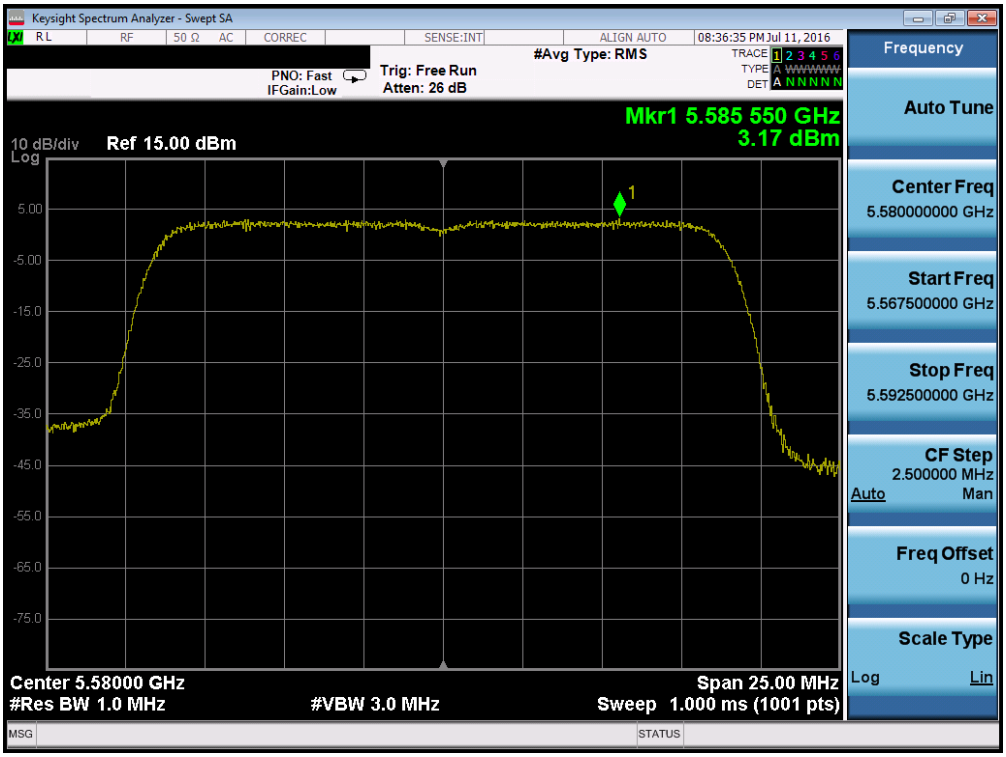
Plot 7-97. Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 144)

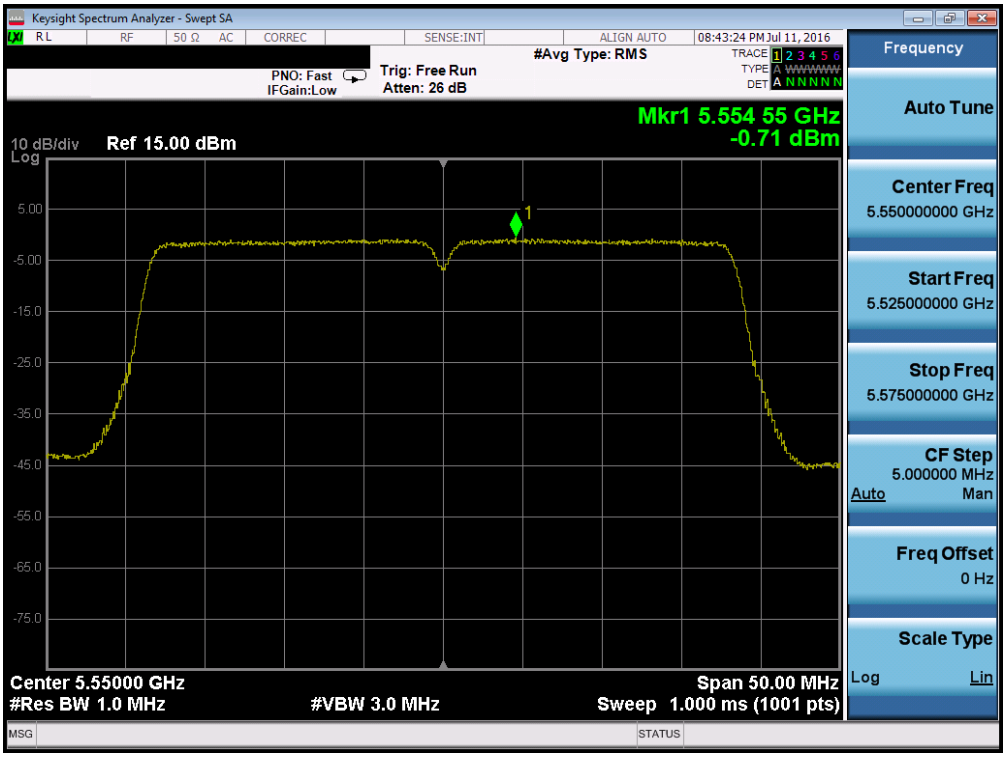
Plot 7-98. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 100)



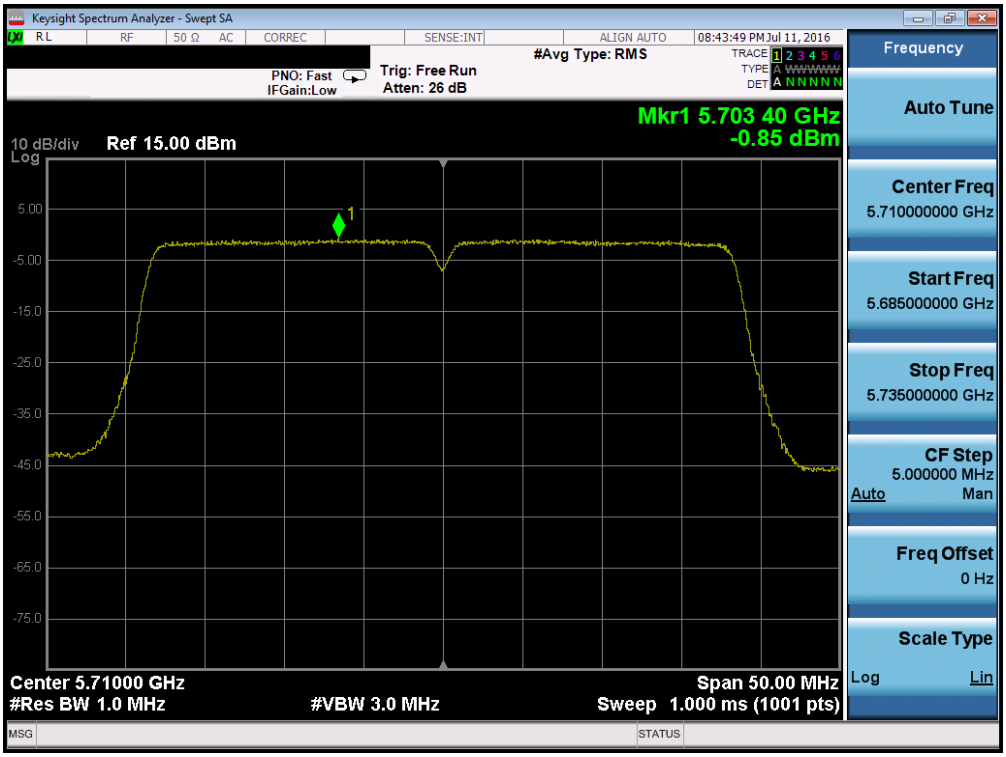
Plot 7-99. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 116)

Plot 7-100. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 144)

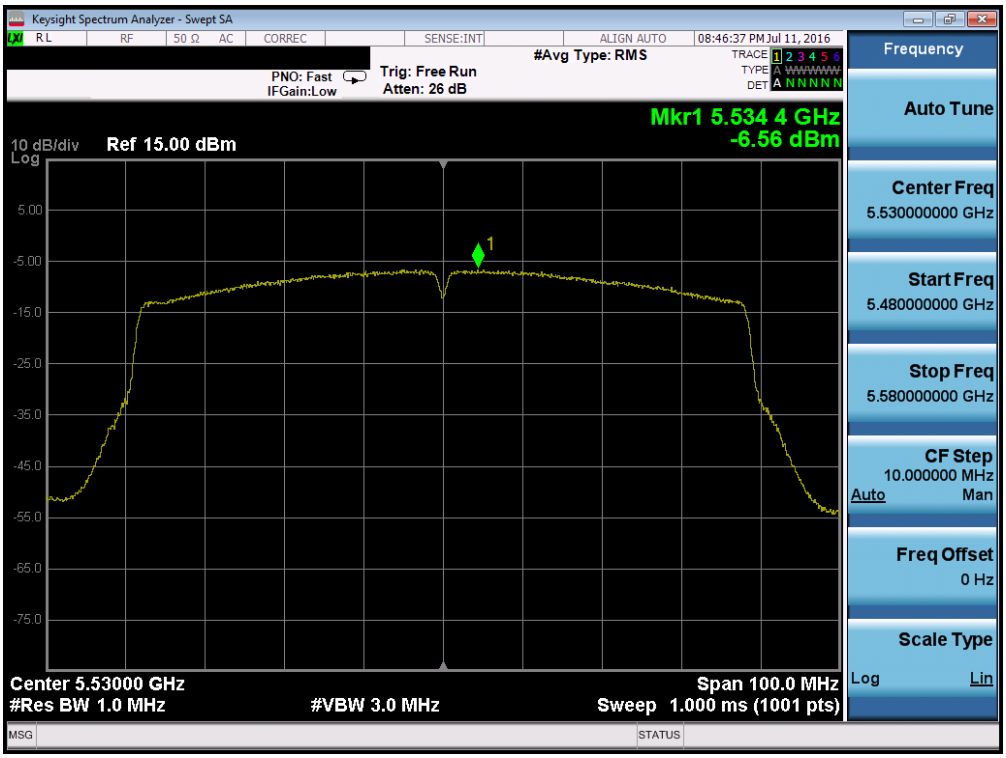
Plot 7-101. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 102)



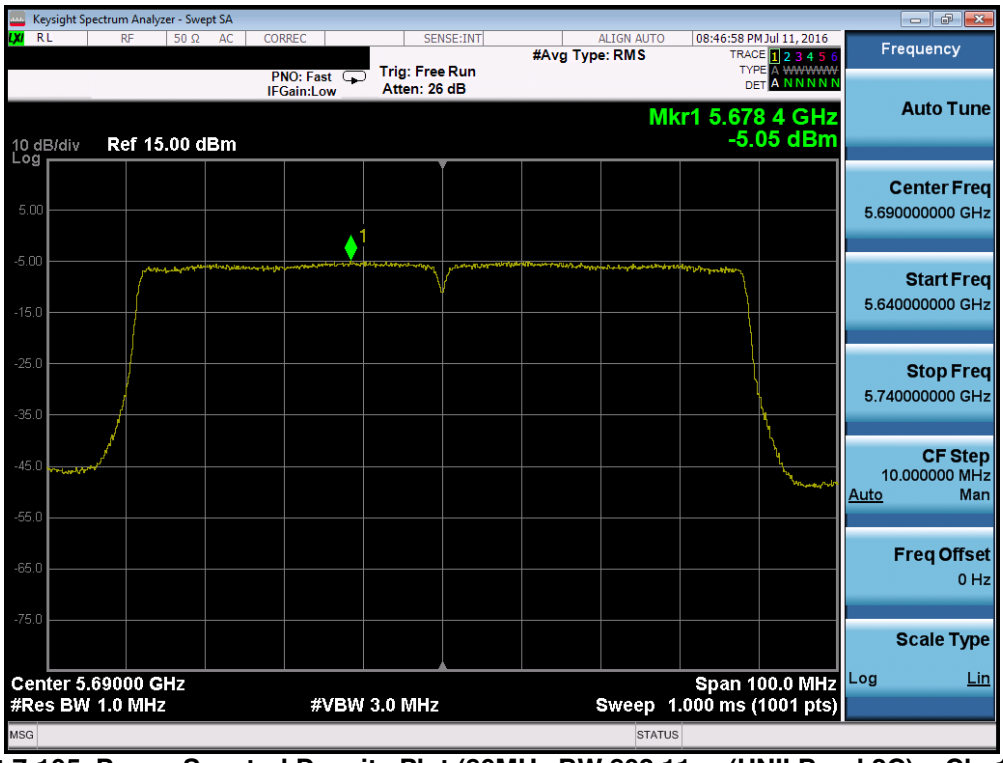
Plot 7-102. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 110)



Plot 7-103. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 142)



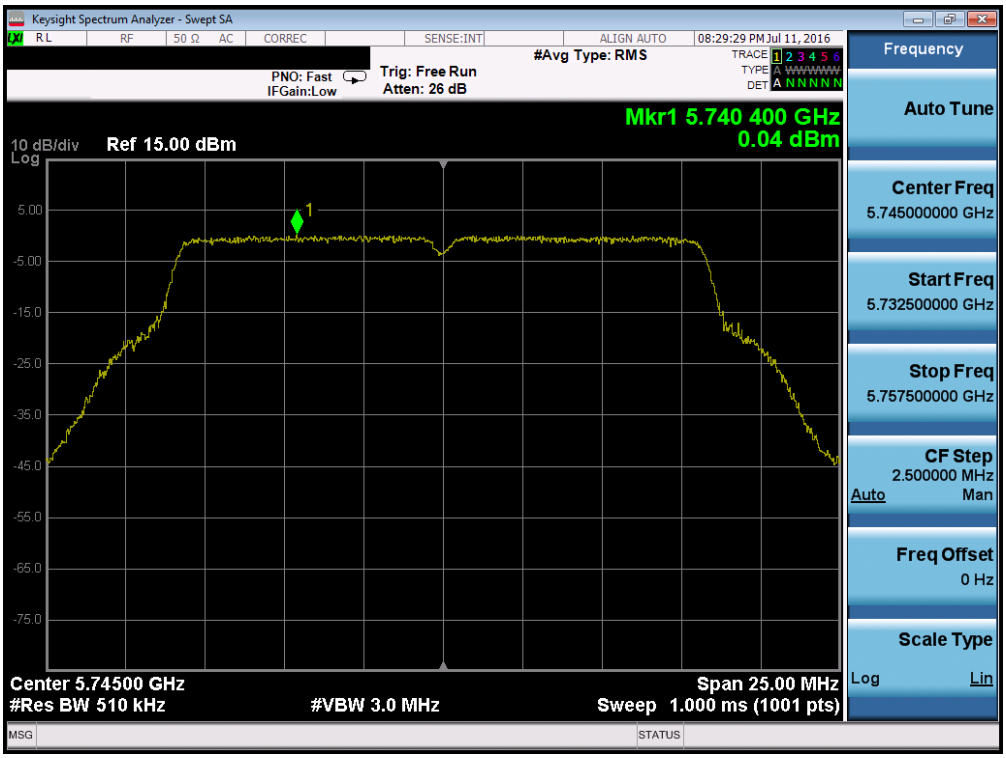
Plot 7-104. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2C) – Ch. 106)



Plot 7-105. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2C) – Ch. 138)

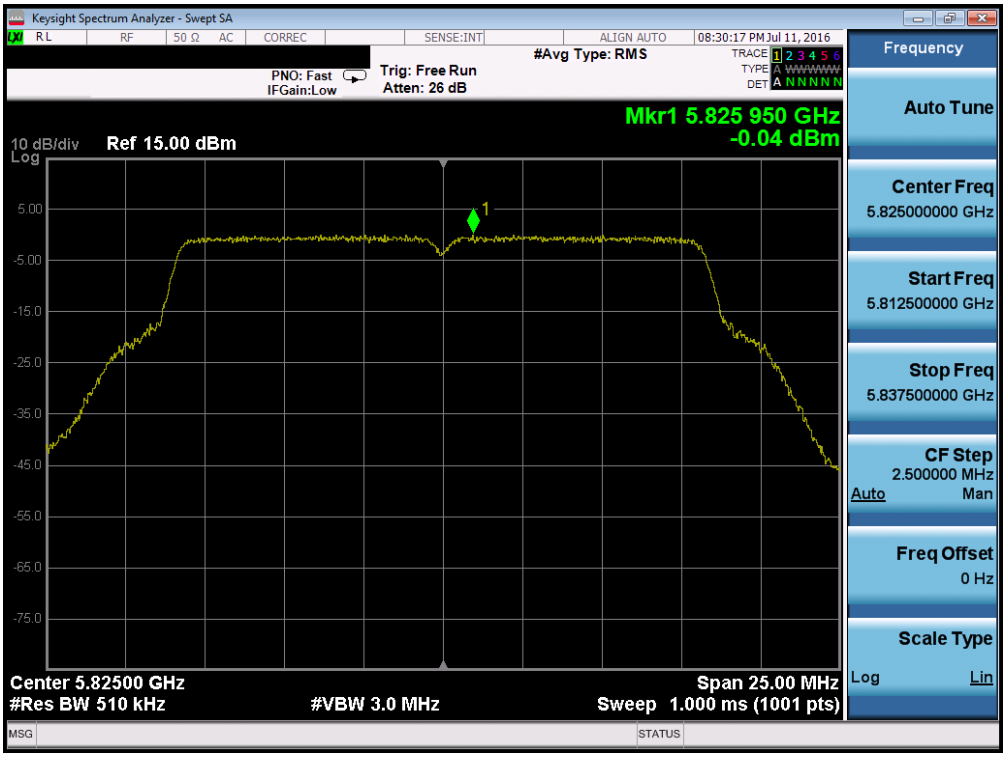
	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured Power Density [dBm]	Max Permissible Power Density [dBm/500kHz]	Margin [dB]	Pass / Fail
Band 3	5745	149	a	6	0.04	30.0	-29.96	Pass
	5785	157	a	6	-0.18	30.0	-30.18	Pass
	5825	165	a	6	-0.04	30.0	-30.04	Pass
	5745	149	n (20MHz)	6.5/7.2 (MCS0)	0.13	30.0	-29.87	Pass
	5785	157	n (20MHz)	6.5/7.2 (MCS0)	0.57	30.0	-29.43	Pass
	5825	165	n (20MHz)	6.5/7.2 (MCS0)	0.19	30.0	-29.81	Pass
	5755	151	n (40MHz)	13.5/15 (MCS0)	-3.76	30.0	-33.76	Pass
	5795	159	n (40MHz)	13.5/15 (MCS0)	-2.36	30.0	-32.36	Pass
	5775	155	ac (80MHz)	29.3/32.5 (MCS0)	-6.22	30.0	-36.22	Pass

Table 7-18. Band 3 Conducted Power Spectral Density Measurements



Plot 7-106. Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 149)

Plot 7-107. Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 157)

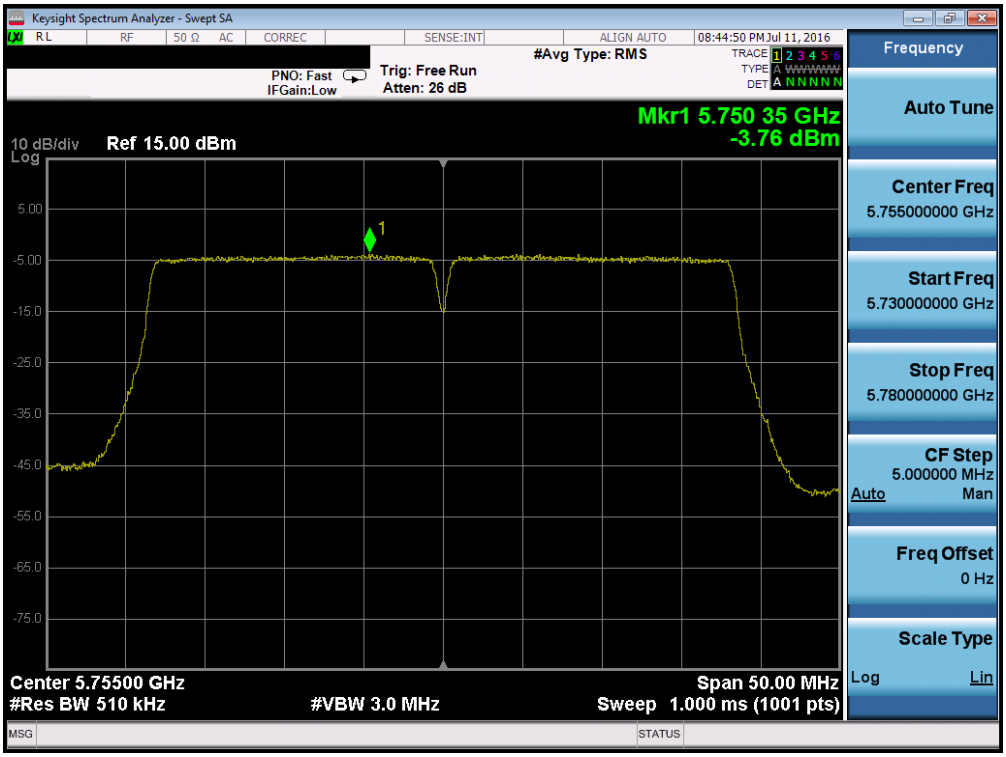


Plot 7-108. Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 165)

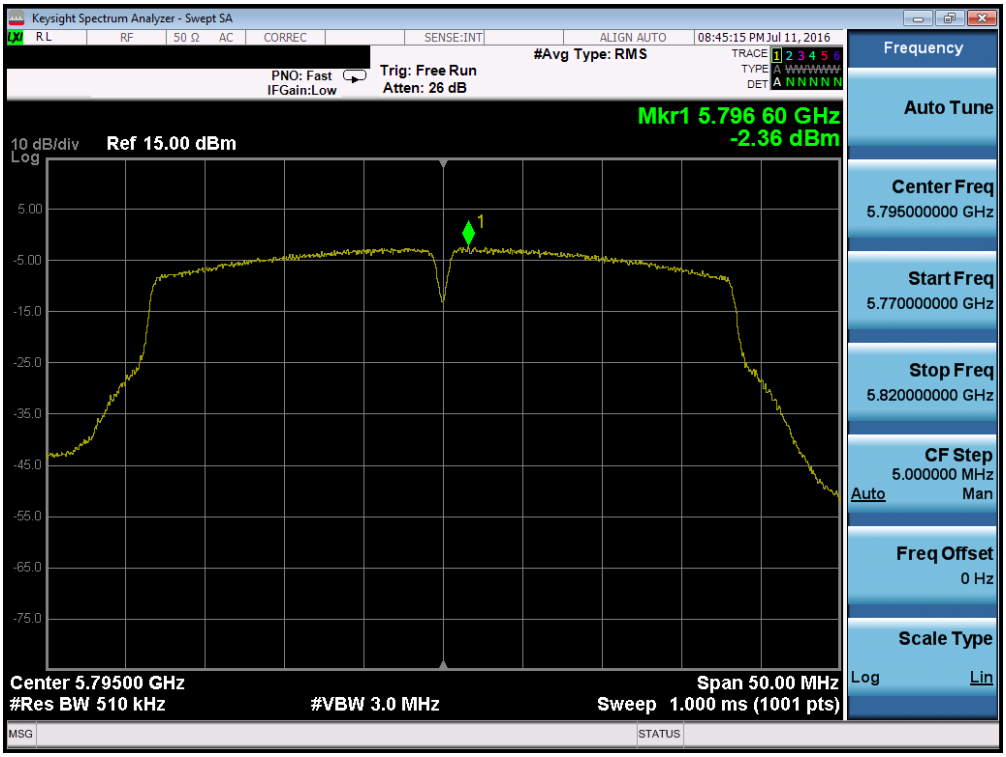
Plot 7-109. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 149)

Plot 7-110. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 157)

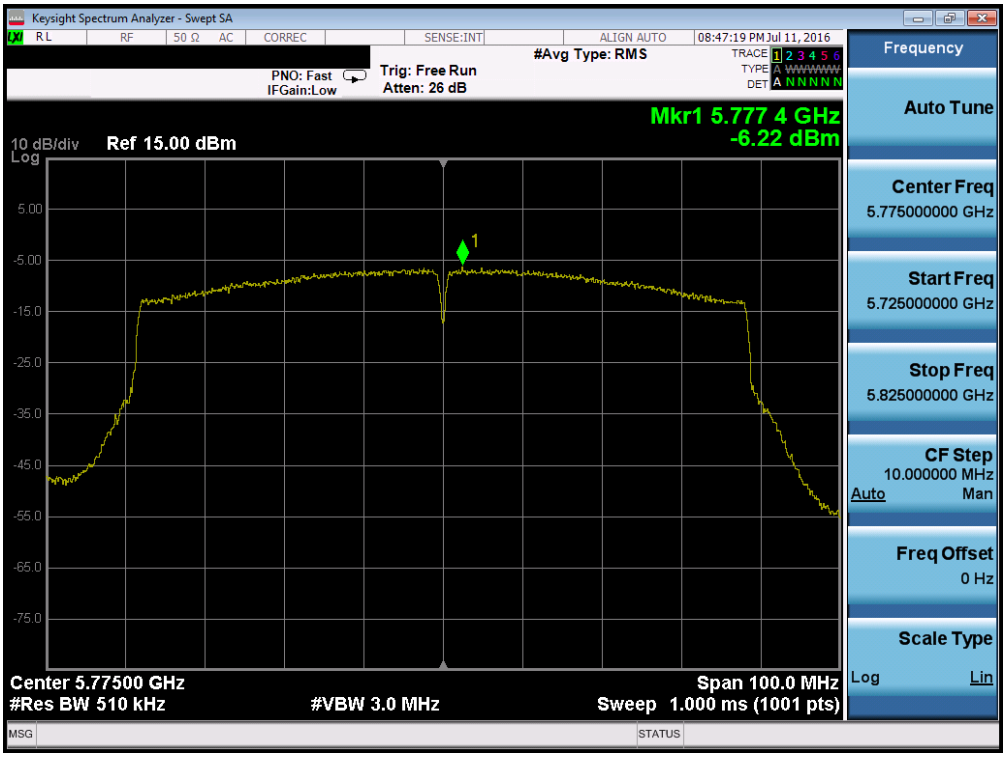
Plot 7-111. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 165)



Plot 7-112. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 3) – Ch. 151)



Plot 7-113. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 3) – Ch. 159)

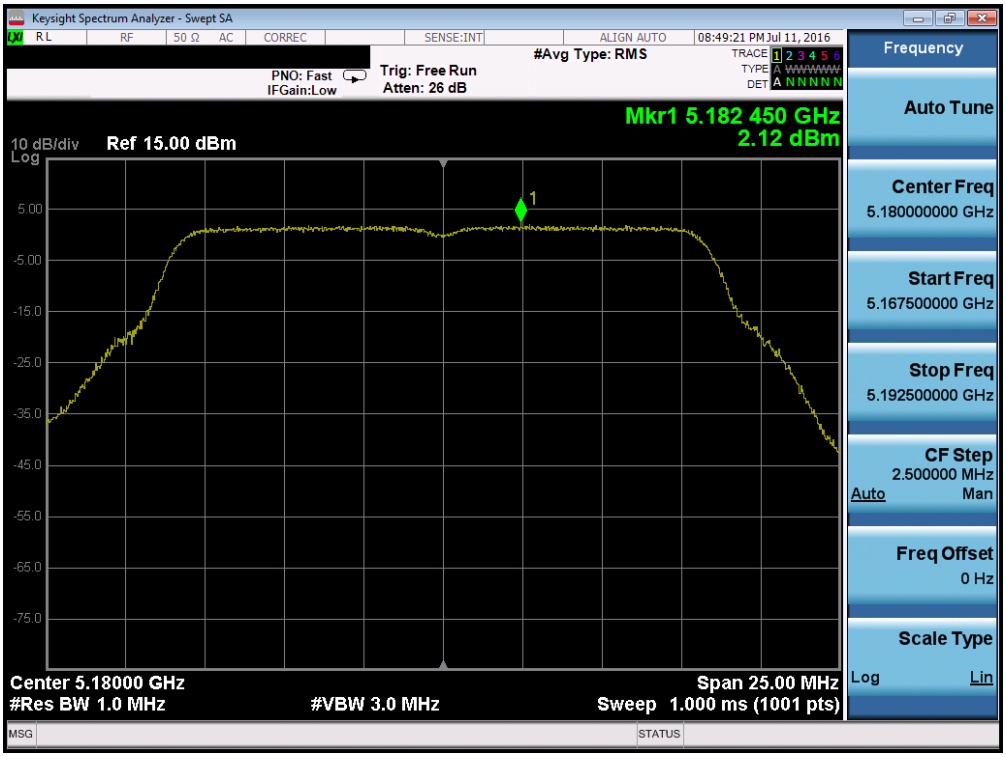


Plot 7-114. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 3) – Ch. 155)

Secondary Antenna Power Spectral Density Measurements

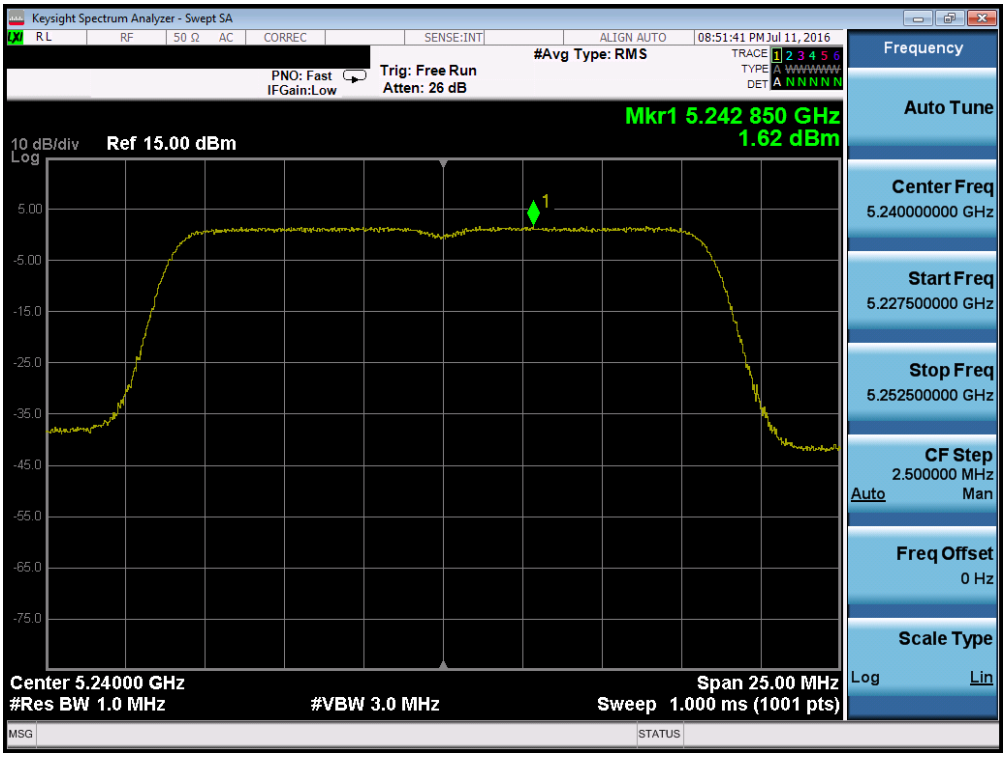
	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured Power Density [dBm]	Max Permissible Power Density [dBm/MHz]	Margin [dB]	Pass / Fail
Band 1	5180	36	a	6	2.12	11.0	-8.88	Pass
	5200	40	a	6	1.72	11.0	-9.28	Pass
	5240	48	a	6	1.62	11.0	-9.38	Pass
	5180	36	n (20MHz)	6.5/7.2 (MCS0)	1.86	11.0	-9.14	Pass
	5200	40	n (20MHz)	6.5/7.2 (MCS0)	1.50	11.0	-9.50	Pass
	5240	48	n (20MHz)	6.5/7.2 (MCS0)	4.01	11.0	-6.99	Pass
	5190	38	n (40MHz)	13.5/15 (MCS0)	-2.67	11.0	-13.67	Pass
	5230	46	n (40MHz)	13.5/15 (MCS0)	-2.94	11.0	-13.94	Pass
	5210	42	ac (80MHz)	29.3/32.5 (MCS0)	-6.58	11.0	-17.58	Pass
Band 2A	5260	52	a	6	1.78	11.0	-9.22	Pass
	5280	56	a	6	1.92	11.0	-9.08	Pass
	5320	64	a	6	2.00	11.0	-9.00	Pass
	5260	52	n (20MHz)	6.5/7.2 (MCS0)	1.18	11.0	-9.82	Pass
	5280	56	n (20MHz)	6.5/7.2 (MCS0)	1.56	11.0	-9.44	Pass
	5320	64	n (20MHz)	6.5/7.2 (MCS0)	1.92	11.0	-9.08	Pass
	5270	54	n (40MHz)	13.5/15 (MCS0)	-2.11	11.0	-13.11	Pass
	5310	62	n (40MHz)	13.5/15 (MCS0)	-2.53	11.0	-13.53	Pass
	5290	58	ac (80MHz)	29.3/32.5 (MCS0)	-6.87	11.0	-17.87	Pass
Band 2C	5500	100	a	6	1.87	11.0	-9.13	Pass
	5580	116	a	6	1.64	11.0	-9.36	Pass
	5720	144	a	6	1.89	11.0	-9.11	Pass
	5500	100	n (20MHz)	6.5/7.2 (MCS0)	1.60	11.0	-9.40	Pass
	5580	116	n (20MHz)	6.5/7.2 (MCS0)	1.82	11.0	-9.18	Pass
	5720	144	n (20MHz)	6.5/7.2 (MCS0)	1.63	11.0	-9.37	Pass
	5510	102	n (40MHz)	13.5/15 (MCS0)	-2.85	11.0	-13.85	Pass
	5550	110	n (40MHz)	13.5/15 (MCS0)	-2.51	11.0	-13.51	Pass
	5710	142	n (40MHz)	13.5/15 (MCS0)	-2.24	11.0	-13.24	Pass
	5530	106	ac (80MHz)	29.3/32.5 (MCS0)	-7.34	11.0	-18.34	Pass
	5690	138	ac (80MHz)	29.3/32.5 (MCS0)	-6.47	11.0	-17.47	Pass

