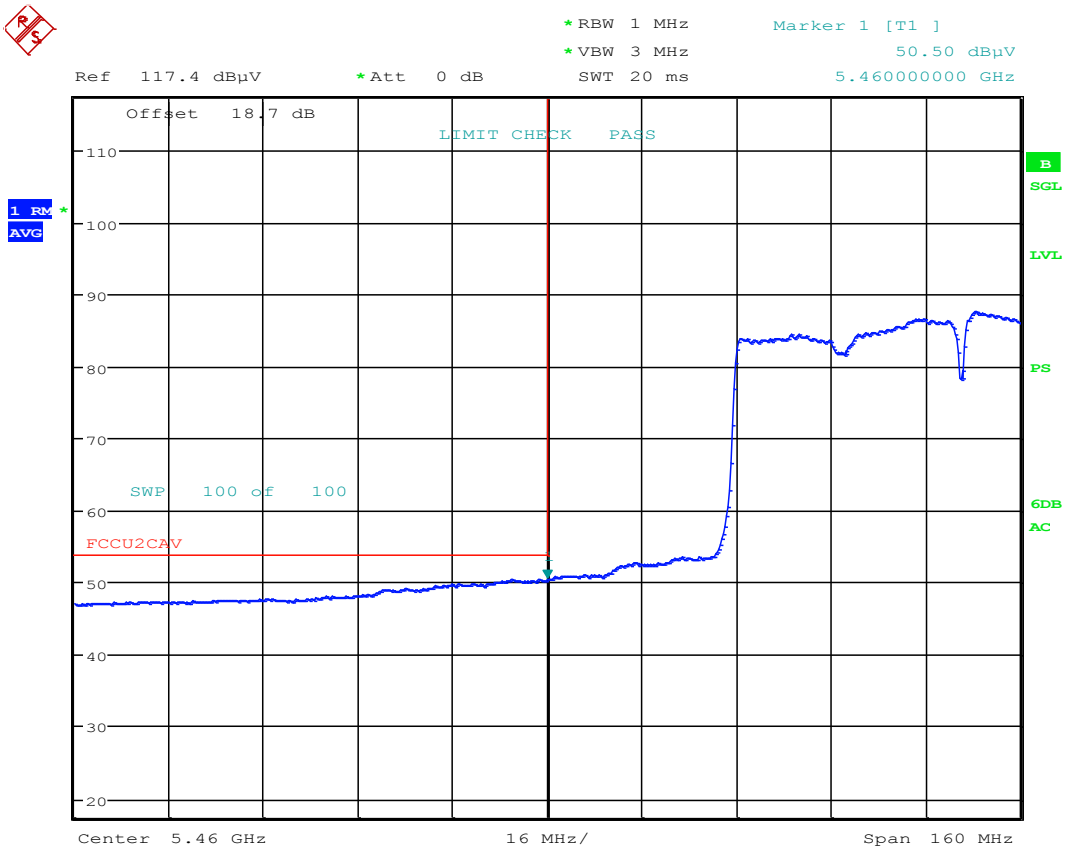
Plot 7-235. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

© 2016 PCTEST Engineering Laboratory, Inc.

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



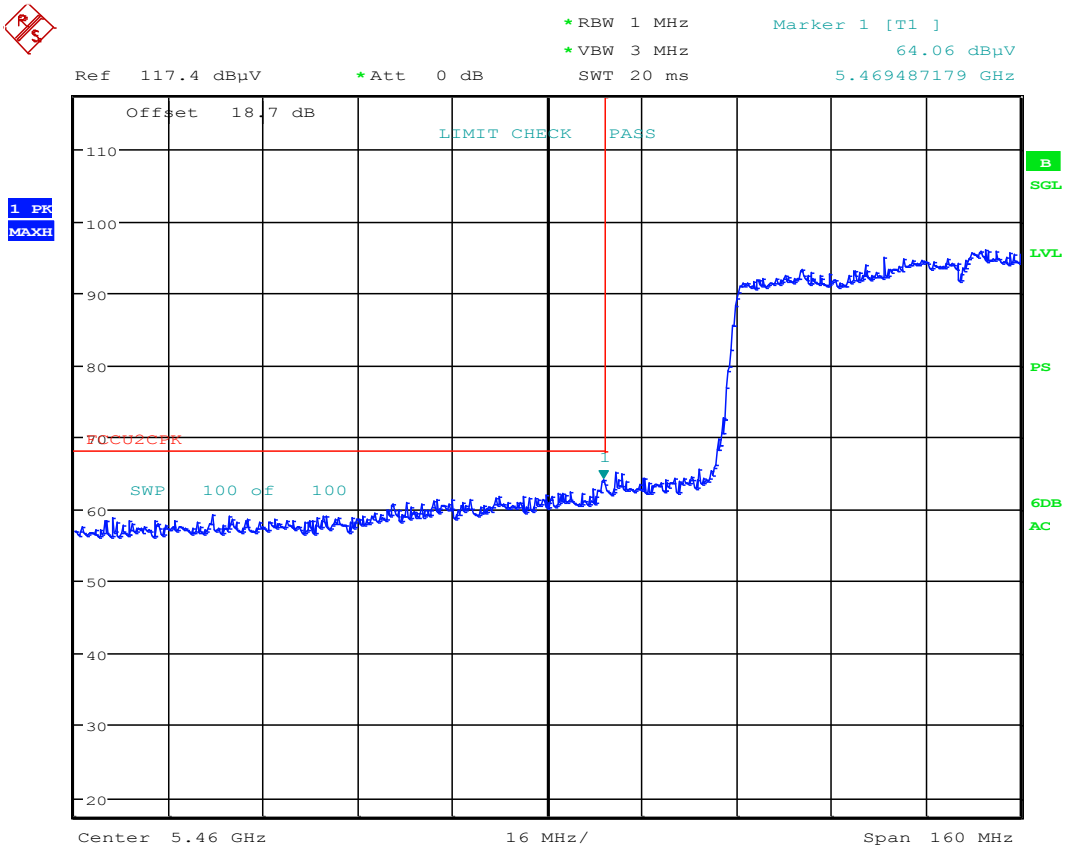
Date: 25.MAR.2016 19:48:22

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

© 2016 PCTEST Engineering Laboratory, Inc.

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

§15.407(b.1)(b.2) §15.205 §15.209



Date: 25.MAR.2016 19:47:54

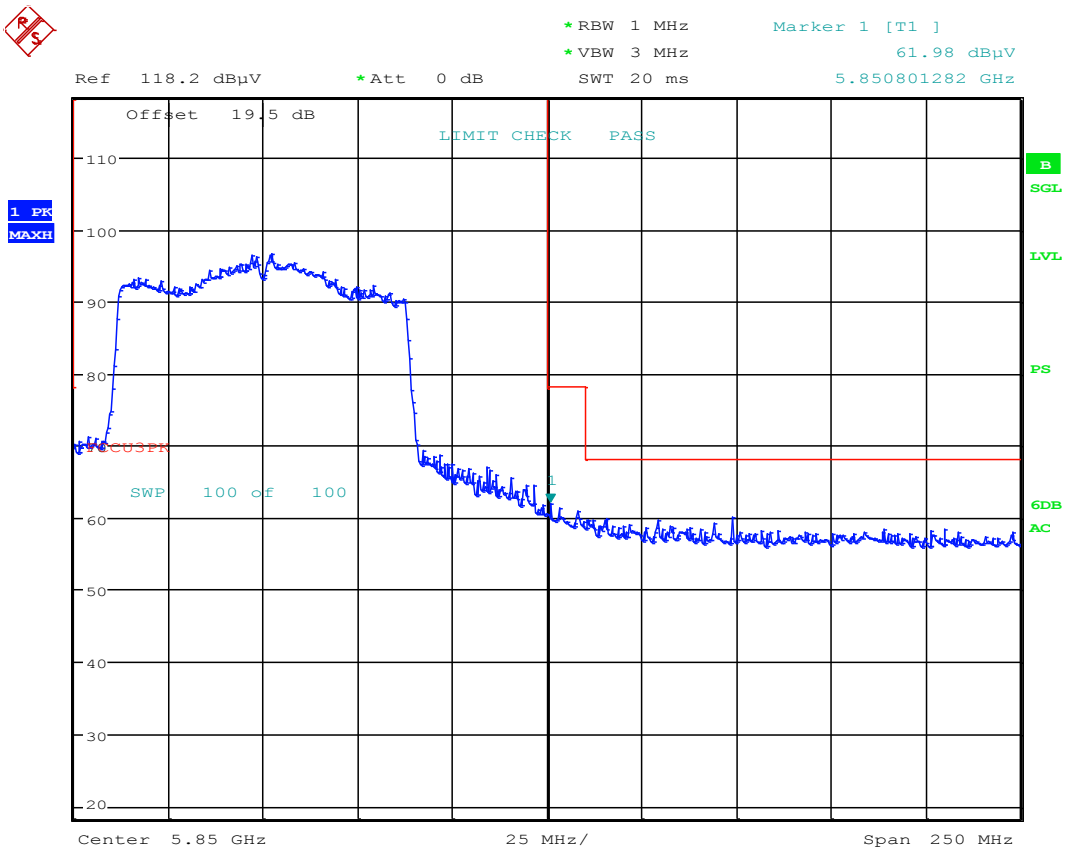
Plot 7-237. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

© 2016 PCTEST Engineering Laboratory, Inc.

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: 25.MAR.2016 20:13:22

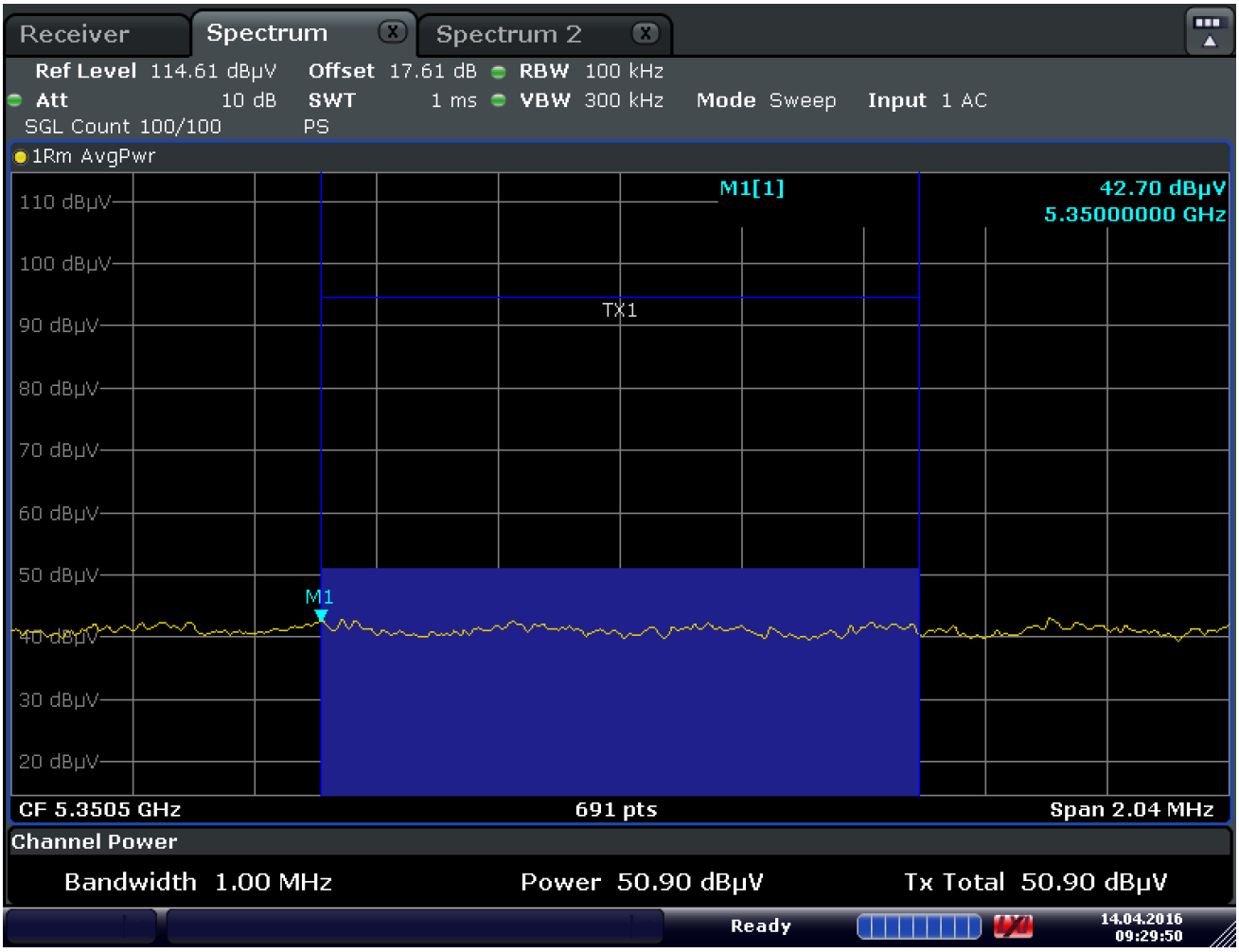
Plot 7-238. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

© 2016 PCTEST Engineering Laboratory, Inc.

Antenna-2 WCP 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



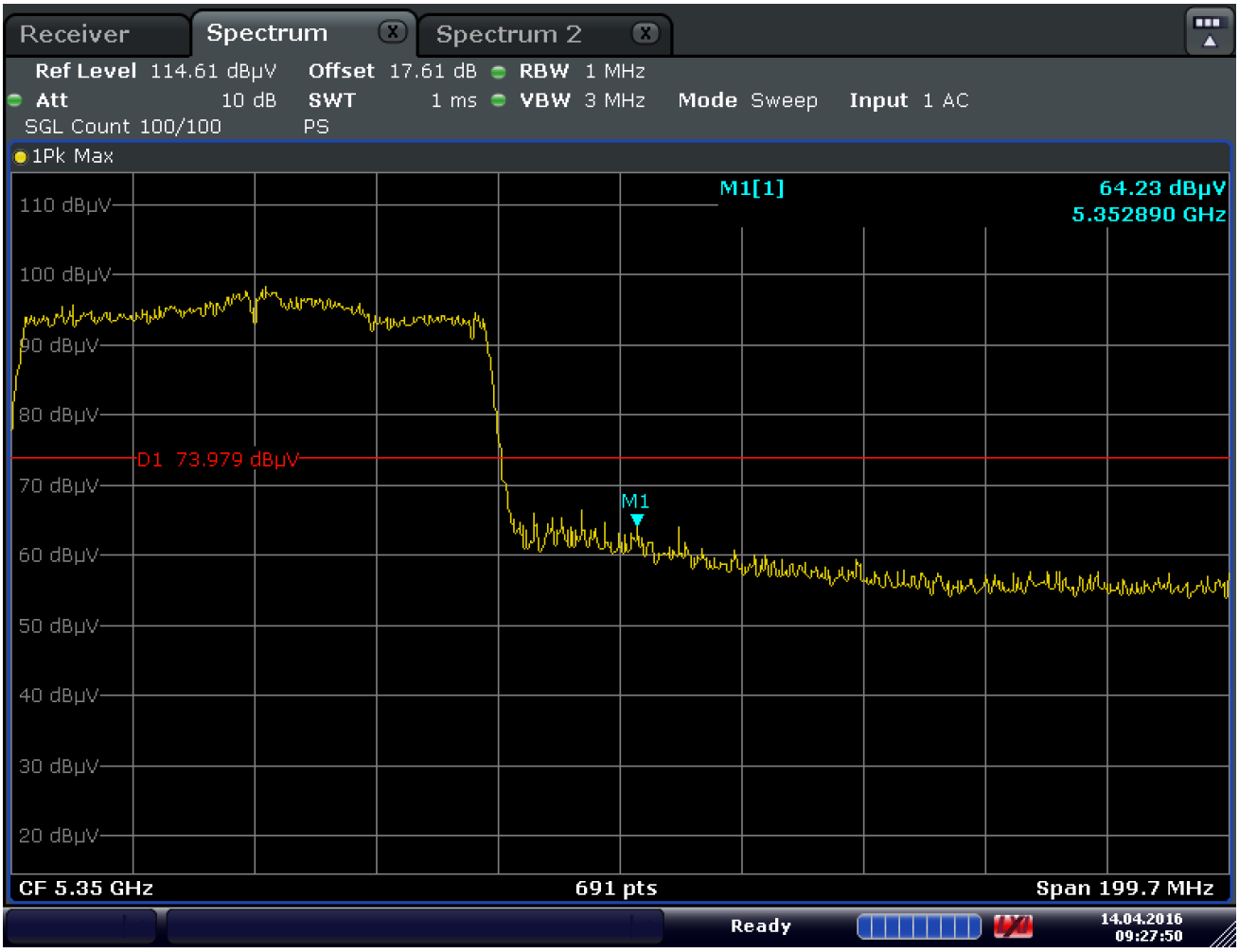
Date: 14.APR.2016 09:29:50

Plot 7-239. Radiated Restricted Band Edge Plot with WCP

© 2016 PCTEST Engineering Laboratory, Inc.

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

§15.407(b.1)(b.2) §15.205 §15.209



Date: 14.APR.2016 09:27:50

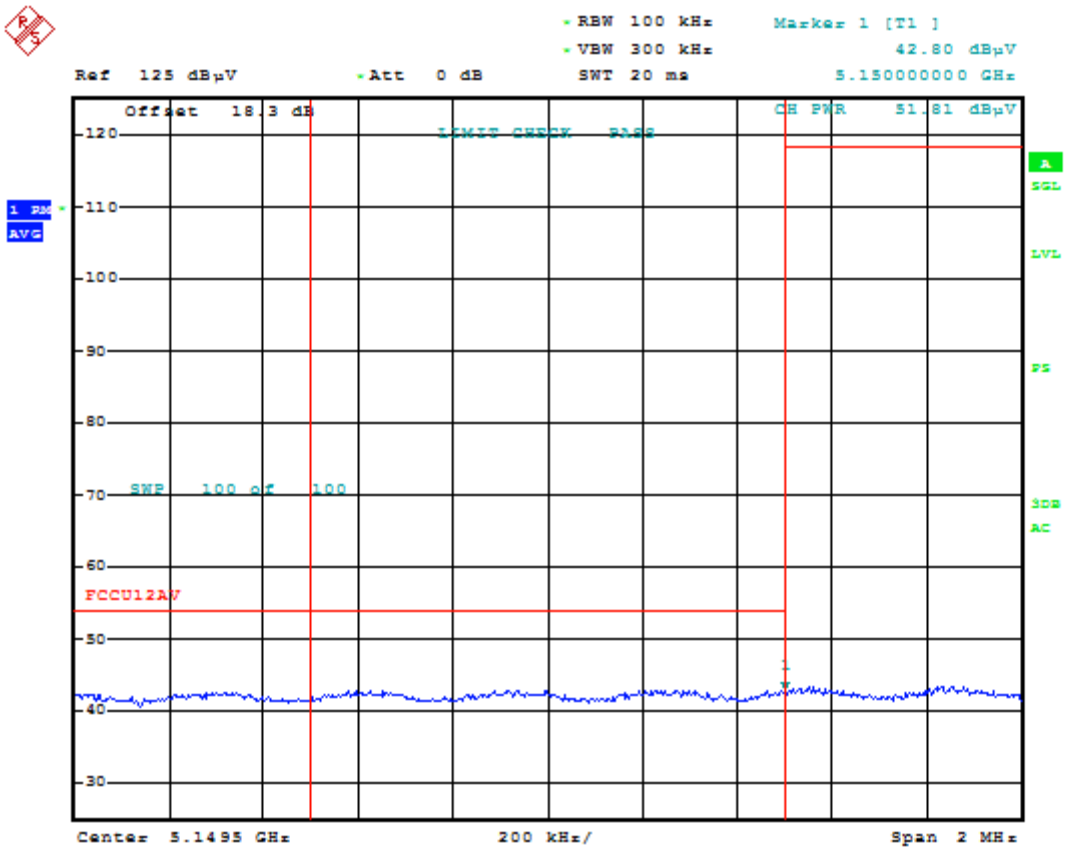
Plot 7-240. Radiated Restricted Band Edge Plot with WCP

© 2016 PCTEST Engineering Laboratory, Inc.