Table 7-19. Conducted Power Spectral Density Measurements



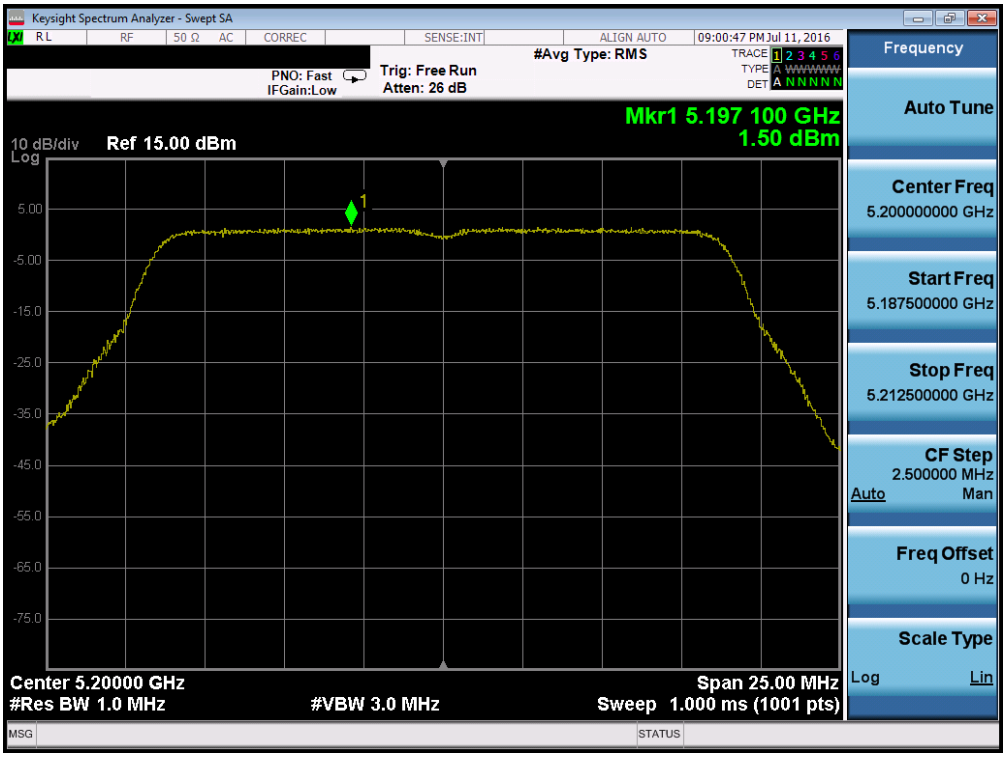
Plot 7-115. Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 36)

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

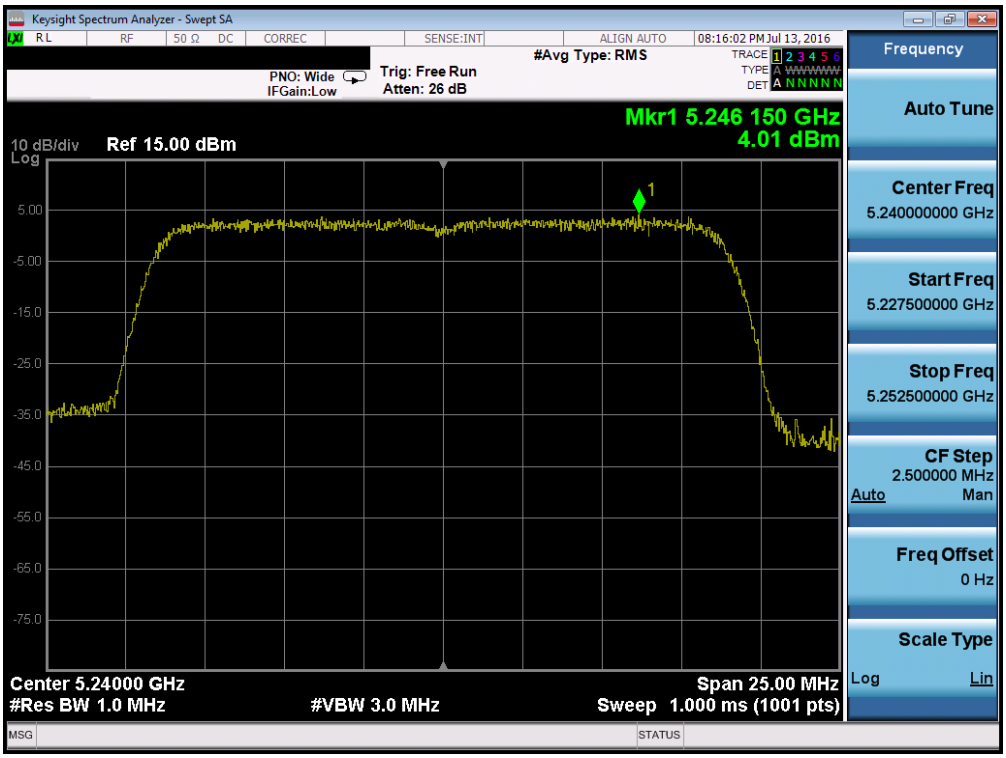


Plot 7-117. Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 48)

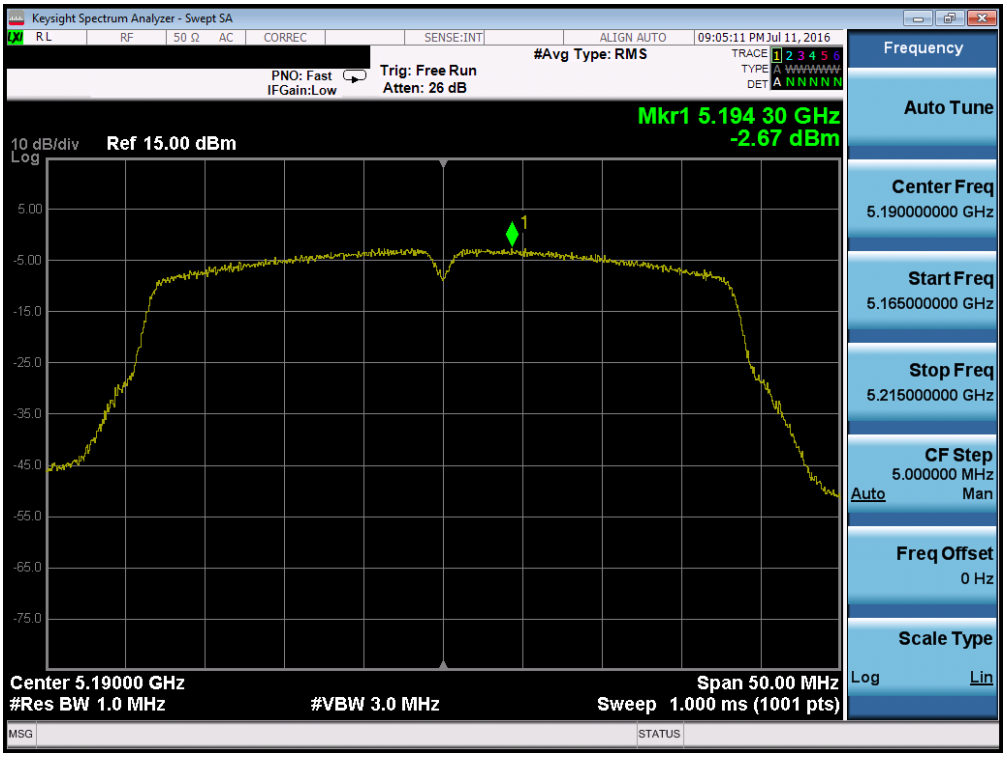
Plot 7-118. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 36)



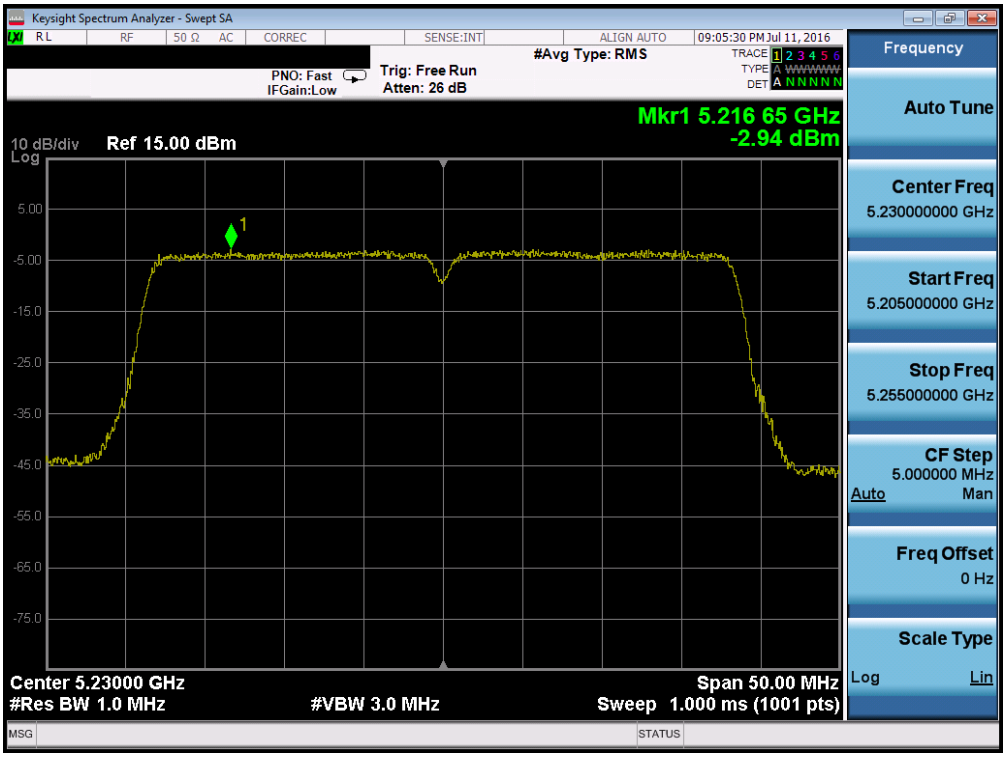
Plot 7-119. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 40)



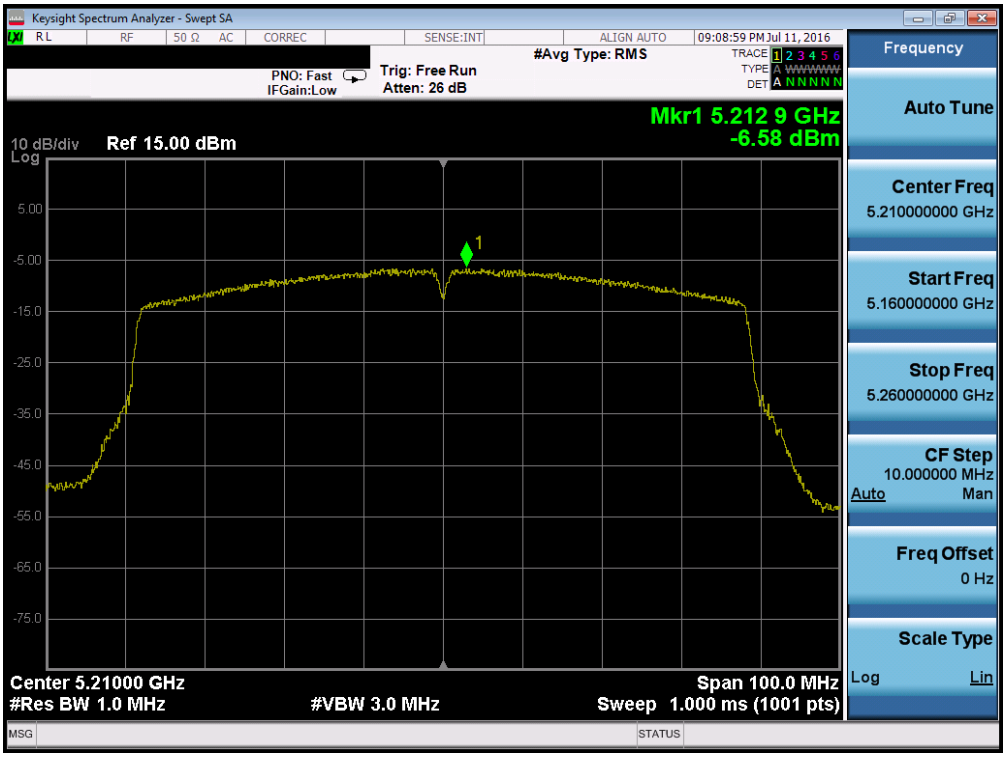
Plot 7-120. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 48)



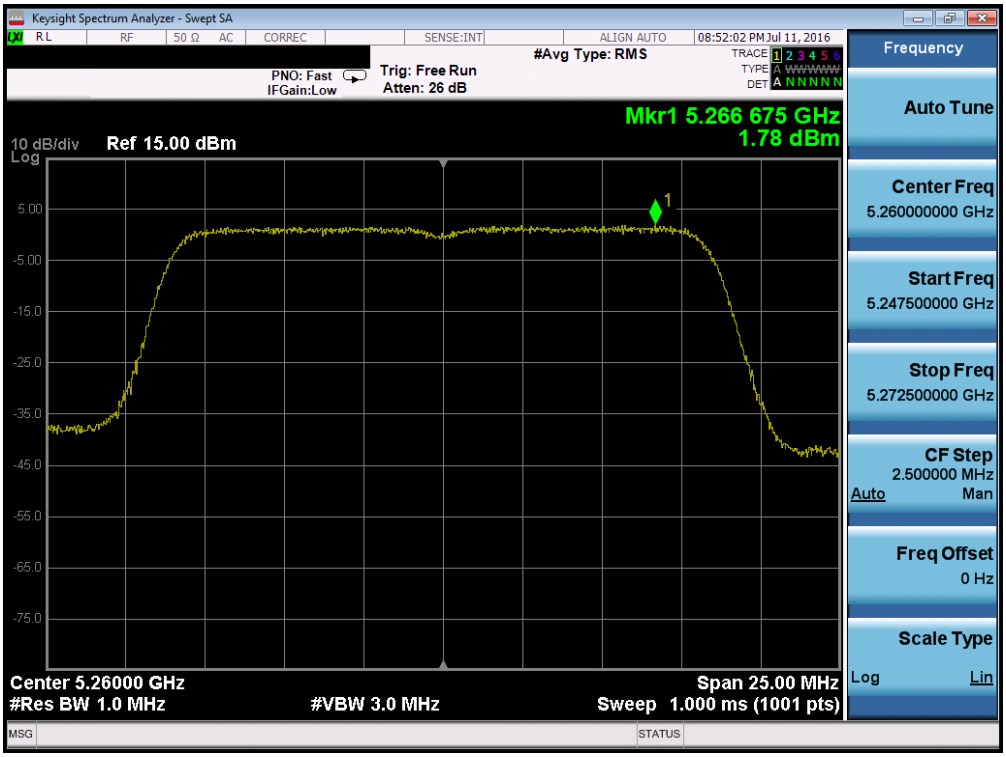
Plot 7-121. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 1) – Ch. 38)



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



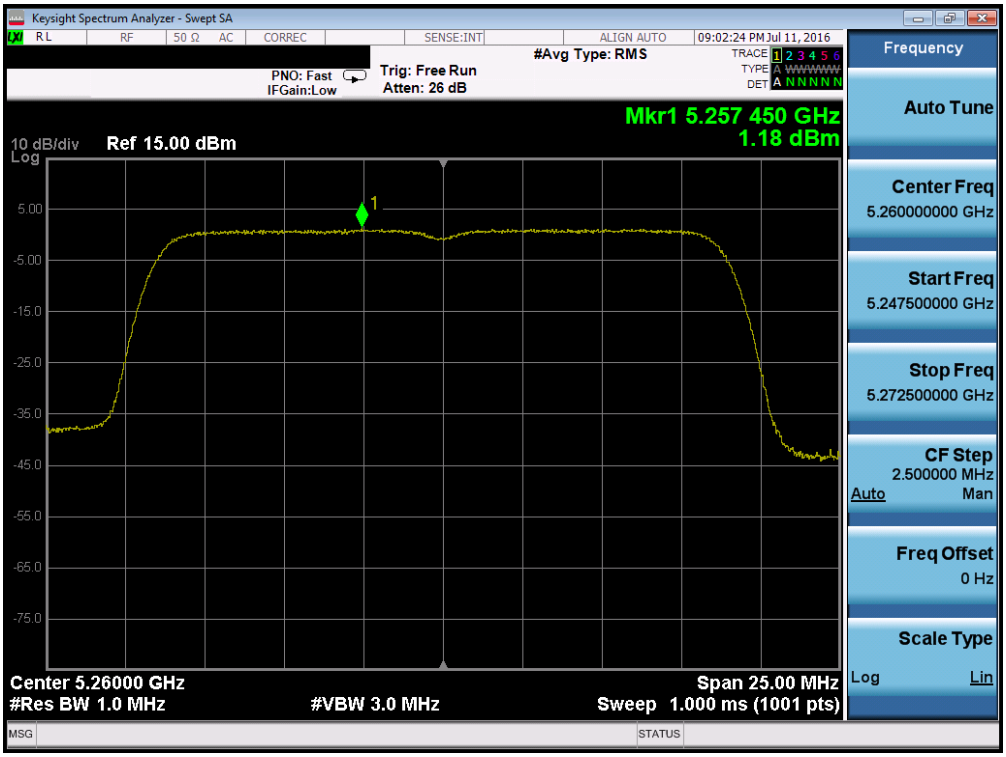
Plot 7-123. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 1) – Ch. 42)



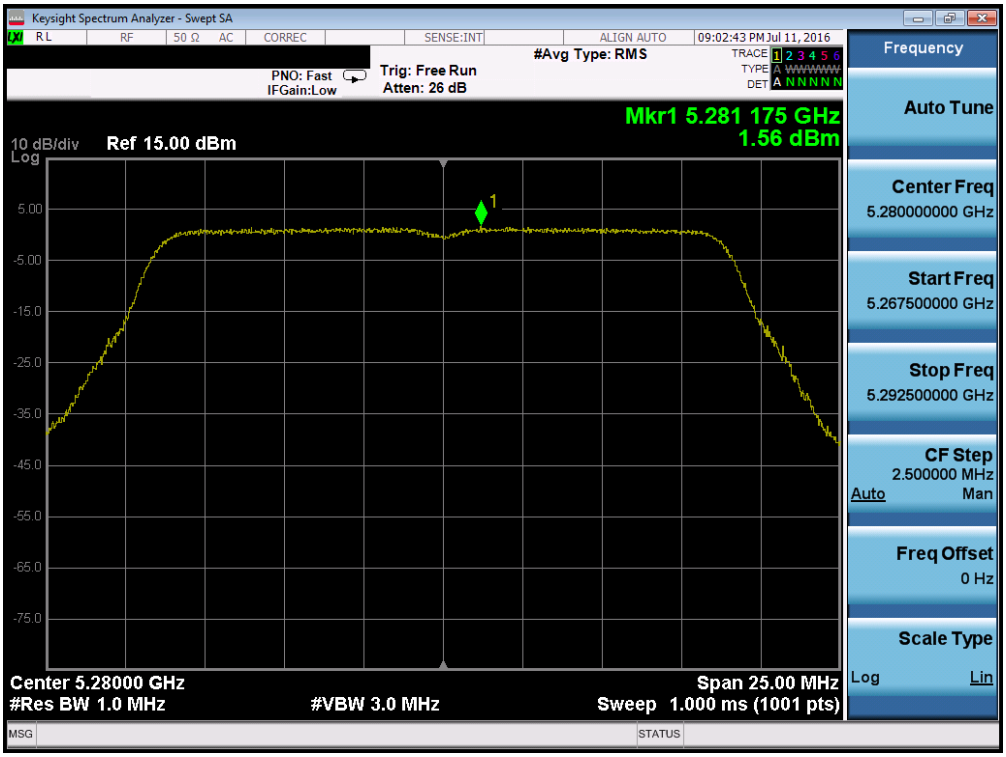
Plot 7-124. Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 52)

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

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

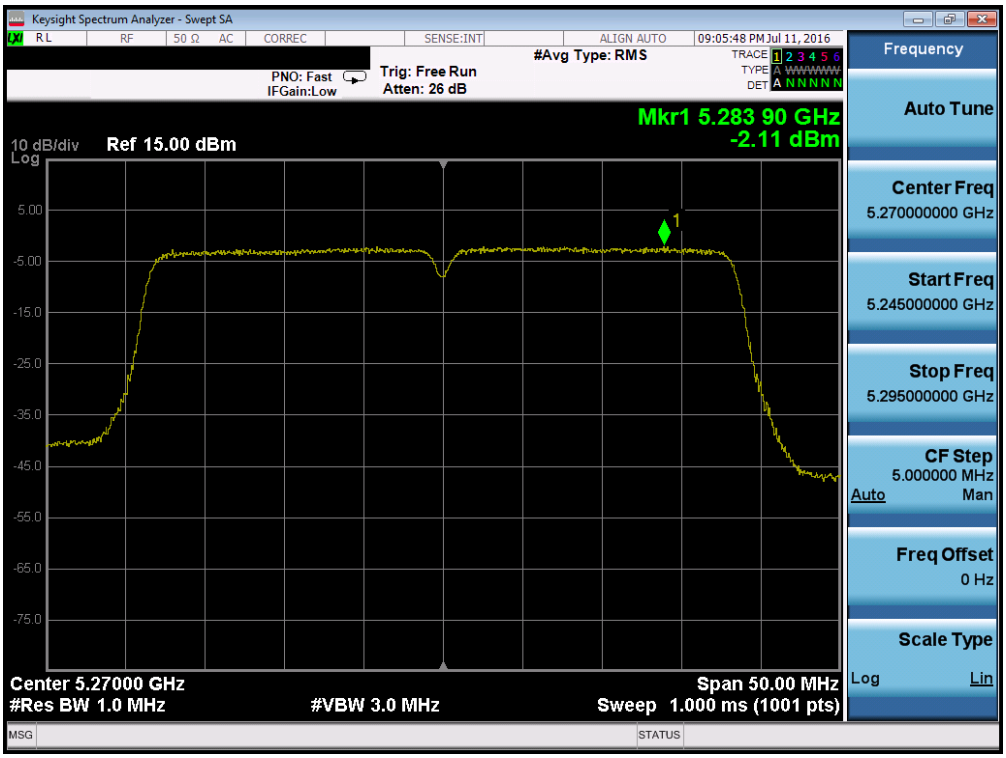


Plot 7-127. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 52)



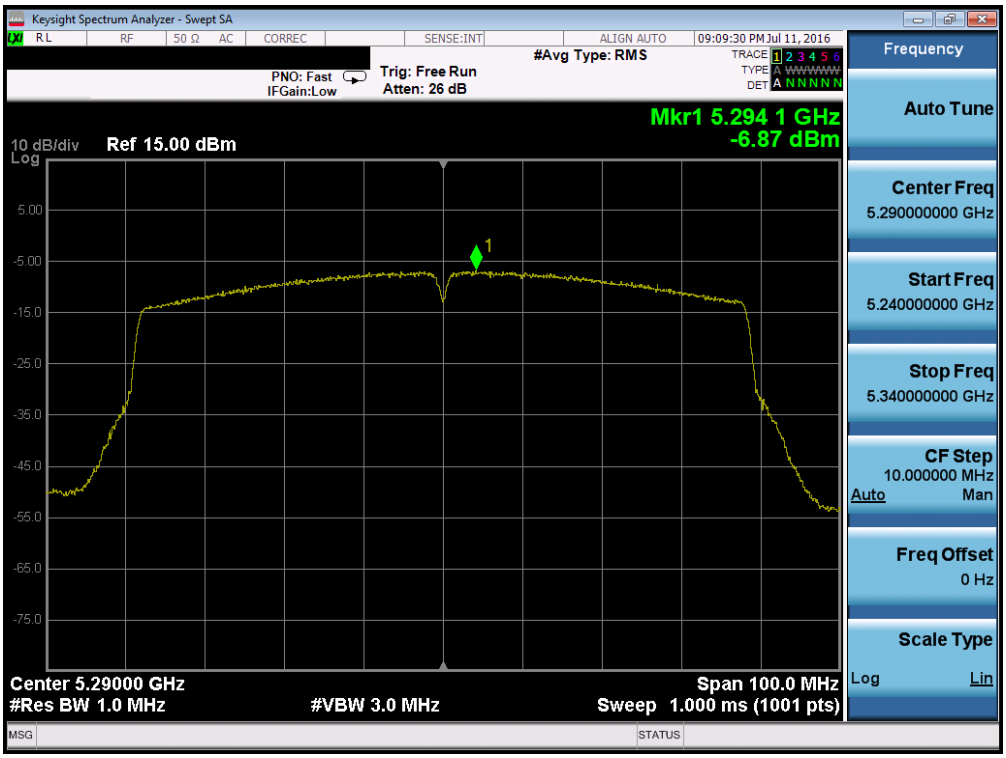
Plot 7-128. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 56)

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



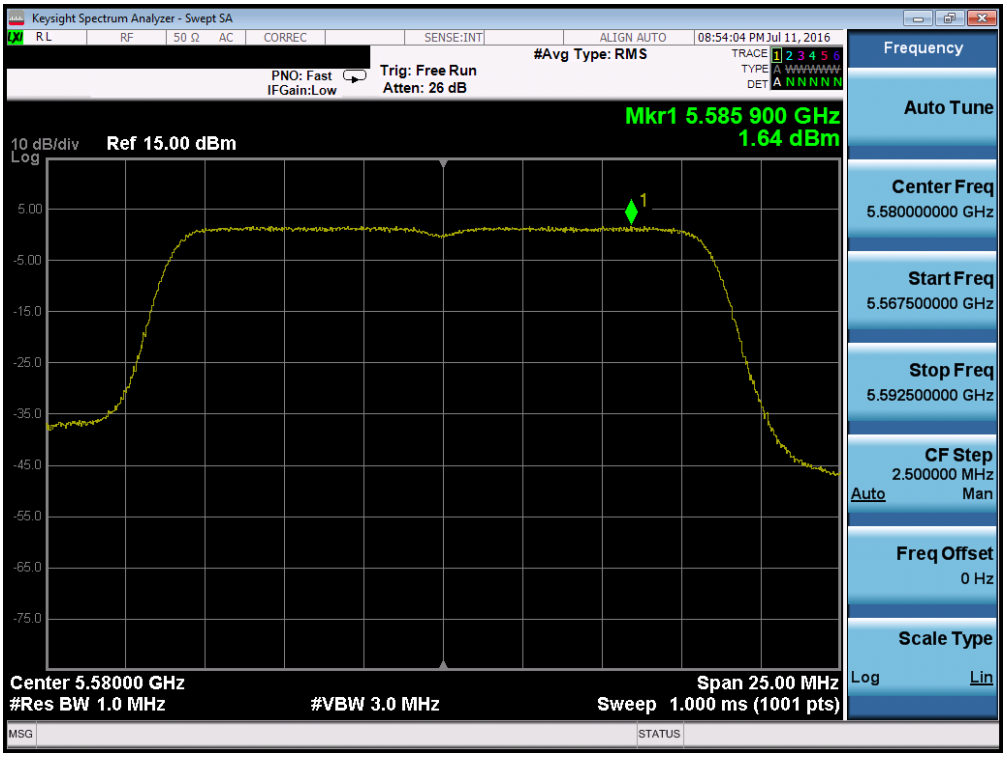
Plot 7-130. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2A) – Ch. 54)

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



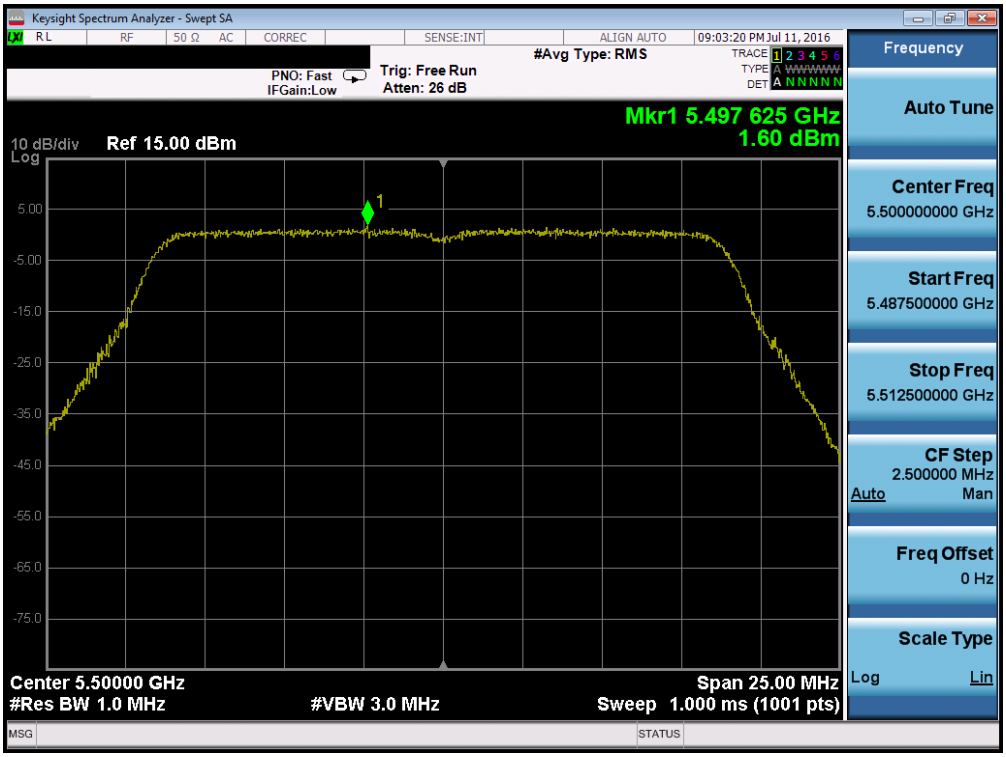
Plot 7-132. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2A) – Ch. 58)

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

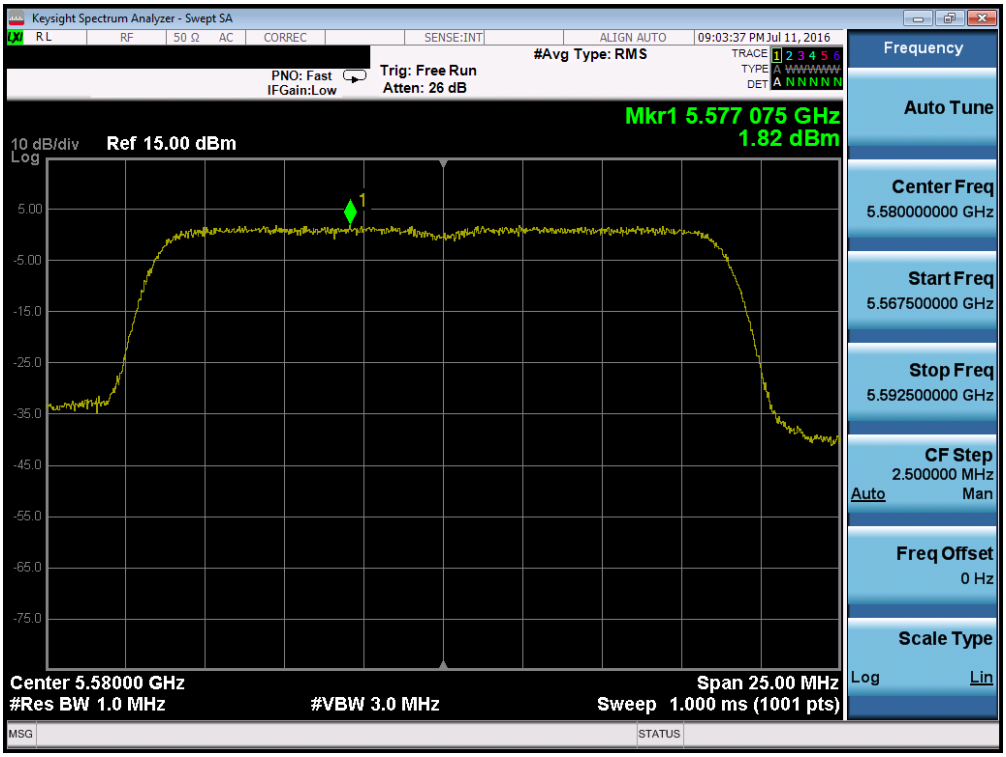


Plot 7-134. Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 116)

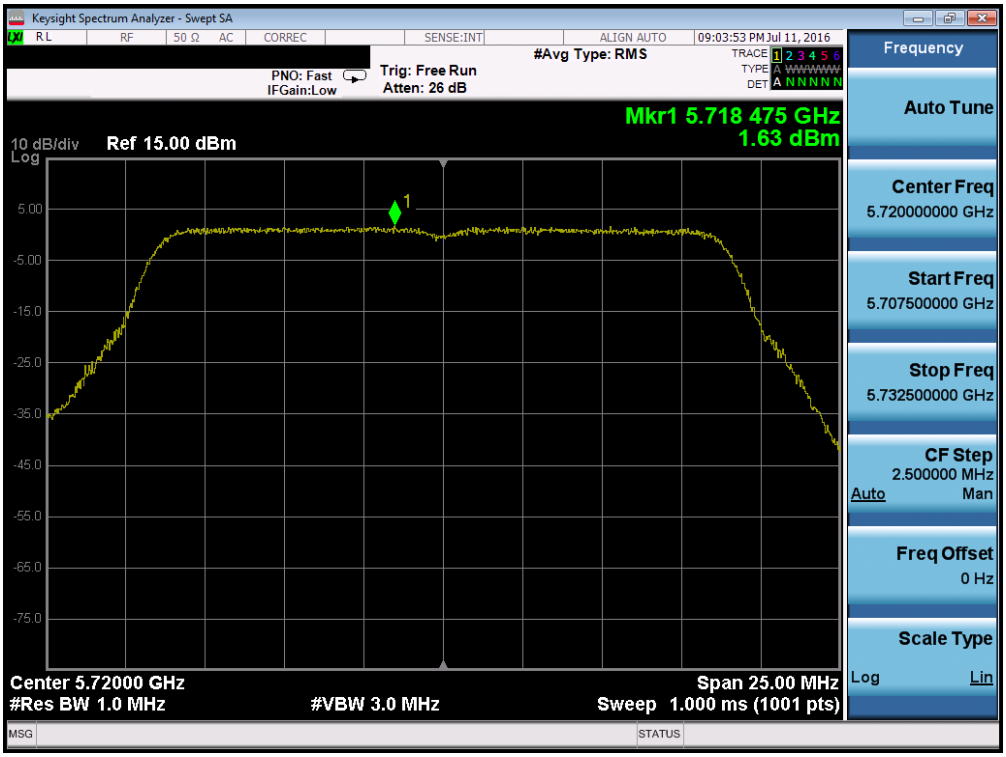
Plot 7-135. Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 144)



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

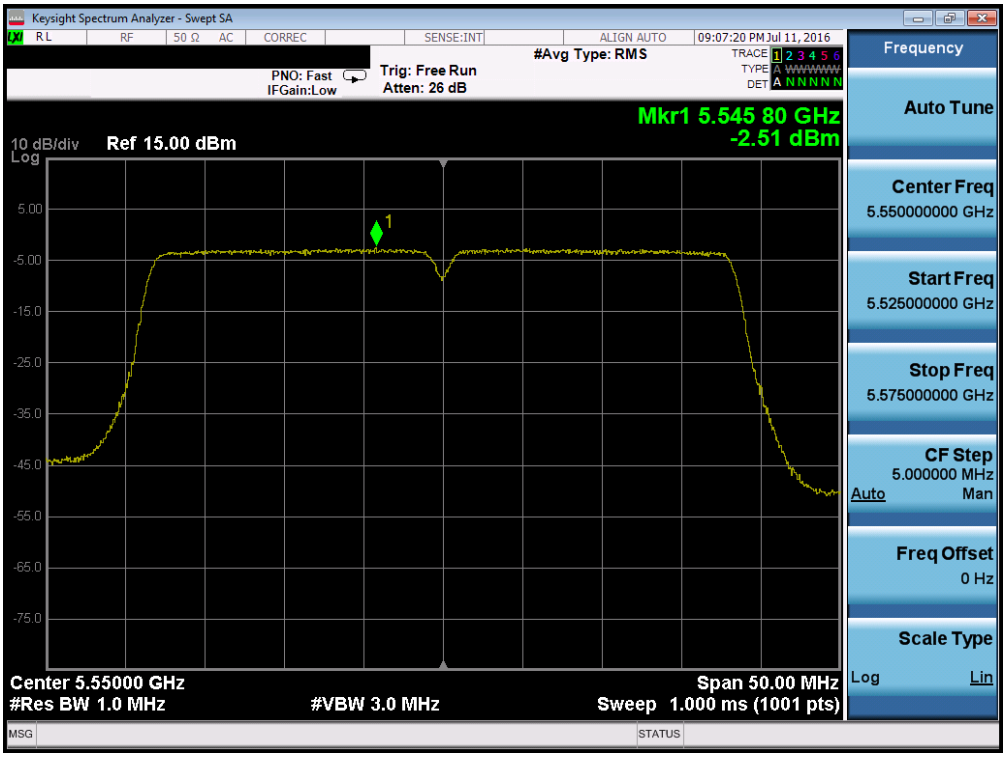


Plot 7-137. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 116)

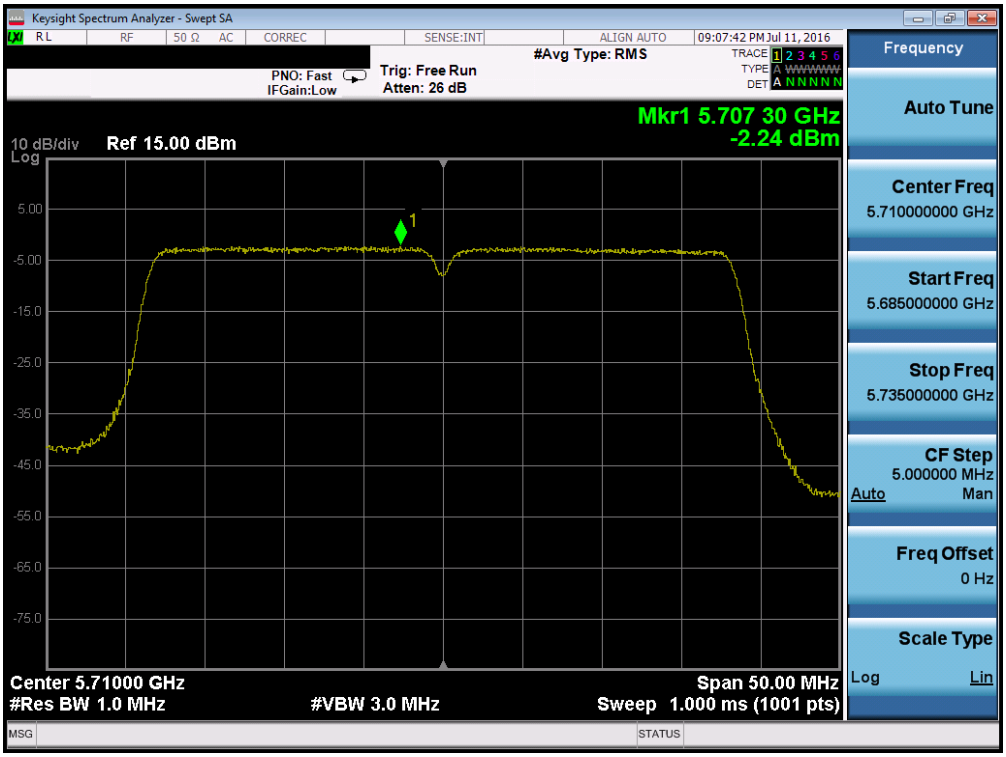


Plot 7-138. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 144)

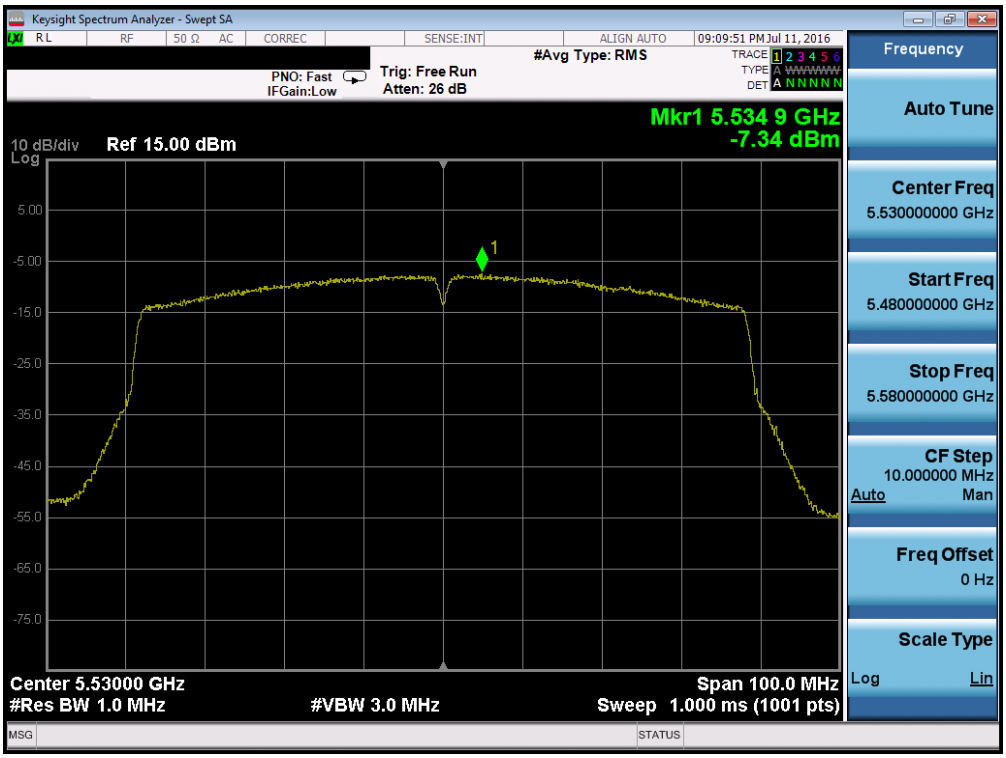
Plot 7-139. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 102)



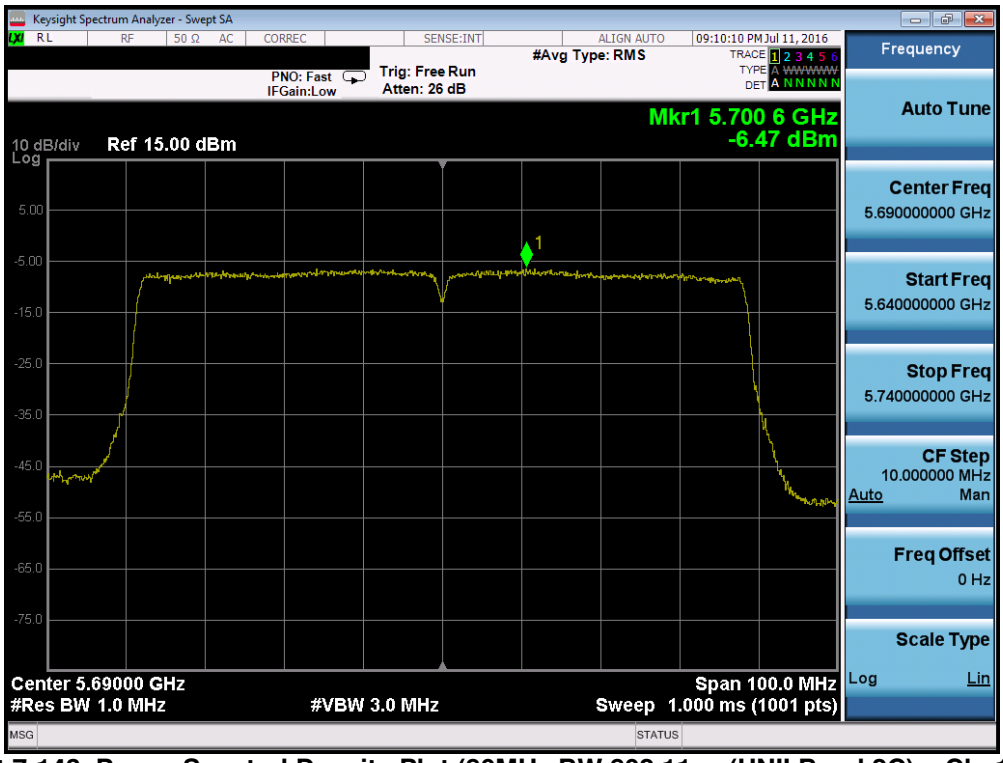
Plot 7-140. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 110)



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



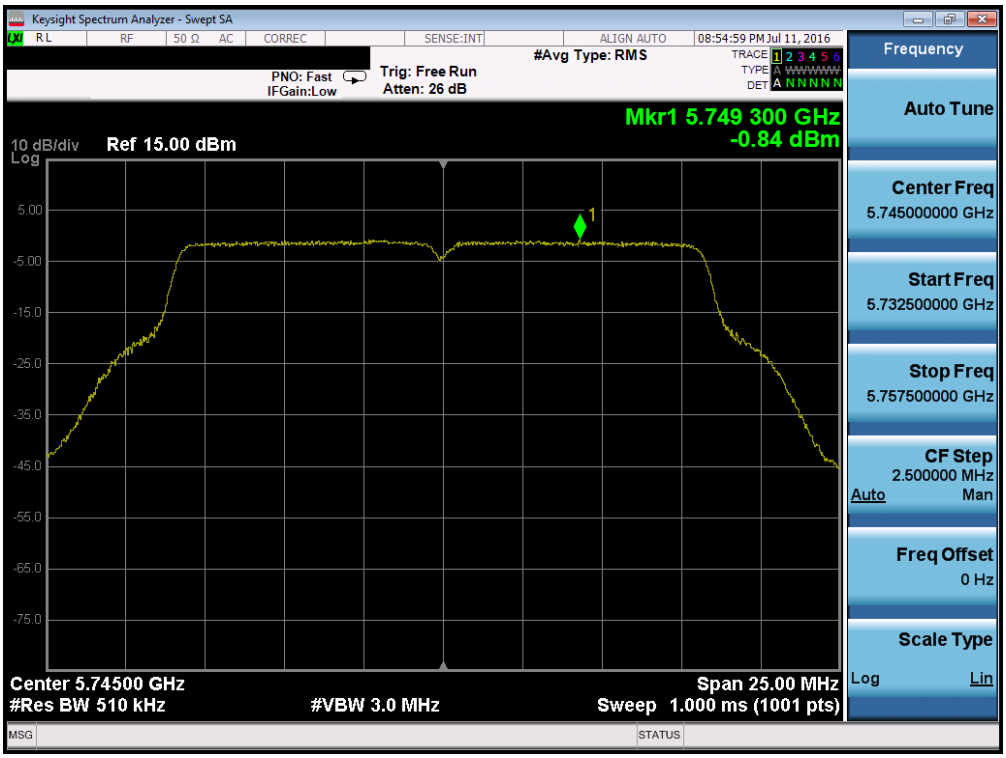
Plot 7-142. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2C) – Ch. 106)



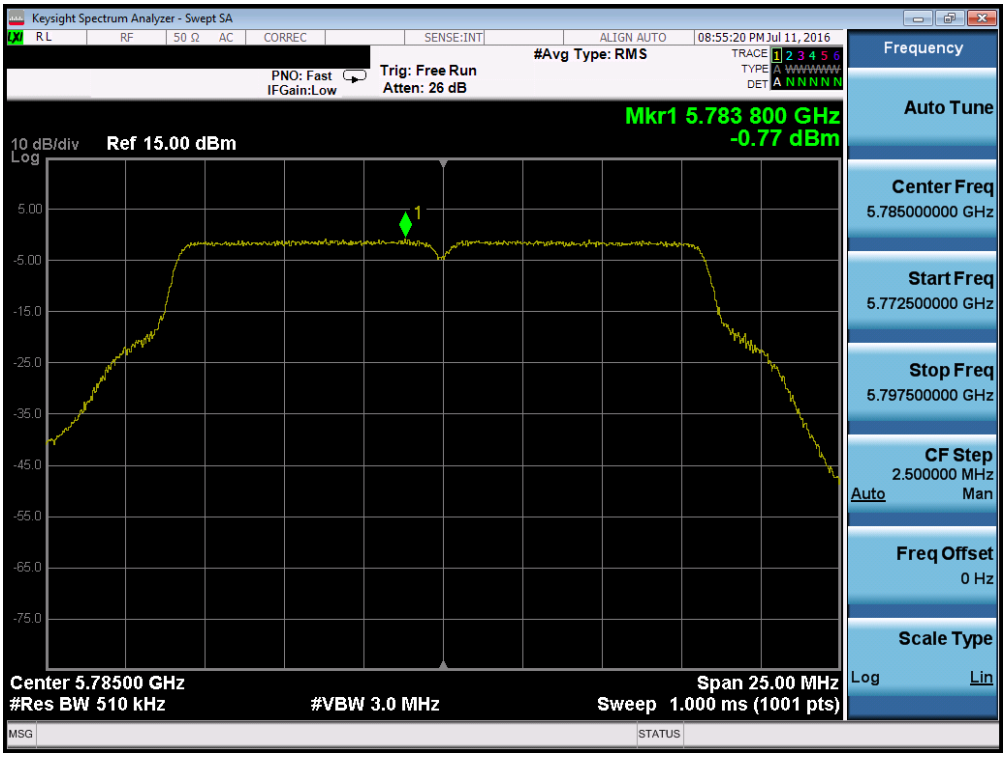
Plot 7-143. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2C) – Ch. 138)

	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured Power Density [dBm]	Max Permissible Power Density [dBm/500kHz]	Margin [dB]	Pass / Fail
Band 3	5745	149	a	6	-0.84	30.0	-30.84	Pass
	5785	157	a	6	-0.77	30.0	-30.77	Pass
	5825	165	a	6	-0.56	30.0	-30.56	Pass
	5745	149	n (20MHz)	6.5/7.2 (MCS0)	-0.85	30.0	-30.85	Pass
	5785	157	n (20MHz)	6.5/7.2 (MCS0)	-0.69	30.0	-30.69	Pass
	5825	165	n (20MHz)	6.5/7.2 (MCS0)	-0.78	30.0	-30.78	Pass
	5755	151	n (40MHz)	13.5/15 (MCS0)	-4.84	30.0	-34.84	Pass
	5795	159	n (40MHz)	13.5/15 (MCS0)	-4.09	30.0	-34.09	Pass
	5775	155	ac (80MHz)	29.3/32.5 (MCS0)	-6.83	30.0	-36.83	Pass

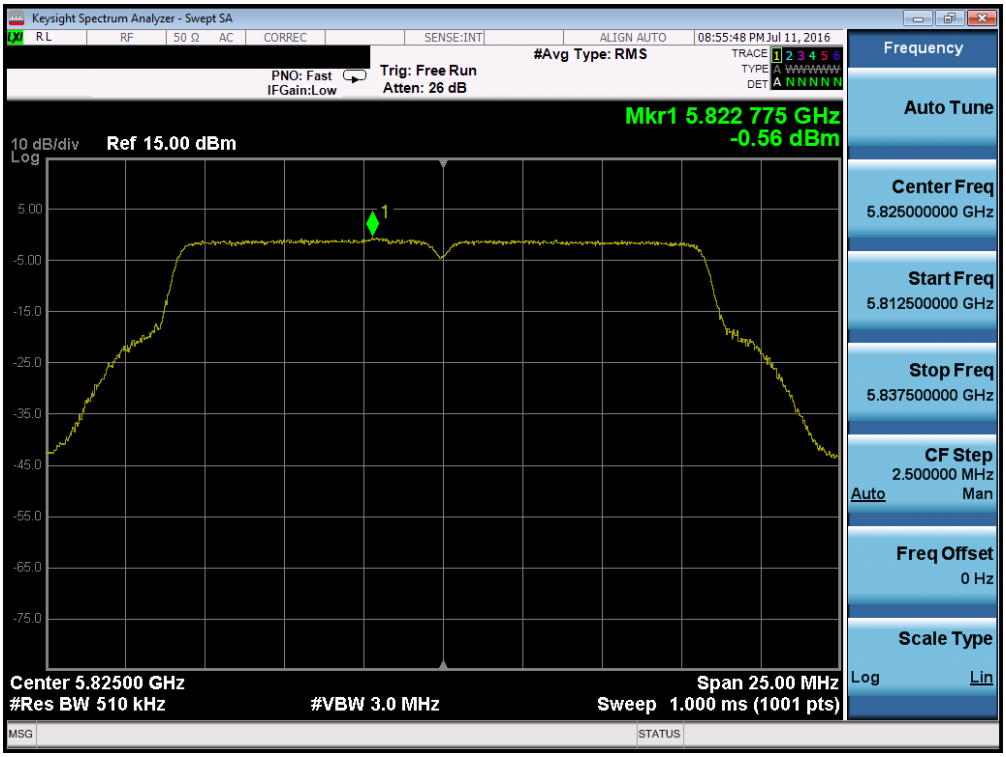
Table 7-20. Band 3 Conducted Power Spectral Density Measurements



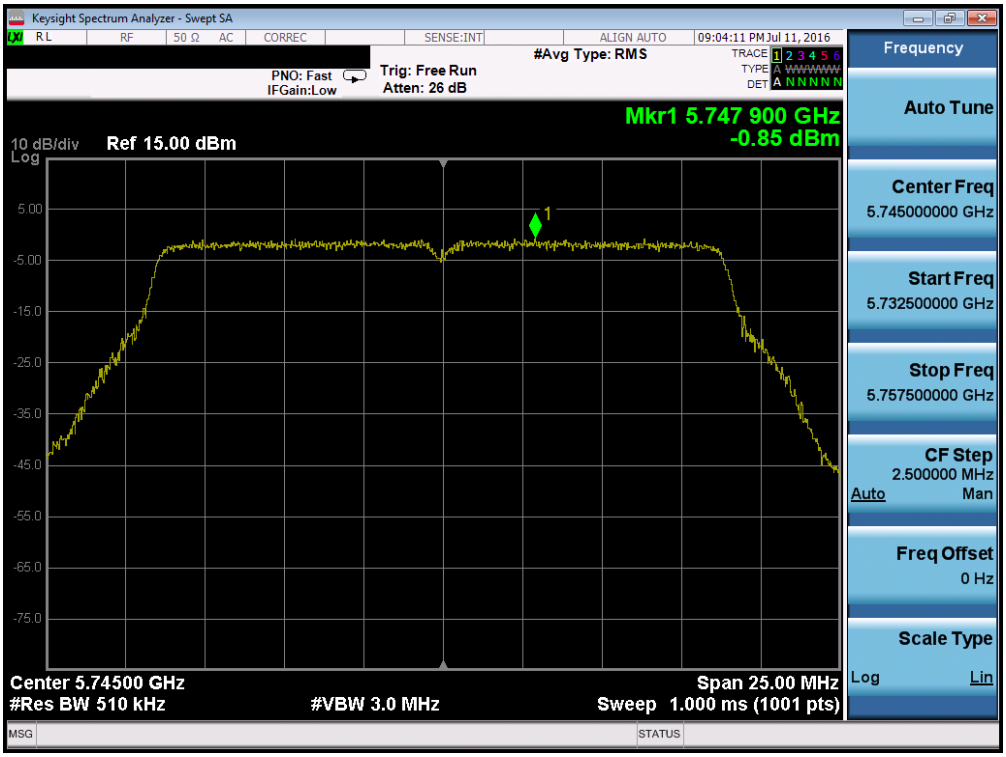
Plot 7-144. Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 149)



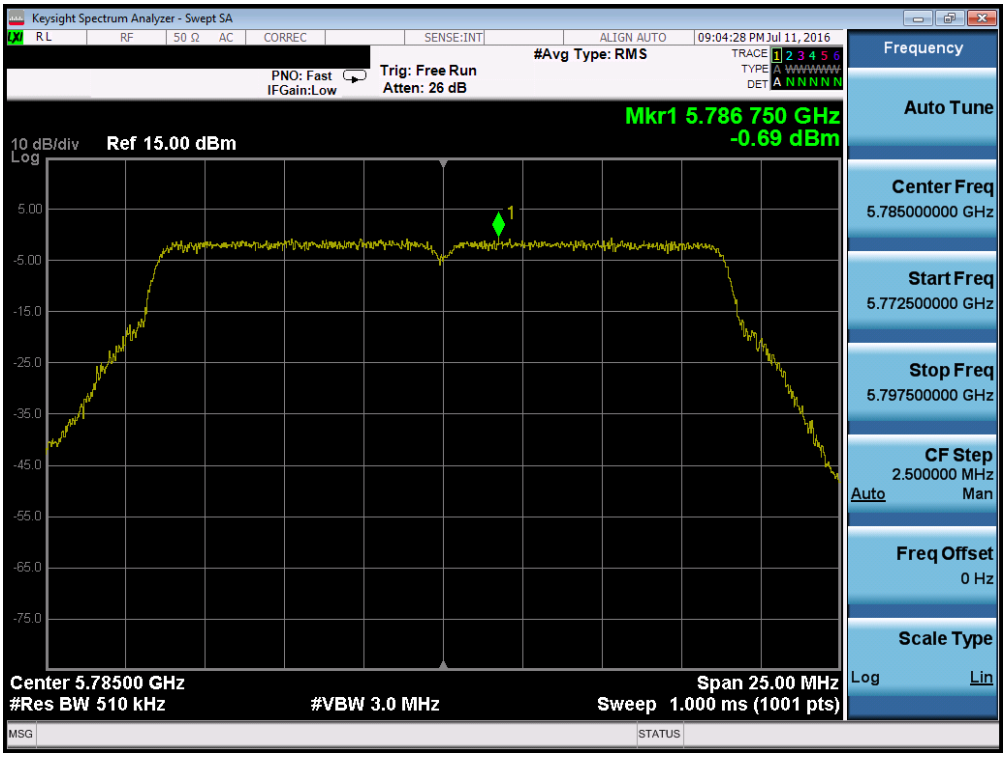
Plot 7-145. Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 157)



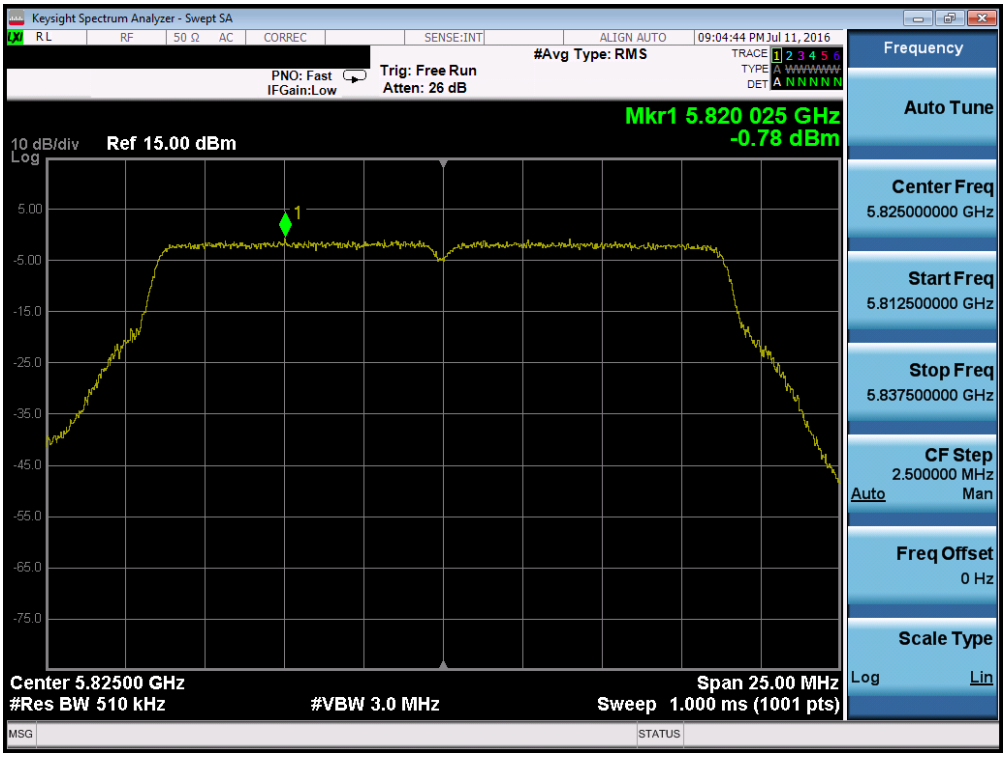
Plot 7-146. Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 165)



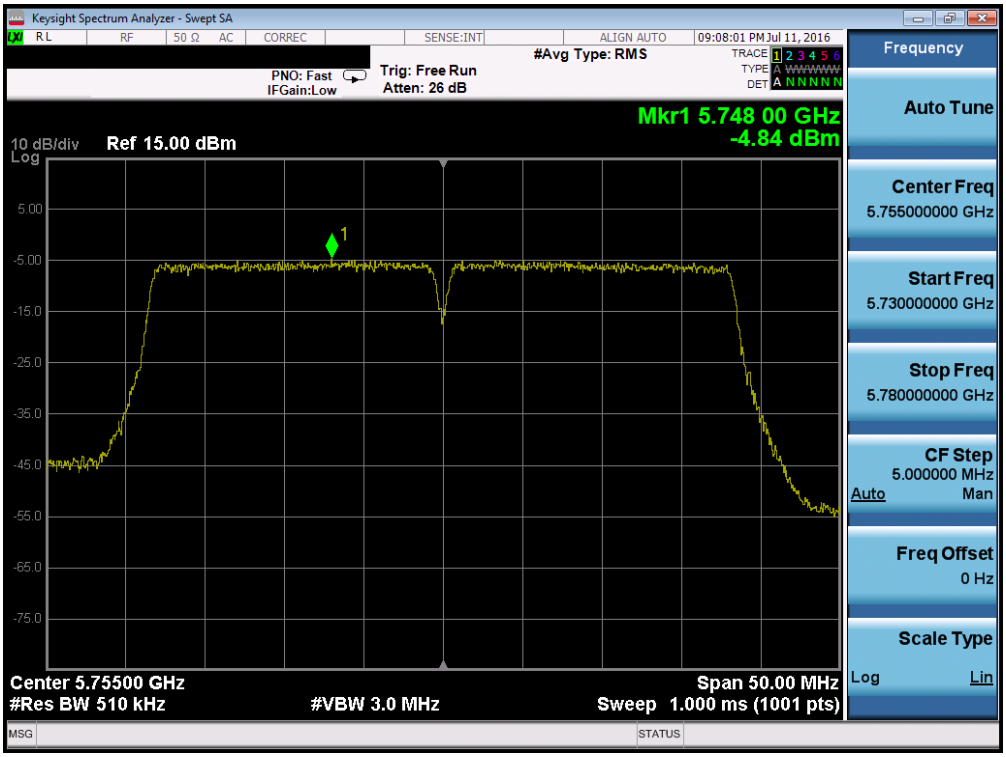
Plot 7-147. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 149)



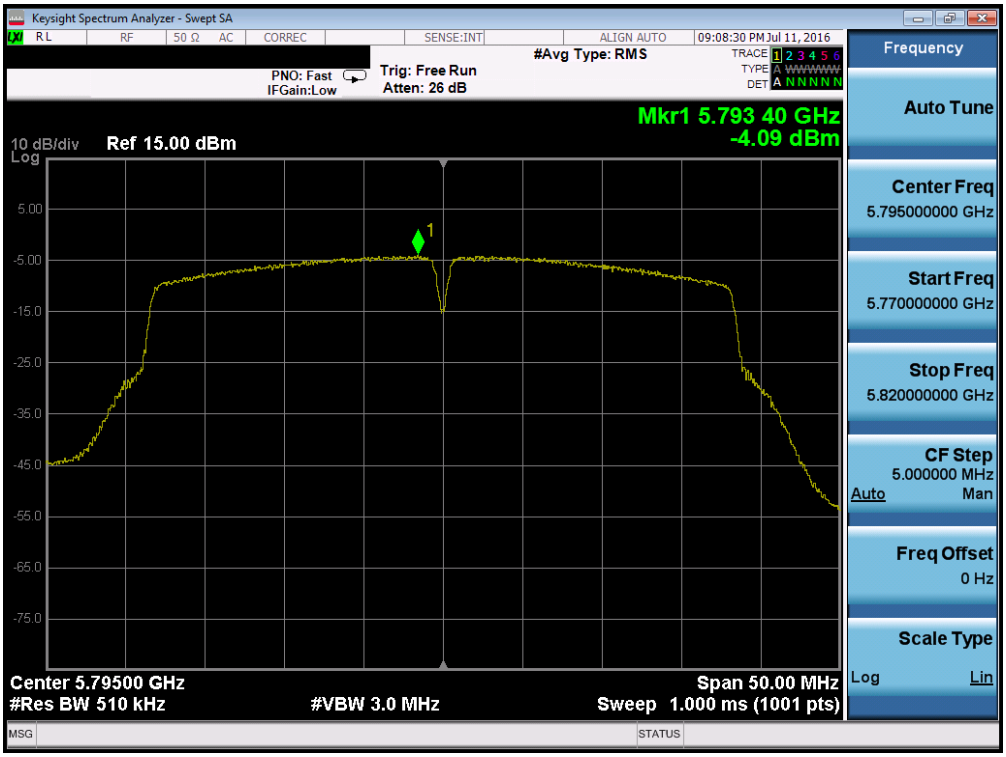
Plot 7-148. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 157)