7.7.10 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



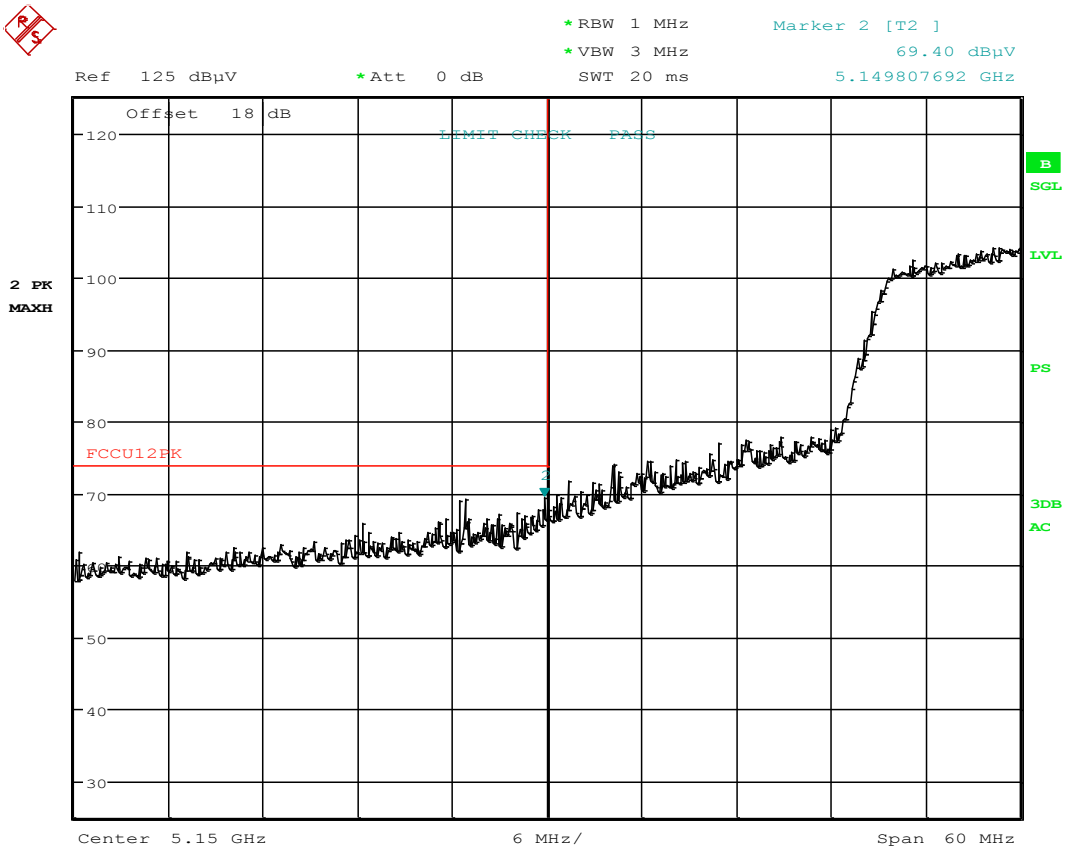
Date: 25.MAR.2016 03:56:00

Plot 7-241. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

© 2016 PCTEST Engineering Laboratory, Inc.

MIMO Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



Date: 25.MAR.2016 03:56:37

Plot 7-242. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)

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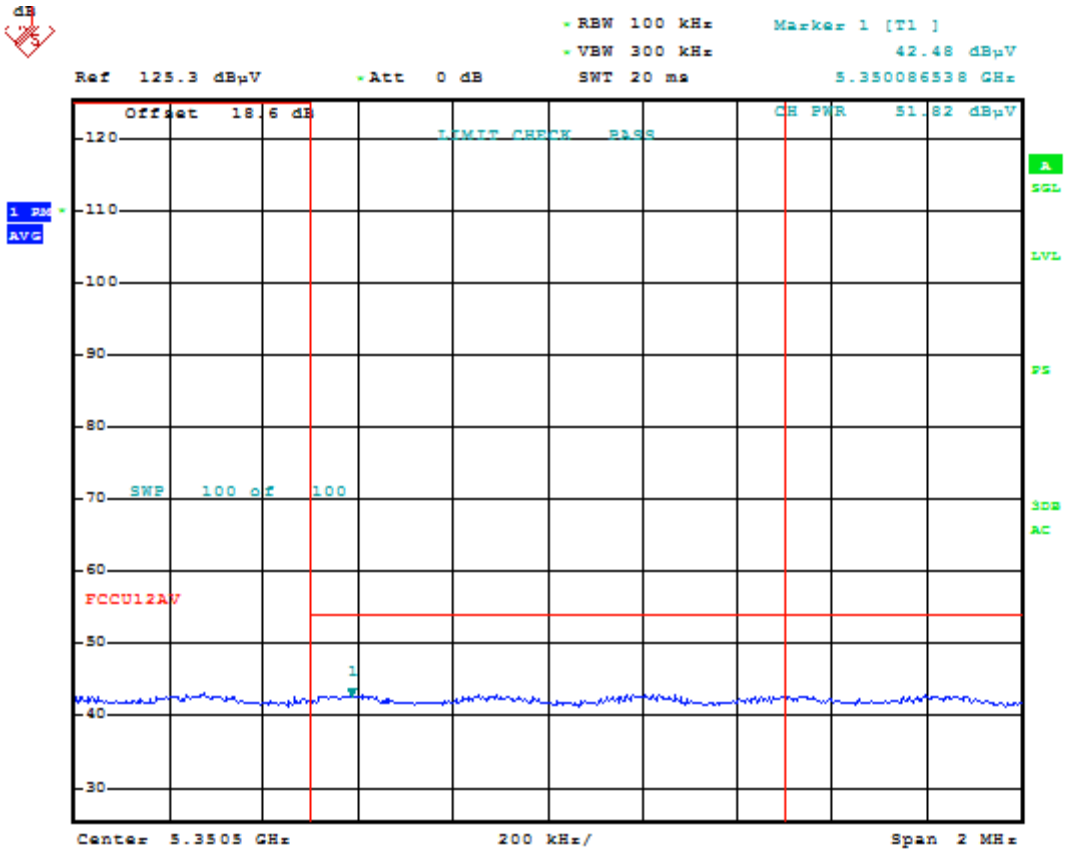
MIMO Radiated Band Edge Measurements (20MHz BW)

§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



Plot 7-243. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

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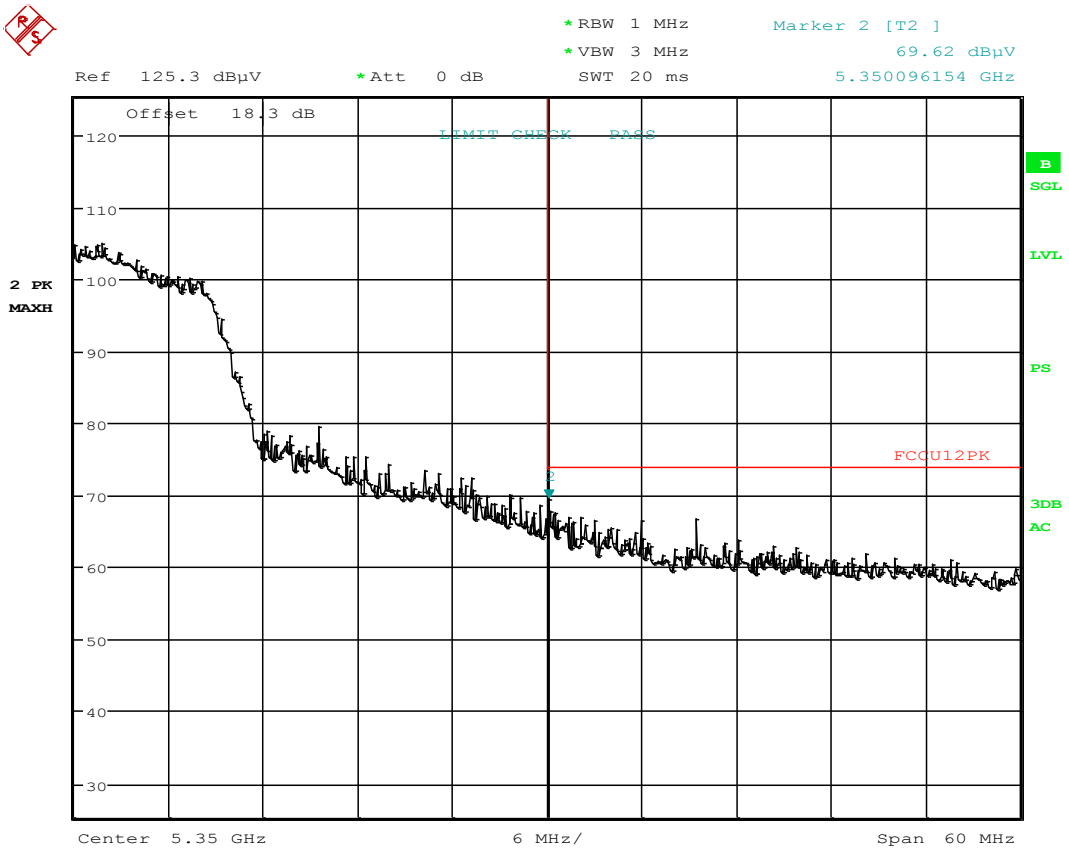
MIMO Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



Date: 25.MAR.2016 04:16:19

Plot 7-244. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

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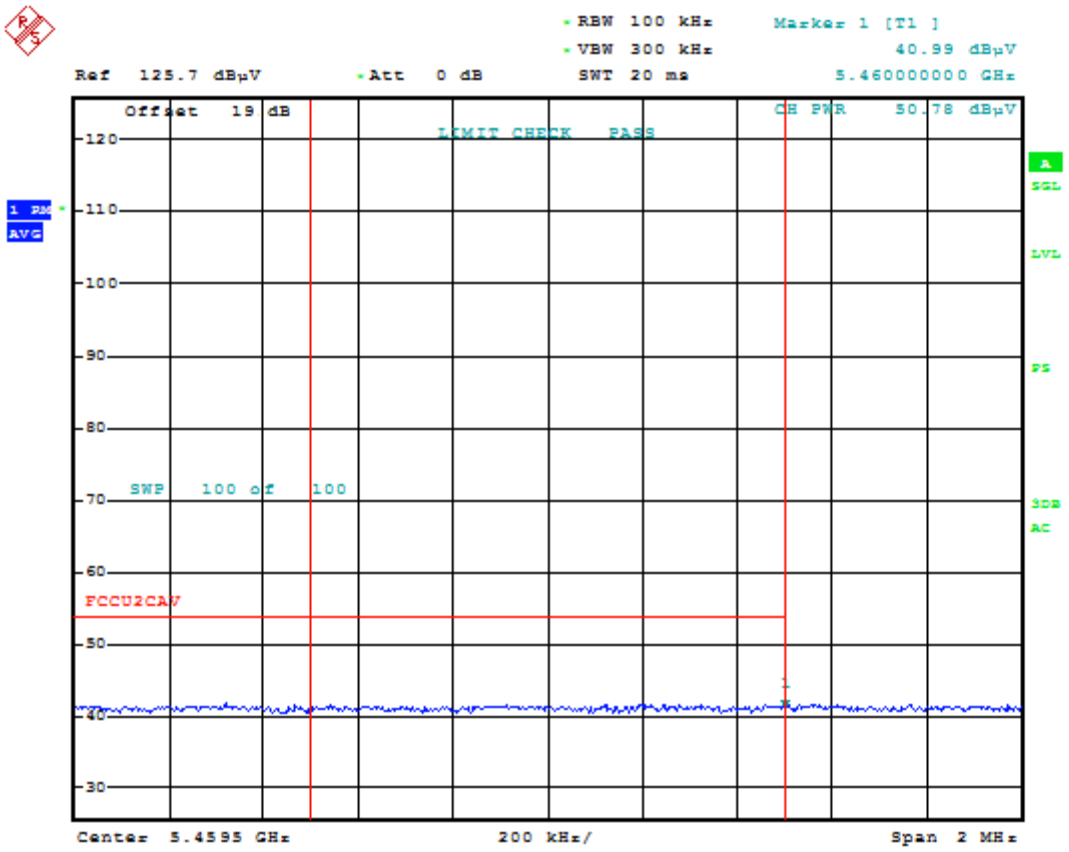
MIMO Radiated Band Edge Measurements (20MHz BW)

§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



Plot 7-245. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

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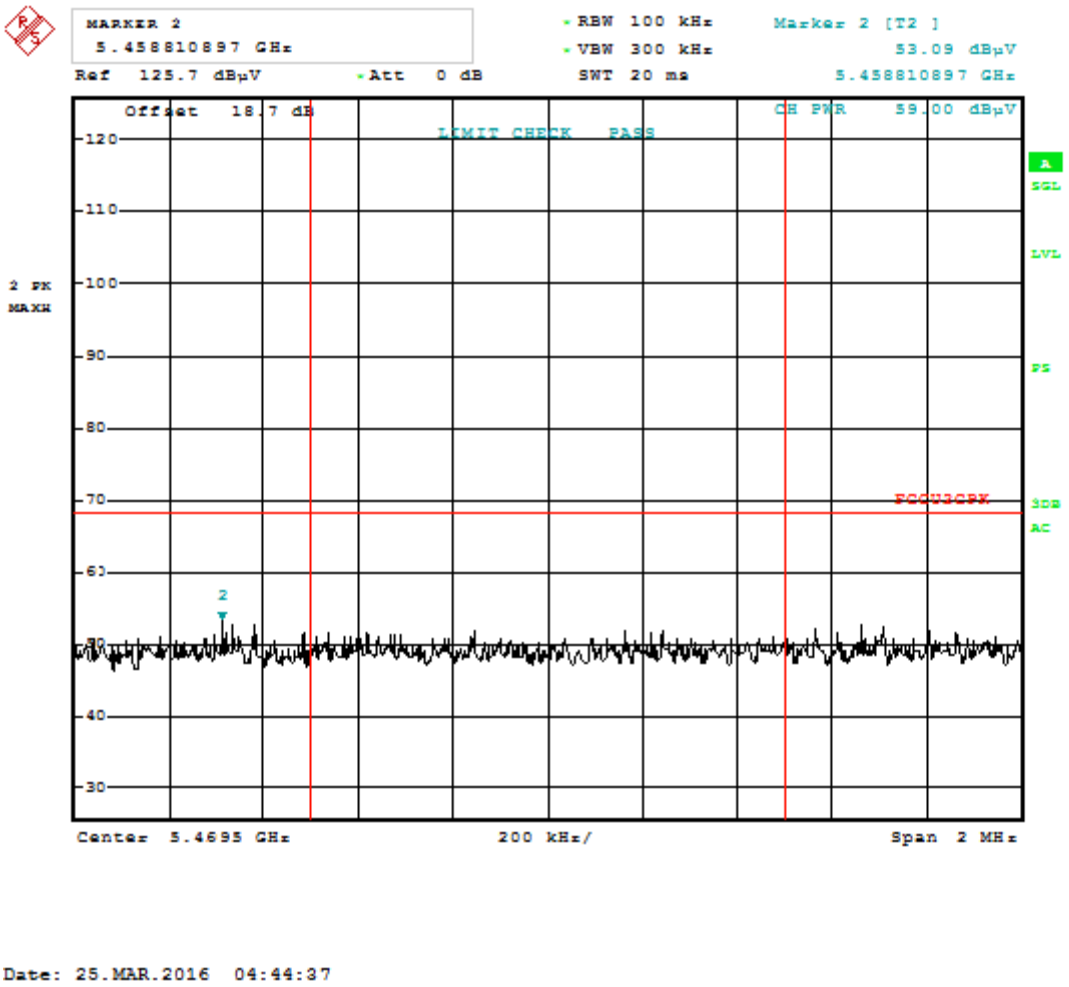
MIMO Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



Plot 7-246. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

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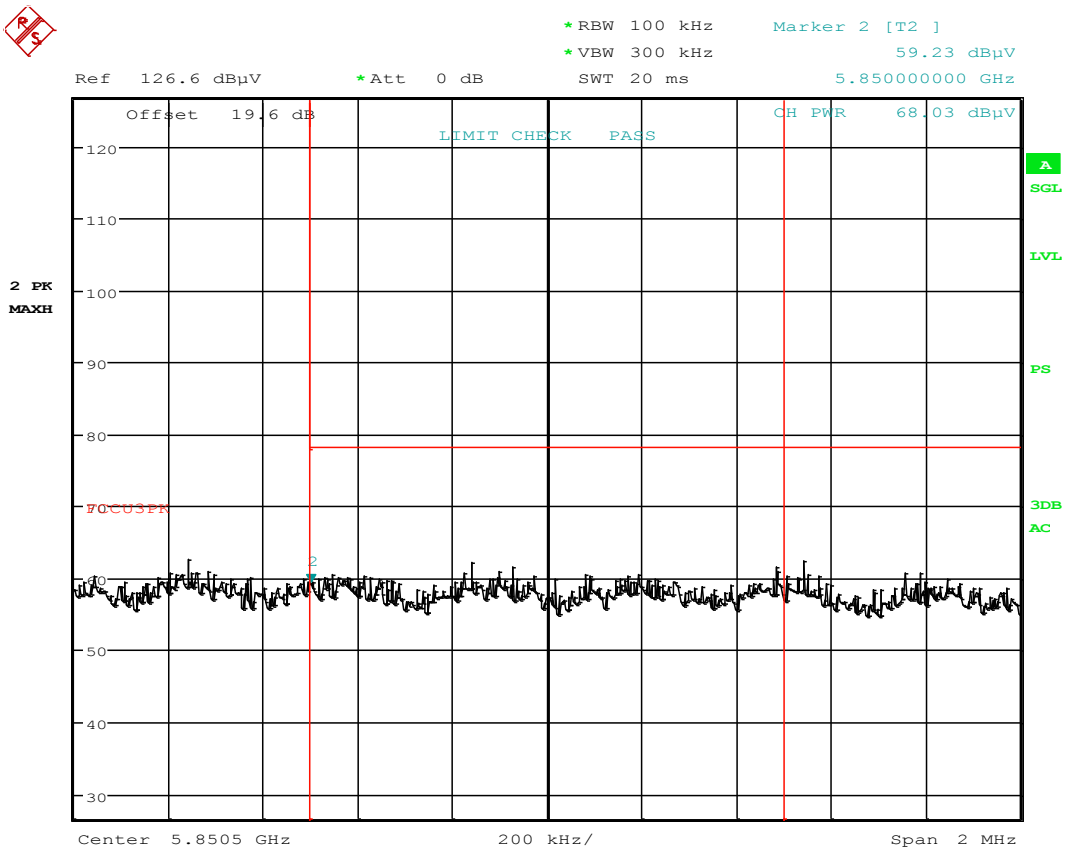
MIMO Radiated Band Edge Measurements (20MHz BW)