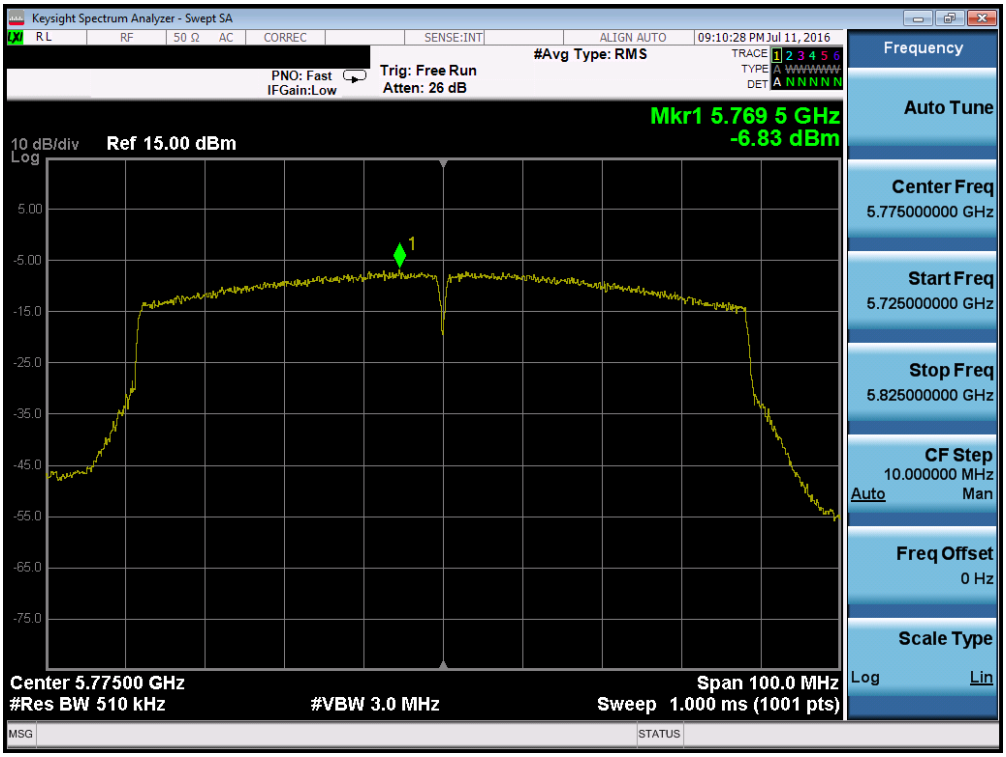
Plot 7-149. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 165)



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



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



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

Summed MIMO Power Spectral Density Measurements

	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Primary Antenna Power Density [dBm]	Secondary Antenna Power Density [dBm]	Summed MIMO Power Density [dBm]	Max Permissible Power Density [dBm/MHz]	Margin [dB]	Pass / Fail
Band 1	5180	36	n (20MHz)	6.5/7.2 (MCS0)	2.09	1.86	4.99	11.0	-6.01	Pass
	5200	40	n (20MHz)	6.5/7.2 (MCS0)	2.18	1.50	4.87	11.0	-6.13	Pass
	5240	48	n (20MHz)	6.5/7.2 (MCS0)	2.30	4.01	6.25	11.0	-4.75	Pass
	5190	38	n (40MHz)	13.5/15 (MCS0)	-2.14	-2.67	0.61	11.0	-10.39	Pass
	5230	46	n (40MHz)	13.5/15 (MCS0)	-1.57	-2.94	0.81	11.0	-10.19	Pass
	5210	42	ac (80MHz)	29.3/32.5 (MCS0)	-5.35	-6.58	-2.91	11.0	-13.91	Pass
Band 2A	5260	52	n (20MHz)	6.5/7.2 (MCS0)	2.54	1.18	4.92	11.0	-6.08	Pass
	5280	56	n (20MHz)	6.5/7.2 (MCS0)	1.97	1.56	4.78	11.0	-6.22	Pass
	5320	64	n (20MHz)	6.5/7.2 (MCS0)	2.48	1.92	5.22	11.0	-5.78	Pass
	5270	54	n (40MHz)	13.5/15 (MCS0)	-2.23	-2.11	0.84	11.0	-10.16	Pass
	5310	62	n (40MHz)	13.5/15 (MCS0)	-2.44	-2.53	0.53	11.0	-10.47	Pass
	5290	58	ac (80MHz)	29.3/32.5 (MCS0)	-5.79	-6.87	-3.28	11.0	-14.28	Pass
Band 2C	5500	100	n (20MHz)	6.5/7.2 (MCS0)	2.74	1.60	5.22	11.0	-5.78	Pass
	5580	116	n (20MHz)	6.5/7.2 (MCS0)	3.17	1.82	5.56	11.0	-5.44	Pass
	5720	144	n (20MHz)	6.5/7.2 (MCS0)	2.49	1.63	5.09	11.0	-5.91	Pass
	5510	102	n (40MHz)	13.5/15 (MCS0)	-2.04	-2.85	0.58	11.0	-10.42	Pass
	5550	110	n (40MHz)	13.5/15 (MCS0)	-0.71	-2.51	1.49	11.0	-9.51	Pass
	5710	142	n (40MHz)	13.5/15 (MCS0)	-0.85	-2.24	1.52	11.0	-9.48	Pass
	5530	106	ac (80MHz)	29.3/32.5 (MCS0)	-6.56	-7.34	-3.93	11.0	-14.93	Pass
	5690	138	ac (80MHz)	29.3/32.5 (MCS0)	-5.05	-6.47	-2.69	11.0	-13.69	Pass

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

	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Primary Antenna Power Density [dBm]	Secondary Antenna 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)	0.13	-0.85	2.68	30.0	-27.32	Pass
	5785	157	n (20MHz)	6.5/7.2 (MCS0)	0.57	-0.69	3.00	30.0	-27.00	Pass
	5825	165	n (20MHz)	6.5/7.2 (MCS0)	0.19	-0.78	2.74	30.0	-27.26	Pass
	5755	151	n (40MHz)	13.5/15 (MCS0)	-3.76	-4.84	-1.25	30.0	-31.25	Pass
	5795	159	n (40MHz)	13.5/15 (MCS0)	-2.36	-4.09	-0.13	30.0	-30.13	Pass
	5775	155	ac (80MHz)	29.3/32.5 (MCS0)	-6.22	-6.83	-3.51	30.0	-33.51	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 Primary Antenna and Secondary Antenna were first measured separately as shown in the section above. The measured values were then summed in linear power units then converted back to dBm.

Sample MIMO Calculation:

At 5180MHz the average conducted power spectral density was measured to be 2.09 dBm for Primary Antenna and 1.86 dBm for Secondary Antenna.

Primary Antenna + Secondary Antenna = MIMO

(2.09 dBm + 1.86 dBm) = (1.62 mW + 1.54 mW) = 3.15 mW = 4.99 dBm

7.6 Frequency Stability

§15.407(g)

The EUT was placed inside of an environmental chamber as the temperature in the chamber was varied between -30ºC and +50ºC. The temperature was incremented by 10º 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: 3.85 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	5,179,999,920	-80	-0.00000154
100 %		- 30	5,180,000,186	186	0.00000359
100 %		- 20	5,180,000,028	28	0.00000054
100 %		- 10	5,180,000,172	172	0.00000332
100 %		0	5,179,999,879	-121	-0.00000234
100 %		+ 10	5,180,000,177	177	0.00000342
100 %		+ 20	5,180,000,052	52	0.00000100
100 %		+ 30	5,179,999,618	-382	-0.00000737
100 %		+ 40	5,180,000,044	44	0.00000085
100 %		+ 50	5,180,000,300	300	0.00000579
BATT. ENDPOINT	3.45	+ 20	5,179,999,803	-197	-0.00000380

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

Note:

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

Frequency Stability

§15.407(g)

The EUT was placed inside of an environmental chamber as the temperature in the chamber was varied between -30ºC and +50ºC. The temperature was incremented by 10º 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: 3.85 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (ºC)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	5,260,000,028	28	0.00000053
100 %		- 30	5,259,999,700	-300	-0.00000570
100 %		- 20	5,259,999,835	-165	-0.00000314
100 %		- 10	5,260,000,277	277	0.00000527
100 %		0	5,260,000,150	150	0.00000285
100 %		+ 10	5,260,000,179	179	0.00000340
100 %		+ 20	5,259,999,843	-157	-0.00000298
100 %		+ 30	5,260,000,061	61	0.00000116
100 %		+ 40	5,259,999,942	-58	-0.00000110
100 %		+ 50	5,259,999,965	-35	-0.00000067
BATT. ENDPOINT	3.45	+ 20	5,260,000,141	141	0.00000268

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

Note:

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

Frequency Stability

§15.407(g)

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

OPERATING FREQUENCY: 5,500,000,000 Hz

CHANNEL: 100

REFERENCE VOLTAGE: 3.85 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	5,499,999,769	-231	-0.00000420
100 %		- 30	5,499,999,910	-90	-0.00000164
100 %		- 20	5,500,000,105	105	0.00000191
100 %		- 10	5,500,000,034	34	0.00000062
100 %		0	5,500,000,362	362	0.00000658
100 %		+ 10	5,499,999,800	-200	-0.00000364
100 %		+ 20	5,499,999,873	-127	-0.00000231
100 %		+ 30	5,499,999,948	-52	-0.00000095
100 %		+ 40	5,500,000,139	139	0.00000253
100 %		+ 50	5,500,000,001	1	0.00000002
BATT. ENDPOINT	3.45	+ 20	5,499,999,989	-11	-0.00000020

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

Note:

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

Frequency Stability

§15.407(g)

The EUT was placed inside of an environmental chamber as the temperature in the chamber was varied between -30ºC and +50ºC. The temperature was incremented by 10º 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: 3.85 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (ºC)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	5,744,999,942	-58	-0.00000101
100 %		- 30	5,744,999,873	-127	-0.00000221
100 %		- 20	5,744,999,796	-204	-0.00000355
100 %		- 10	5,744,999,941	-59	-0.00000103
100 %		0	5,745,000,172	172	0.00000299
100 %		+ 10	5,744,999,695	-305	-0.00000531
100 %		+ 20	5,745,000,136	136	0.00000237
100 %		+ 30	5,744,999,873	-127	-0.00000221
100 %		+ 40	5,744,999,963	-37	-0.00000064
100 %		+ 50	5,744,999,998	-2	-0.00000003
BATT. ENDPOINT	3.45	+ 20	5,744,999,789	-211	-0.00000367

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

Note:

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

7.7 Radiated Spurious Emission Measurements – Above 1GHz

§15.407(b.1)(b.6) §15.205 §15.209

Test Overview and Limit

All out of band radiated spurious emissions are measured with a spectrum analyzer connected to a receive antenna while the EUT is operating at its maximum duty cycle, at its maximum power control level, as defined in KDB 789033 D02 v01r02, 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 v01r02 – Section G

Test Settings

Average Measurements above 1GHz (Method AD)

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

Peak Measurements above 1GHz

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

Peak Measurements below 1GHz

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

Test Setup

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

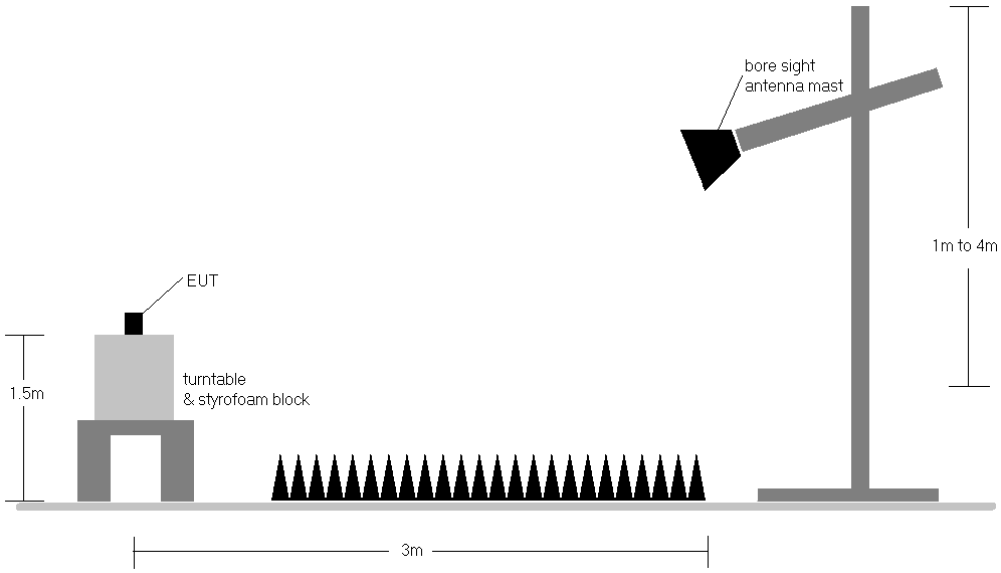


Figure 7-5. Test Instrument & Measurement Setup

Test Notes

1. All radiated spurious emissions levels were measured in a radiated test setup per the guidance of KDB 789033 D02 v01r02 Section G.
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.

Sample Calculations

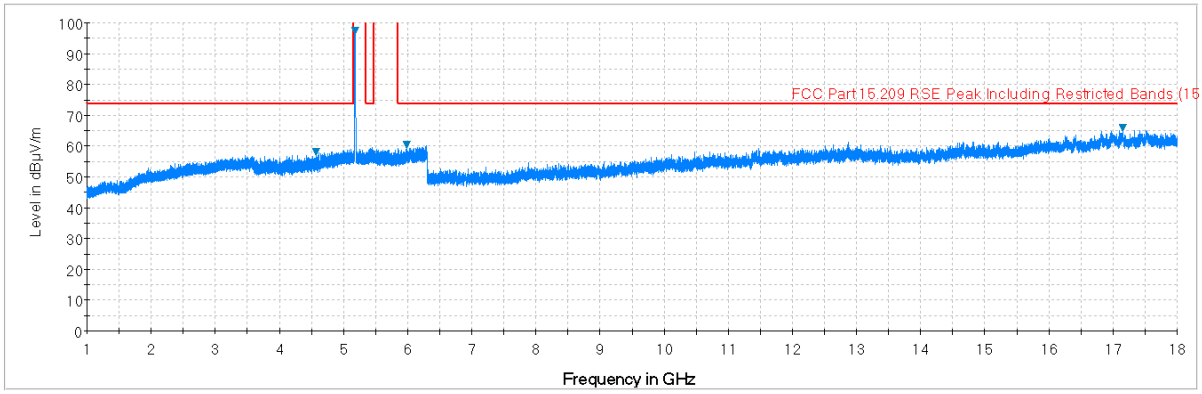
Determining Spurious Emissions Levels

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

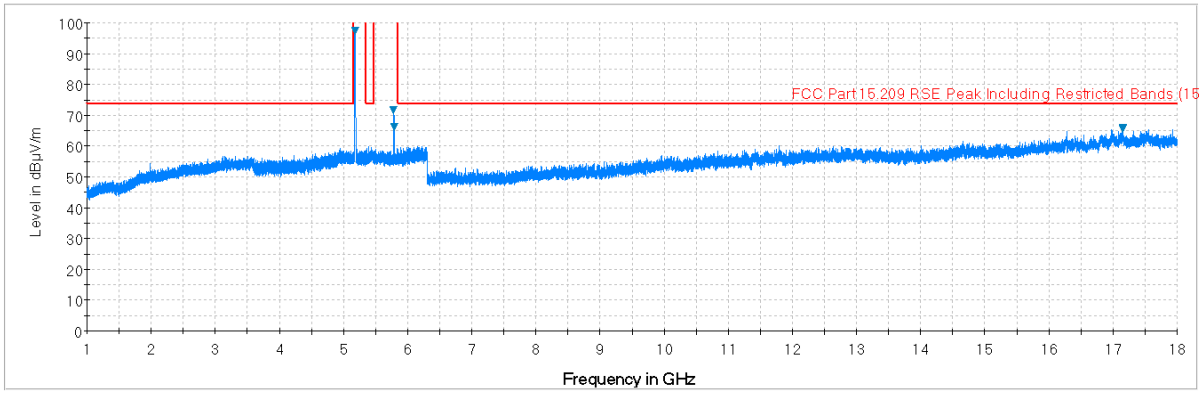
Radiated Band Edge Measurement Offset

- The amplitude offset shown in the radiated restricted band edge plots in Section 7.7 was calculated using the formula:
  Offset (dB) = (Antenna Factor + Cable Loss + 10 dB Attenuator) – Preamplifier Gain

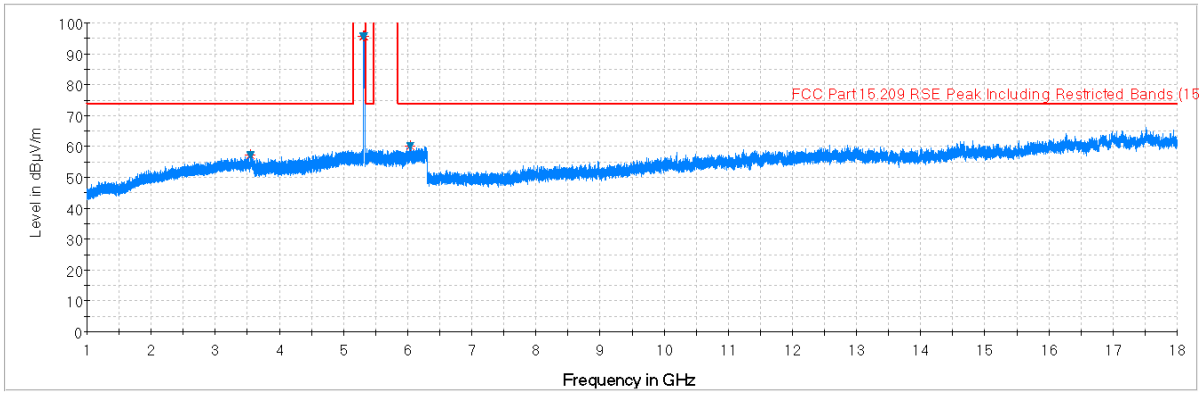
7.7.1 Primary Antenna Radiated Spurious Emission Measurements



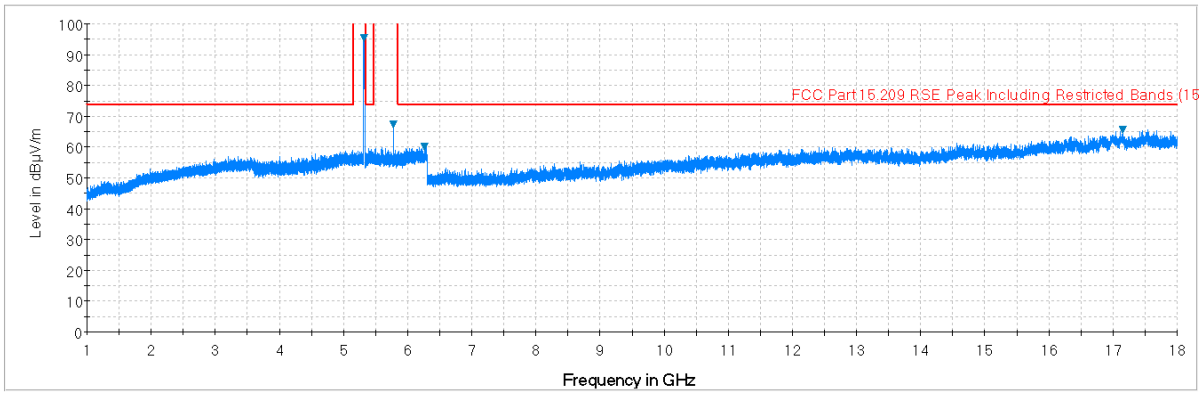
Plot 7-153. Radiated Spurious Plot above 1GHz (802.11a – U1 Ch. 40, Ant. Pol. H)



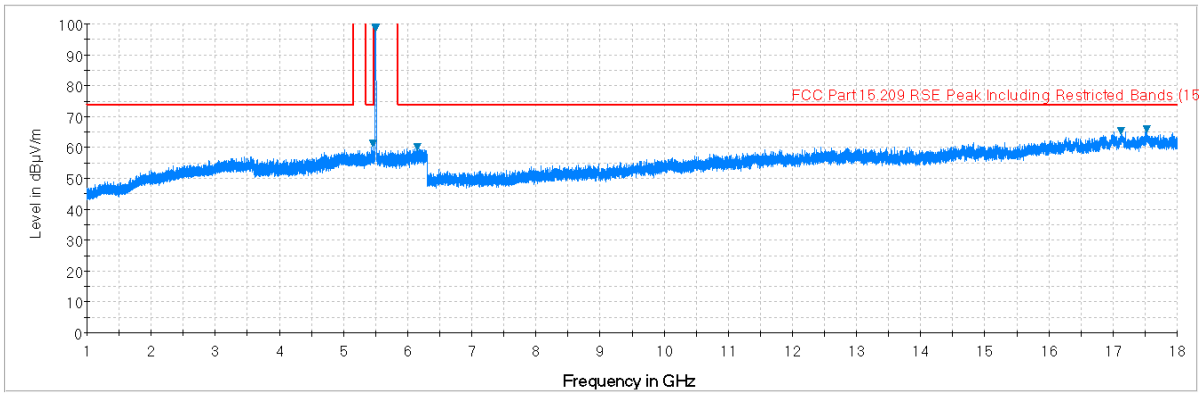
Plot 7-154. Radiated Spurious Plot above 1GHz (802.11a – U1 Ch. 40, Ant. Pol. V)



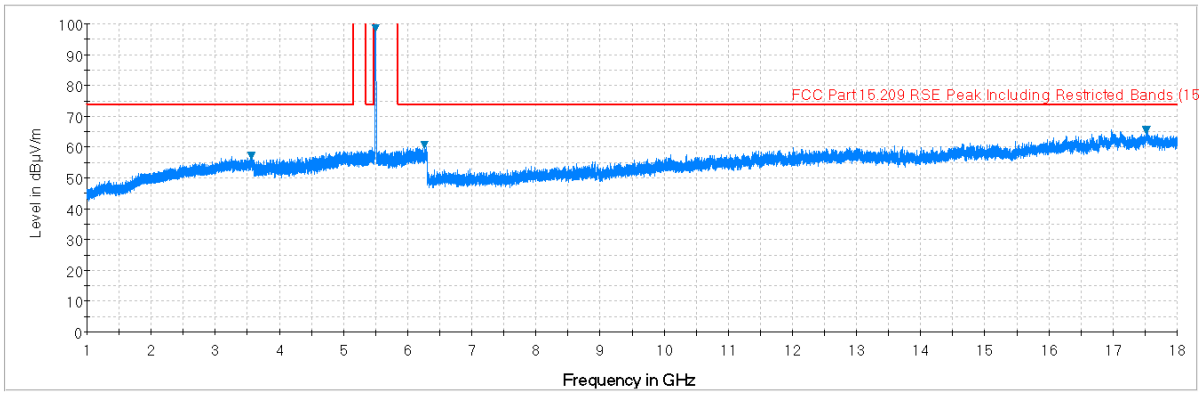
Plot 7-155. Radiated Spurious Plot above 1GHz (802.11a – U2A Ch. 56, Ant. Pol. H)



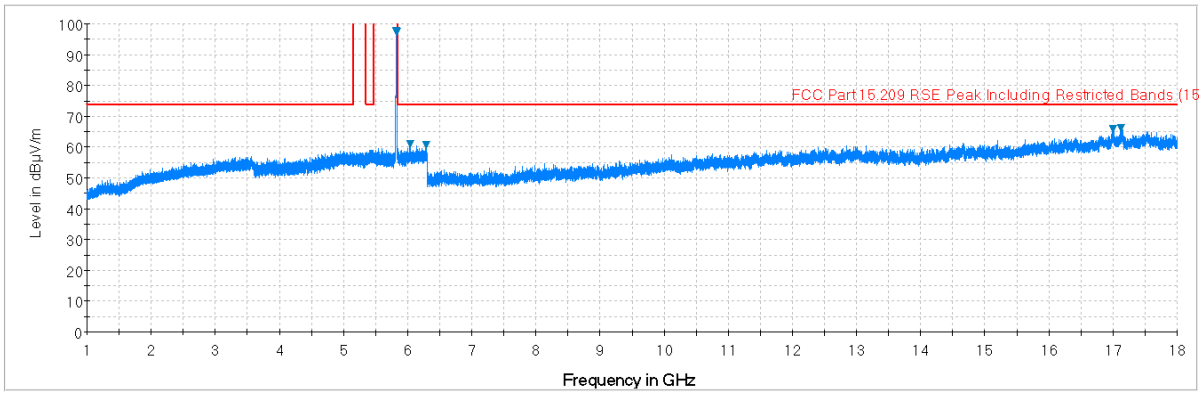
Plot 7-156. Radiated Spurious Plot above 1GHz (802.11a – U2A Ch. 56, Ant. Pol. V)



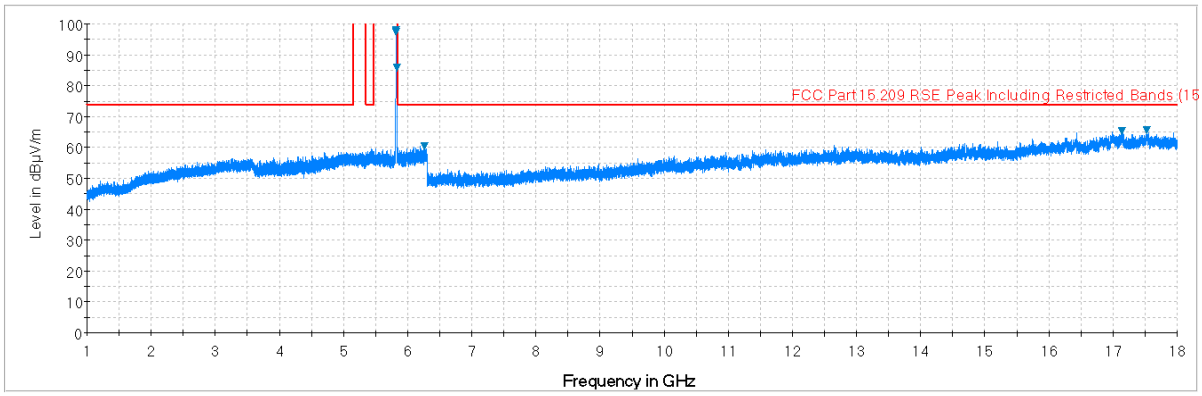
Plot 7-157. Radiated Spurious Plot above 1GHz (802.11a – U2C Ch. 116, Ant. Pol. H)



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



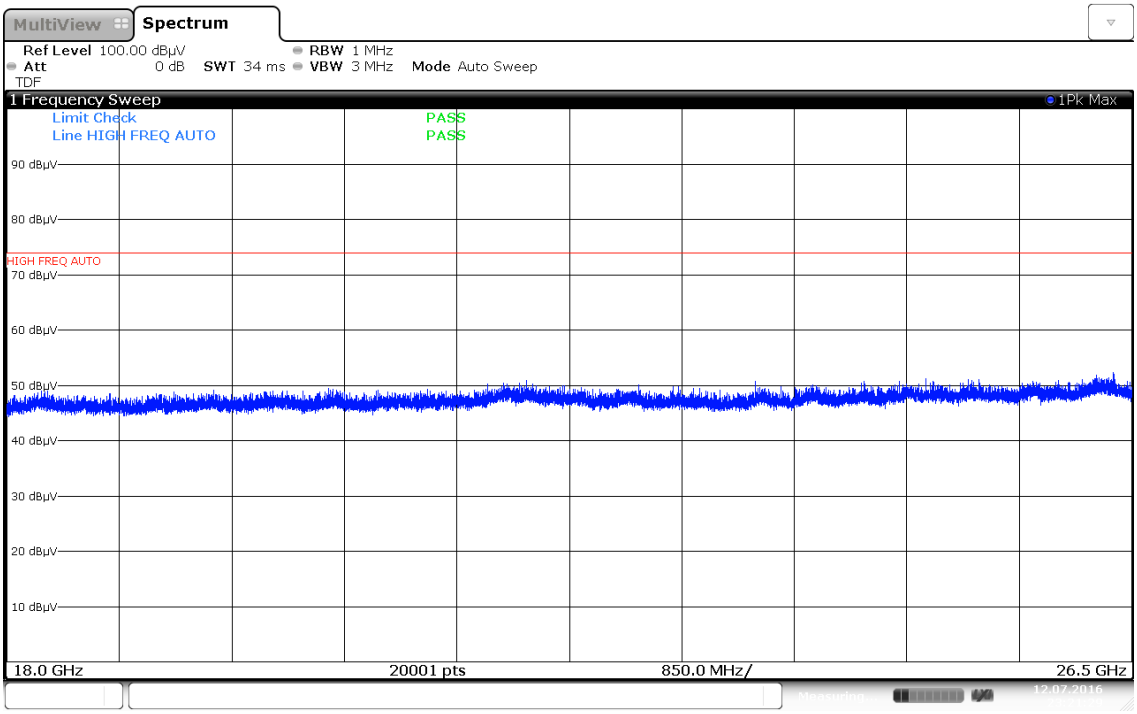
Plot 7-159. Radiated Spurious Plot above 1GHz (802.11a – U3 Ch. 157, Ant. Pol. H)



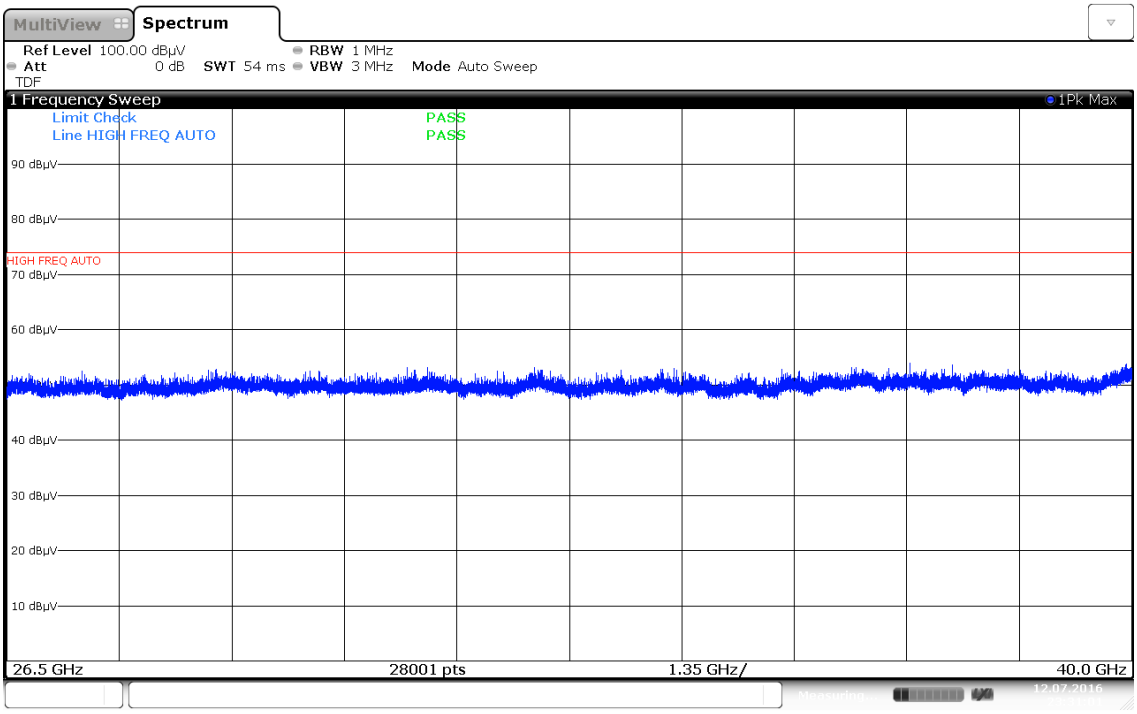
Plot 7-160. Radiated Spurious Plot above 1GHz (802.11a – U3 Ch. 157, Ant. Pol. V)

Primary Antenna Radiated Spurious Emissions Measurements (Above 18GHz)