§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: 25.MAR.2016 04:59:42

Plot 7-247. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

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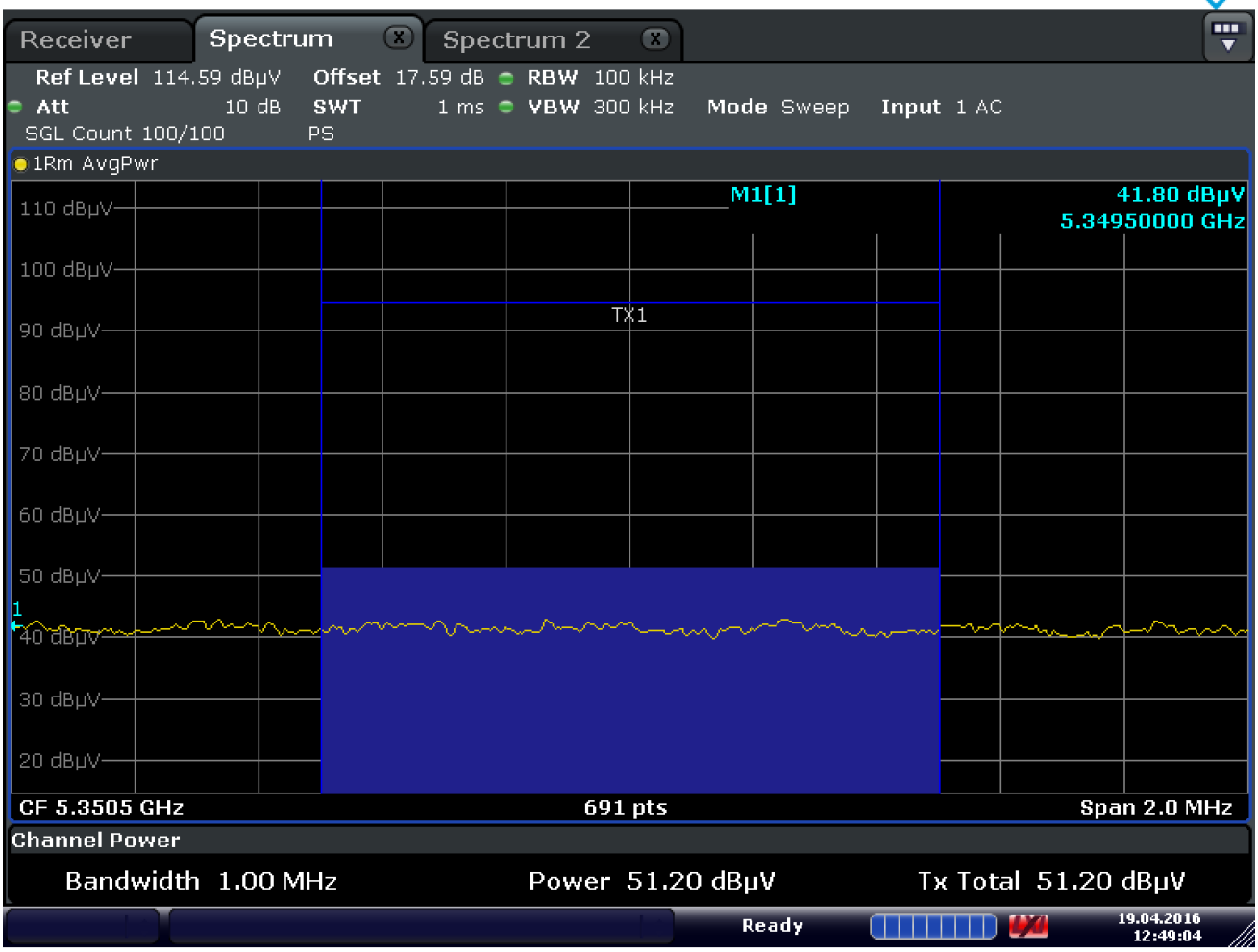
MIMO WCP Radiated Band Edge Measurements (20MHz BW)

§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: 19.APR.2016 12:49:04

Plot 7-248. Radiated Restricted Band Edge Plot with WCP

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MIMO WCP Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

Date: 19.APR.2016 12:49:38

Plot 7-249. Radiated Restricted Band Edge Plot with WCP

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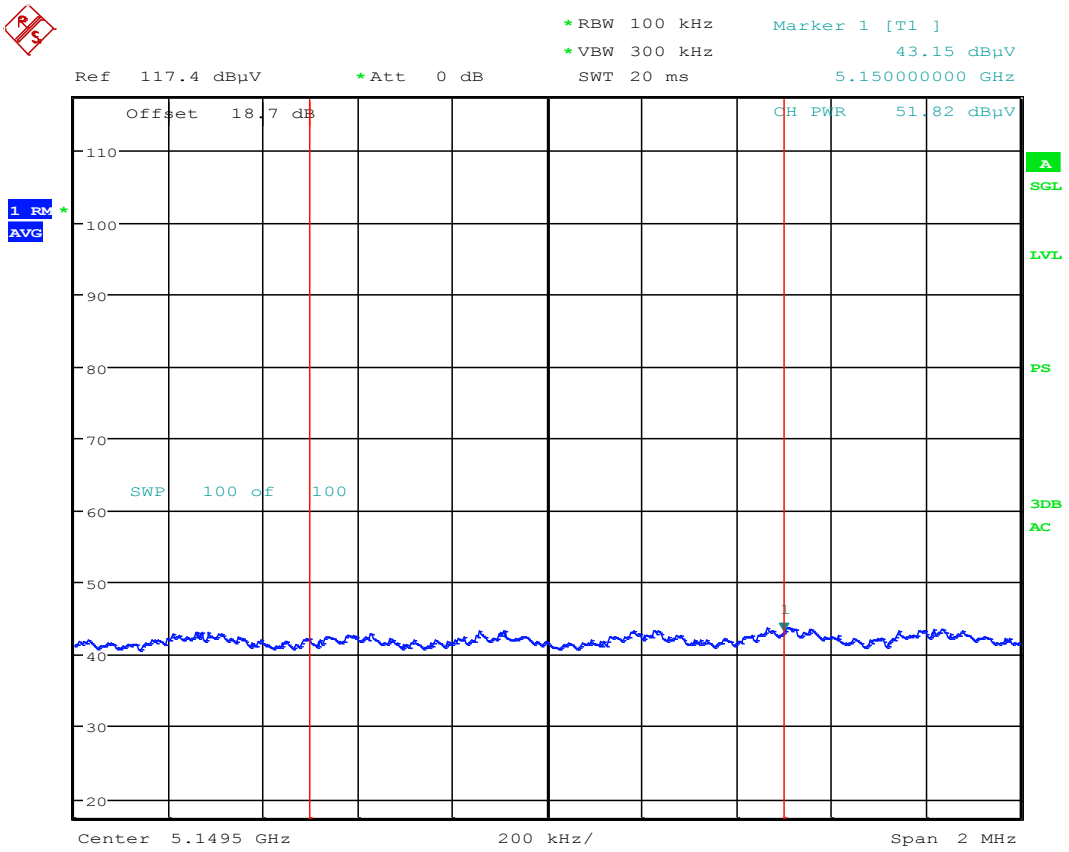
7.7.11 MIMO Radiated Band Edge Measurements (40MHz BW)

§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



Date: 25.MAR.2016 21:23:51

Plot 7-250. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

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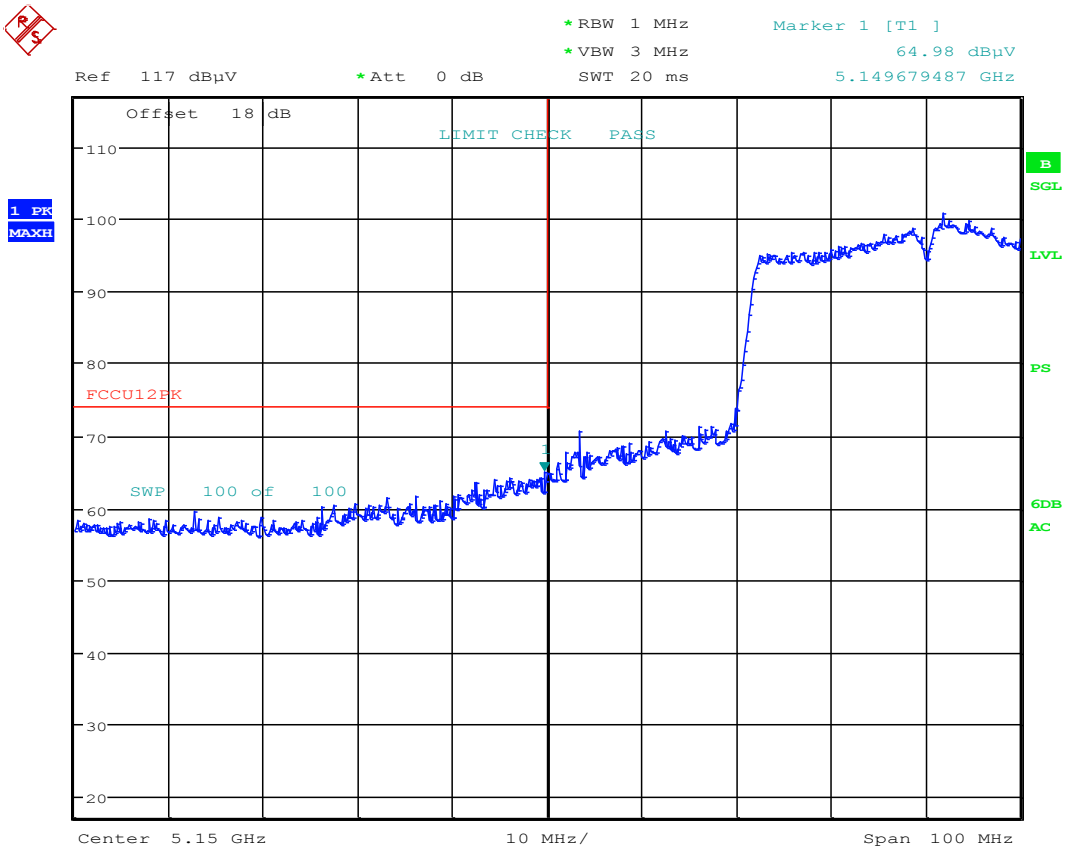
MIMO Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



Date: 25.MAR.2016 21:24:41

Plot 7-251. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)

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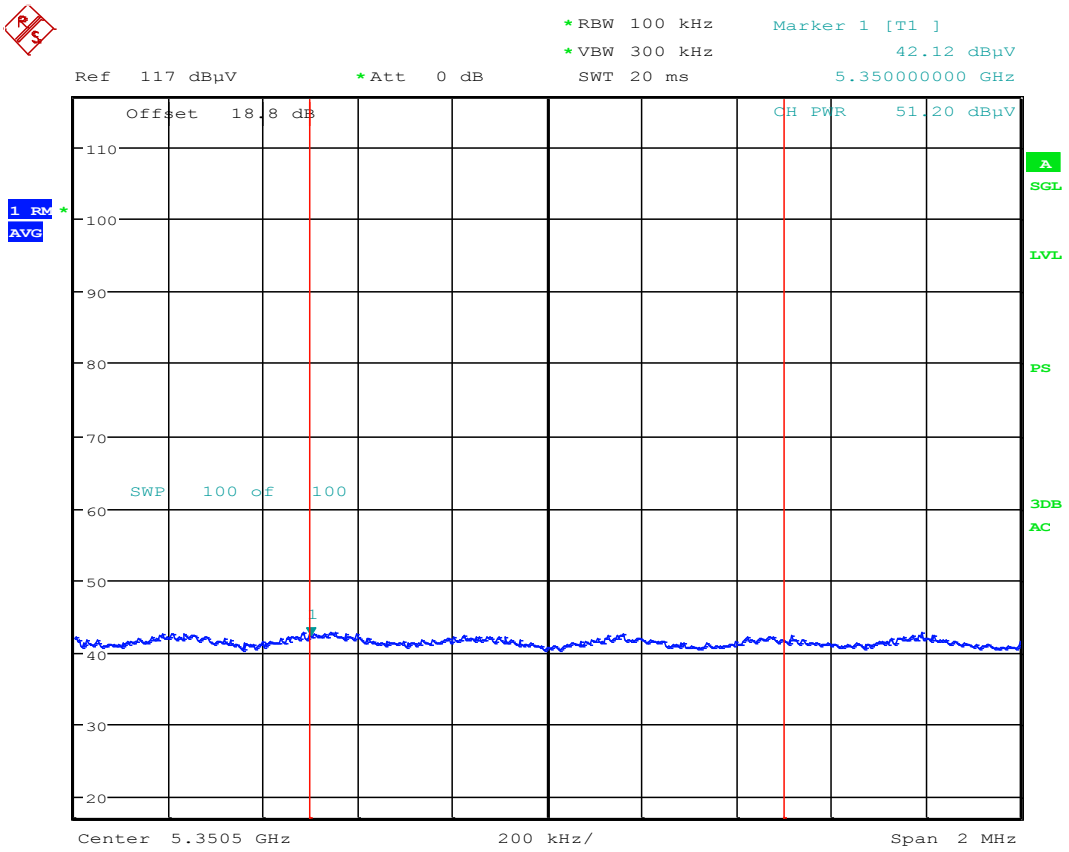
MIMO Radiated Band Edge Measurements (40MHz BW)

§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



Date: 25.MAR.2016 21:59:39

Plot 7-252. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

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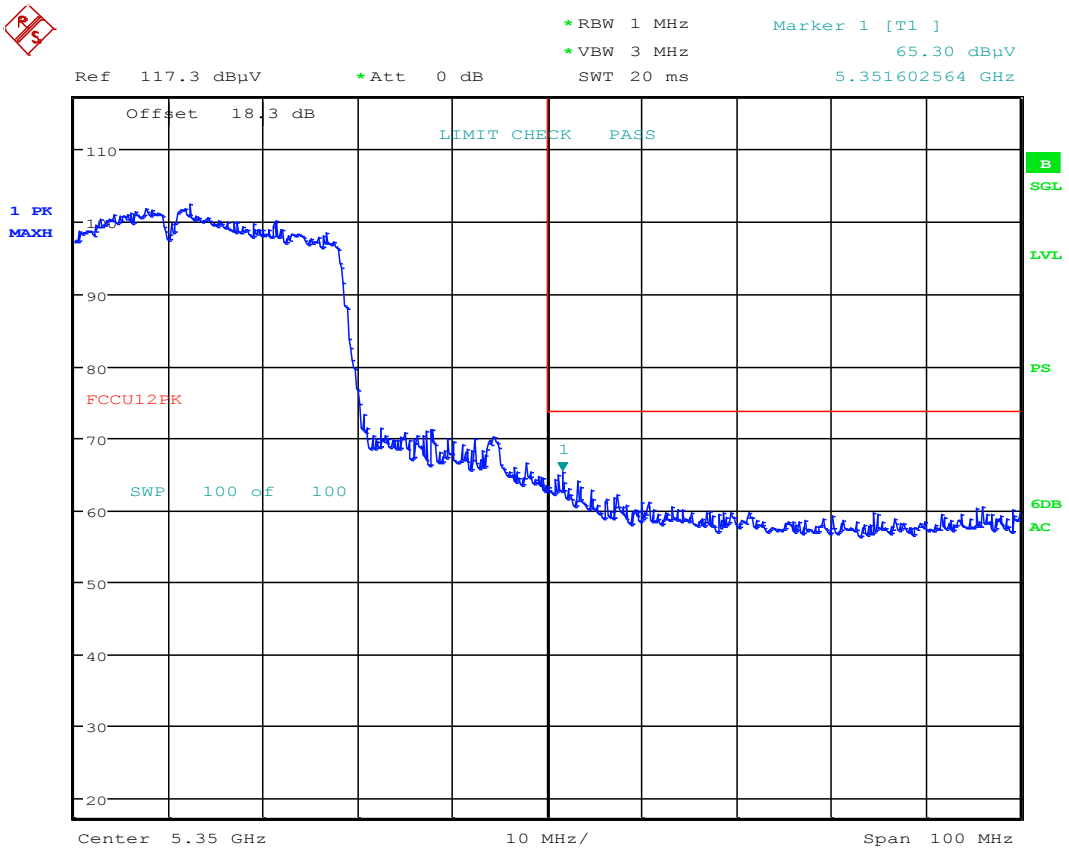
MIMO Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



Date: 25.MAR.2016 22:00:03

Plot 7-253. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

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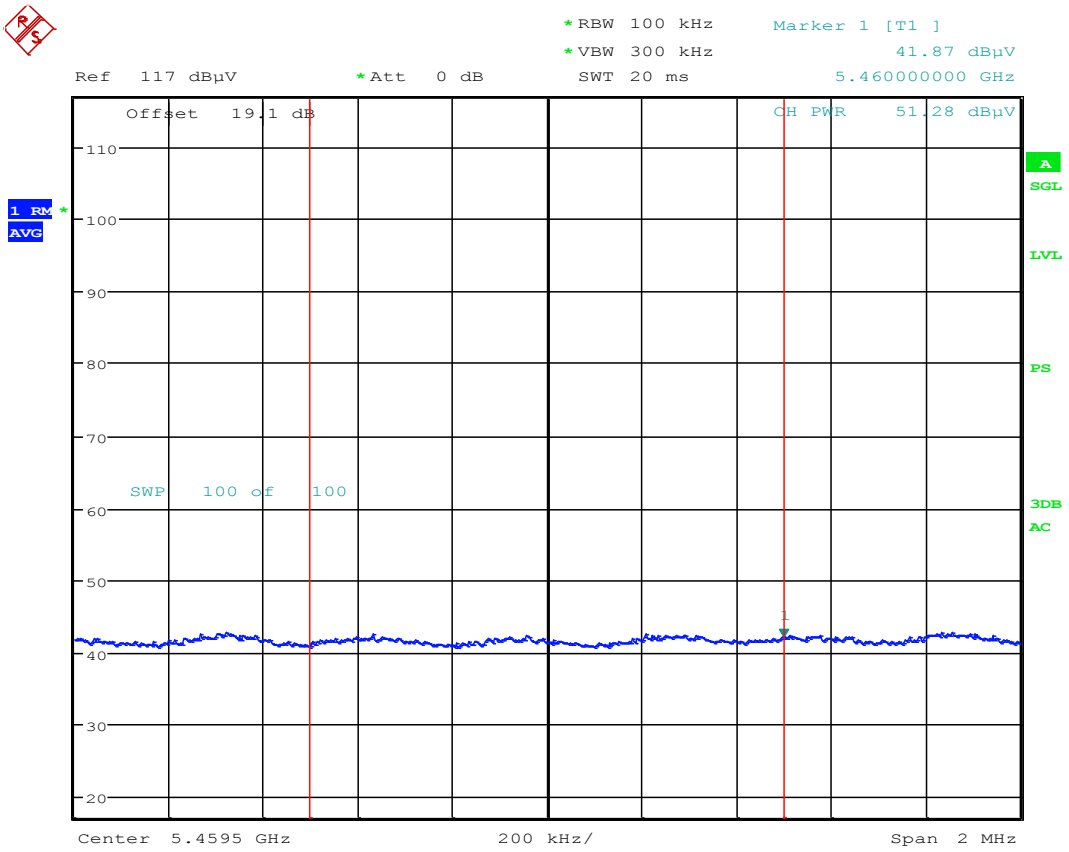
MIMO Radiated Band Edge Measurements (40MHz BW)