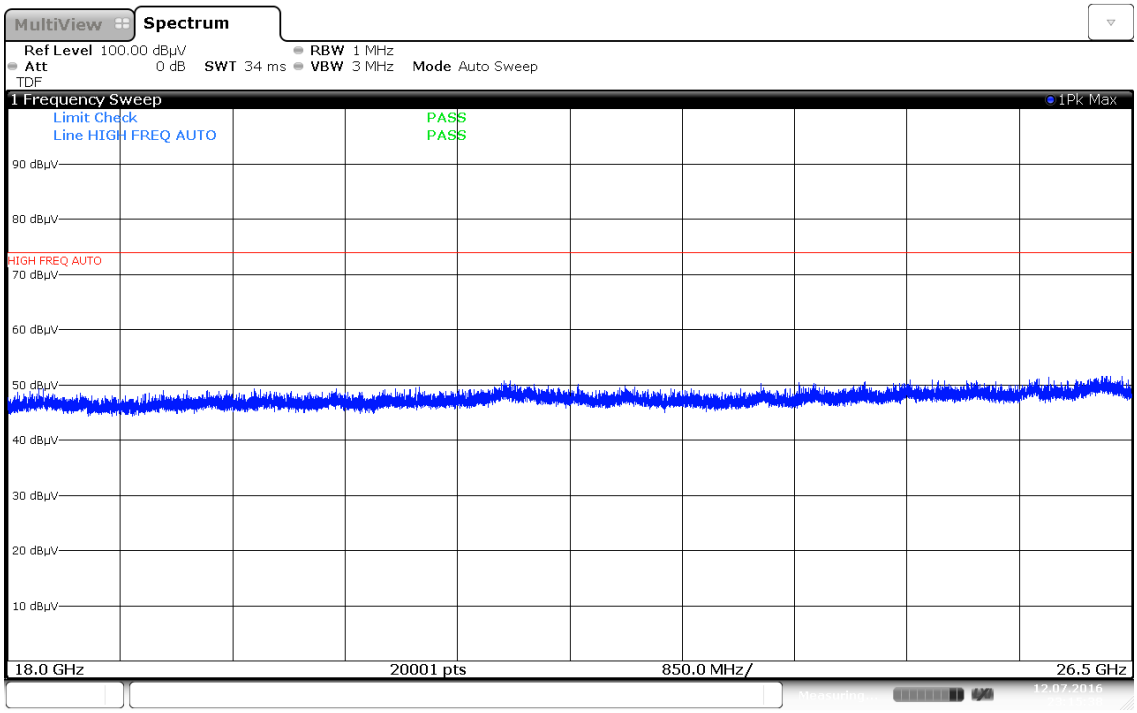
§15.209



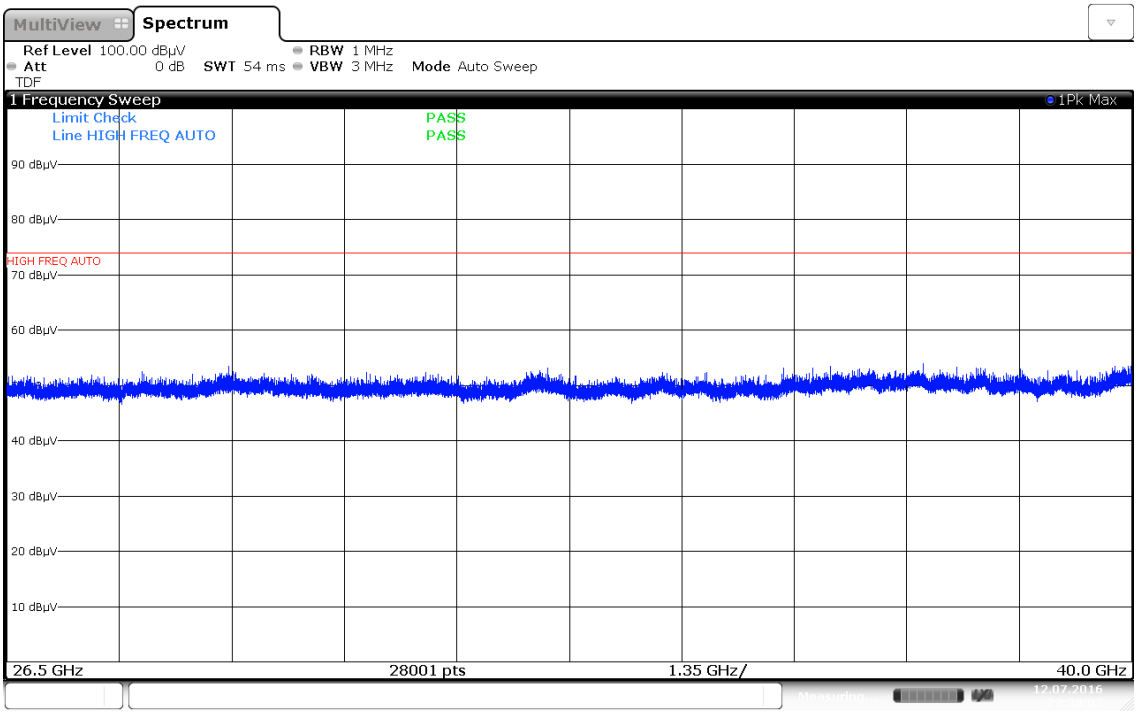
Plot 7-161. Radiated Spurious Plot above 18GHz (802.11a – Ant. Pol. H)



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



Plot 7-163. Radiated Spurious Plot above 18GHz (802.11a – Ant. Pol. V)



Plot 7-164. Radiated Spurious Plot above 18GHz (802.11a – Ant. Pol. V)

Primary Antenna 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 [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10360.00	Peak	H	-	-	-68.44	20.04	0.00	58.60	68.20	-9.60
*	15540.00	Average	H	-	-	-81.83	24.53	0.00	49.70	53.98	-4.28
*	15540.00	Peak	H	-	-	-67.32	24.53	0.00	64.21	73.98	-9.77
*	20720.00	Average	H	-	-	-114.41	44.39	-9.54	27.43	53.98	-26.55
*	20720.00	Peak	H	-	-	-101.85	44.39	-9.54	39.99	73.98	-33.99
	25900.00	Peak	H	-	-	-102.08	45.11	-9.54	40.49	68.20	-27.71

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 [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10400.00	Peak	H	-	-	-67.59	19.77	0.00	59.18	68.20	-9.02
*	15600.00	Average	H	-	-	-80.20	23.99	0.00	50.79	53.98	-3.19
*	15600.00	Peak	H	-	-	-67.35	23.99	0.00	63.64	73.98	-10.34
*	20800.00	Average	H	-	-	-114.78	44.39	-9.54	27.07	53.98	-26.91
*	20800.00	Peak	H	-	-	-101.71	44.39	-9.54	40.14	73.98	-33.84
	26000.00	Peak	H	-	-	-111.81	45.12	-9.54	30.76	68.20	-37.44

Table 7-29. Radiated Measurements

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

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10480.00	Peak	H	-	-	-68.14	21.01	0.00	59.87	68.20	-8.33
*	15720.00	Average	H	-	-	-82.01	24.78	0.00	49.77	53.98	-4.21
*	15720.00	Peak	H	-	-	-67.70	24.78	0.00	64.08	73.98	-9.90
*	20960.00	Average	H	-	-	-114.41	44.31	-9.54	27.36	53.98	-26.62
*	20960.00	Peak	H	-	-	-102.72	44.31	-9.54	39.05	73.98	-34.93
	26200.00	Peak	H	-	-	-101.95	45.01	-9.54	40.52	68.20	-27.68

Table 7-30. Radiated Measurements

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

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10520.00	Peak	H	-	-	-67.51	20.31	0.00	59.80	68.20	-8.40
*	15780.00	Average	H	-	-	-82.29	24.83	0.00	49.54	53.98	-4.44
*	15780.00	Peak	H	-	-	-67.44	24.83	0.00	64.39	73.98	-9.59
*	21040.00	Average	H	-	-	-114.22	44.29	-9.54	27.53	53.98	-26.45
*	21040.00	Peak	H	-	-	-102.04	44.29	-9.54	39.71	73.98	-34.27
	26300.00	Peak	H	-	-	-101.88	45.00	-9.54	40.57	68.20	-27.63

Table 7-31. Radiated Measurements

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

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10560.00	Peak	H	-	-	-68.16	20.15	0.00	58.99	68.20	-9.21
*	15840.00	Average	H	-	-	-82.31	25.00	0.00	49.69	53.98	-4.29
*	15840.00	Peak	H	-	-	-67.10	25.00	0.00	64.90	73.98	-9.08
*	21120.00	Average	H	-	-	-114.00	44.28	-9.54	27.73	53.98	-26.25
*	21120.00	Peak	H	-	-	-101.92	44.28	-9.54	39.81	73.98	-34.17
	26400.00	Peak	H	-	-	-100.91	45.02	-9.54	41.57	68.20	-26.63

Table 7-32. Radiated Measurements

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

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	10640.00	Average	H	-	-	-80.01	20.67	0.00	47.66	53.98	-6.32
*	10640.00	Peak	H	-	-	-68.14	20.67	0.00	59.53	73.98	-14.45
*	15960.00	Average	H	-	-	-82.13	24.80	0.00	49.67	53.98	-4.31
*	15960.00	Peak	H	-	-	-66.81	24.80	0.00	64.99	73.98	-8.99
*	21280.00	Average	H	-	-	-113.99	44.26	-9.54	27.73	53.98	-26.24
*	21280.00	Peak	H	-	-	-101.13	44.26	-9.54	40.59	73.98	-33.38
	26600.00	Peak	H	-	-	-102.47	47.61	-9.54	42.59	68.20	-25.61

Table 7-33. Radiated Measurements

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

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11000.00	Average	H	-	-	-79.80	20.30	0.00	47.50	53.98	-6.47
*	11000.00	Peak	H	-	-	-67.44	20.30	0.00	59.86	73.98	-14.11
	16500.00	Peak	H	-	-	-68.29	26.48	0.00	65.19	68.20	-3.01
	22000.00	Peak	H	-	-	-101.60	44.50	-9.54	40.36	68.20	-27.84
	27500.00	Peak	H	-	-	-102.02	47.97	-9.54	43.41	68.20	-24.79

Table 7-34. Radiated Measurements

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

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11160.00	Average	H	-	-	-79.69	20.41	0.00	47.72	53.98	-6.26
*	11160.00	Peak	H	-	-	-67.23	20.41	0.00	60.18	73.98	-13.80
	16740.00	Peak	H	-	-	-68.42	26.49	0.00	65.07	68.20	-3.13
*	22320.00	Average	H	-	-	-114.07	44.56	-9.54	27.95	53.98	-26.03
*	22320.00	Peak	H	-	-	-102.60	44.56	-9.54	39.42	73.98	-34.56
	27900.00	Peak	H	-	-	-101.50	48.08	-9.54	44.04	68.20	-24.16

Table 7-35. Radiated Measurements

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

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11440.00	Average	H	-	-	-79.97	21.62	0.00	48.65	53.98	-5.33
*	11440.00	Peak	H	-	-	-68.79	21.62	0.00	59.83	73.98	-14.15
	17160.00	Peak	H	-	-	-69.24	26.92	0.00	64.68	68.20	-3.52
*	22880.00	Average	H	-	-	-114.18	44.56	-9.54	27.84	53.98	-26.14
*	22880.00	Peak	H	-	-	-101.67	44.56	-9.54	40.35	73.98	-33.63
	28600.00	Peak	H	-	-	-102.74	48.32	-9.54	43.04	68.20	-25.16

Table 7-36. Radiated Measurements

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

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11490.00	Average	H	-	-	-79.80	21.30	0.00	48.50	53.98	-5.48
*	11490.00	Peak	H	-	-	-66.58	21.30	0.00	61.72	73.98	-12.26
	17235.00	Peak	H	-	-	-68.56	26.60	0.00	65.04	68.20	-3.16
*	22980.00	Average	H	-	-	-113.70	44.68	-9.54	28.44	53.98	-25.54
*	22980.00	Peak	H	-	-	-101.43	44.68	-9.54	40.71	73.98	-33.27
	28725.00	Peak	H	-	-	-101.35	48.26	-9.54	44.37	68.20	-23.83

Table 7-37. Radiated Measurements

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

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11570.00	Average	H	-	-	-80.23	21.72	0.00	48.49	53.98	-5.49
*	11570.00	Peak	H	-	-	-68.63	21.72	0.00	60.09	73.98	-13.89
	17355.00	Peak	H	-	-	-68.84	26.68	0.00	64.84	68.20	-3.36
	23140.00	Peak	H	-	-	-101.11	44.75	-9.54	41.10	68.20	-27.10
	28925.00	Peak	H	-	-	-101.12	48.29	-9.54	44.63	68.20	-23.57

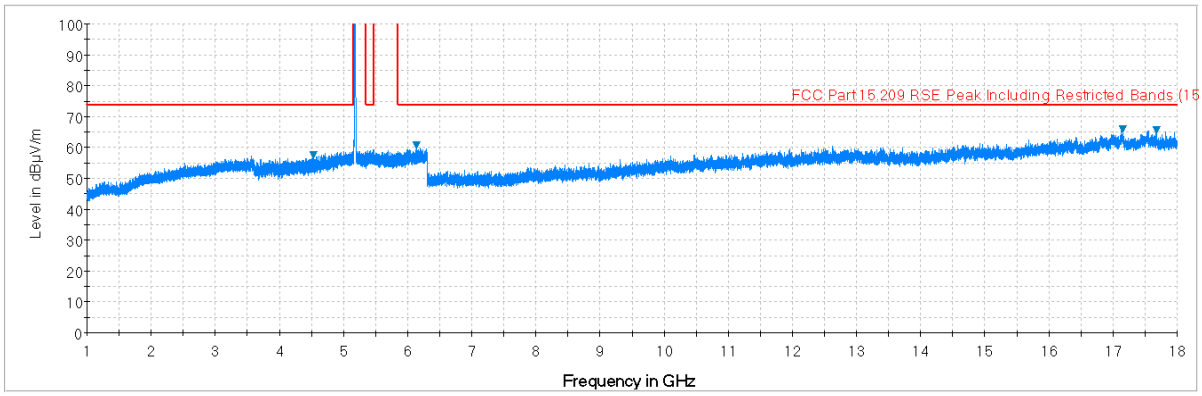
Table 7-38. Radiated Measurements

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

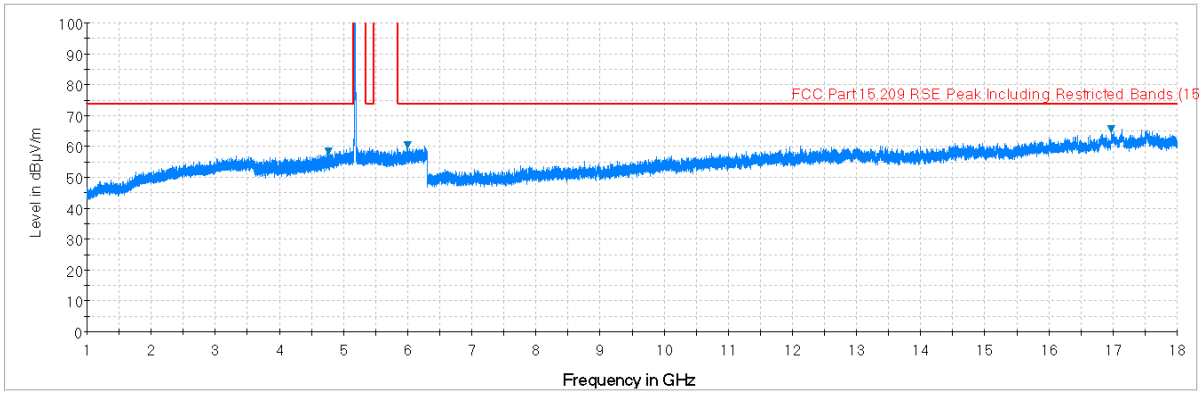
	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11650.00	Average	H	-	-	-80.19	22.20	0.00	49.01	53.98	-4.97
*	11650.00	Peak	H	-	-	-67.54	22.20	0.00	61.66	73.98	-12.32
	17475.00	Peak	H	-	-	-69.57	27.55	0.00	64.98	68.20	-3.22
	23300.00	Peak	H	-	-	-102.15	44.75	-9.54	40.06	68.20	-28.14
	29125.00	Peak	H	-	-	-102.52	48.28	-9.54	43.22	68.20	-24.98

Table 7-39. Radiated Measurements

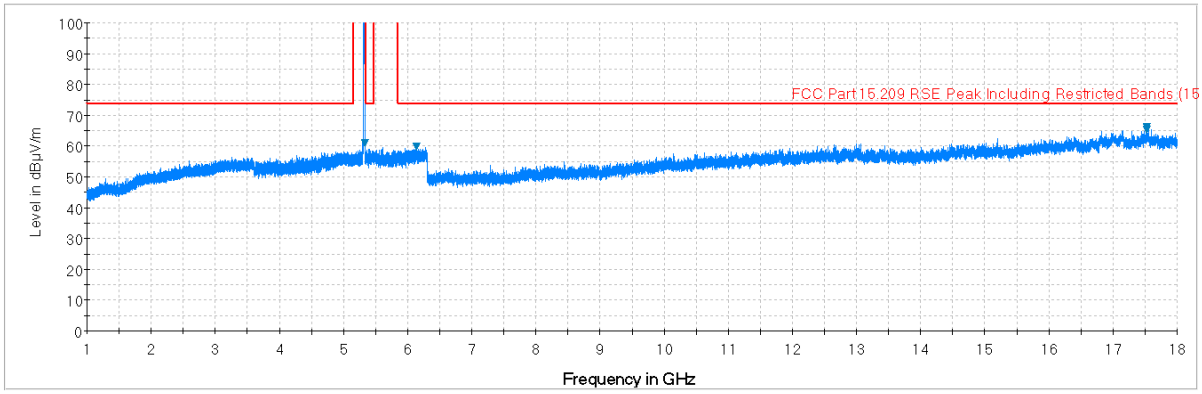
7.7.2 Secondary Antenna Radiated Spurious Emission Measurements



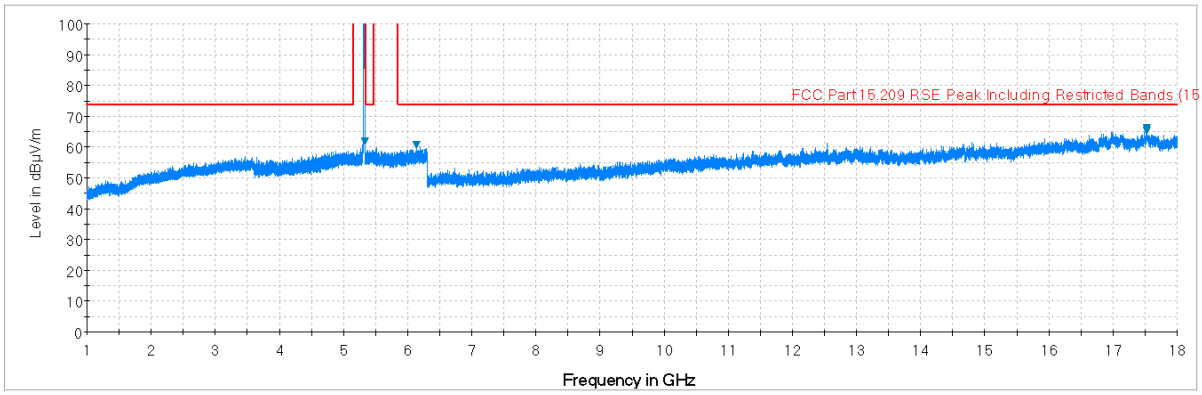
Plot 7-165. Radiated Spurious Plot above 1GHz (802.11a – U1 Ch. 40, Ant. Pol. H)



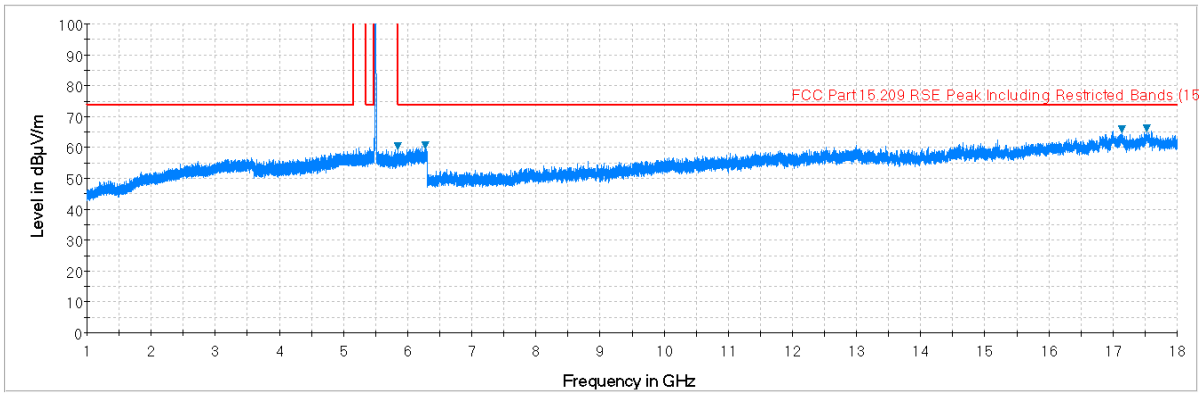
Plot 7-166. Radiated Spurious Plot above 1GHz (802.11a – U1 Ch. 40, Ant. Pol. V)



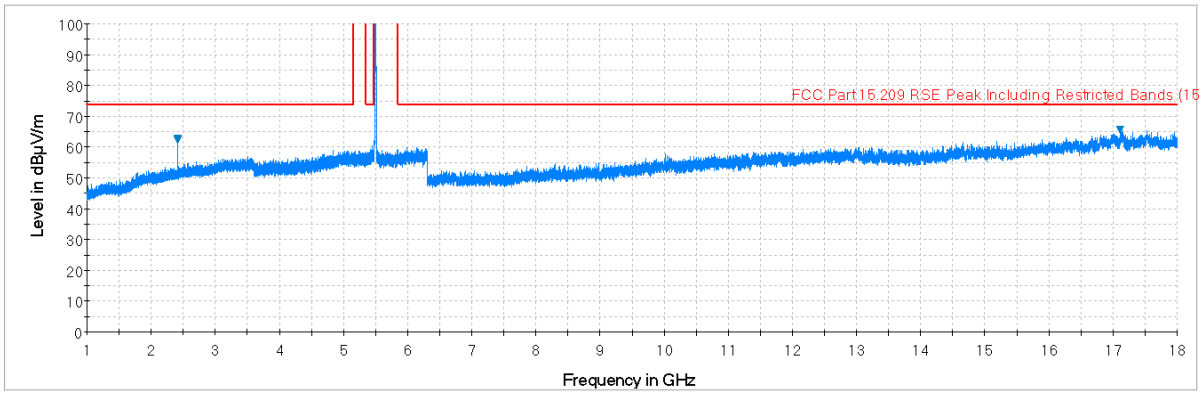
Plot 7-167. Radiated Spurious Plot above 1GHz (802.11a – U2A Ch. 56, Ant. Pol. H)



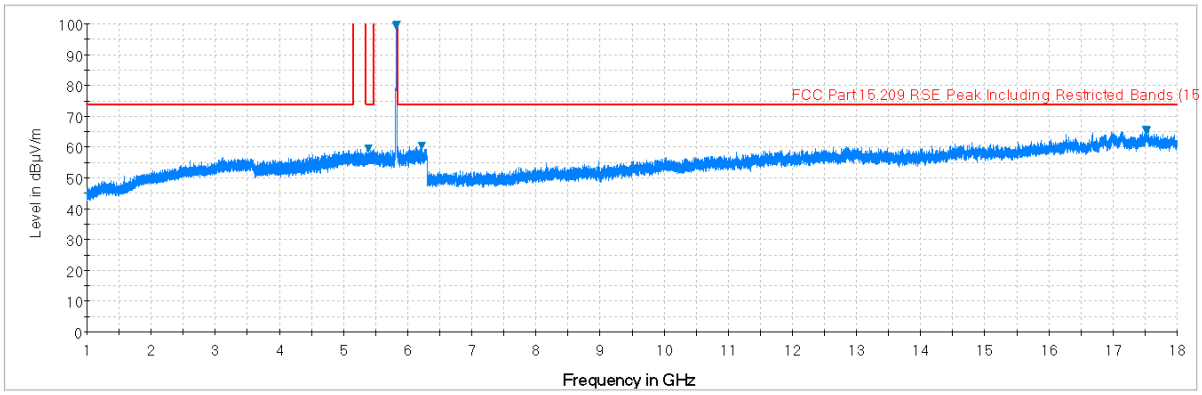
Plot 7-168. Radiated Spurious Plot above 1GHz (802.11a – U2A Ch. 56, Ant. Pol. V)



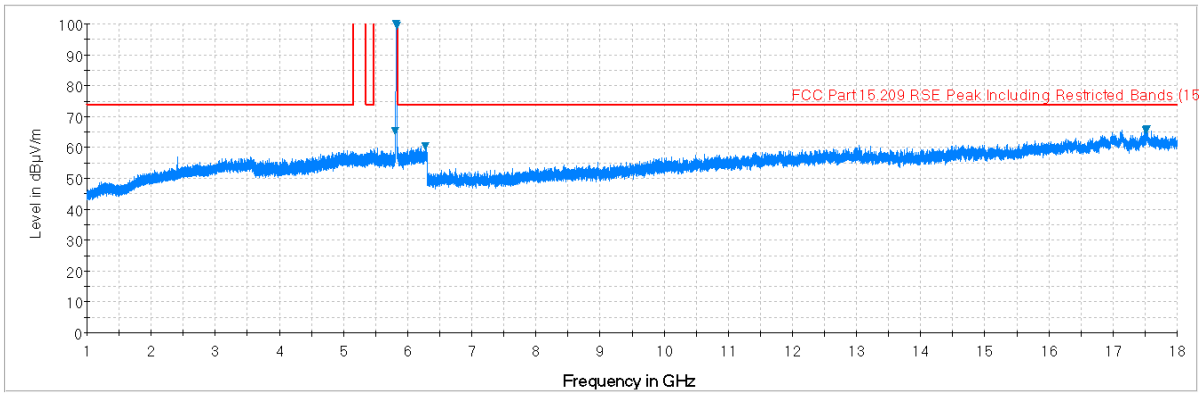
Plot 7-169. Radiated Spurious Plot above 1GHz (802.11a – U2C Ch. 116, Ant. Pol. H)



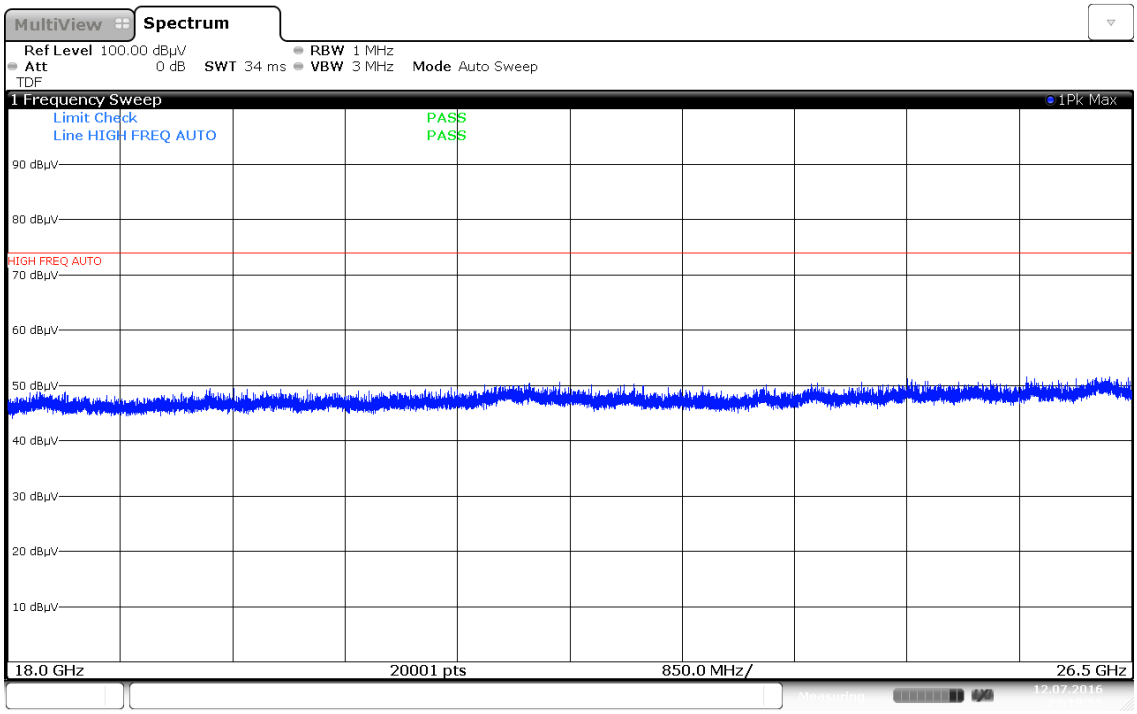
Plot 7-170. Radiated Spurious Plot above 1GHz (802.11a – U2C Ch. 116, Ant. Pol. V)



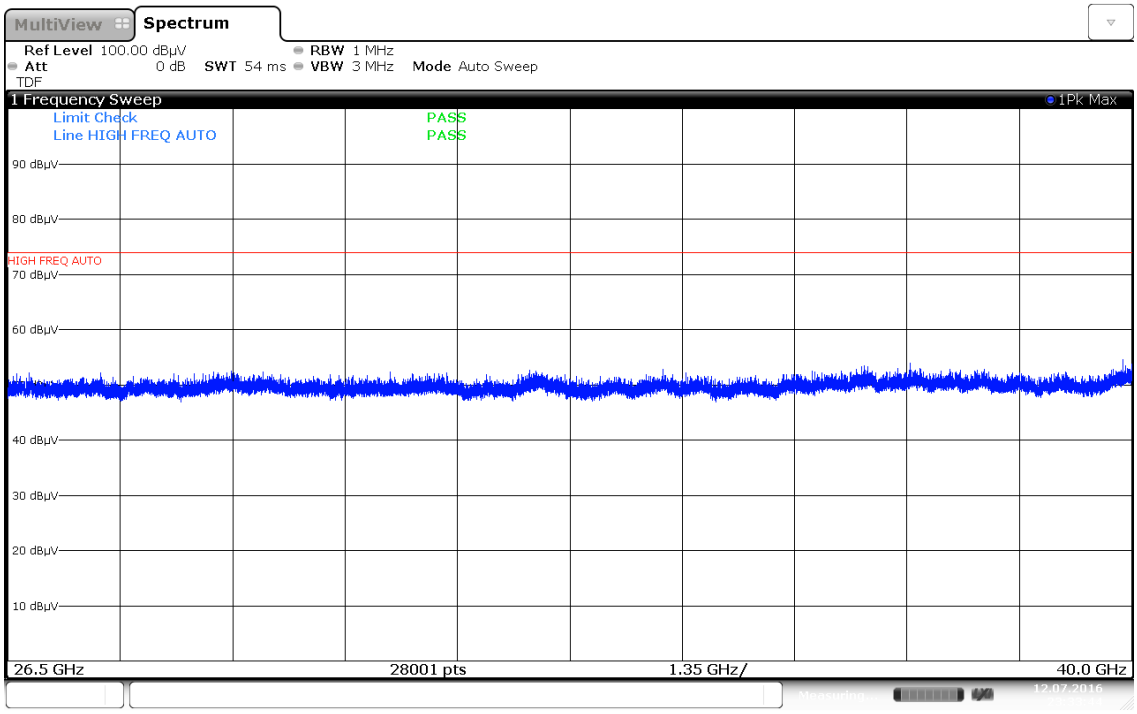
Plot 7-171. Radiated Spurious Plot above 1GHz (802.11a – U3 Ch. 157, Ant. Pol. H)



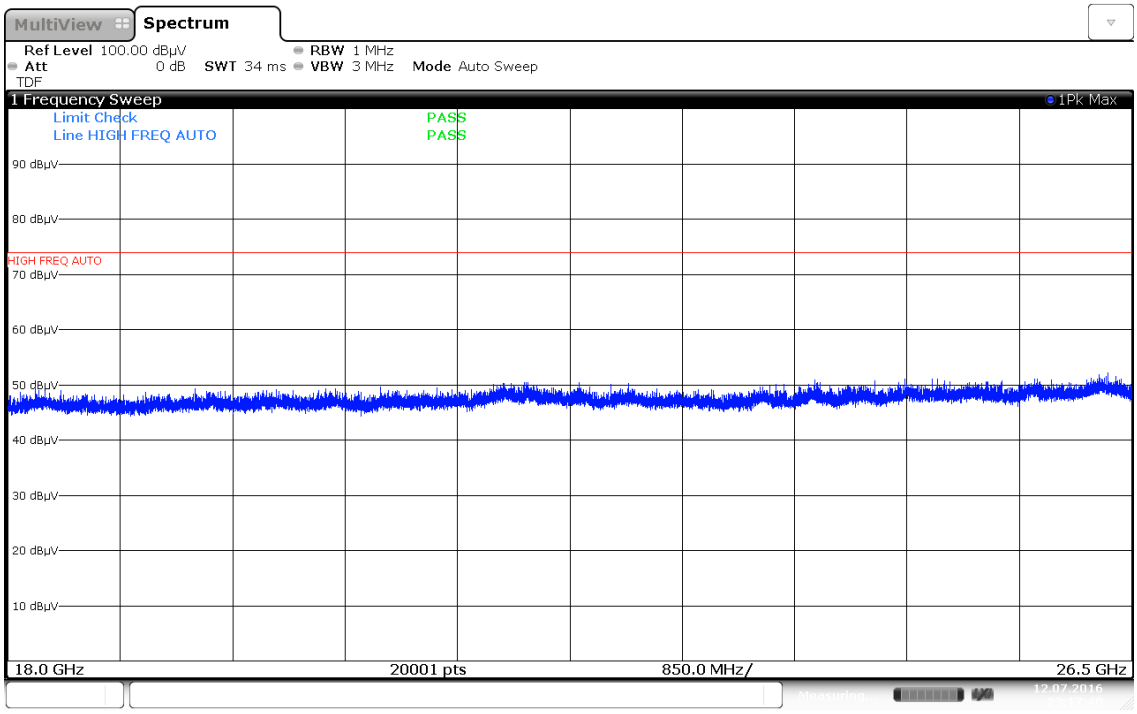
Plot 7-172. Radiated Spurious Plot above 1GHz (802.11a – U3 Ch. 157, Ant. Pol. V)



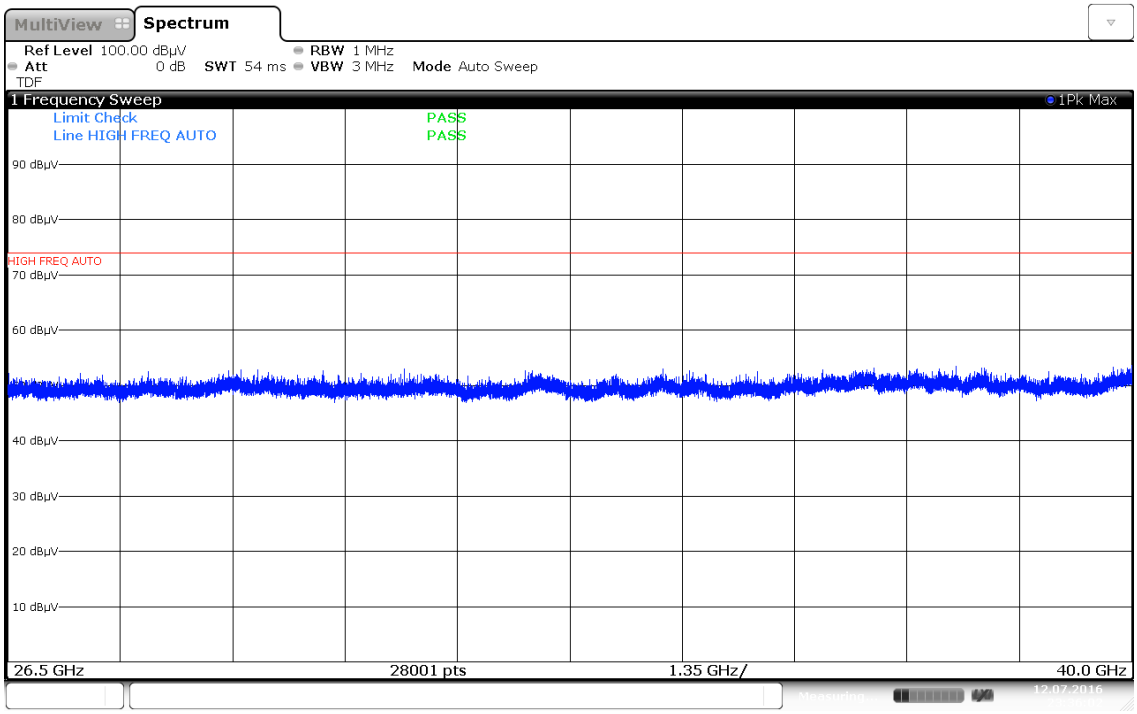
Plot 7-173. Radiated Spurious Plot above 18GHz (802.11a – Ant. Pol. H)



Plot 7-174. Radiated Spurious Plot above 18GHz (802.11a – Ant. Pol. H)



Plot 7-175. Radiated Spurious Plot above 18GHz (802.11a – Ant. Pol. V)



Plot 7-176. Radiated Spurious Plot above 18GHz (802.11a – Ant. Pol. V)

Secondary Antenna 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 [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10360.00	Peak	H	-	-	-68.30	20.04	0.00	58.74	68.20	-9.46
*	15540.00	Average	H	-	-	-81.20	24.53	0.00	50.33	53.98	-3.65
*	15540.00	Peak	H	-	-	-67.26	24.53	0.00	64.27	73.98	-9.71
*	20720.00	Average	H	-	-	-114.39	44.39	-9.54	27.45	53.98	-26.53
*	20720.00	Peak	H	-	-	-102.06	44.39	-9.54	39.78	73.98	-34.20
	25900.00	Peak	H	-	-	-102.11	45.11	-9.54	40.46	68.20	-27.74

Table 7-40. 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 [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10400.00	Peak	H	-	-	-67.53	19.77	0.00	59.24	68.20	-8.96
*	15600.00	Average	H	-	-	-80.41	23.99	0.00	50.58	53.98	-3.40
*	15600.00	Peak	H	-	-	-67.33	23.99	0.00	63.66	73.98	-10.32
*	20800.00	Average	H	-	-	-114.46	44.39	-9.54	27.39	53.98	-26.59
*	20800.00	Peak	H	-	-	-102.33	44.39	-9.54	39.52	73.98	-34.46
	26000.00	Peak	H	-	-	-101.67	45.12	-9.54	40.90	68.20	-27.30

Table 7-41. 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 [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10480.00	Peak	H	-	-	-68.03	21.01	0.00	59.98	68.20	-8.22
*	15720.00	Average	H	-	-	-81.45	24.78	0.00	50.33	53.98	-3.65
*	15720.00	Peak	H	-	-	-67.92	24.78	0.00	63.86	73.98	-10.12
*	20960.00	Average	H	-	-	-114.92	44.31	-9.54	26.85	53.98	-27.13
*	20960.00	Peak	H	-	-	-102.71	44.31	-9.54	39.06	73.98	-34.92
	26200.00	Peak	H	-	-	-101.22	45.01	-9.54	41.25	68.20	-26.95

Table 7-42. Radiated Measurements

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

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10520.00	Peak	H	-	-	-68.67	20.31	0.00	58.64	68.20	-9.56
*	15780.00	Average	H	-	-	-81.61	24.83	0.00	50.22	53.98	-3.76
*	15780.00	Peak	H	-	-	-68.12	24.83	0.00	63.71	73.98	-10.27
*	21040.00	Average	H	-	-	-114.20	44.29	-9.54	27.55	53.98	-26.43
*	21040.00	Peak	H	-	-	-101.28	44.29	-9.54	40.47	73.98	-33.51
	26300.00	Peak	H	-	-	-101.56	45.00	-9.54	40.89	68.20	-27.31

Table 7-43. 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 [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10560.00	Peak	H	-	-	-68.90	20.15	0.00	58.25	68.20	-9.95
*	15840.00	Average	H	-	-	-81.51	25.00	0.00	50.49	53.98	-3.49
*	15840.00	Peak	H	-	-	-67.98	25.00	0.00	64.02	73.98	-9.96
*	21120.00	Average	H	-	-	-113.61	44.28	-9.54	28.12	53.98	-25.86
*	21120.00	Peak	H	-	-	-101.12	44.28	-9.54	40.61	73.98	-33.37
	26400.00	Peak	H	-	-	-101.41	45.02	-9.54	41.07	68.20	-27.13

Table 7-44. 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 [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	10640.00	Average	H	-	-	-79.84	20.67	0.00	47.83	53.98	-6.15
*	10640.00	Peak	H	-	-	-68.61	20.67	0.00	59.06	73.98	-14.92
*	15960.00	Average	H	-	-	-81.49	24.80	0.00	50.31	53.98	-3.67
*	15960.00	Peak	H	-	-	-67.54	24.80	0.00	64.26	73.98	-9.72
*	21280.00	Average	H	-	-	-114.09	44.26	-9.54	27.63	53.98	-26.34
*	21280.00	Peak	H	-	-	-101.32	44.26	-9.54	40.40	73.98	-33.57
	26600.00	Peak	H	-	-	-102.30	47.61	-9.54	42.76	68.20	-25.44

Table 7-45. Radiated Measurements

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

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11000.00	Average	H	-	-	-79.39	20.30	0.00	47.91	53.98	-6.06
*	11000.00	Peak	H	-	-	-66.57	20.30	0.00	60.73	73.98	-13.24
	16500.00	Peak	H	-	-	-68.39	26.48	0.00	65.09	68.20	-3.11
	22000.00	Peak	H	-	-	-100.87	44.50	-9.54	41.09	68.20	-27.11
	27500.00	Peak	H	-	-	-102.41	47.97	-9.54	43.02	68.20	-25.18

Table 7-46. Radiated Measurements

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

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11160.00	Average	H	-	-	-79.77	20.41	0.00	47.64	53.98	-6.34
*	11160.00	Peak	H	-	-	-67.64	20.41	0.00	59.77	73.98	-14.21
	16740.00	Peak	H	-	-	-68.64	26.49	0.00	64.85	68.20	-3.35
*	22320.00	Average	H	-	-	-114.28	44.56	-9.54	27.74	53.98	-26.24
*	22320.00	Peak	H	-	-	-102.59	44.56	-9.54	39.43	73.98	-34.55
	27900.00	Peak	H	-	-	-102.02	48.08	-9.54	43.52	68.20	-24.68

Table 7-47. 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 [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11440.00	Average	H	-	-	-79.89	21.62	0.00	48.73	53.98	-5.25
*	11440.00	Peak	H	-	-	-68.27	21.62	0.00	60.35	73.98	-13.63
	17160.00	Peak	H	-	-	-68.96	26.92	0.00	64.96	68.20	-3.24
*	22880.00	Average	H	-	-	-114.29	44.56	-9.54	27.73	53.98	-26.25
*	22880.00	Peak	H	-	-	-102.39	44.56	-9.54	39.63	73.98	-34.35
	28600.00	Peak	H	-	-	-102.24	48.32	-9.54	43.54	68.20	-24.66

Table 7-48. Radiated Measurements

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

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11490.00	Average	H	-	-	-79.59	21.30	0.00	48.71	53.98	-5.27
*	11490.00	Peak	H	-	-	-68.06	21.30	0.00	60.24	73.98	-13.74
	17235.00	Peak	H	-	-	-68.61	26.60	0.00	64.99	68.20	-3.21
*	22980.00	Average	H	-	-	-113.82	44.68	-9.54	28.32	53.98	-25.66
*	22980.00	Peak	H	-	-	-101.07	44.68	-9.54	41.07	73.98	-32.91
	28725.00	Peak	H	-	-	-101.89	48.26	-9.54	43.83	68.20	-24.37

Table 7-49. 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 [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11570.00	Average	H	-	-	-80.36	21.72	0.00	48.36	53.98	-5.62
*	11570.00	Peak	H	-	-	-68.83	21.72	0.00	59.89	73.98	-14.09
	17355.00	Peak	H	-	-	-68.66	26.68	0.00	65.02	68.20	-3.18
	23140.00	Peak	H	-	-	-101.74	44.75	-9.54	40.47	68.20	-27.73
	28925.00	Peak	H	-	-	-100.73	48.29	-9.54	45.02	68.20	-23.18

Table 7-50. Radiated Measurements

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

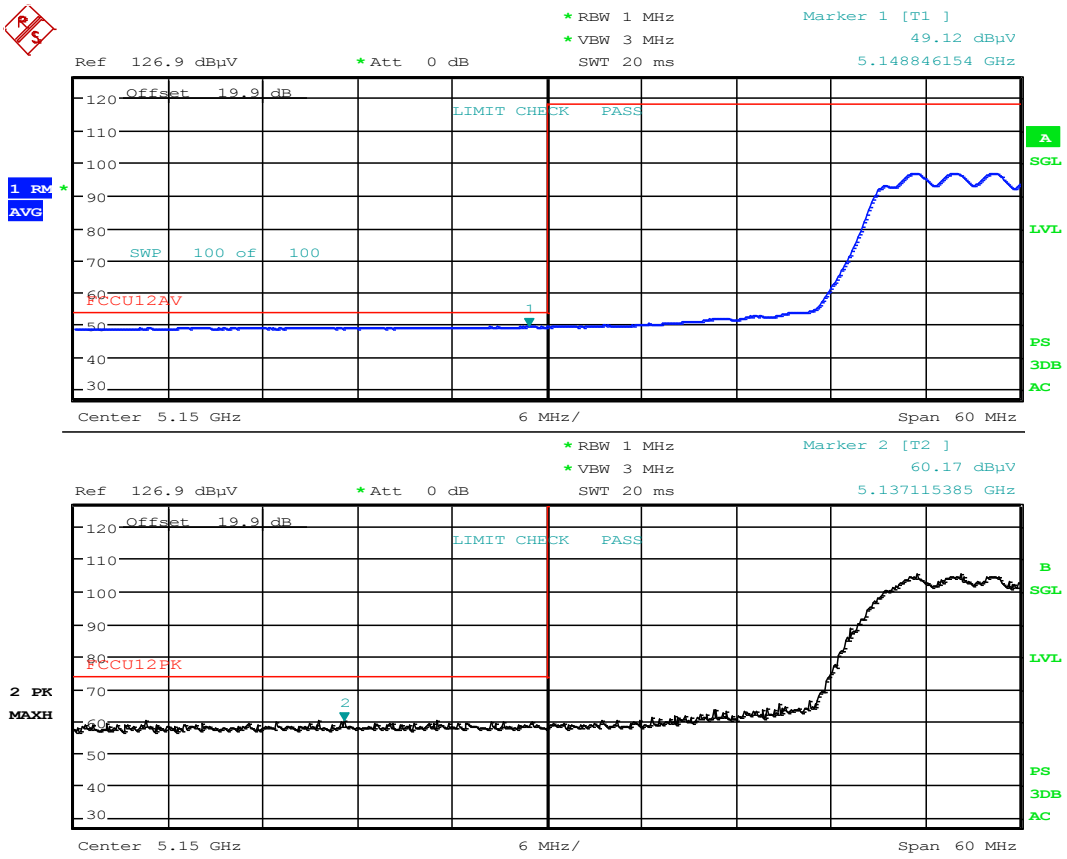
	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11650.00	Average	H	-	-	-80.03	22.20	0.00	49.17	53.98	-4.81
*	11650.00	Peak	H	-	-	-67.70	22.20	0.00	61.50	73.98	-12.48
	17475.00	Peak	H	-	-	-69.56	27.55	0.00	64.99	68.20	-3.21
	23300.00	Peak	H	-	-	-102.51	44.75	-9.54	39.70	68.20	-28.50
	29125.00	Peak	H	-	-	-101.78	48.28	-9.54	43.96	68.20	-24.24

Table 7-51. Radiated Measurements

7.7.3 Primary Antenna Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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



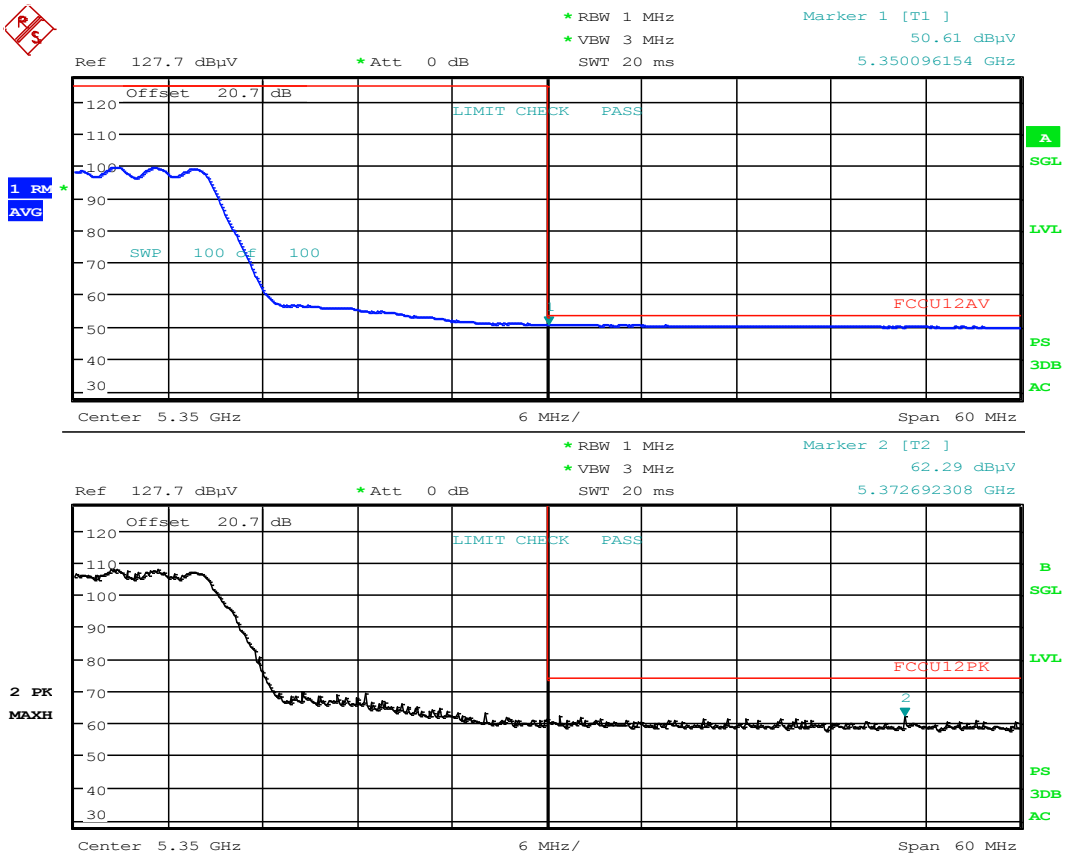
Date: 12.JUL.2016 10:01:59

Plot 7-177. Radiated Restricted Lower Band Edge Plot

Primary Antenna Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

Worst Case Mode:	802.11n
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5320MHz
Channel:	64



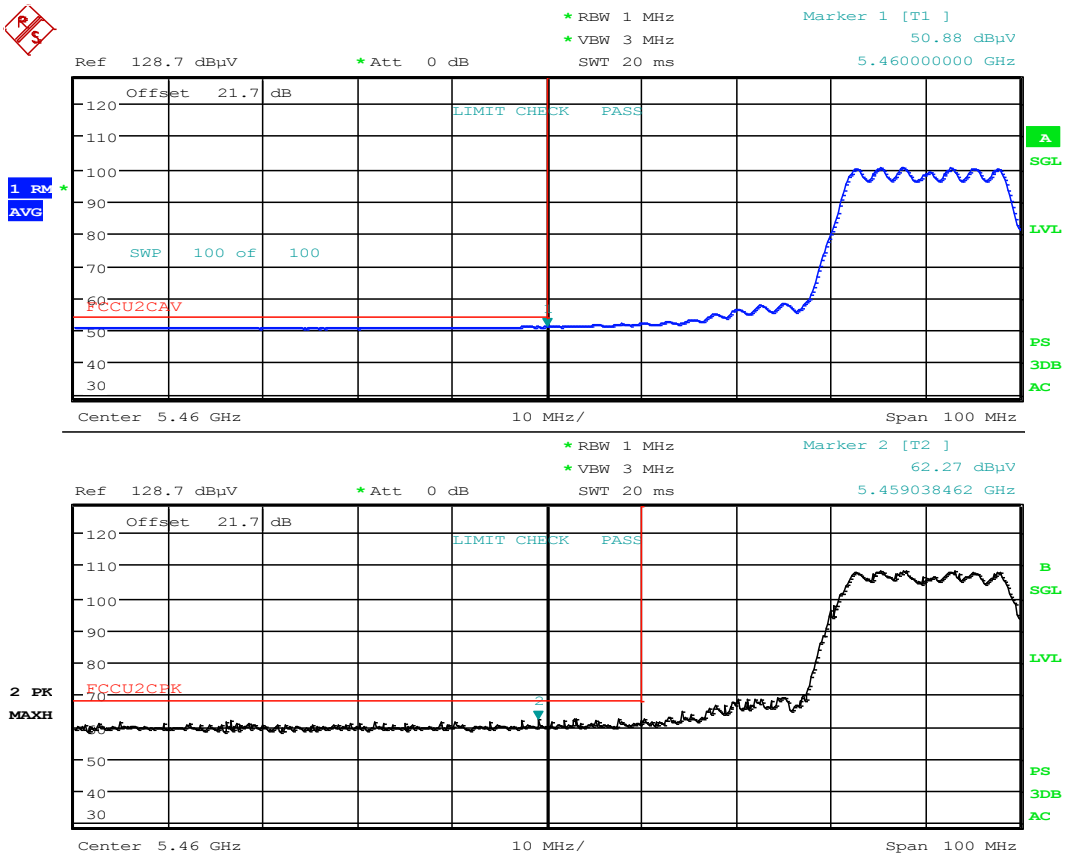
Date: 12.JUL.2016 10:17:00

Plot 7-178. Radiated Restricted Upper Band Edge Plot

Primary Antenna Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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



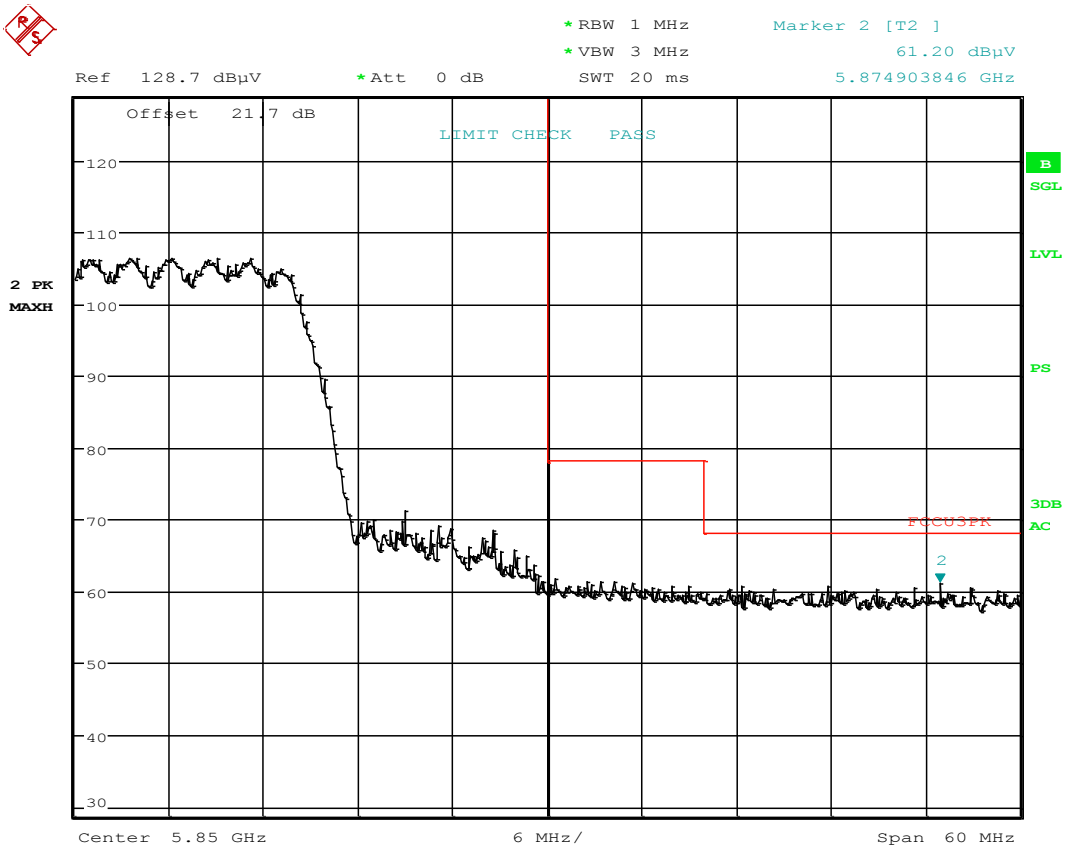
Date: 12.JUL.2016 10:21:38

Plot 7-179. Radiated Restricted Lower Band Edge Plot

Primary Antenna 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



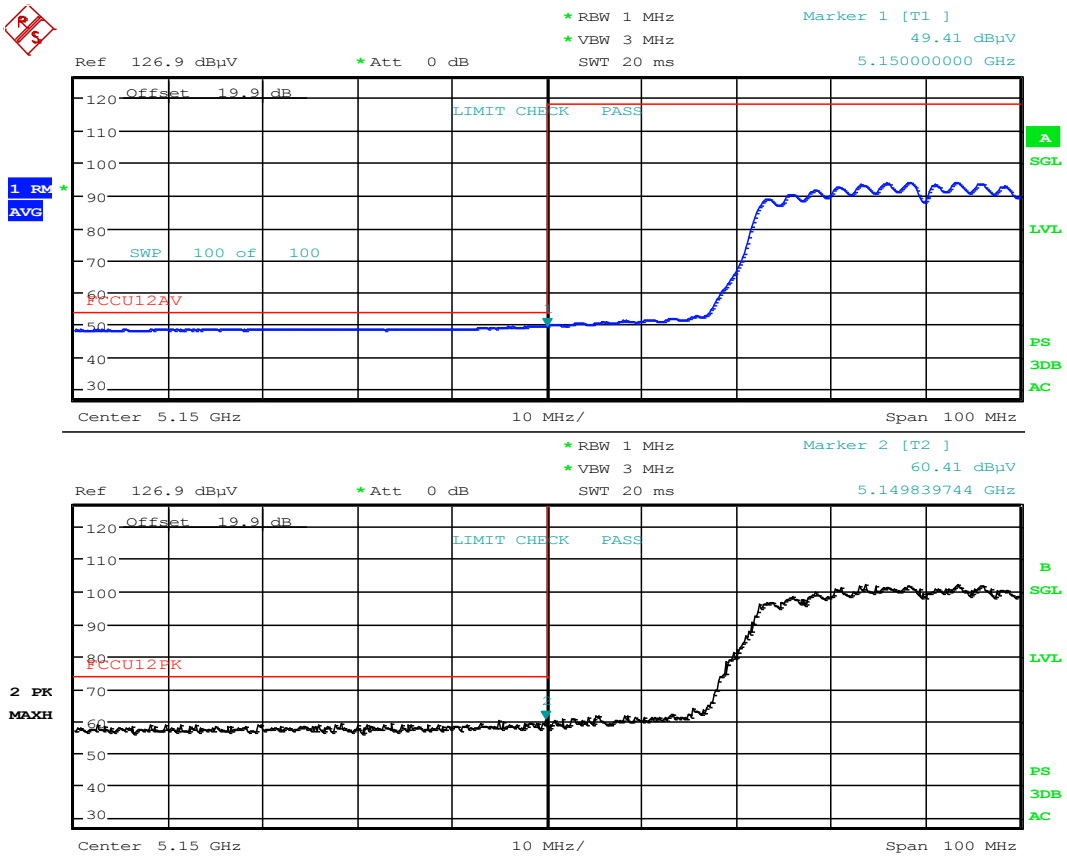
Date: 12.JUL.2016 10:34:10

Plot 7-180. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

7.7.4 Primary Antenna 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



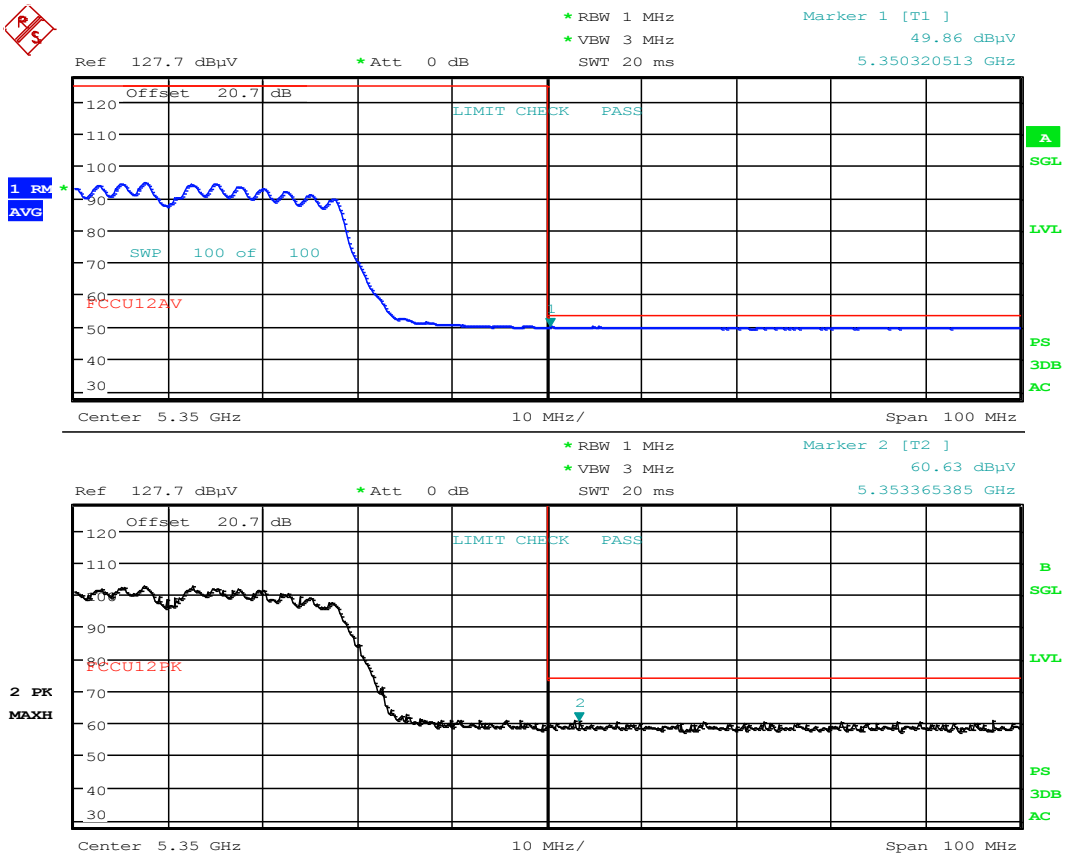
Date: 12.JUL.2016 10:38:06

Plot 7-181. Radiated Restricted Lower Band Edge Plot

Primary Antenna 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



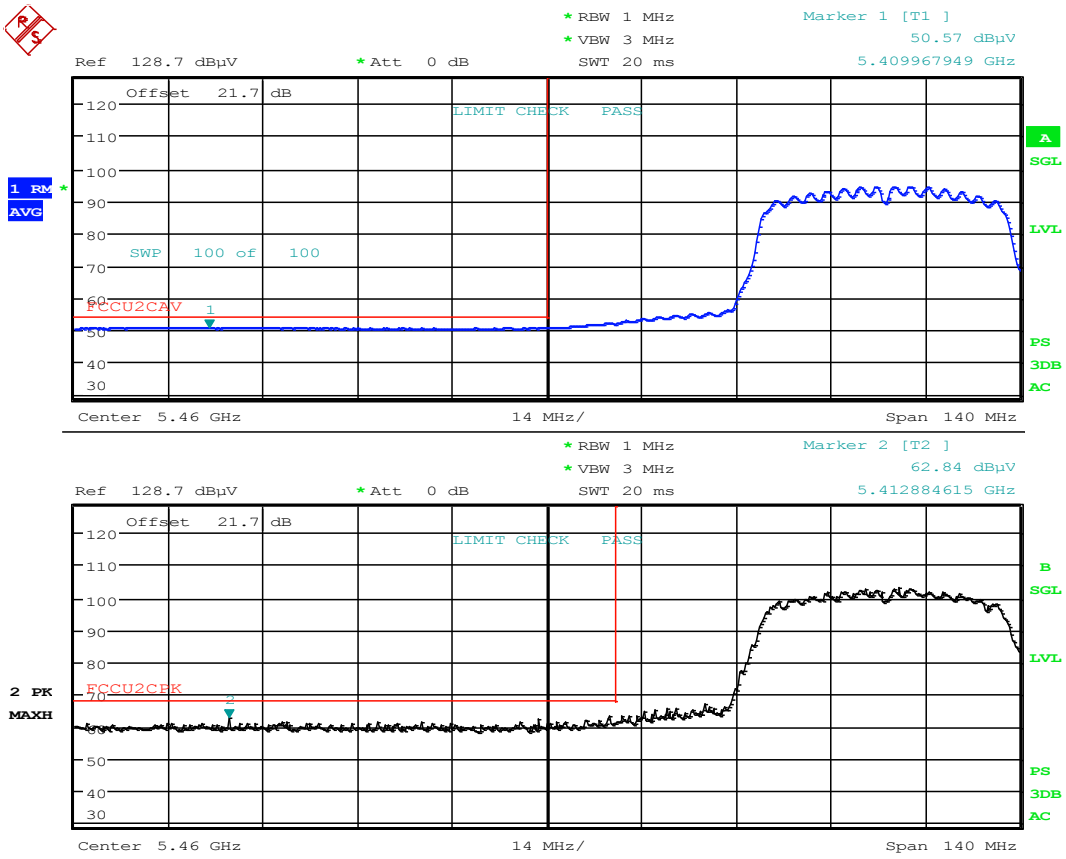
Date: 12.JUL.2016 10:50:45

Plot 7-182. Radiated Restricted Upper Band Edge Plot

Primary Antenna 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



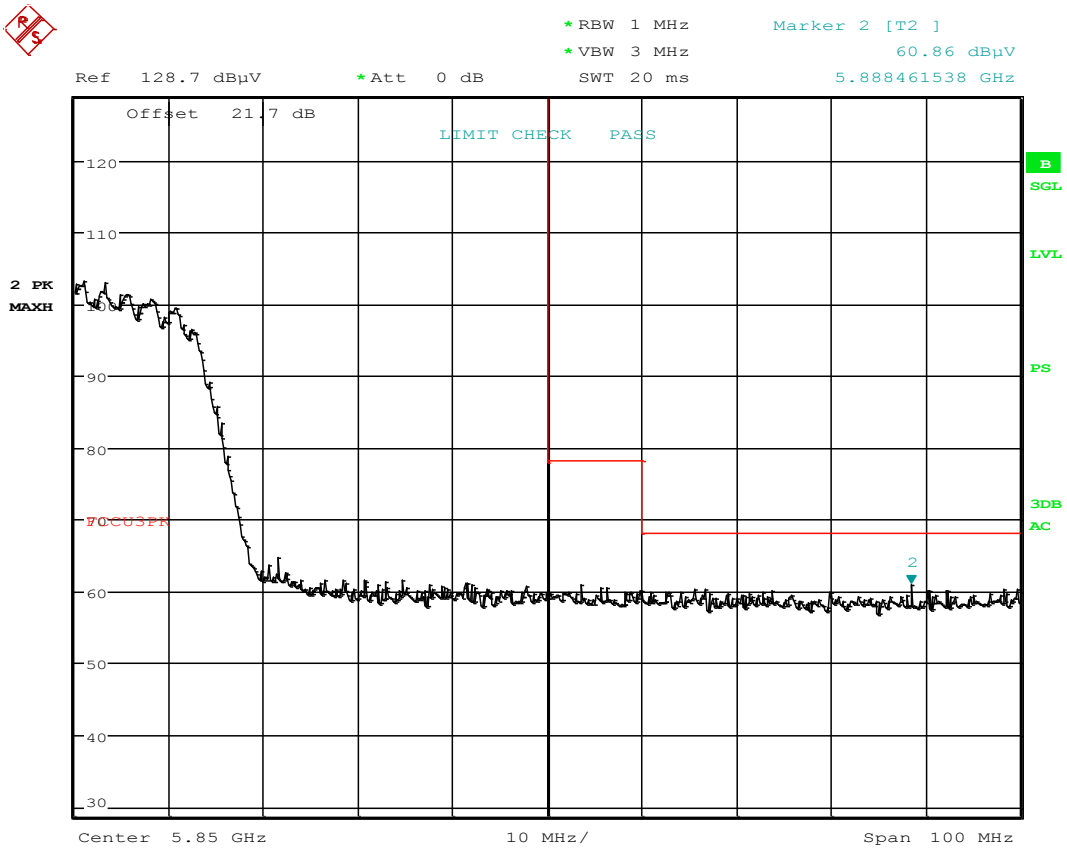
Date: 12.JUL.2016 10:54:37

Plot 7-183. Radiated Restricted Lower Band Edge Plot

Primary Antenna 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



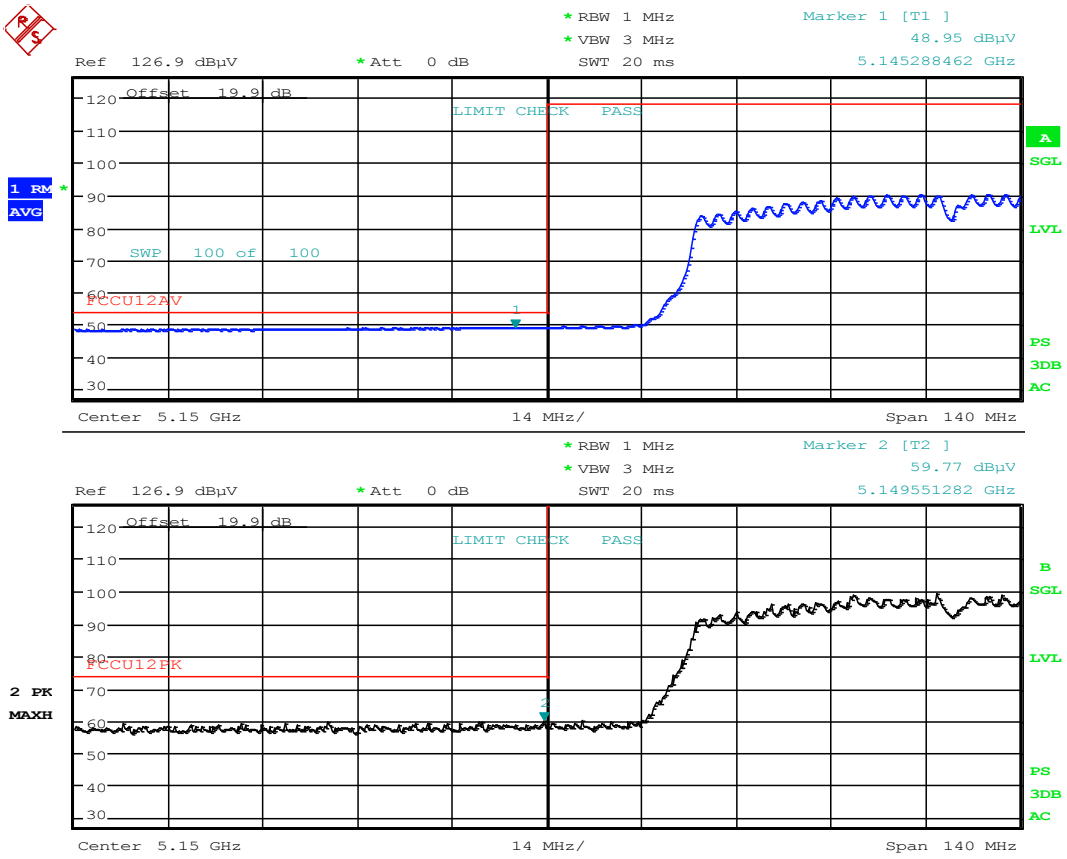
Date: 12.JUL.2016 10:59:15

Plot 7-184. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

7.7.5 Primary Antenna Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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