§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: 25.MAR.2016 22:36:12

Plot 7-254. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

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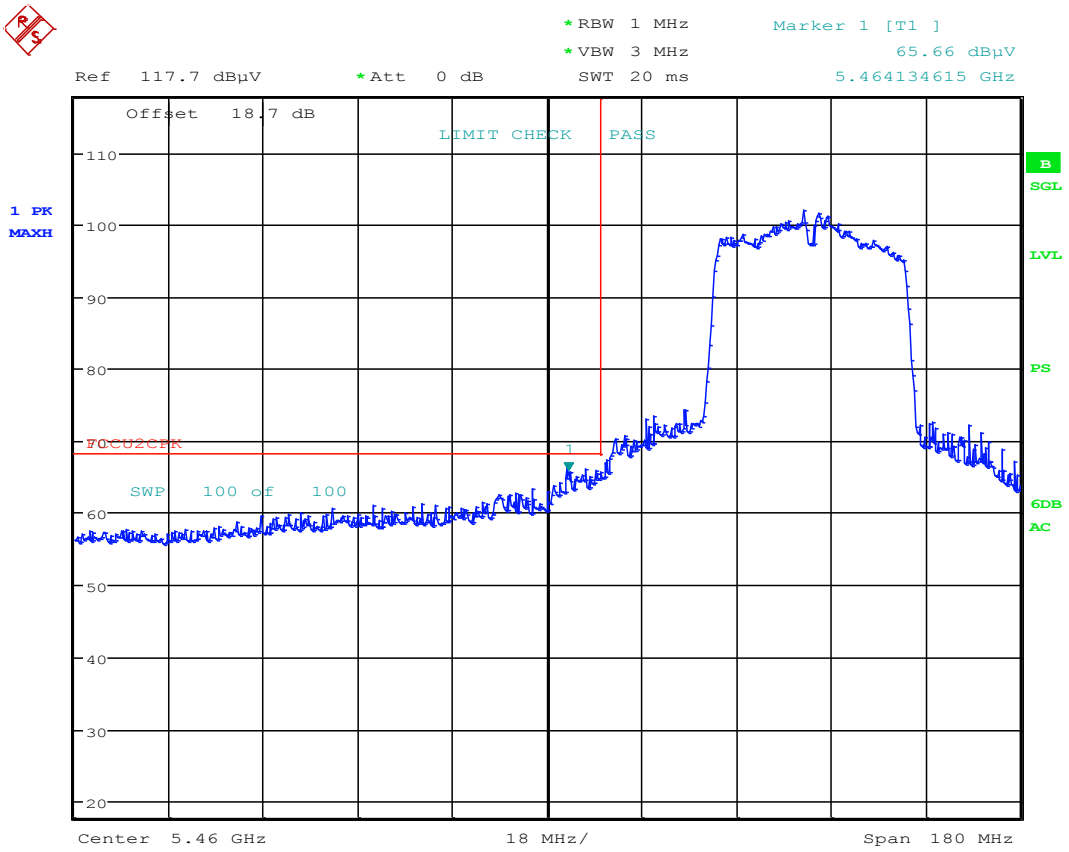
MIMO Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



Date: 25.MAR.2016 22:42:11

Plot 7-255. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

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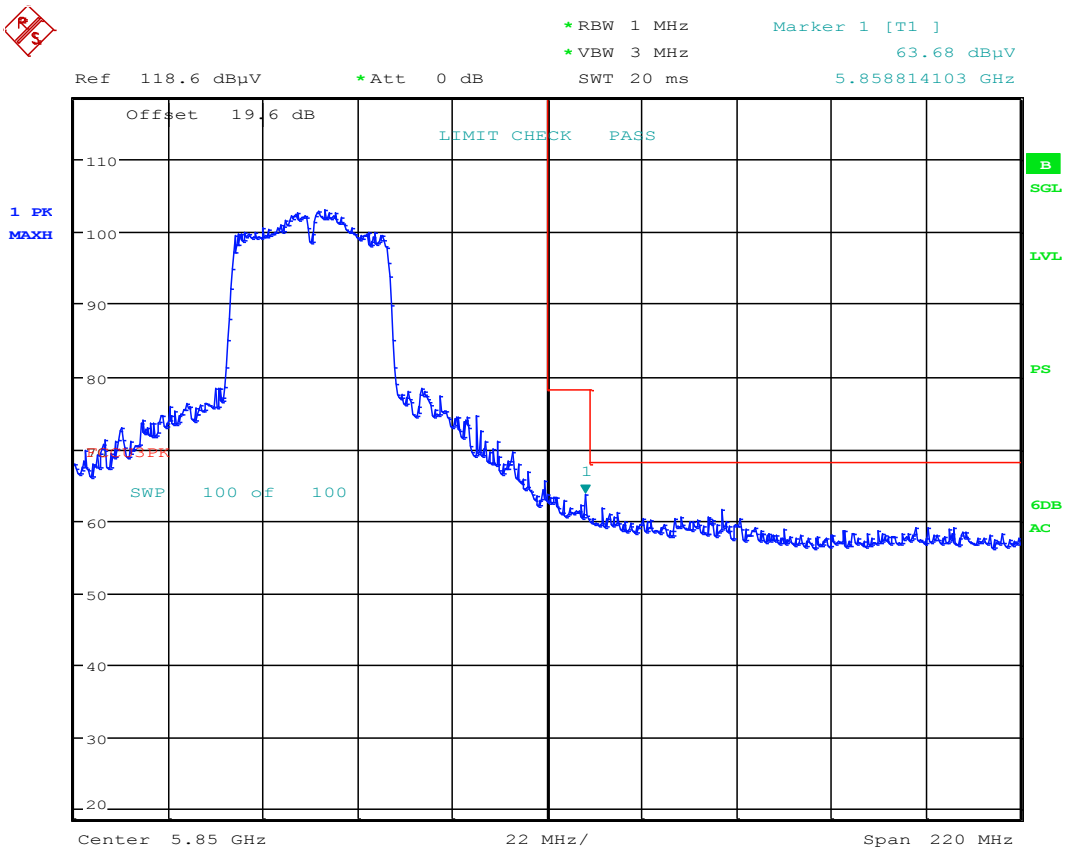
MIMO Radiated Band Edge Measurements (40MHz BW)

§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: 25.MAR.2016 23:08:27

Plot 7-256. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

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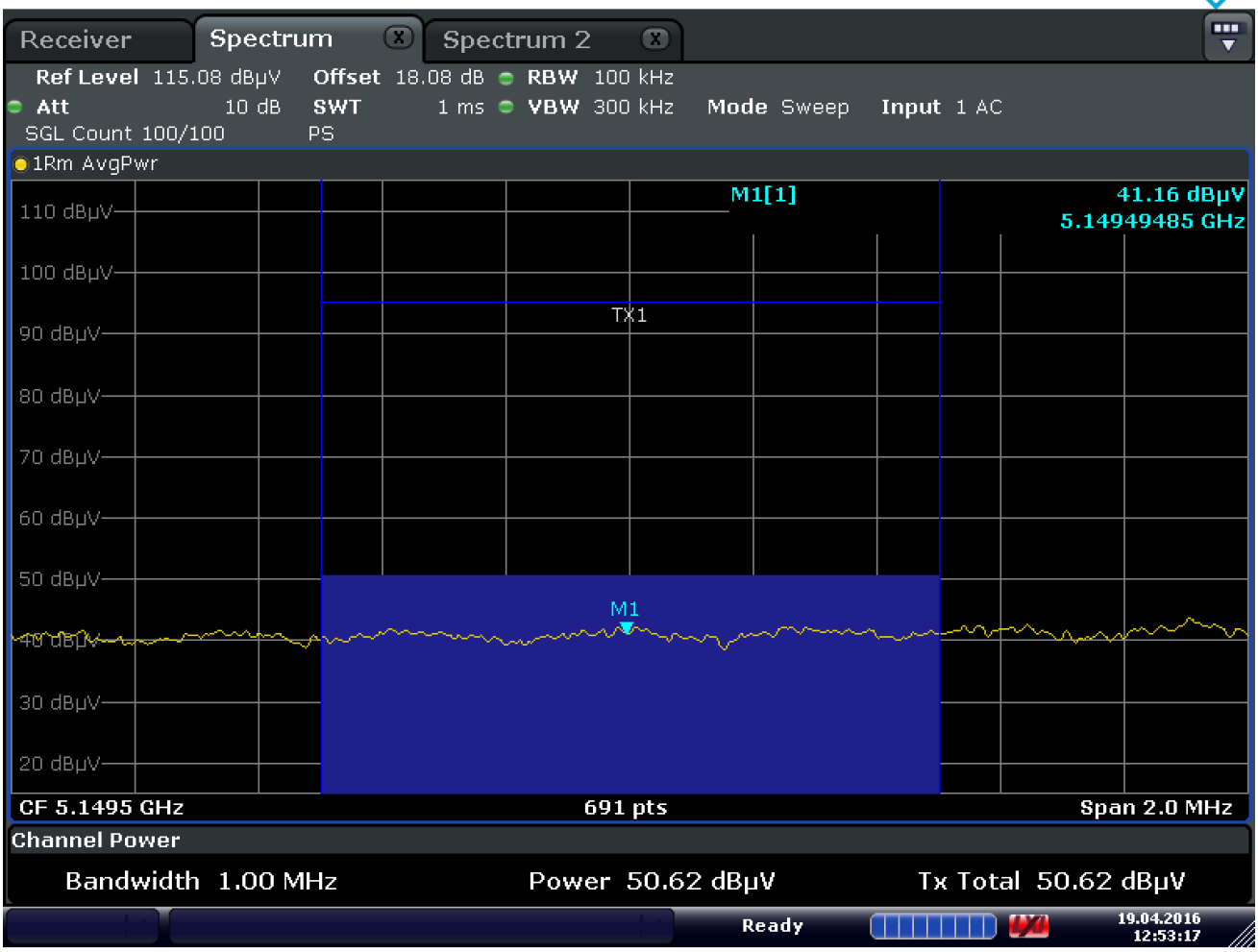
MIMO WCP Radiated Band Edge Measurements (40MHz BW)

§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



Date: 19.APR.2016 12:53:17

Plot 7-257. Radiated Restricted Band Edge Plot with WCP

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MIMO WCP Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

Date: 19.APR.2016 12:41:38

Plot 7-258. Radiated Restricted Band Edge Plot with WCP

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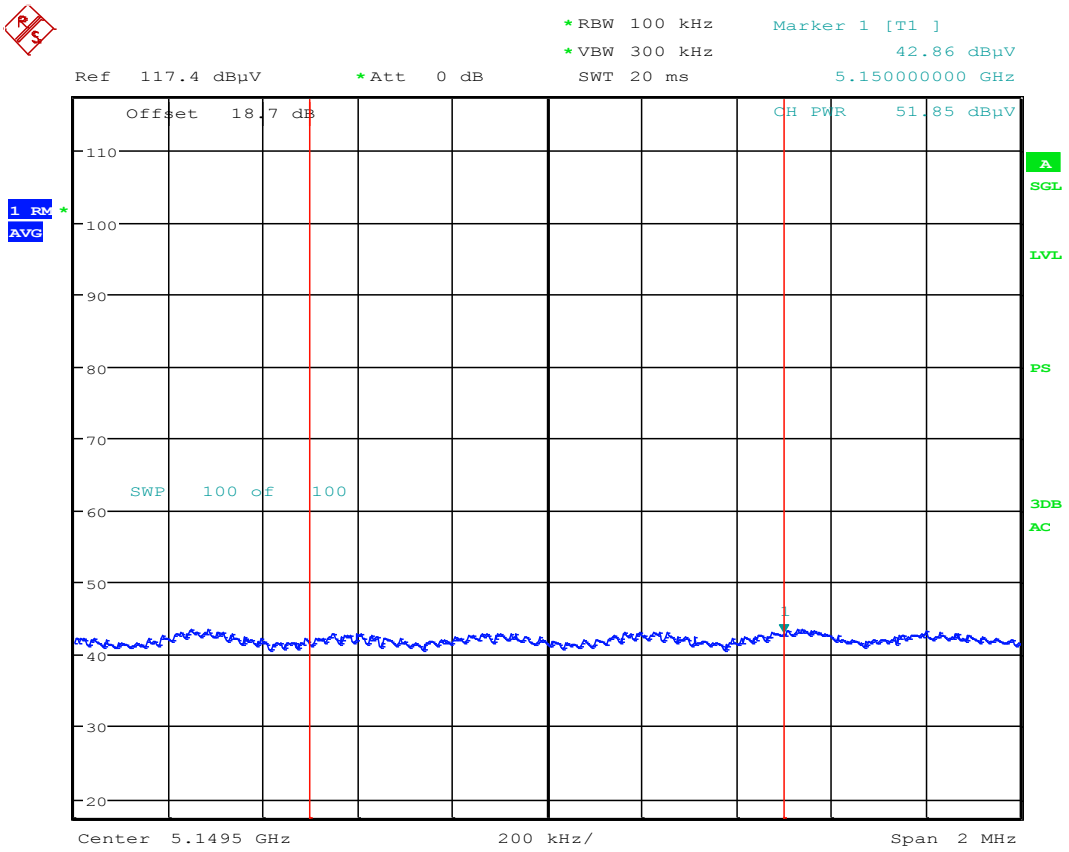
7.7.12 MIMO Radiated Band Edge Measurements (80MHz BW)

§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: 25.MAR.2016 21:50:25

Plot 7-259. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

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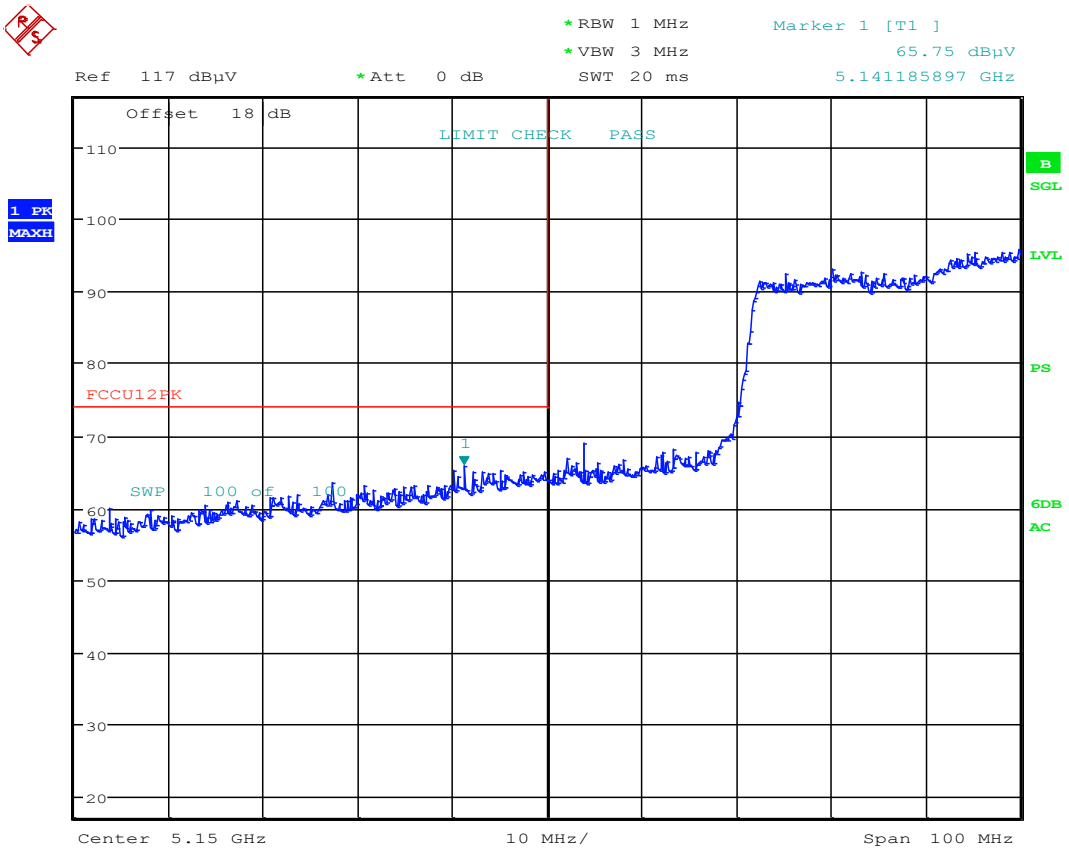
MIMO Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



Date: 25.MAR.2016 21:50:43

Plot 7-260. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)

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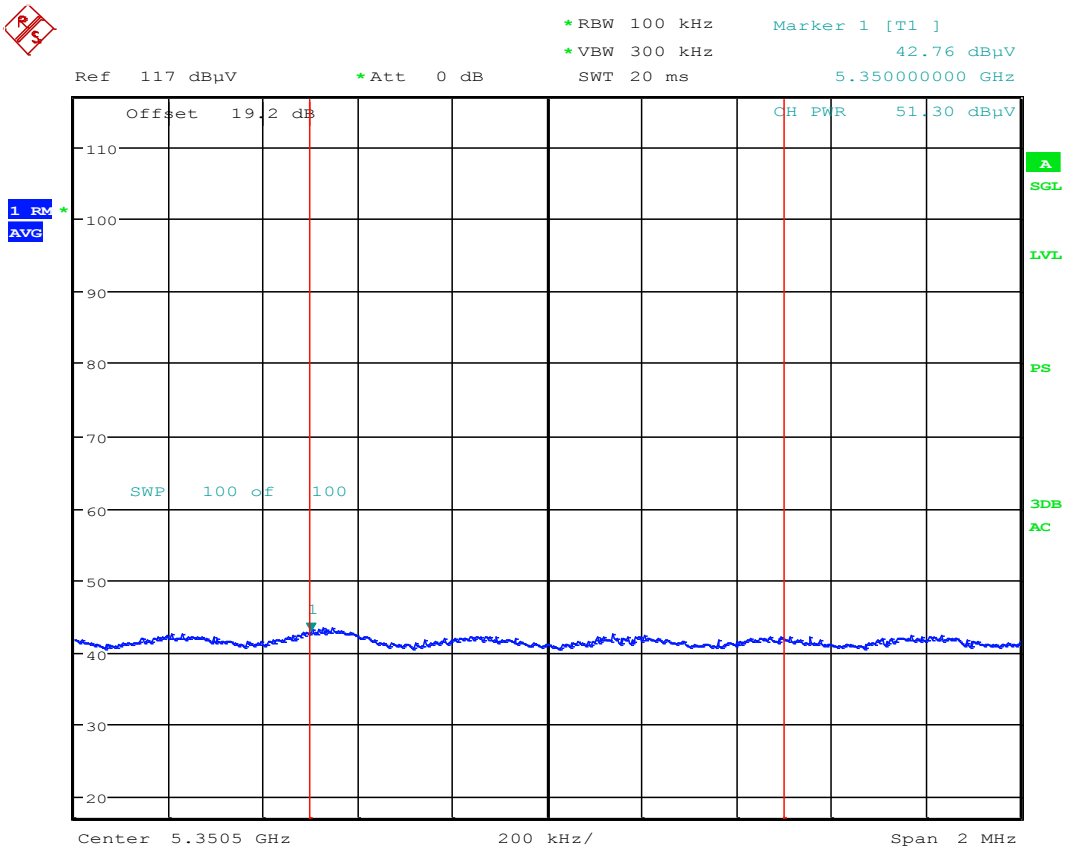
MIMO Radiated Band Edge Measurements (80MHz BW)