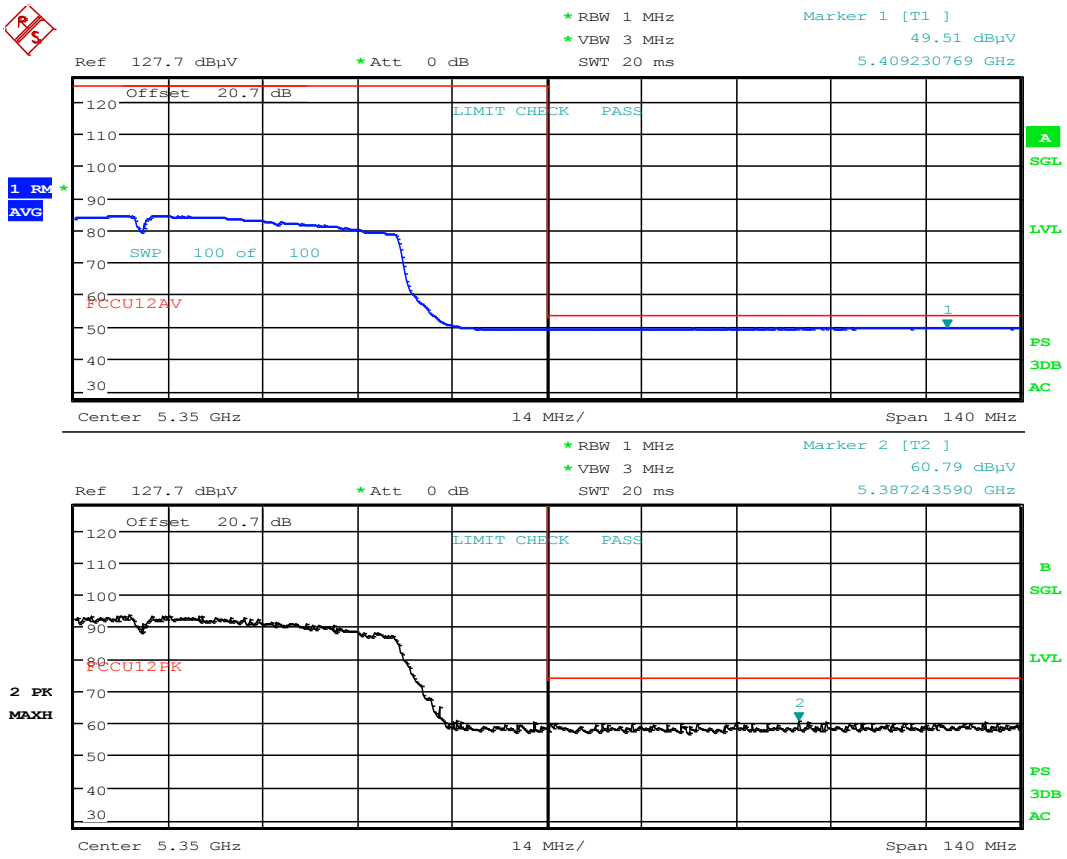
Date: 12.JUL.2016 11:04:01

Plot 7-185. Radiated Restricted Lower Band Edge Plot

Primary Antenna 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



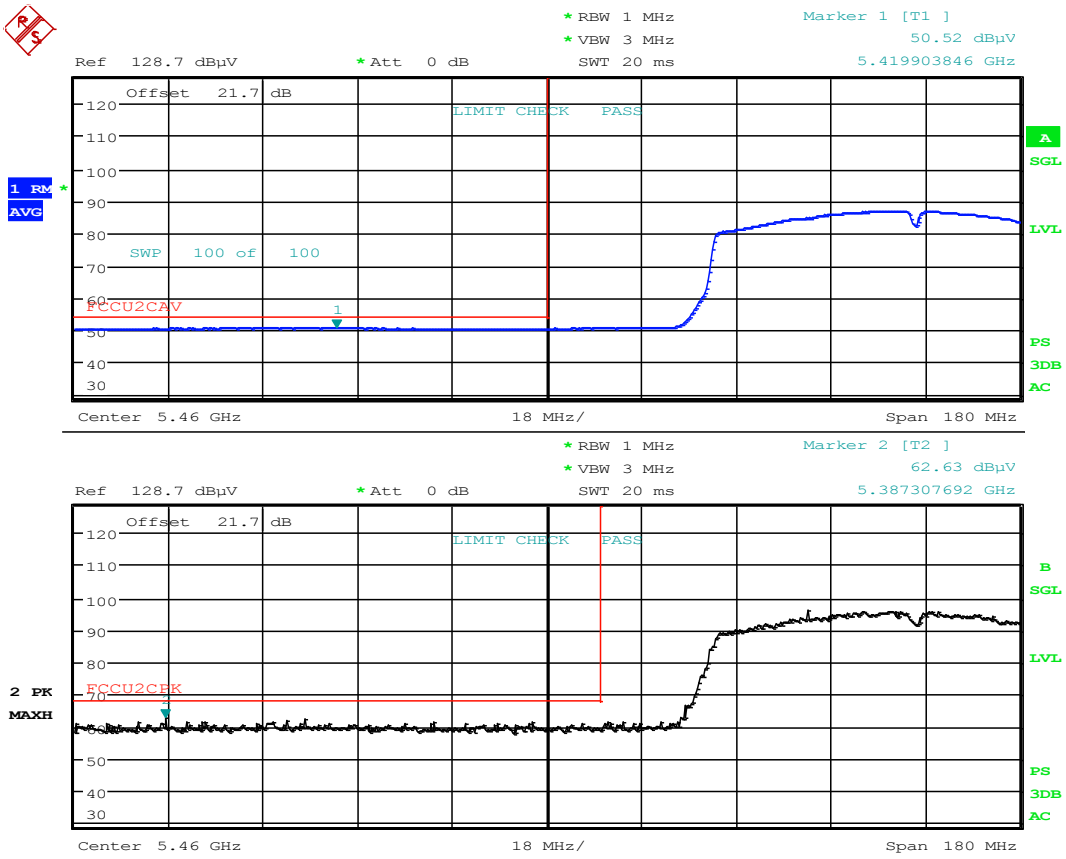
Date: 12.JUL.2016 11:21:49

Plot 7-186. Radiated Restricted Upper Band Edge Plot

Primary Antenna 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



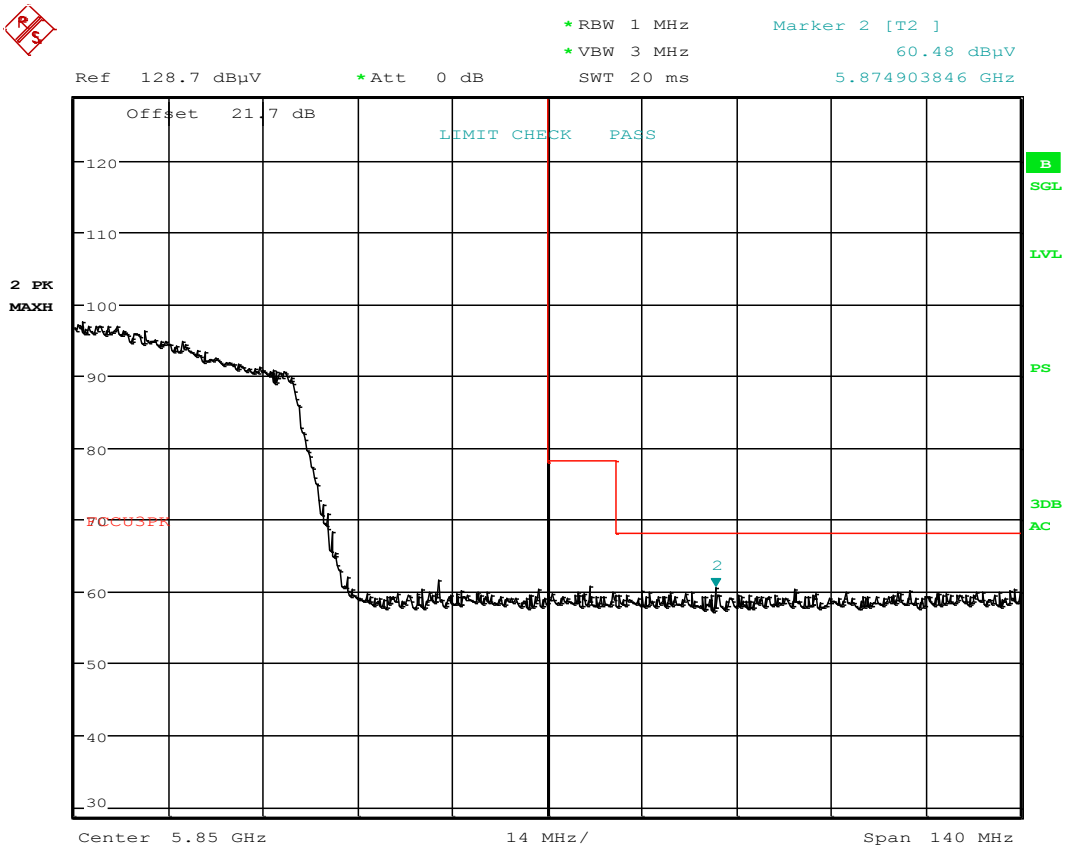
Date: 12.JUL.2016 11:25:26

Plot 7-187. Radiated Restricted Lower Band Edge Plot

Primary Antenna 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



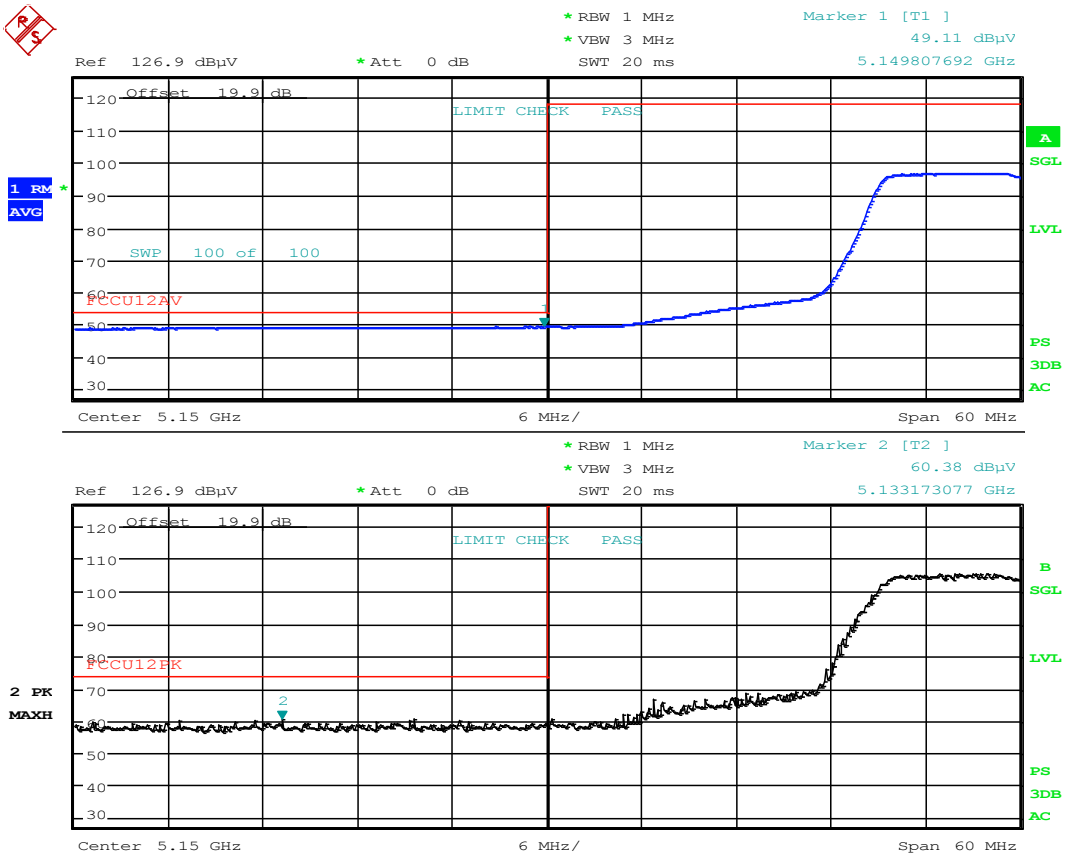
Date: 12.JUL.2016 11:29:29

Plot 7-188. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

7.7.6 Secondary Antenna Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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



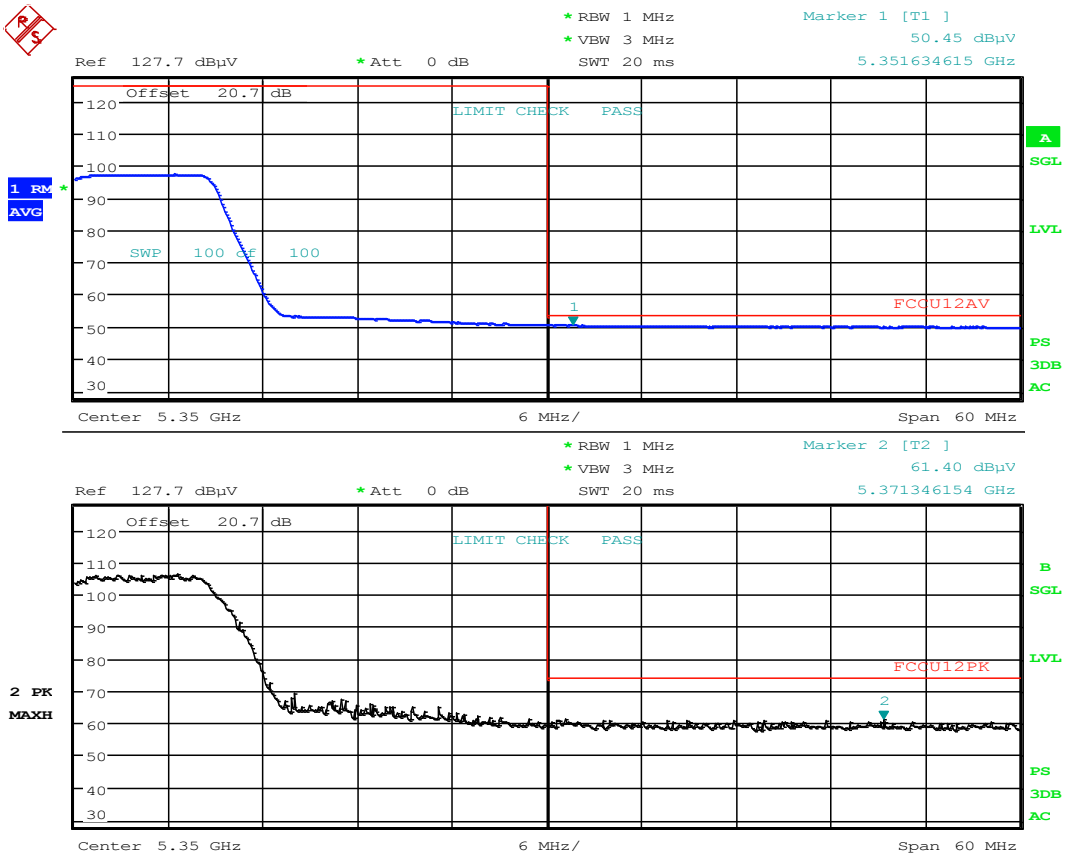
Date: 12.JUL.2016 11:41:37

Plot 7-189. Radiated Restricted Lower Band Edge Plot

Secondary Antenna Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

Worst Case Mode:	802.11ac
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5320MHz
Channel:	64



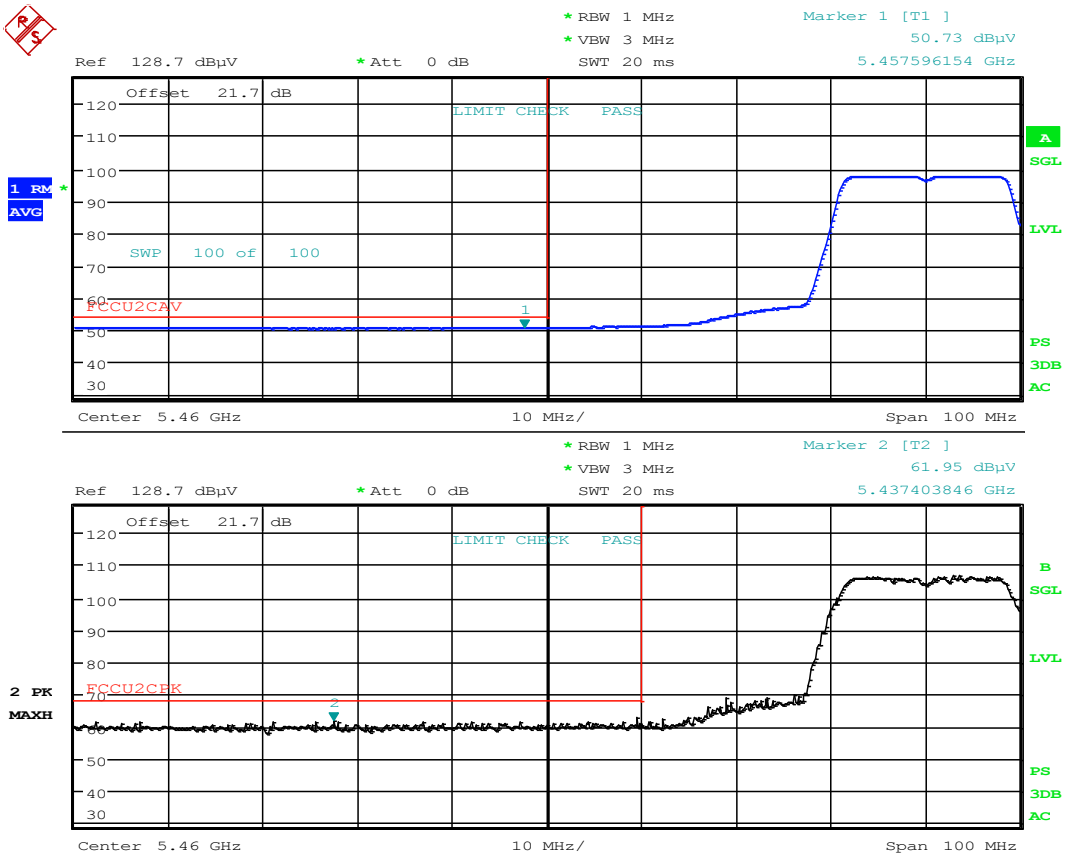
Date: 12.JUL.2016 11:52:14

Plot 7-190. Radiated Restricted Upper Band Edge Plot

Secondary Antenna Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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



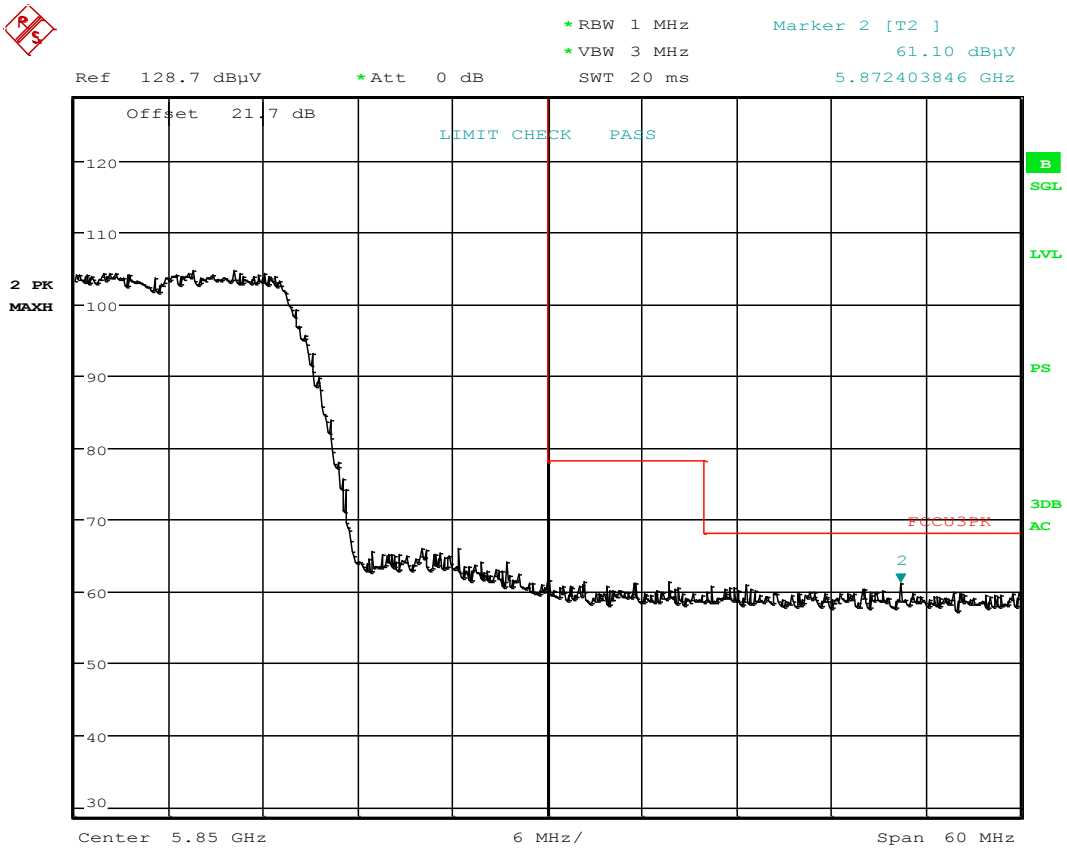
Date: 12.JUL.2016 11:56:02

Plot 7-191. Radiated Restricted Lower Band Edge Plot

Secondary Antenna Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

Worst Case Mode:	802.11ac
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5825MHz
Channel:	165



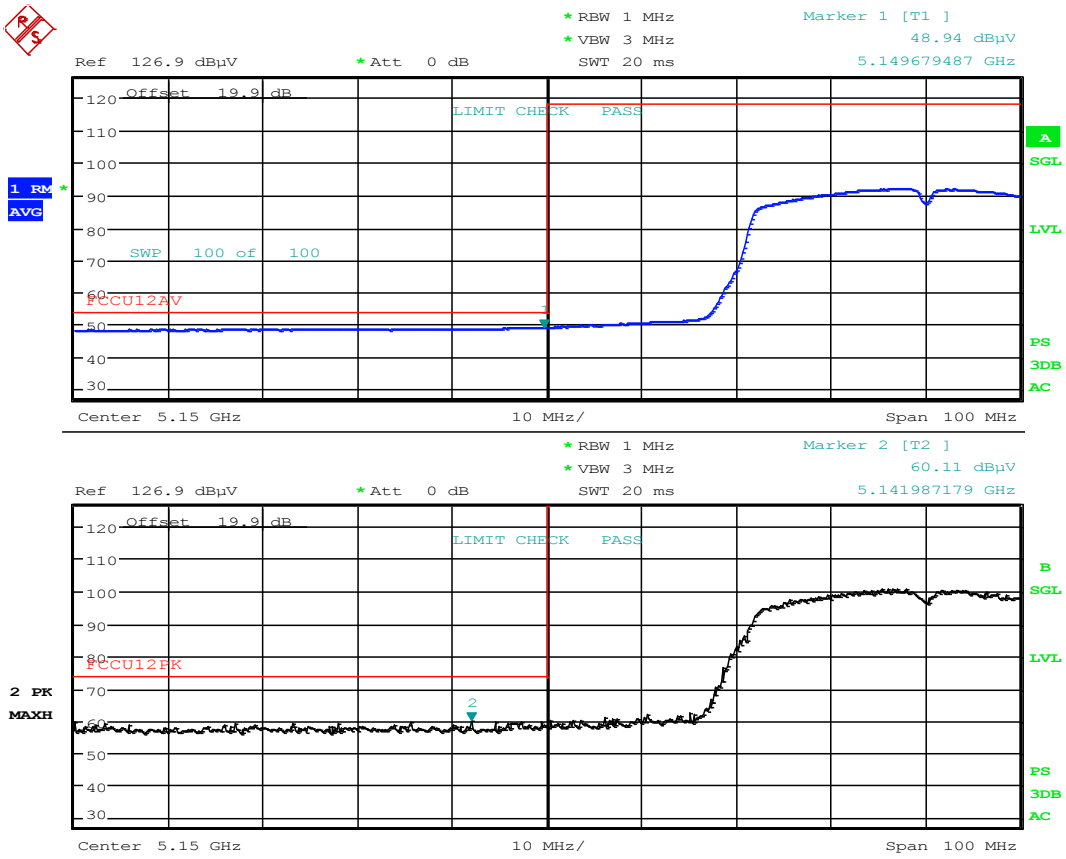
Date: 12.JUL.2016 12:00:48

Plot 7-192. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

7.7.7 Secondary Antenna Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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



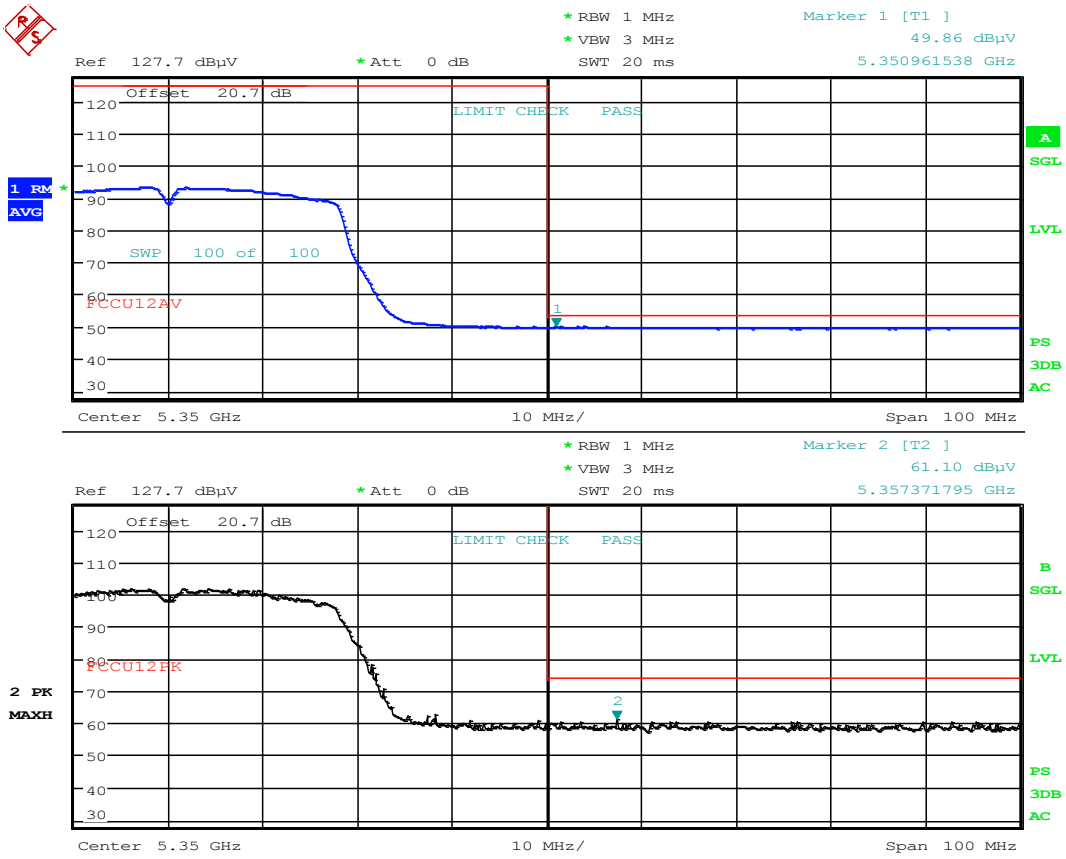
Date: 12.JUL.2016 12:12:05

Plot 7-193. Radiated Restricted Lower Band Edge Plot

Secondary Antenna Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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