§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



Date: 25.MAR.2016 22:28:27

Plot 7-261. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

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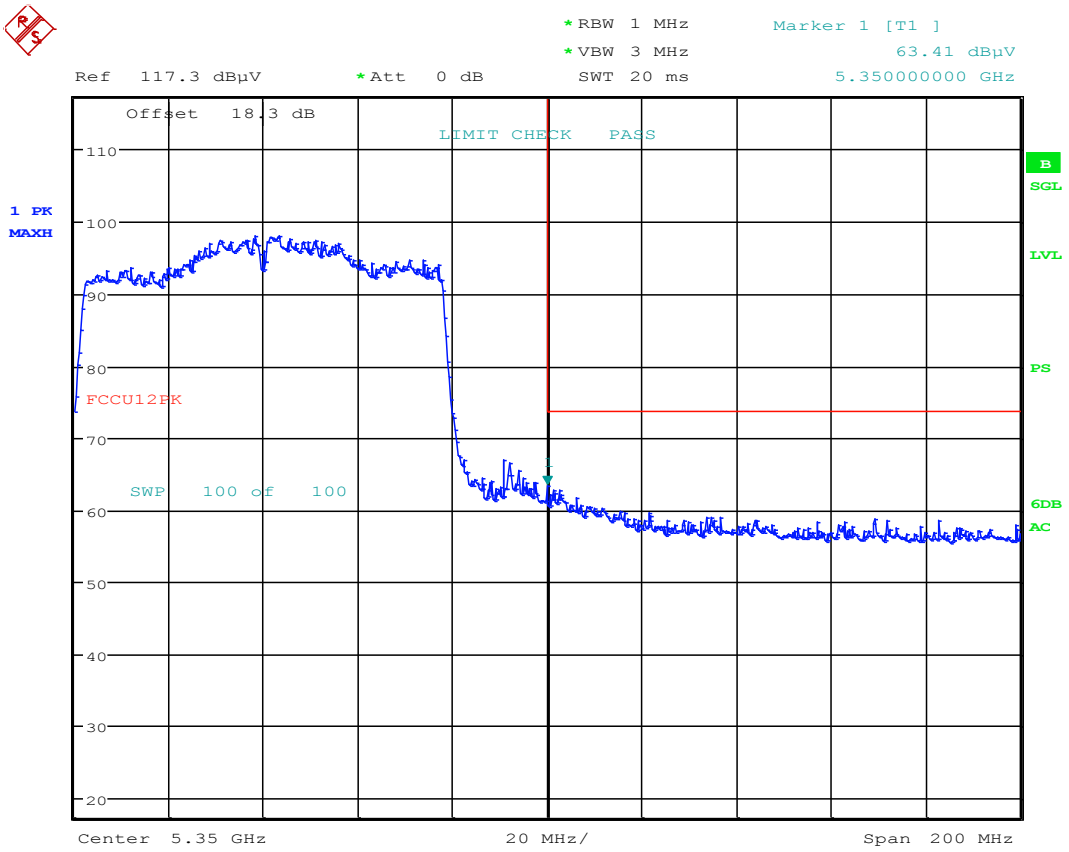
MIMO Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



Date: 25.MAR.2016 22:29:03

Plot 7-262. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

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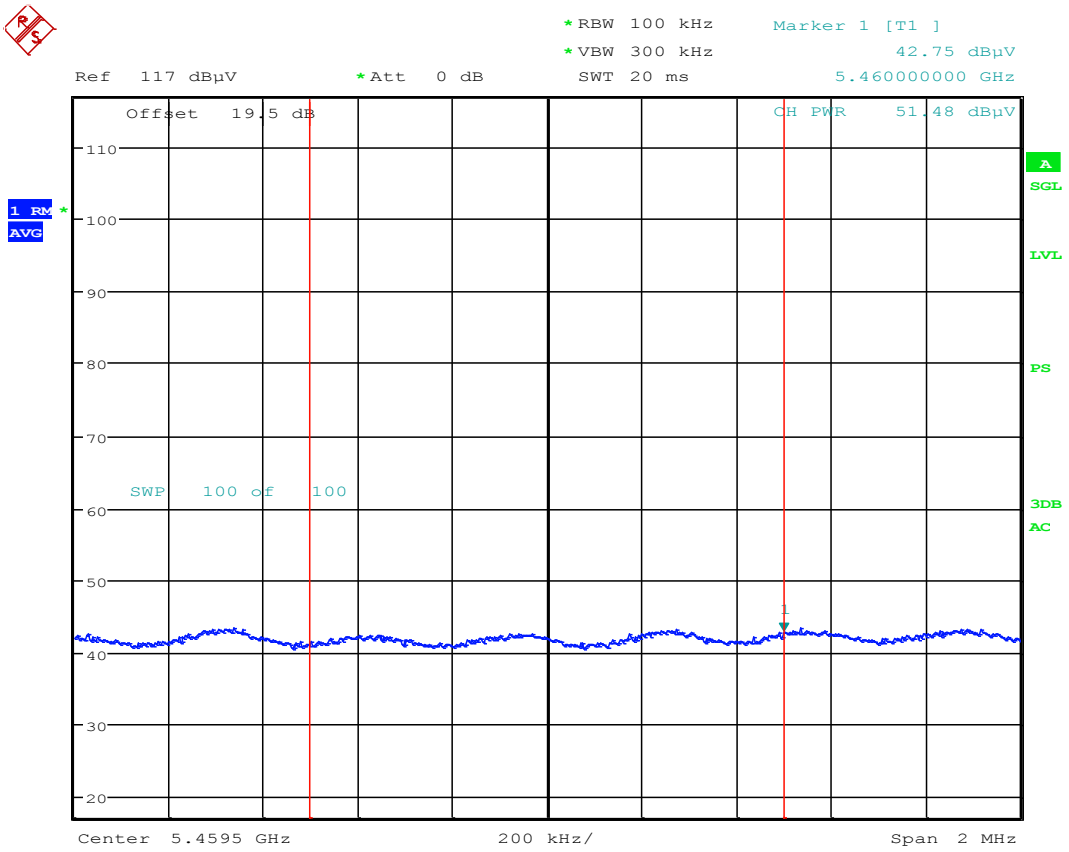
MIMO Radiated Band Edge Measurements (80MHz BW)

§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: 25.MAR.2016 22:49:10

Plot 7-263. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

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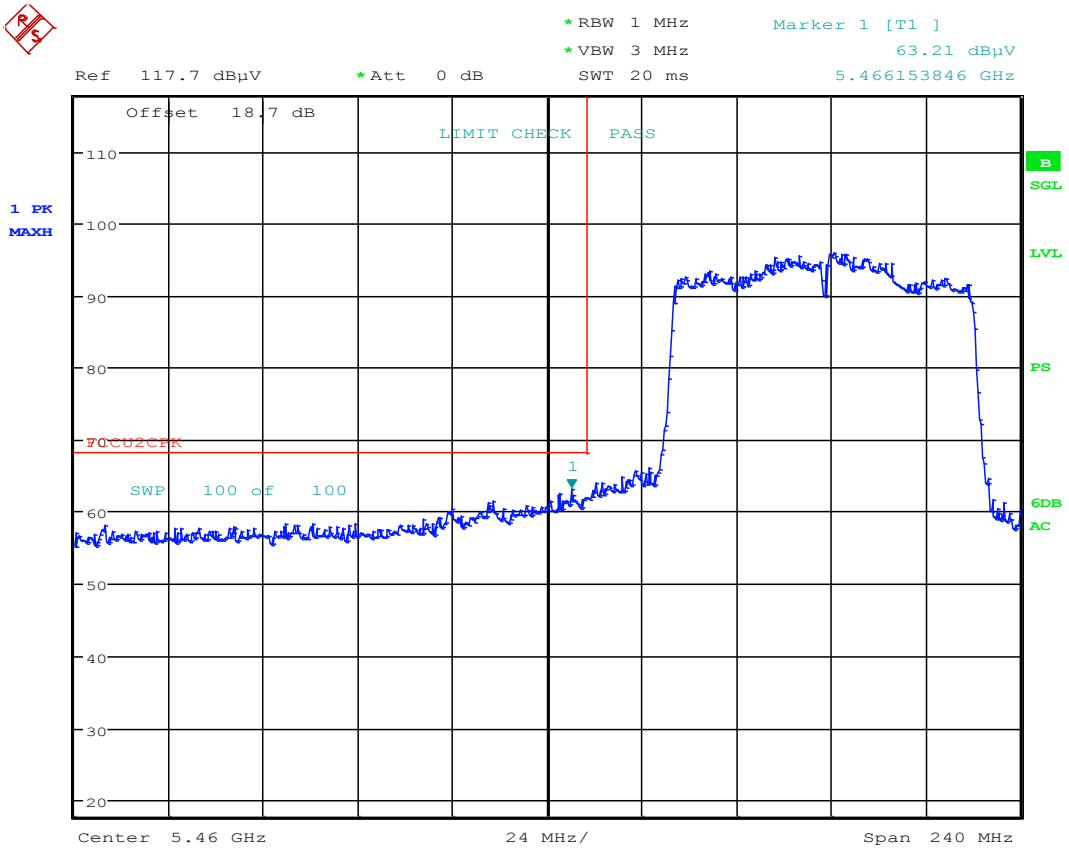
MIMO Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



Date: 25.MAR.2016 22:49:55

Plot 7-264. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

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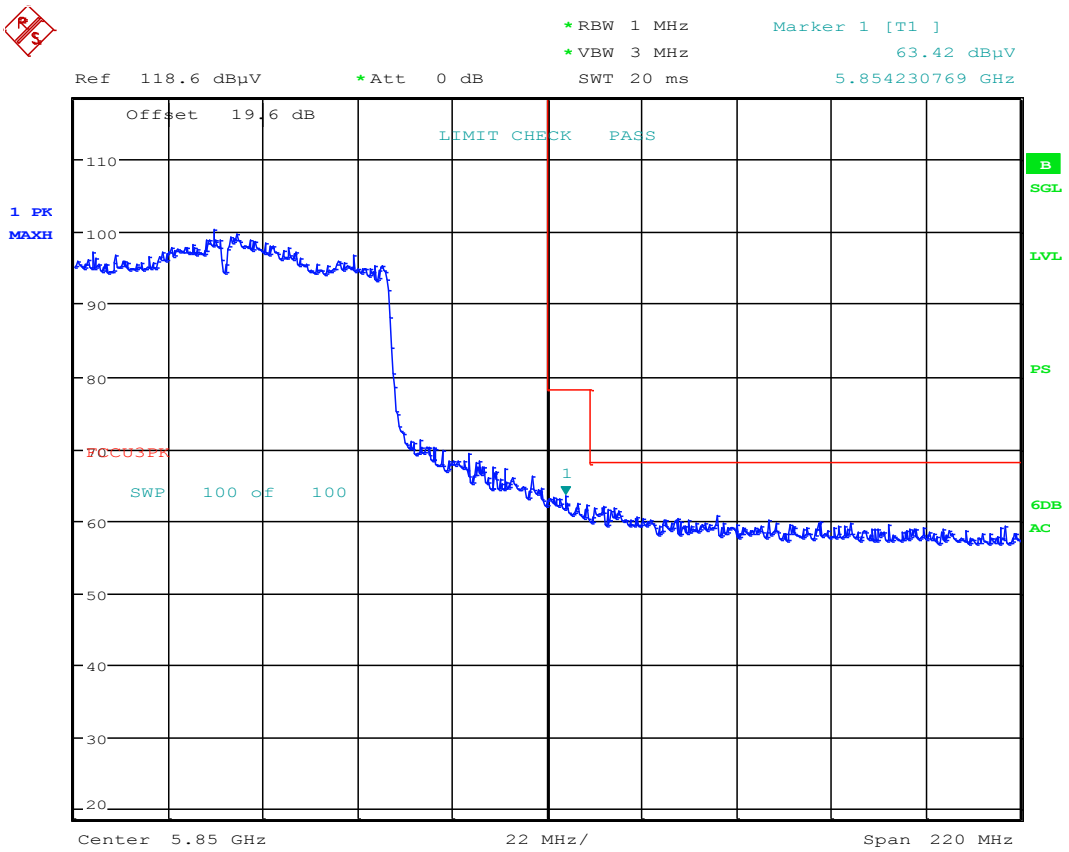
MIMO Radiated Band Edge Measurements (80MHz BW)

§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: 25.MAR.2016 23:06:49

Plot 7-265. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

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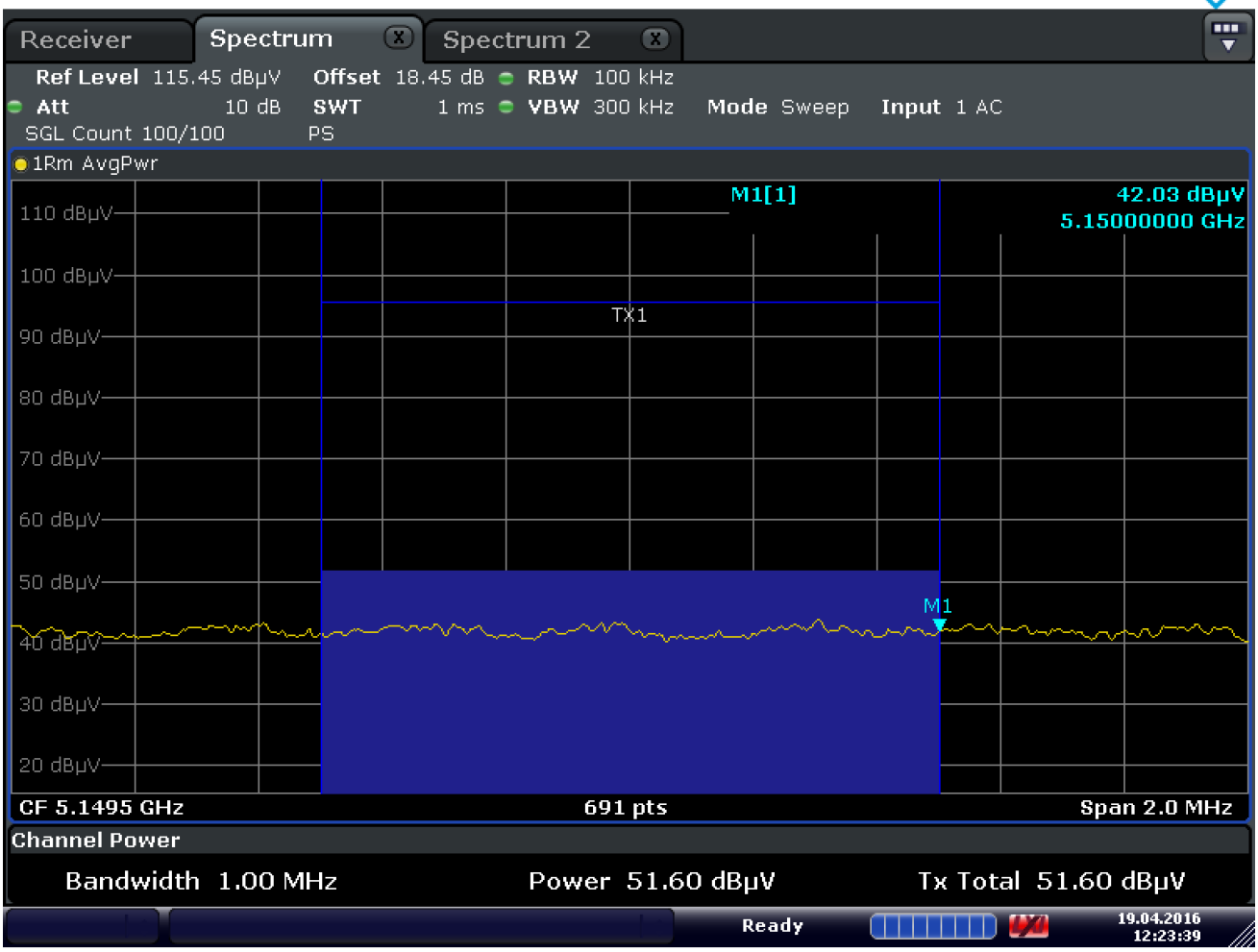
MIMO WCP Radiated Band Edge Measurements (80MHz BW)

§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: 19.APR.2016 12:23:39

Plot 7-266. Radiated Restricted Band Edge Plot with WCP

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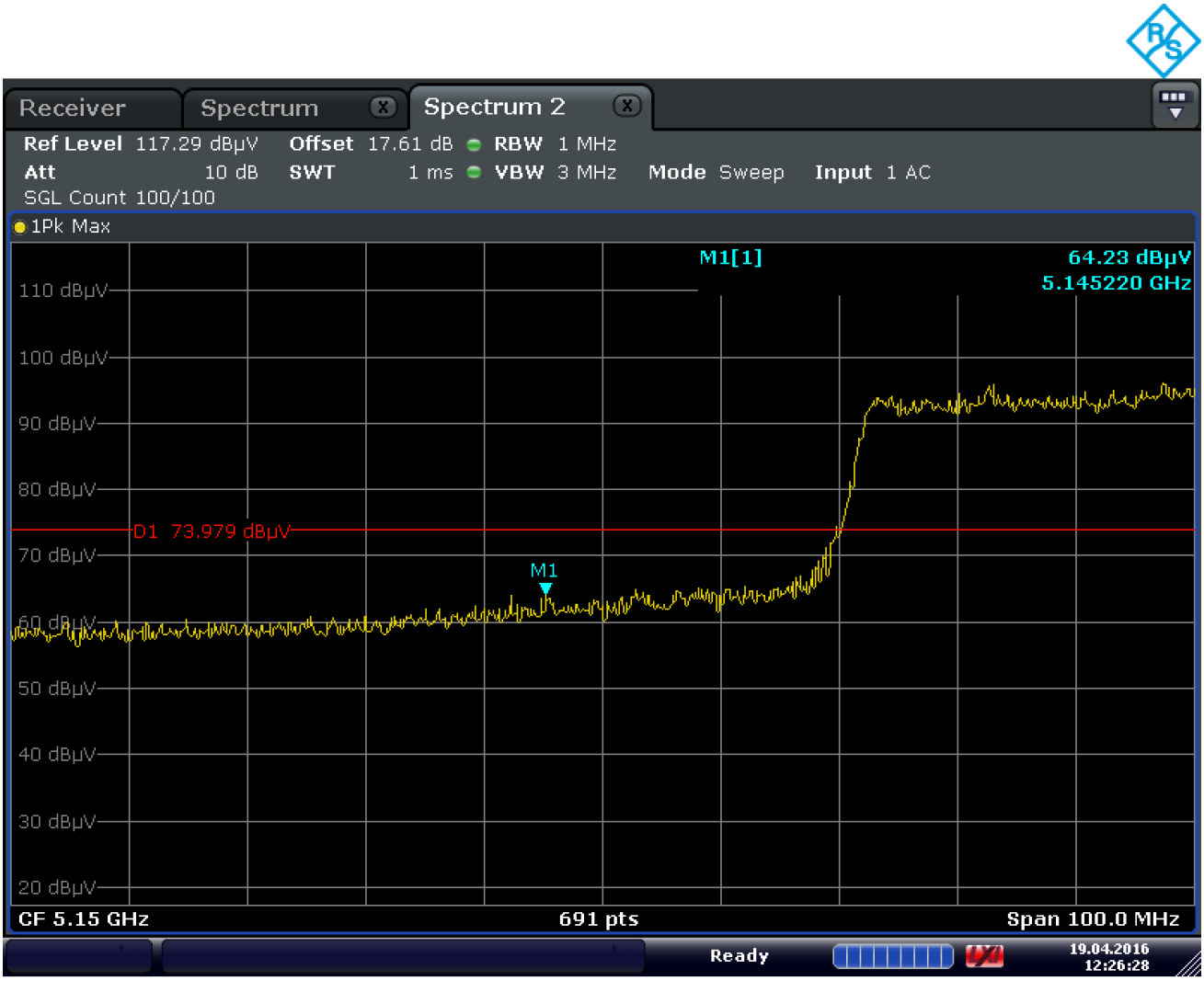
MIMO WCP Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



Date: 19.APR.2016 12:26:28

Plot 7-267. Radiated Restricted Band Edge Plot with WCP

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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 7-62 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 7-62. 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

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Test Setup

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

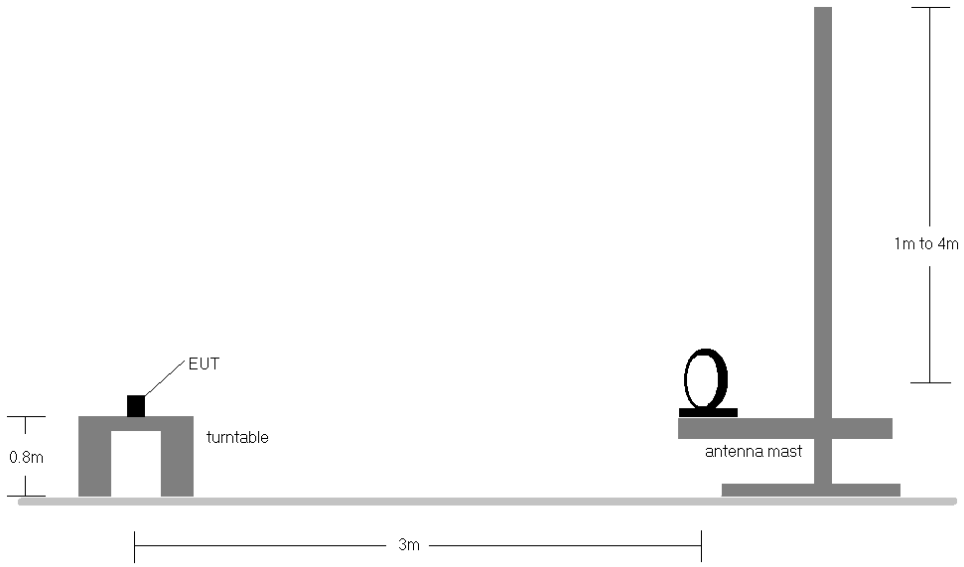

Figure 7-6. Radiated Test Setup < 30MHz

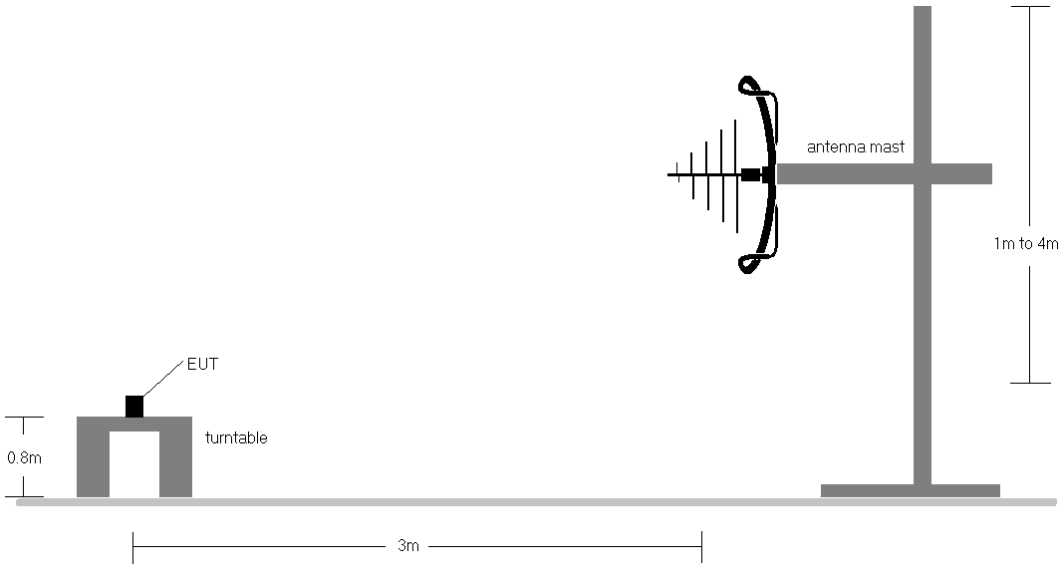

Figure 7-7. Radiated Test Setup < 1GHz

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Test Notes

1. All emissions lying in restricted bands specified in §15.205 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.

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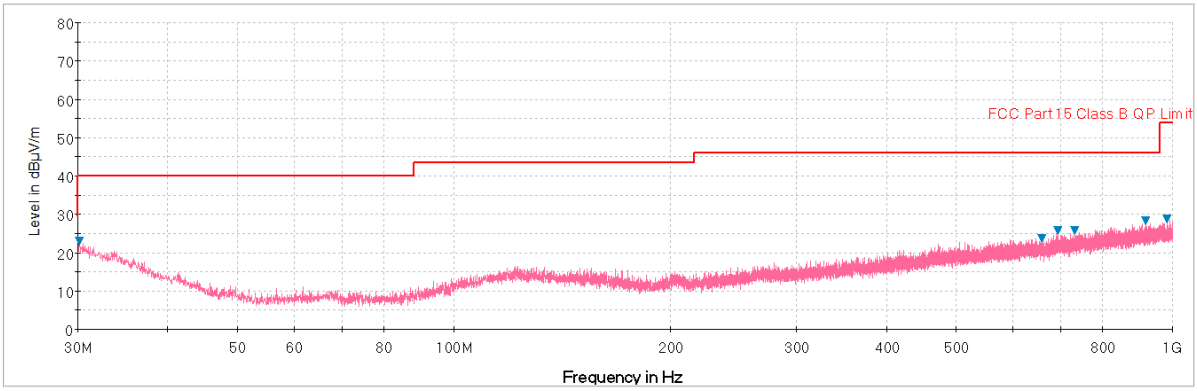
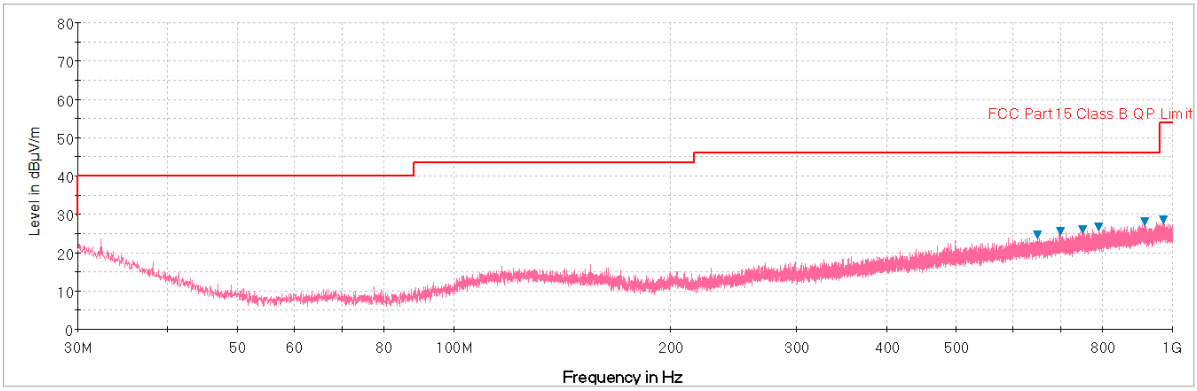
Antenna-1 Radiated Spurious Emissions Measurements (Below 1GHz)

§15.209



Plot 7-268. Radiated Spurious Plot below 1GHz (802.11a – U3 Ch. 157, Ant. Pol. H)



Plot 7-269. Radiated Spurious Plot below 1GHz (802.11a – U3 Ch. 157, Ant. Pol. V)

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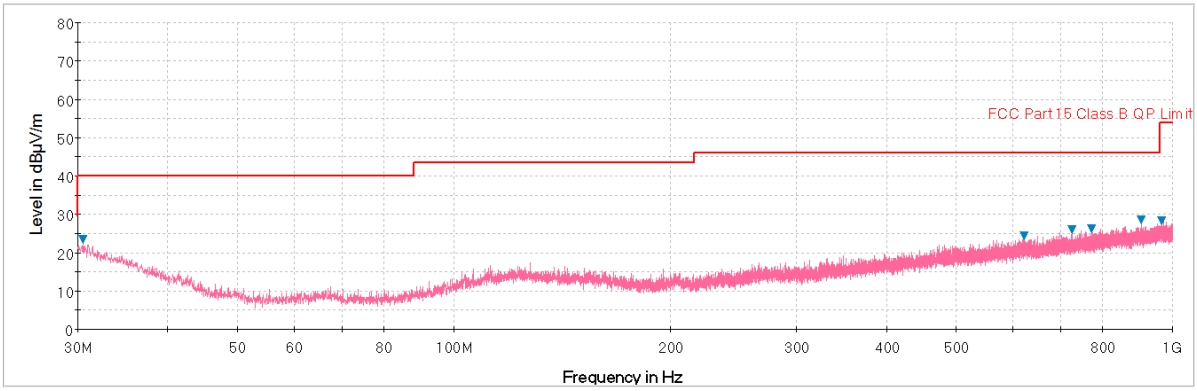
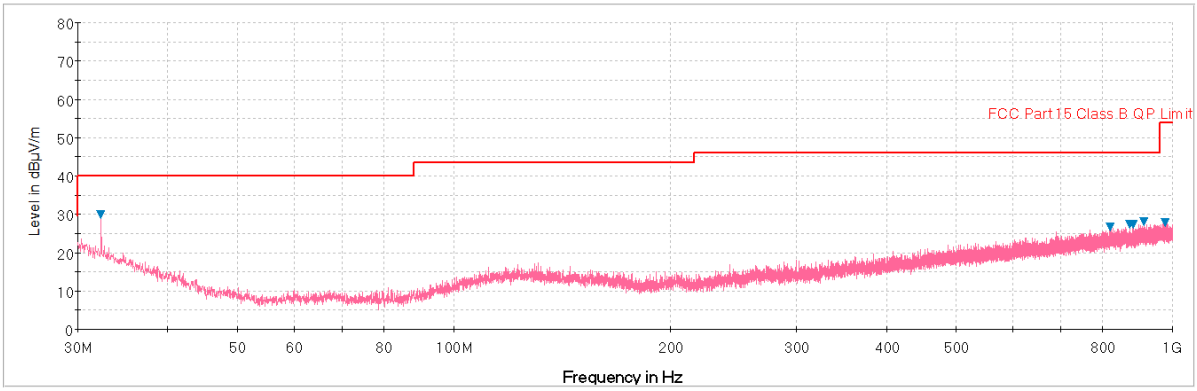
Antenna-2 Radiated Spurious Emissions Measurements (Below 1GHz)

§15.209



Plot 7-270. Radiated Spurious Plot below 1GHz (802.11a – U3 Ch. 157, Ant. Pol. H)



Plot 7-271. Radiated Spurious Plot below 1GHz (802.11a – U3 Ch. 157, Ant. Pol. V)

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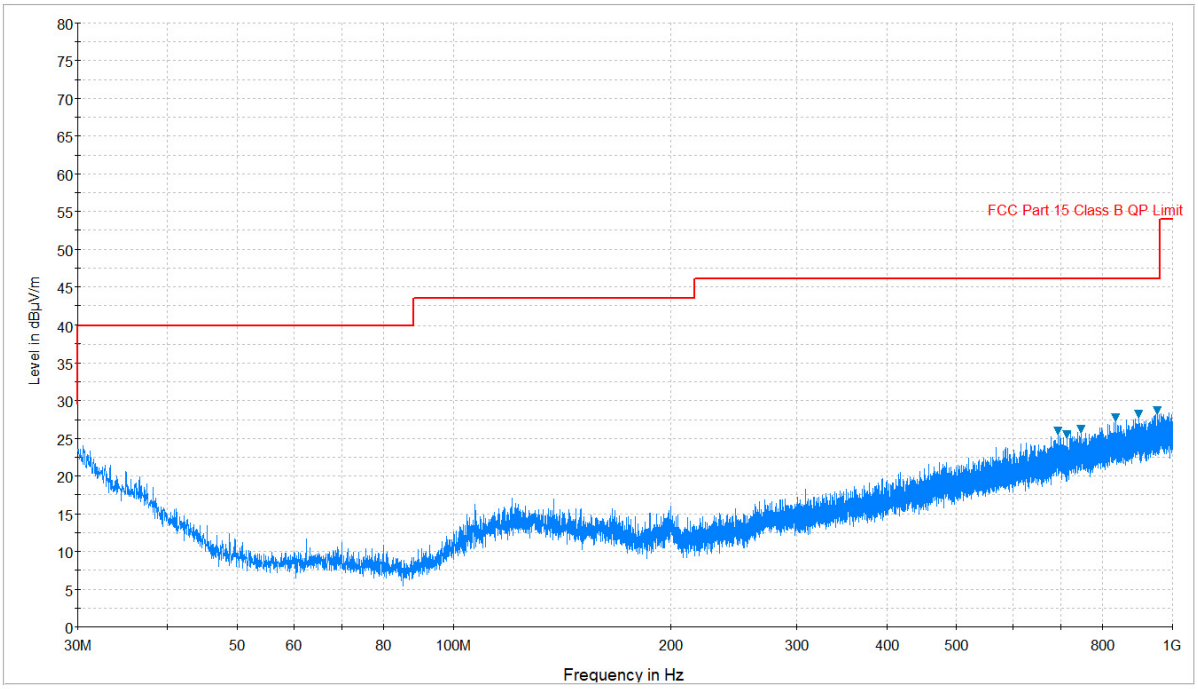
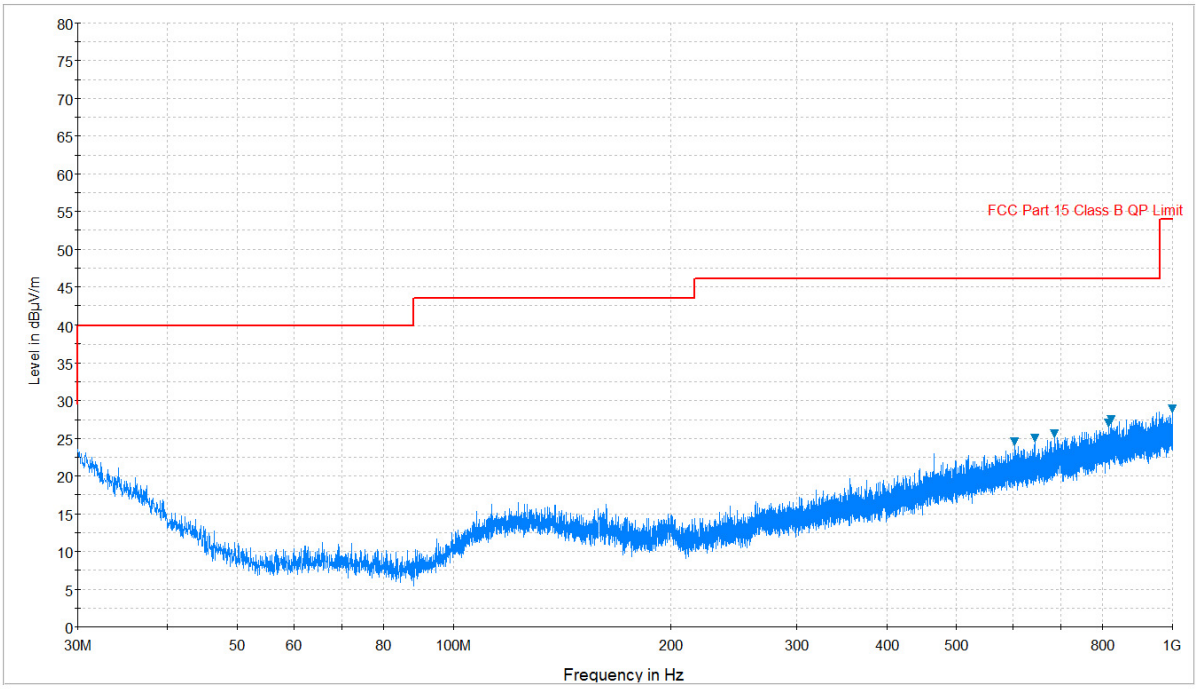
Simultaneous Transmission Radiated Spurious Emissions Measurements (Below 1GHz)

§15.209



Plot 7-272. Radiated Spurious Plot below 1GHz (2.4GHz – 5GHz, Ant. Pol. H)



Plot 7-273. Radiated Spurious Plot below 1GHz (2.4GHz – 5GHz, Ant. Pol. V)

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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 7-63. Conducted Limits

*Decreases with the logarithm of the frequency.

Test Procedures Used

ANSI C63.10-2013, Section 6.2

Test Settings

Quasi-Peak Field Strength Measurements

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

Average Field Strength Measurements

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

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Test Setup

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

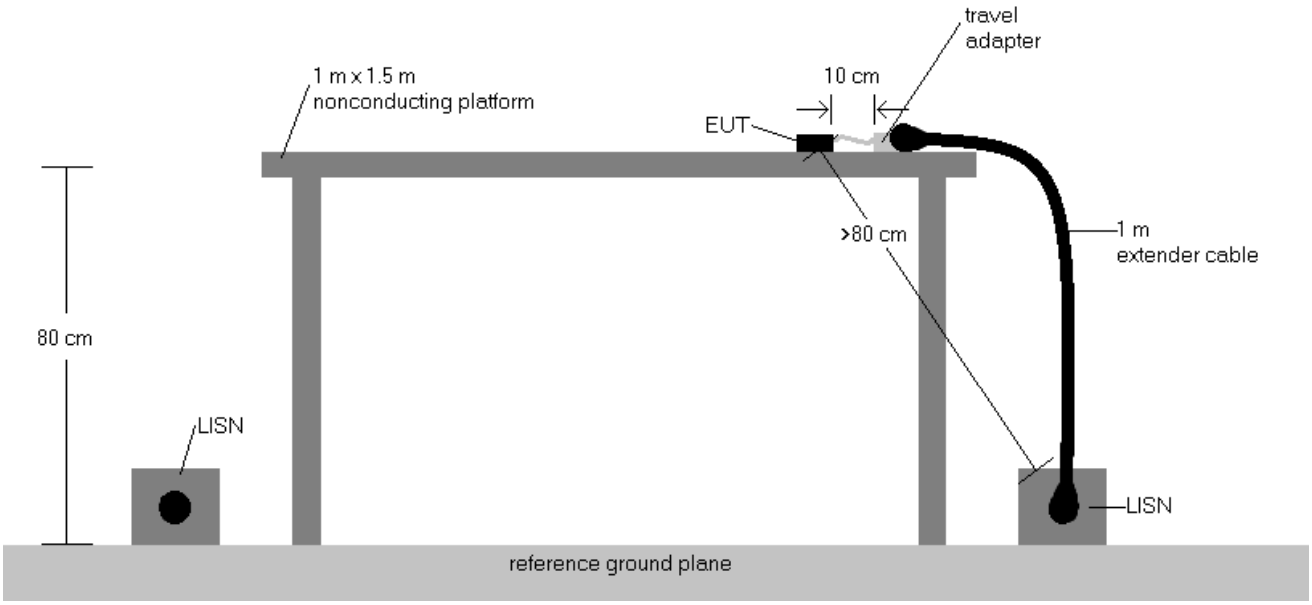

Figure 7-8. Test Instrument & Measurement Setup

Test Notes

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

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Line-Conducted Test Data

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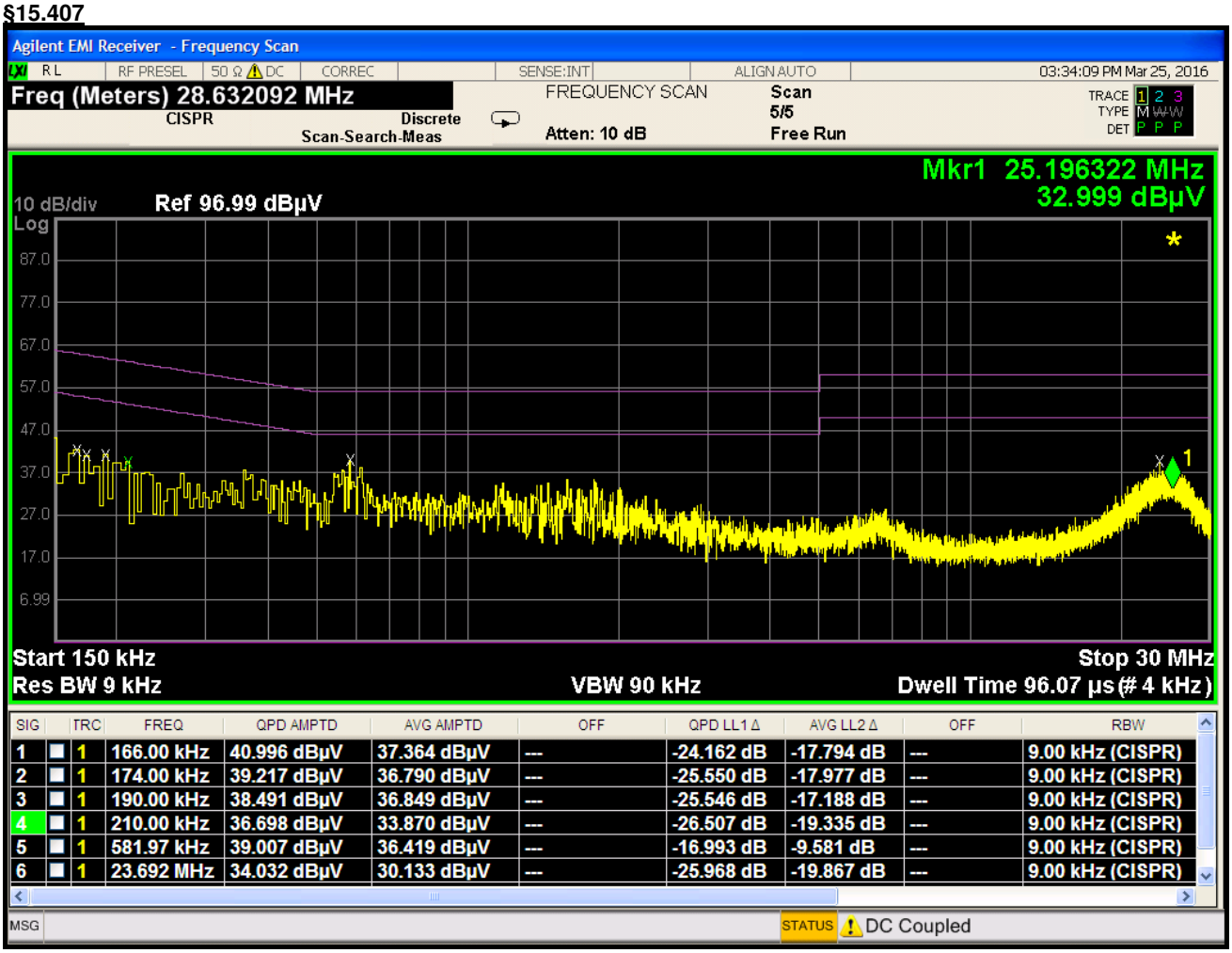

SIG		TRC	FREQ	QPD AMPTD	AVG AMPTD	OFF	QPD LL1 Δ	AVG LL2 Δ	OFF	RBW
1	■	1	166.00 kHz	40.996 dBµV	37.364 dBµV	---	-24.162 dB	-17.794 dB	---	9.00 kHz (CISPR)
2	■	1	174.00 kHz	39.217 dBµV	36.790 dBµV	---	-25.550 dB	-17.977 dB	---	9.00 kHz (CISPR)
3	■	1	190.00 kHz	38.491 dBµV	36.849 dBµV	---	-25.546 dB	-17.188 dB	---	9.00 kHz (CISPR)
4	■	1	210.00 kHz	36.698 dBµV	33.870 dBµV	---	-26.507 dB	-19.335 dB	---	9.00 kHz (CISPR)
5	■	1	581.97 kHz	39.007 dBµV	36.419 dBµV	---	-16.993 dB	-9.581 dB	---	9.00 kHz (CISPR)
6	■	1	23.692 MHz	34.032 dBµV	30.133 dBµV	---	-25.968 dB	-19.867 dB	---	9.00 kHz (CISPR)

Plot 7-274. Line Conducted Plot with 802.11a UNII Band 1 (L1)

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Line-Conducted Test Data

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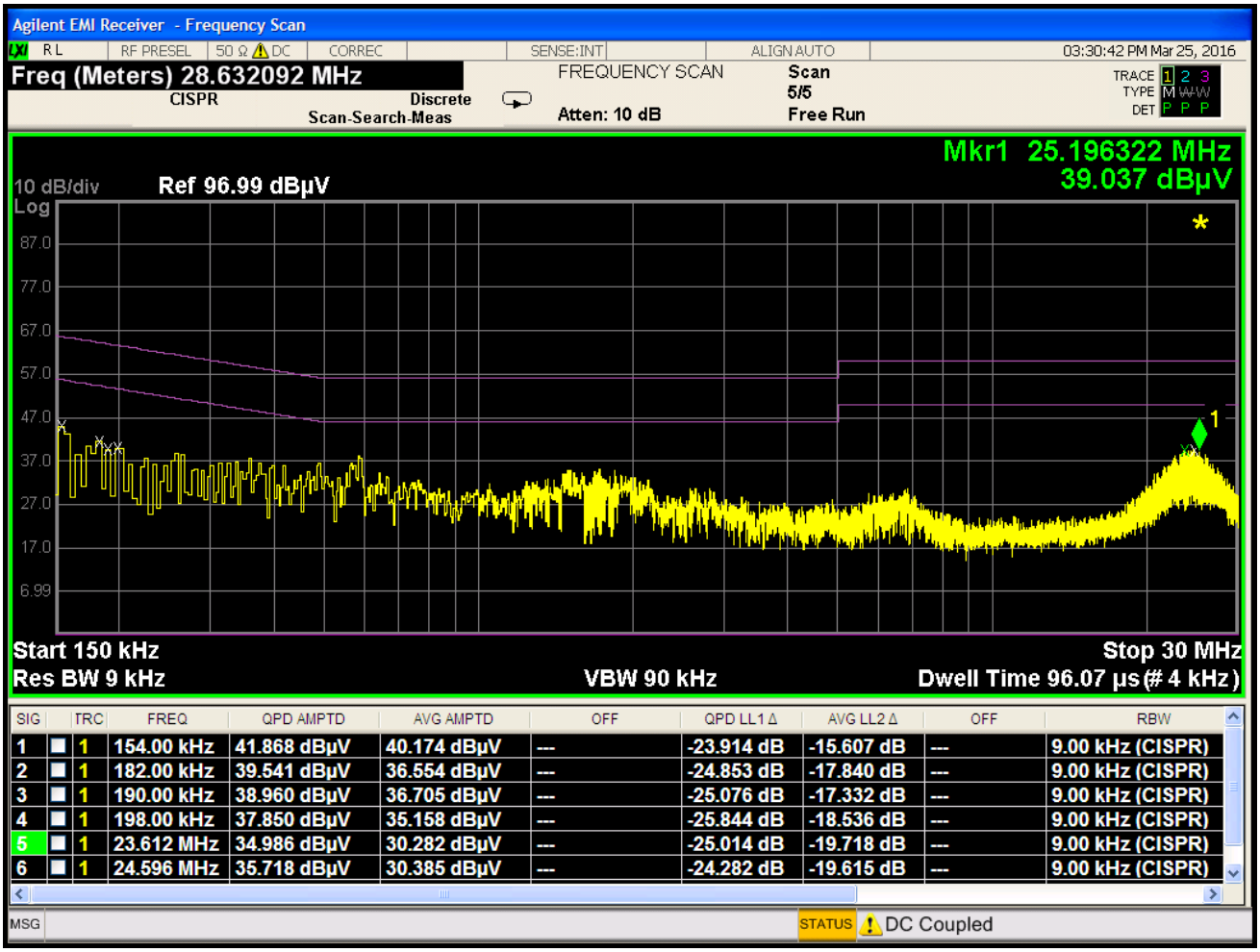

SIG	TRC	FREQ	QPD AMPTD	AVG AMPTD	OFF	QPD LL1 Δ	AVG LL2 Δ	OFF	RBW
1	1	154.00 kHz	41.868 dBµV	40.174 dBµV	---	-23.914 dB	-15.607 dB	---	9.00 kHz (CISPR)
2	1	182.00 kHz	39.541 dBµV	36.554 dBµV	---	-24.853 dB	-17.840 dB	---	9.00 kHz (CISPR)
3	1	190.00 kHz	38.960 dBµV	36.705 dBµV	---	-25.076 dB	-17.332 dB	---	9.00 kHz (CISPR)
4	1	198.00 kHz	37.850 dBµV	35.158 dBµV	---	-25.844 dB	-18.536 dB	---	9.00 kHz (CISPR)
5	1	23.612 MHz	34.986 dBµV	30.282 dBµV	---	-25.014 dB	-19.718 dB	---	9.00 kHz (CISPR)
6	1	24.596 MHz	35.718 dBµV	30.385 dBµV	---	-24.282 dB	-19.615 dB	---	9.00 kHz (CISPR)

Plot 7-275. Line Conducted Plot with 802.11a UNII Band 1 (N)

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Line-Conducted Test Data

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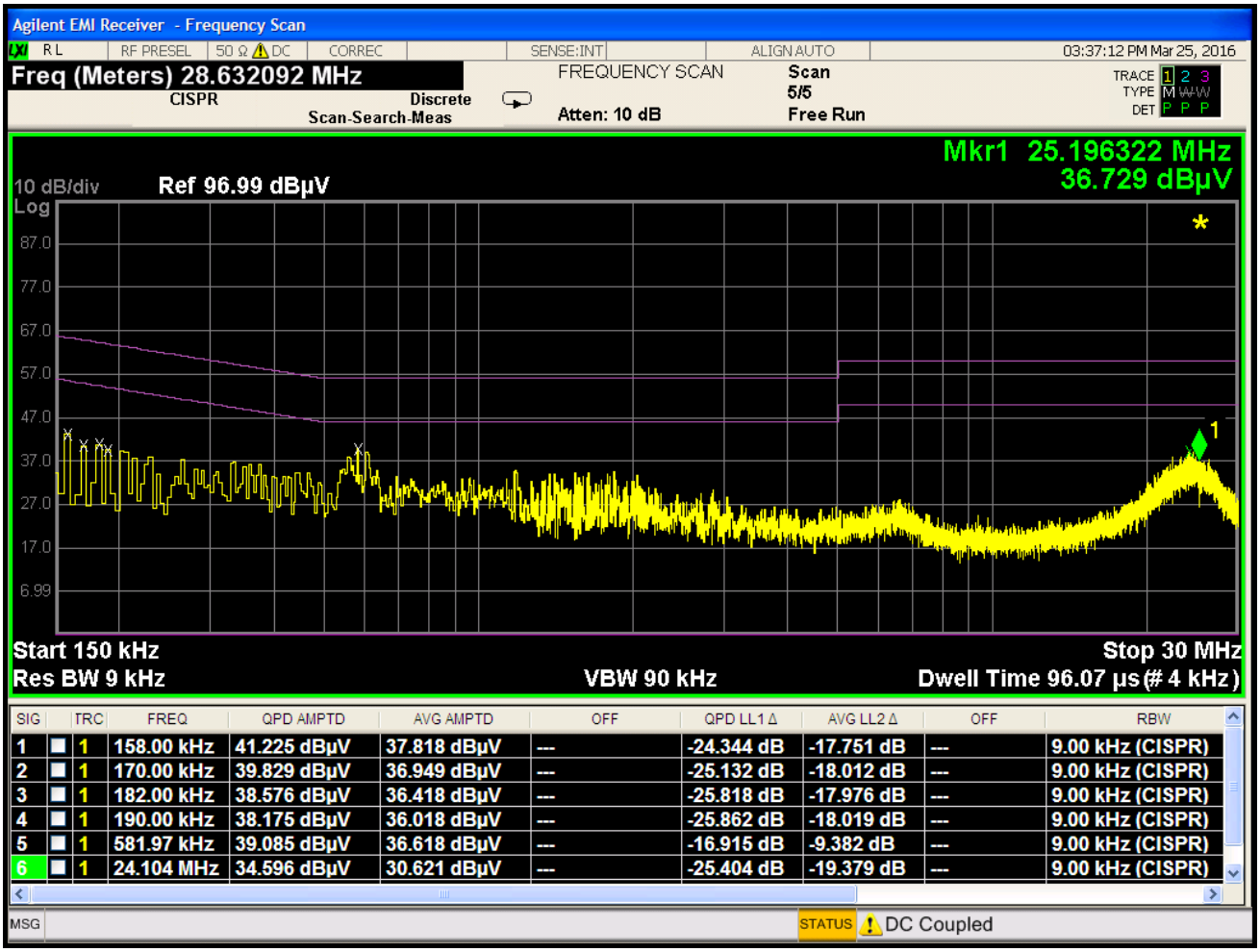

SIG		TRC	FREQ	QPD AMPTD	AVG AMPTD	OFF	QPD LL1 Δ	AVG LL2 Δ	OFF	RBW
1	■	1	158.00 kHz	41.225 dBµV	37.818 dBµV	---	-24.344 dB	-17.751 dB	---	9.00 kHz (CISPR)
2	■	1	170.00 kHz	39.829 dBµV	36.949 dBµV	---	-25.132 dB	-18.012 dB	---	9.00 kHz (CISPR)
3	■	1	182.00 kHz	38.576 dBµV	36.418 dBµV	---	-25.818 dB	-17.976 dB	---	9.00 kHz (CISPR)
4	■	1	190.00 kHz	38.175 dBµV	36.018 dBµV	---	-25.862 dB	-18.019 dB	---	9.00 kHz (CISPR)
5	■	1	581.97 kHz	39.085 dBµV	36.618 dBµV	---	-16.915 dB	-9.382 dB	---	9.00 kHz (CISPR)
6	■	1	24.104 MHz	34.596 dBµV	30.621 dBµV	---	-25.404 dB	-19.379 dB	---	9.00 kHz (CISPR)

Plot 7-276. Line Conducted Plot with 802.11a UNII Band 2A (L1)

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Line-Conducted Test Data

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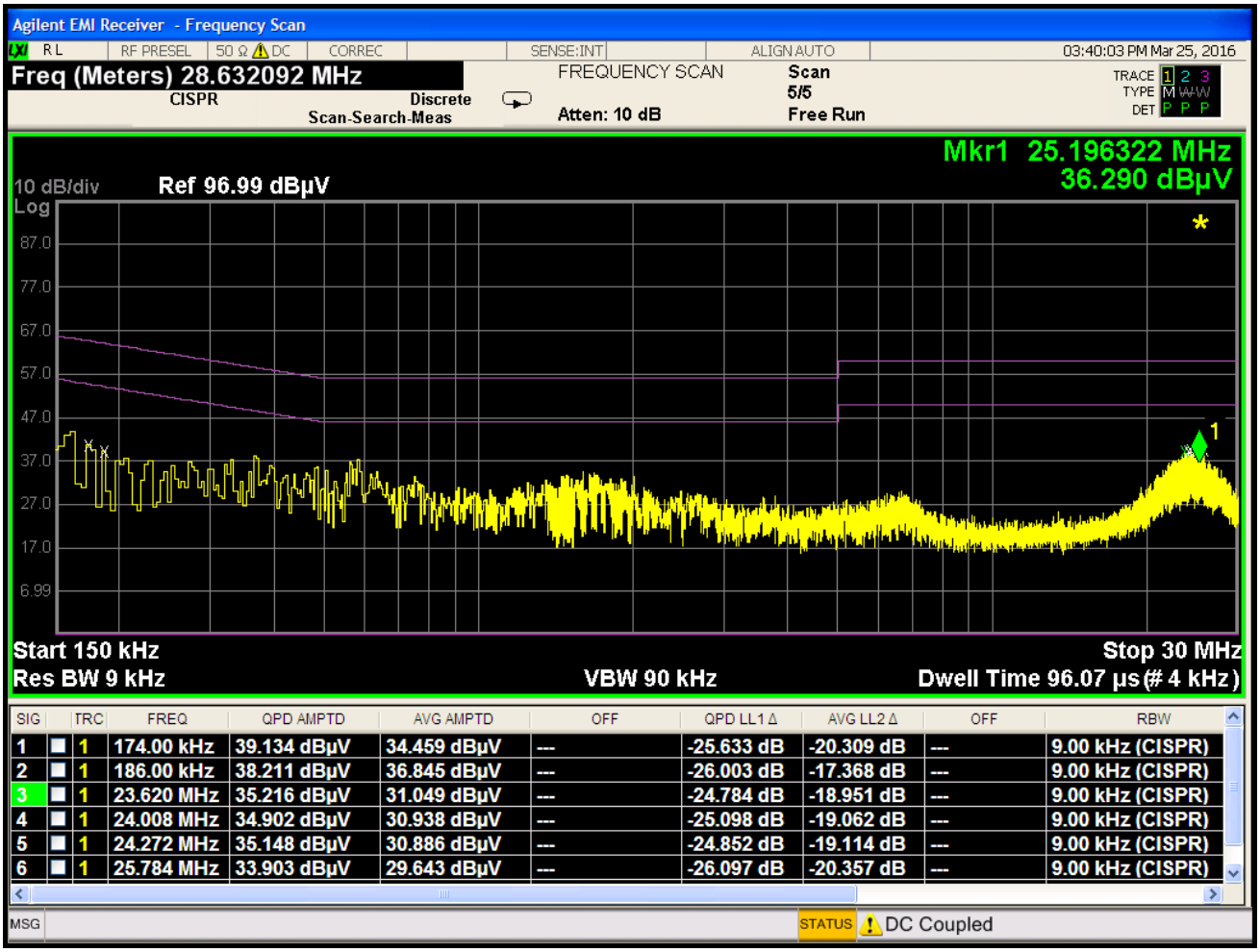

SIG	TRC	FREQ	QPD AMPTD	AVG AMPTD	OFF	QPD LL1 Δ	AVG LL2 Δ	OFF	RBW
1	1	174.00 kHz	39.134 dBµV	34.459 dBµV	---	-25.633 dB	-20.309 dB	---	9.00 kHz (CISPR)
2	1	186.00 kHz	38.211 dBµV	36.845 dBµV	---	-26.003 dB	-17.368 dB	---	9.00 kHz (CISPR)
3	1	23.620 MHz	35.216 dBµV	31.049 dBµV	---	-24.784 dB	-18.951 dB	---	9.00 kHz (CISPR)
4	1	24.008 MHz	34.902 dBµV	30.938 dBµV	---	-25.098 dB	-19.062 dB	---	9.00 kHz (CISPR)
5	1	24.272 MHz	35.148 dBµV	30.886 dBµV	---	-24.852 dB	-19.114 dB	---	9.00 kHz (CISPR)
6	1	25.784 MHz	33.903 dBµV	29.643 dBµV	---	-26.097 dB	-20.357 dB	---	9.00 kHz (CISPR)

Plot 7-277. Line Conducted Plot with 802.11a UNII Band 2A (N)

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Line-Conducted Test Data

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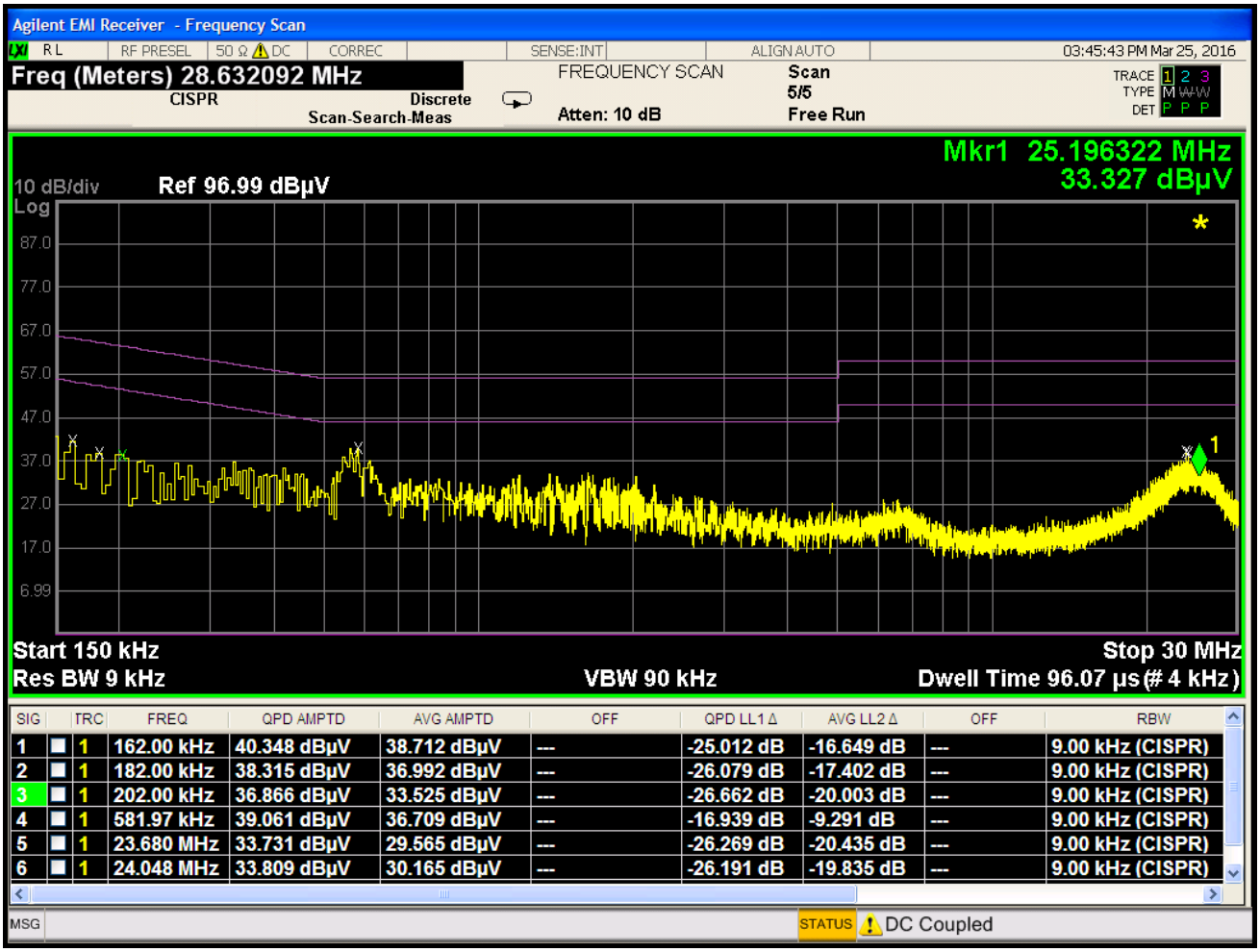

SIG		TRC	FREQ	QPD AMPTD	AVG AMPTD	OFF	QPD LL1 Δ	AVG LL2 Δ	OFF	RBW
1	■	1	162.00 kHz	40.348 dBµV	38.712 dBµV	---	-25.012 dB	-16.649 dB	---	9.00 kHz (CISPR)
2	■	1	182.00 kHz	38.315 dBµV	36.992 dBµV	---	-26.079 dB	-17.402 dB	---	9.00 kHz (CISPR)
3	■	1	202.00 kHz	36.866 dBµV	33.525 dBµV	---	-26.662 dB	-20.003 dB	---	9.00 kHz (CISPR)
4	■	1	581.97 kHz	39.061 dBµV	36.709 dBµV	---	-16.939 dB	-9.291 dB	---	9.00 kHz (CISPR)
5	■	1	23.680 MHz	33.731 dBµV	29.565 dBµV	---	-26.269 dB	-20.435 dB	---	9.00 kHz (CISPR)
6	■	1	24.048 MHz	33.809 dBµV	30.165 dBµV	---	-26.191 dB	-19.835 dB	---	9.00 kHz (CISPR)

Plot 7-278. Line Conducted Plot with 802.11a UNII Band 2C (L1)

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Line-Conducted Test Data

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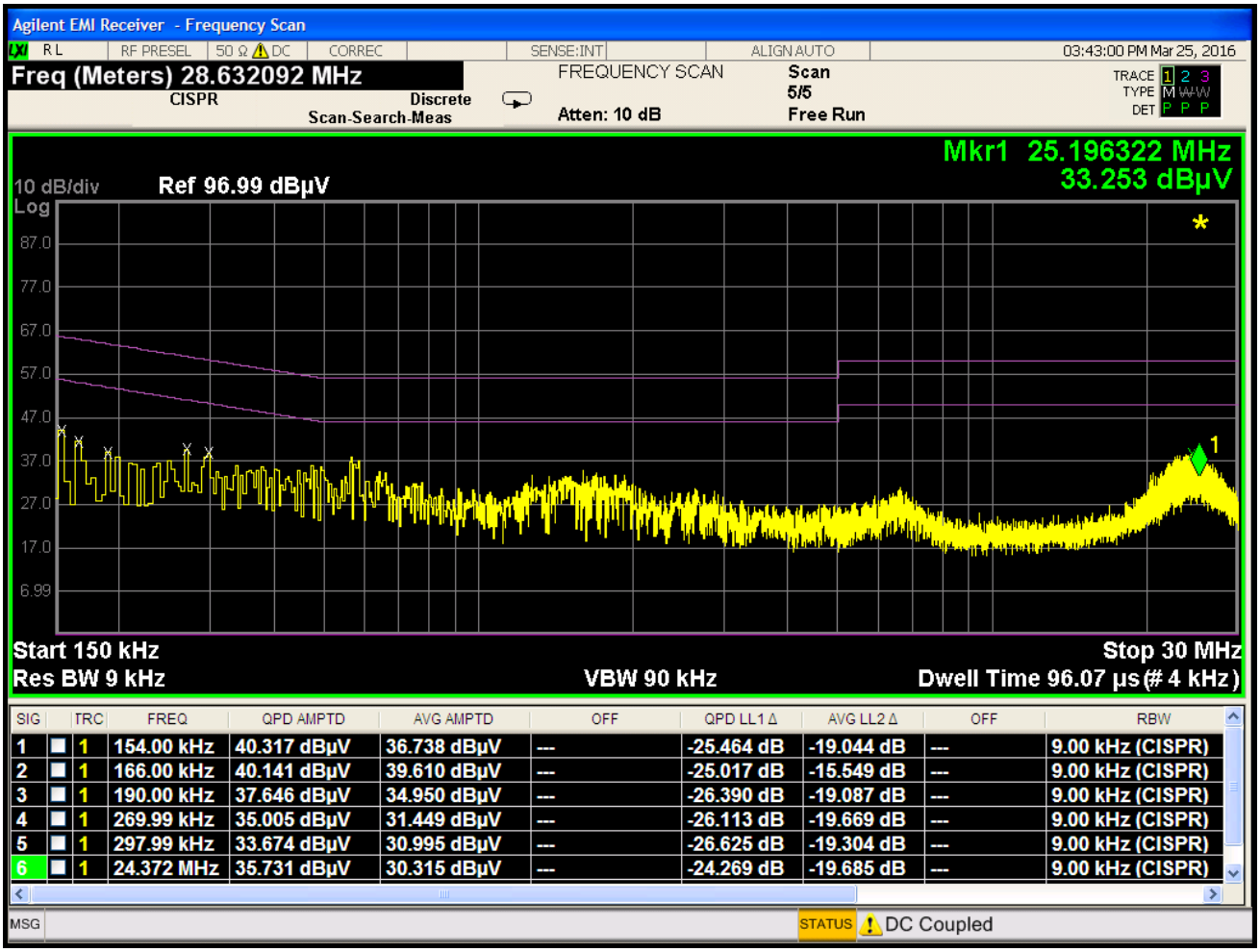

SIG	TRC	FREQ	QPD AMPTD	AVG AMPTD	OFF	QPD LL1 Δ	AVG LL2 Δ	OFF	RBW
1	1	154.00 kHz	40.317 dBµV	36.738 dBµV	---	-25.464 dB	-19.044 dB	---	9.00 kHz (CISPR)
2	1	166.00 kHz	40.141 dBµV	39.610 dBµV	---	-25.017 dB	-15.549 dB	---	9.00 kHz (CISPR)
3	1	190.00 kHz	37.646 dBµV	34.950 dBµV	---	-26.390 dB	-19.087 dB	---	9.00 kHz (CISPR)
4	1	269.99 kHz	35.005 dBµV	31.449 dBµV	---	-26.113 dB	-19.669 dB	---	9.00 kHz (CISPR)
5	1	297.99 kHz	33.674 dBµV	30.995 dBµV	---	-26.625 dB	-19.304 dB	---	9.00 kHz (CISPR)
6	1	24.372 MHz	35.731 dBµV	30.315 dBµV	---	-24.269 dB	-19.685 dB	---	9.00 kHz (CISPR)

Plot 7-279. Line Conducted Plot with 802.11a UNII Band 2C (N)

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Line-Conducted Test Data

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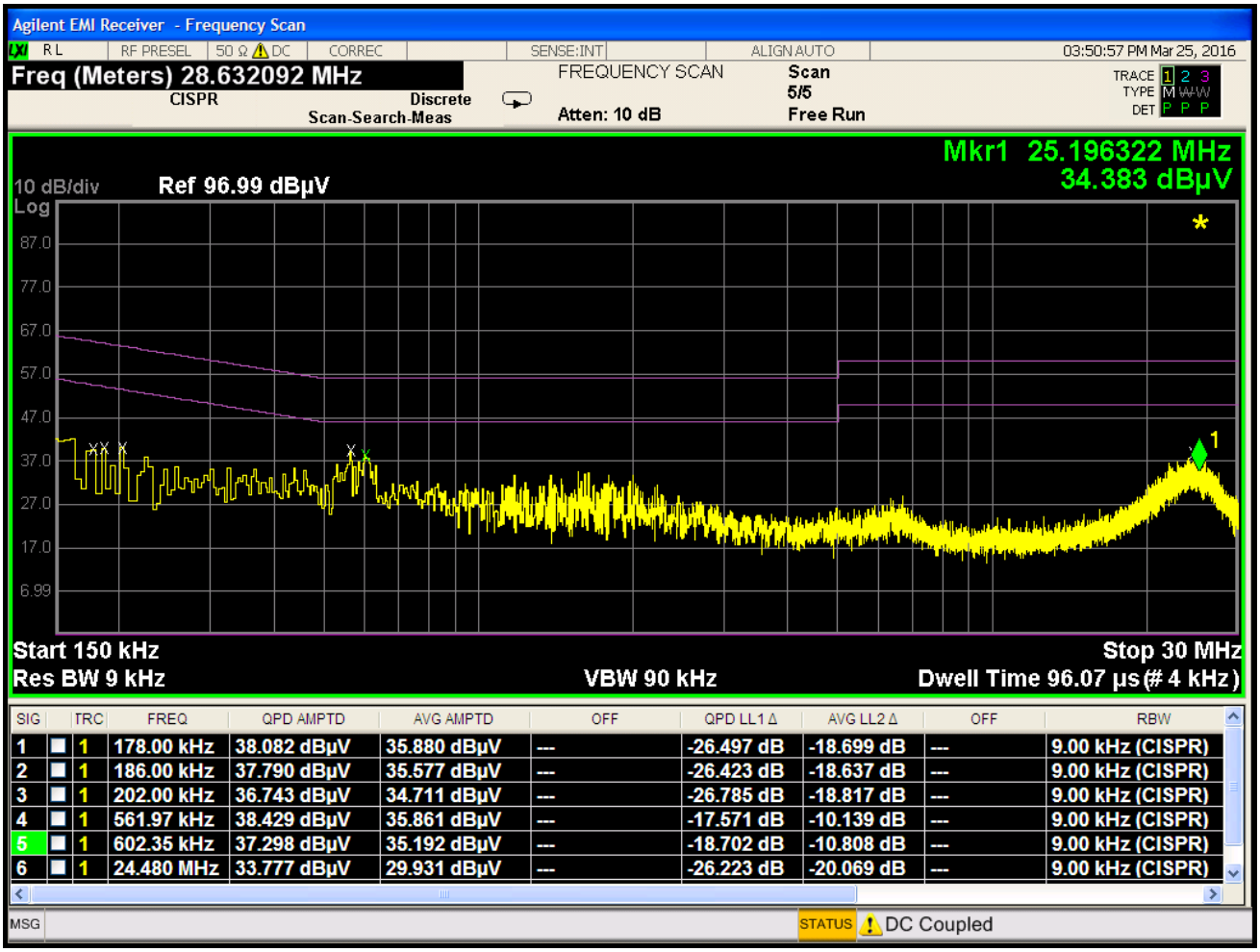

SIG	TRC	FREQ	QPD AMPTD	AVG AMPTD	OFF	QPD LL1 Δ	AVG LL2 Δ	OFF	RBW
1	1	178.00 kHz	38.082 dBµV	35.880 dBµV	---	-26.497 dB	-18.699 dB	---	9.00 kHz (CISPR)
2	1	186.00 kHz	37.790 dBµV	35.577 dBµV	---	-26.423 dB	-18.637 dB	---	9.00 kHz (CISPR)
3	1	202.00 kHz	36.743 dBµV	34.711 dBµV	---	-26.785 dB	-18.817 dB	---	9.00 kHz (CISPR)
4	1	561.97 kHz	38.429 dBµV	35.861 dBµV	---	-17.571 dB	-10.139 dB	---	9.00 kHz (CISPR)
5	1	602.35 kHz	37.298 dBµV	35.192 dBµV	---	-18.702 dB	-10.808 dB	---	9.00 kHz (CISPR)
6	1	24.480 MHz	33.777 dBµV	29.931 dBµV	---	-26.223 dB	-20.069 dB	---	9.00 kHz (CISPR)

Plot 7-280. Line Conducted Plot with 802.11a UNII Band 3 (L1)

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Line-Conducted Test Data

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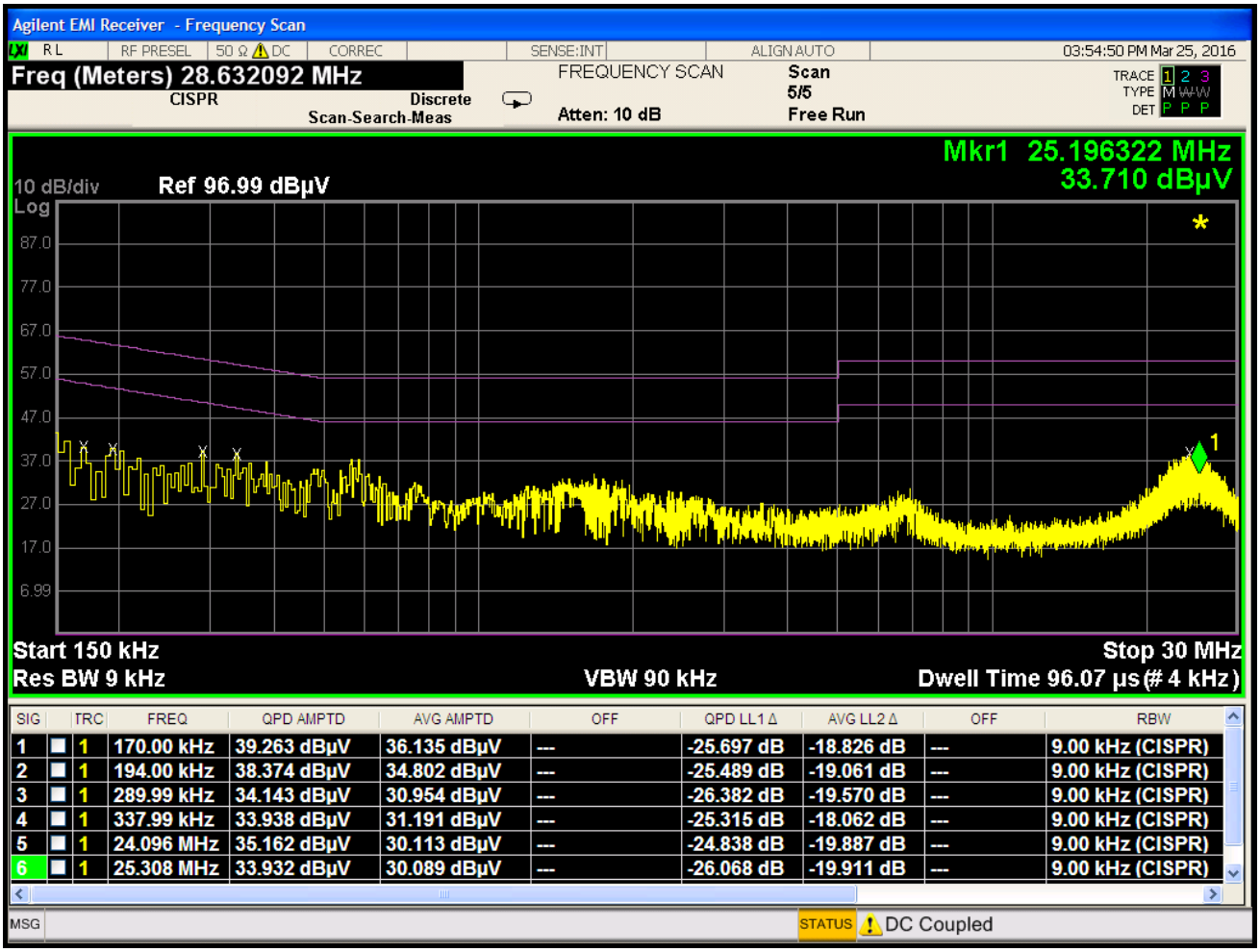

SIG	TRC	FREQ	QPD AMPTD	AVG AMPTD	OFF	QPD LL1 Δ	AVG LL2 Δ	OFF	RBW
1	1	170.00 kHz	39.263 dBµV	36.135 dBµV	---	-25.697 dB	-18.826 dB	---	9.00 kHz (CISPR)
2	1	194.00 kHz	38.374 dBµV	34.802 dBµV	---	-25.489 dB	-19.061 dB	---	9.00 kHz (CISPR)
3	1	289.99 kHz	34.143 dBµV	30.954 dBµV	---	-26.382 dB	-19.570 dB	---	9.00 kHz (CISPR)
4	1	337.99 kHz	33.938 dBµV	31.191 dBµV	---	-25.315 dB	-18.062 dB	---	9.00 kHz (CISPR)
5	1	24.096 MHz	35.162 dBµV	30.113 dBµV	---	-24.838 dB	-19.887 dB	---	9.00 kHz (CISPR)
6	1	25.308 MHz	33.932 dBµV	30.089 dBµV	---	-26.068 dB	-19.911 dB	---	9.00 kHz (CISPR)

Plot 7-281. Line Conducted Plot with 802.11a UNII Band 3 (N)

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8.0 CONCLUSION

The data collected relate only the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSMG891A** is in compliance with Part 15E of the FCC Rules.

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