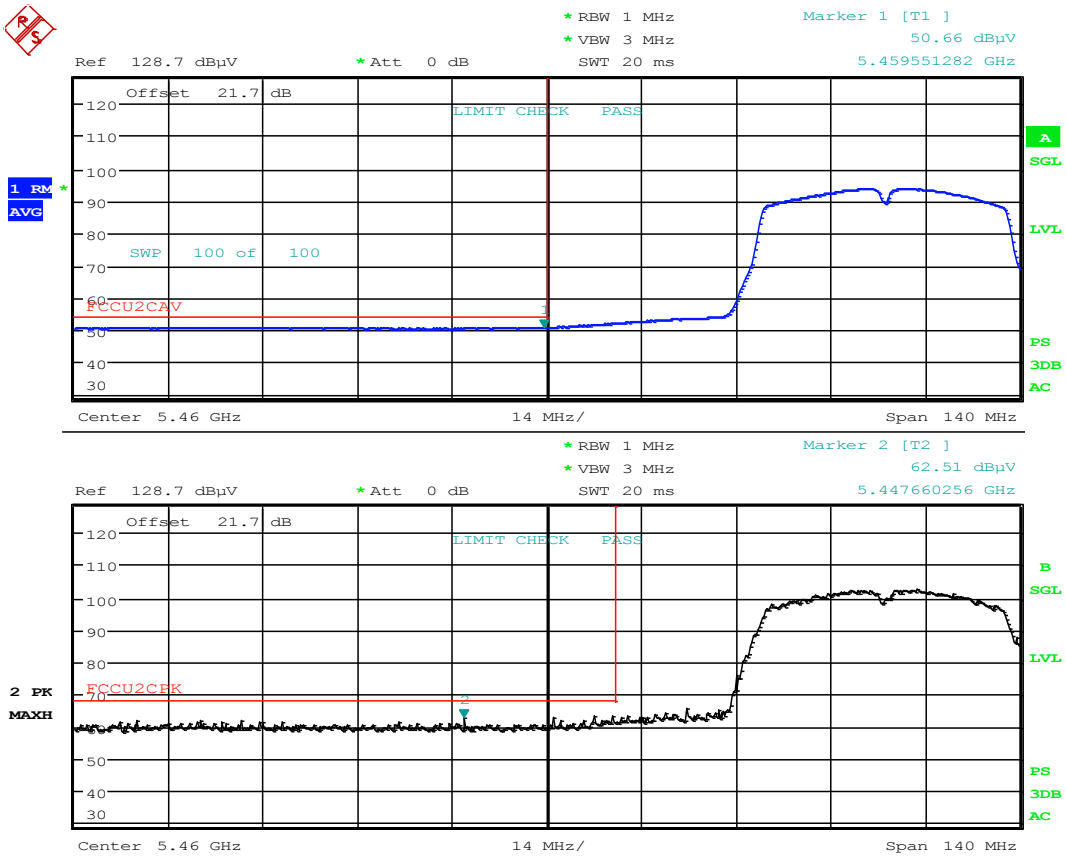
Date: 12.JUL.2016 12:17:42

Plot 7-194. Radiated Restricted Upper Band Edge Plot

Secondary Antenna Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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



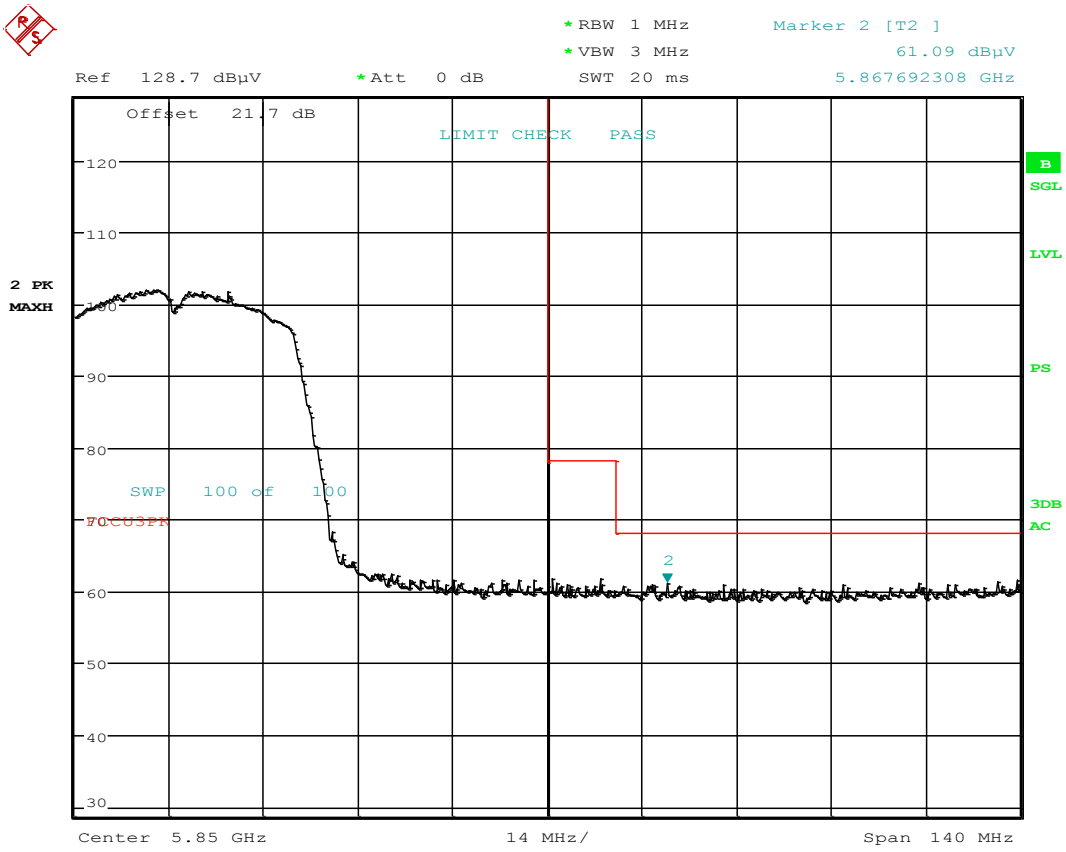
Date: 12.JUL.2016 12:21:21

Plot 7-195. Radiated Restricted Lower Band Edge Plot

Secondary Antenna Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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



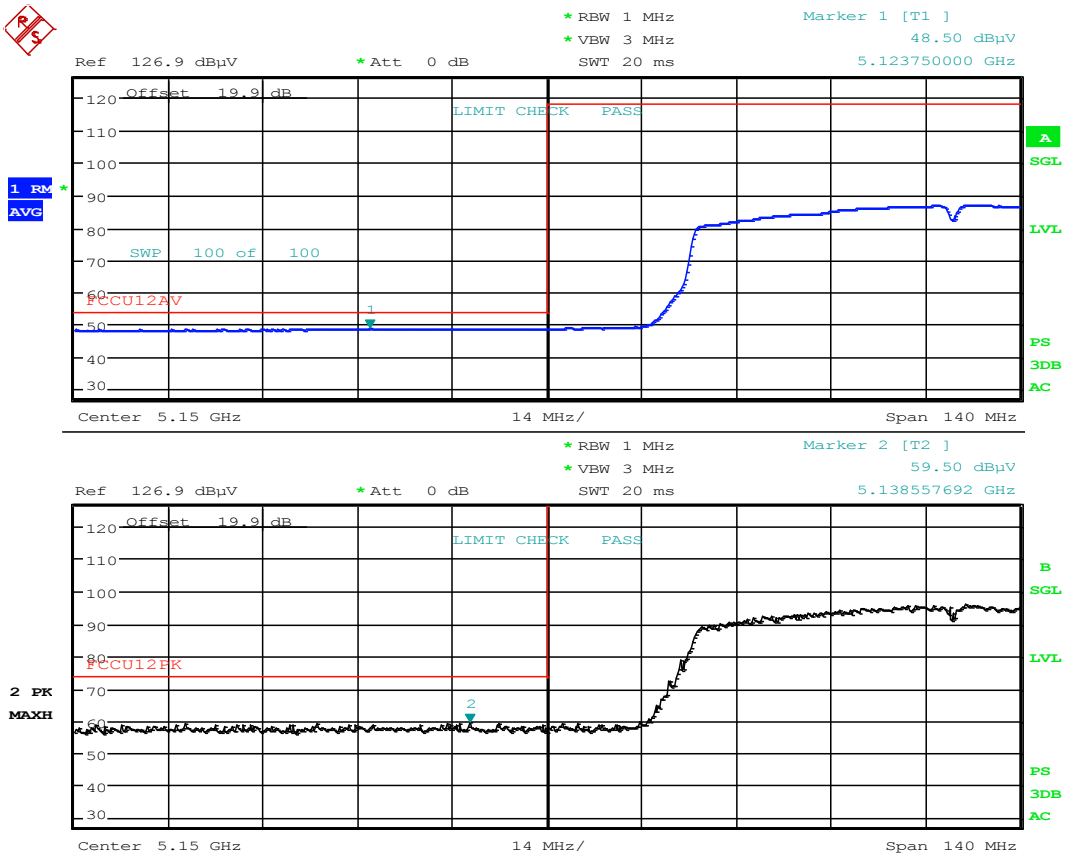
Date: 12.JUL.2016 12:25:28

Plot 7-196. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

7.7.8 Secondary Antenna 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



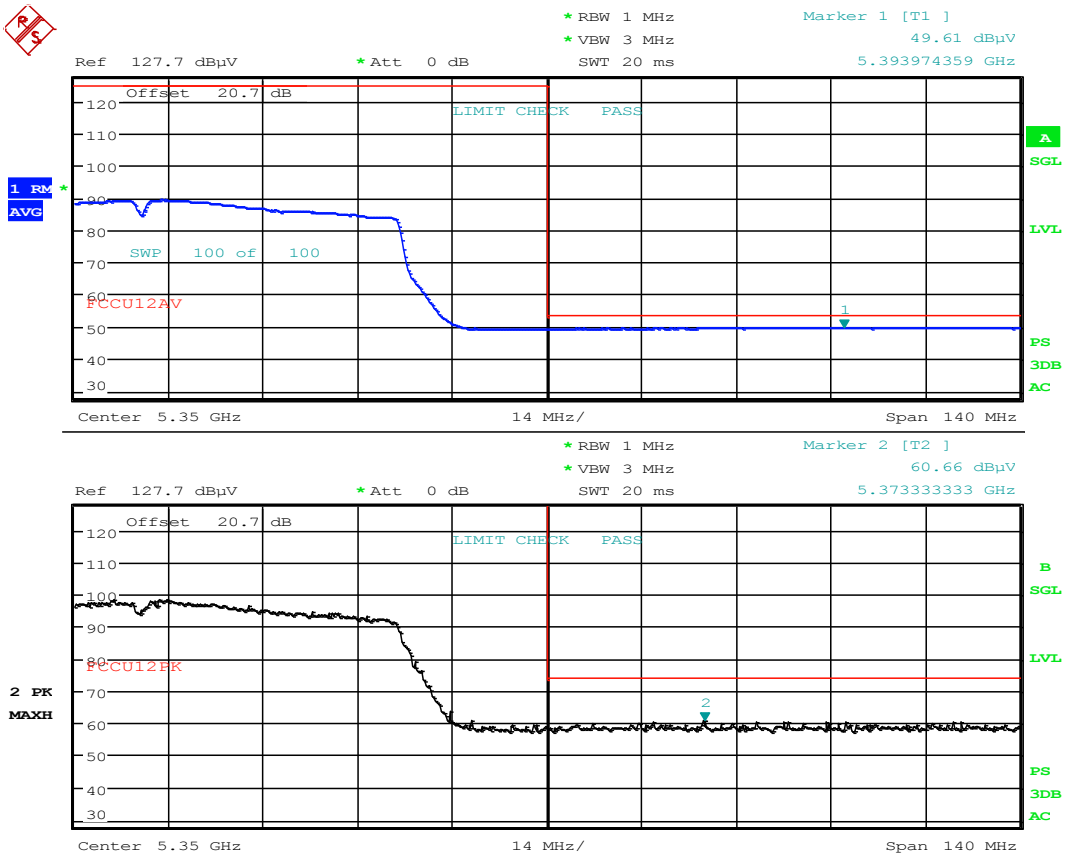
Date: 12.JUL.2016 12:29:58

Plot 7-197. Radiated Restricted Lower Band Edge Plot

Secondary Antenna 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



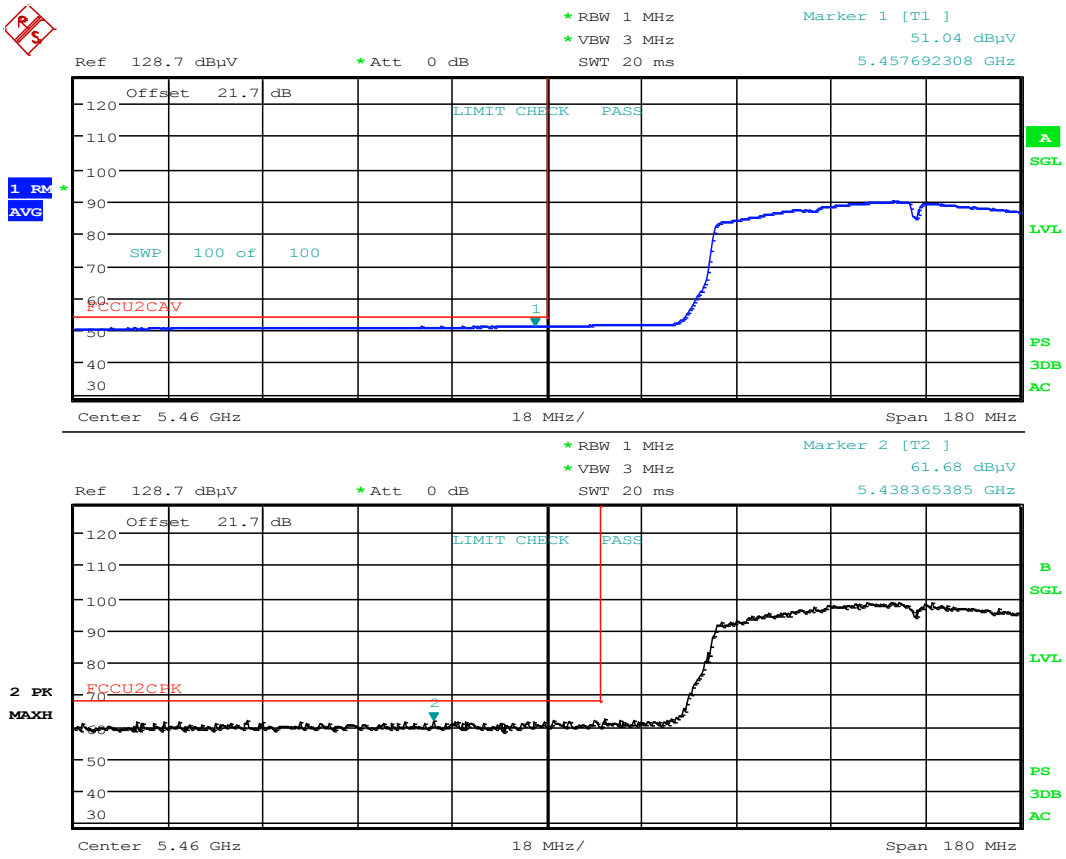
Date: 12.JUL.2016 12:34:11

Plot 7-198. Radiated Restricted Upper Band Edge Plot

Secondary Antenna 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



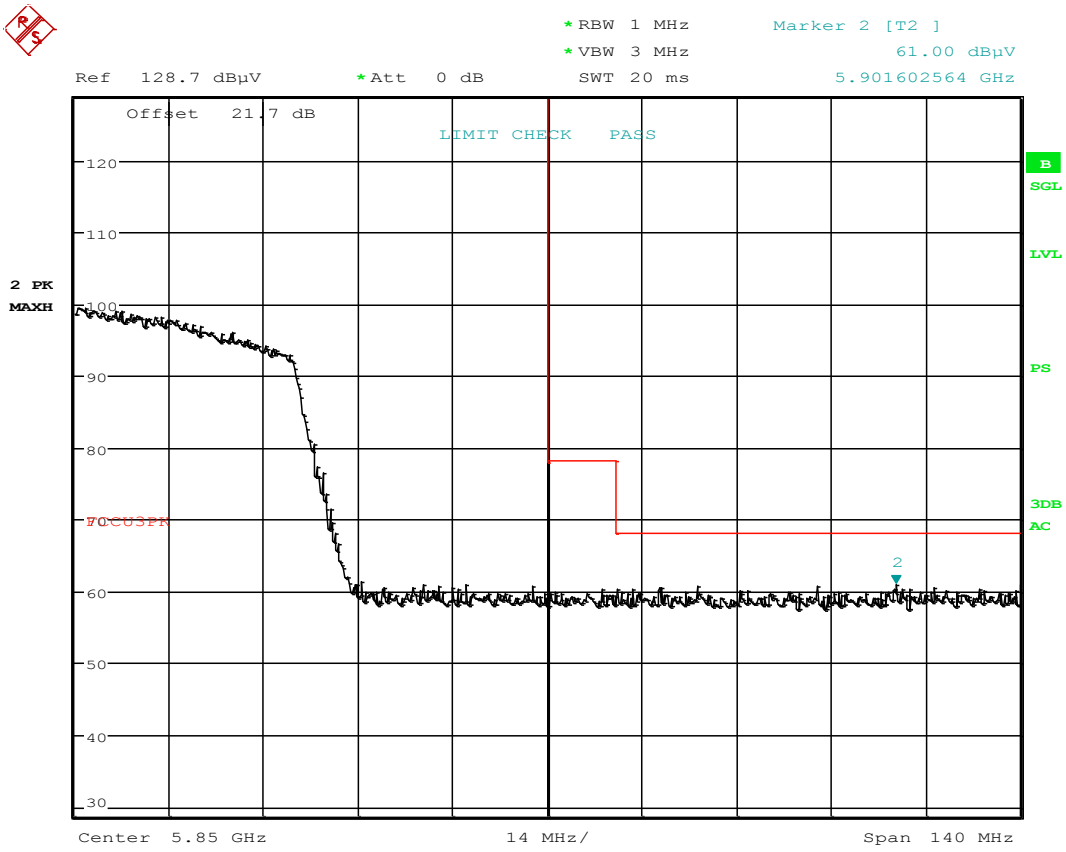
Date: 12.JUL.2016 12:38:05

Plot 7-199. Radiated Restricted Lower Band Edge Plot

Secondary Antenna 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



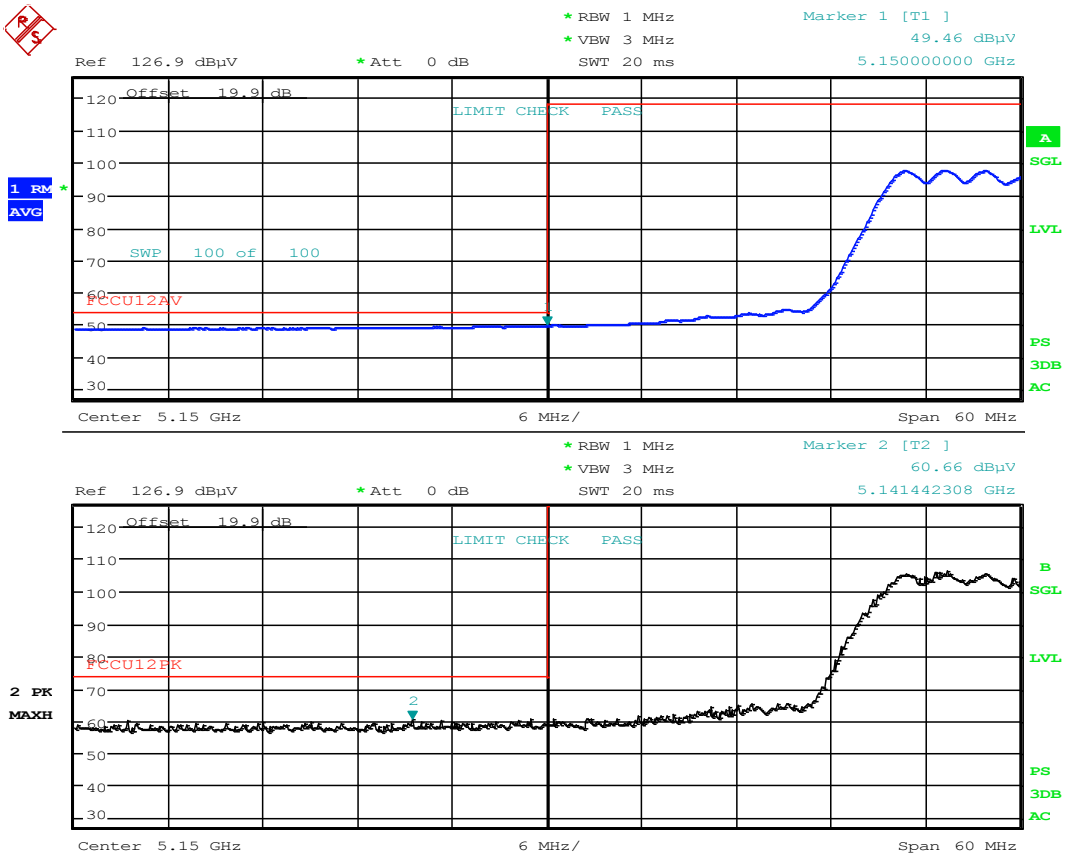
Date: 12.JUL.2016 12:41:30

Plot 7-200. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

7.7.9 MIMO Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

Worst Case Mode:	802.11ac (20MHz)
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5180MHz
Channel:	36



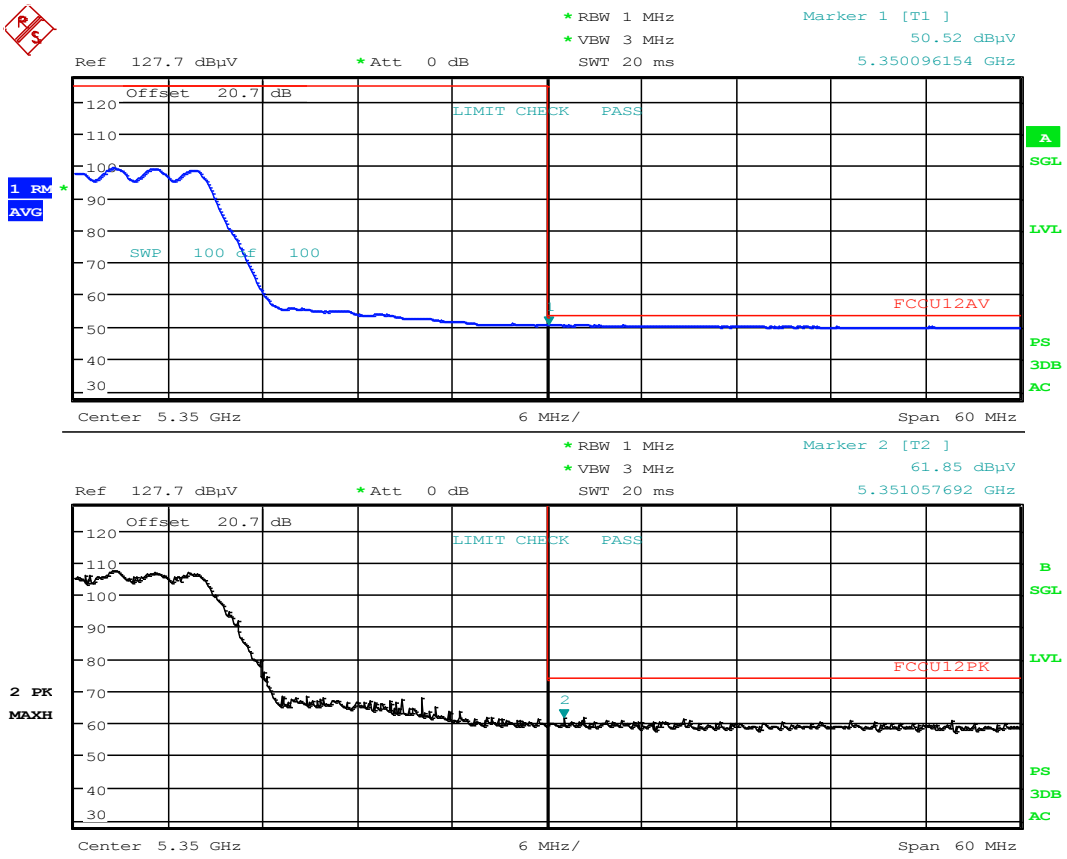
Date: 12.JUL.2016 12:54:06

Plot 7-201. Radiated Restricted Lower Band Edge Plot

MIMO Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

Worst Case Mode:	802.11ac (20MHz)
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5320MHz
Channel:	64



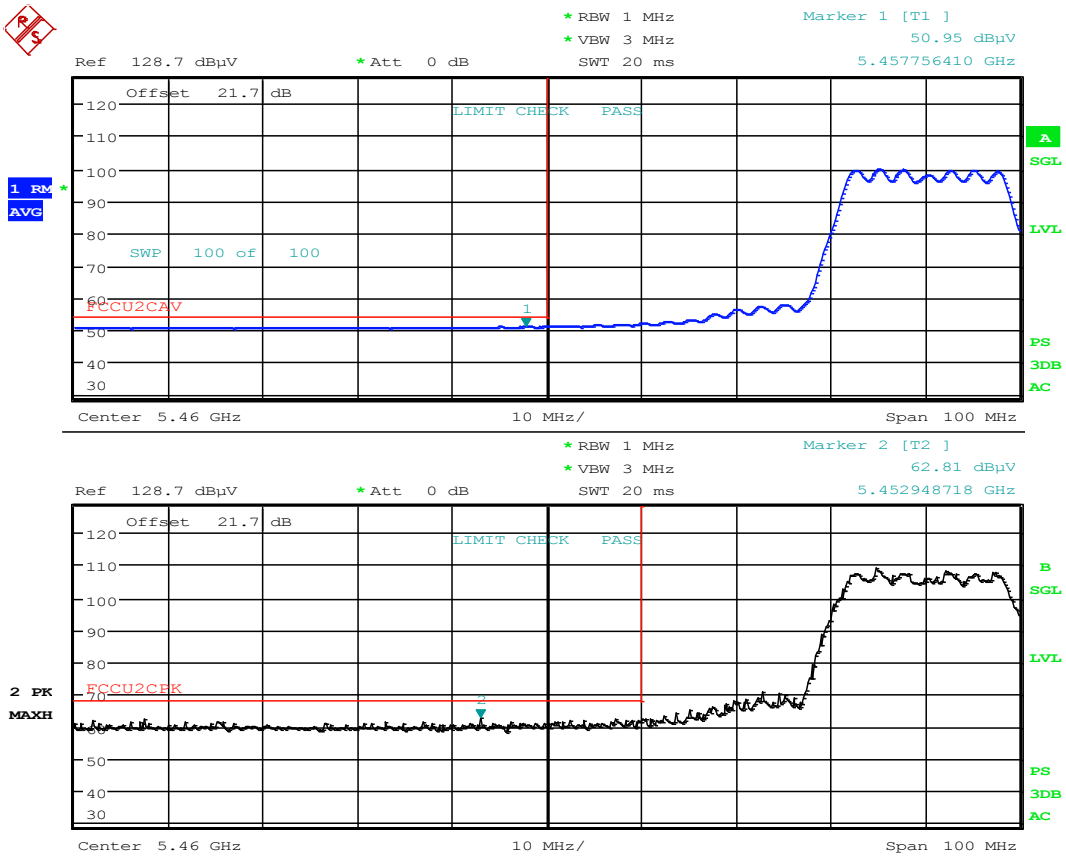
Date: 12.JUL.2016 12:59:16

Plot 7-202. Radiated Restricted Upper Band Edge Plot

MIMO Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

Worst Case Mode:	802.11ac (20MHz)
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5500MHz
Channel:	100



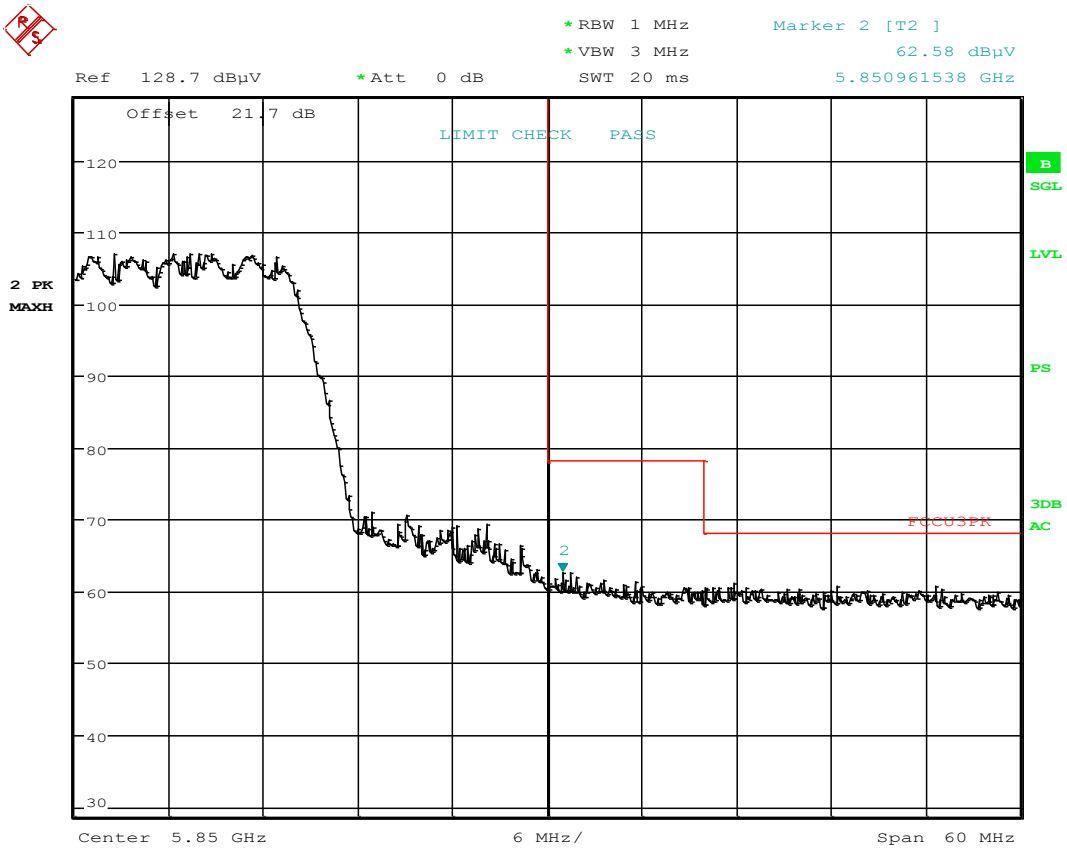
Date: 12.JUL.2016 13:03:17

Plot 7-203. Radiated Restricted Lower Band Edge Plot

MIMO Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

Worst Case Mode:	802.11ac (20MHz)
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5825MHz
Channel:	165



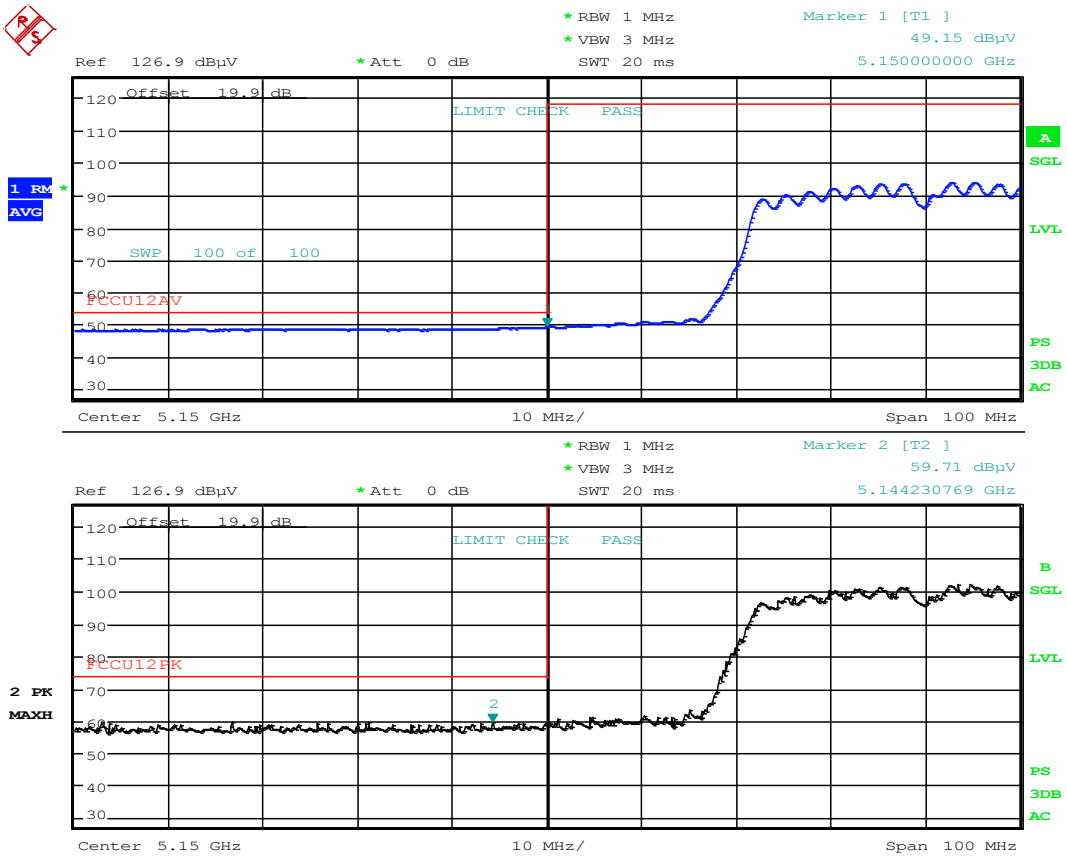
Date: 12.JUL.2016 13:06:50

Plot 7-204. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

7.7.10 MIMO Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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



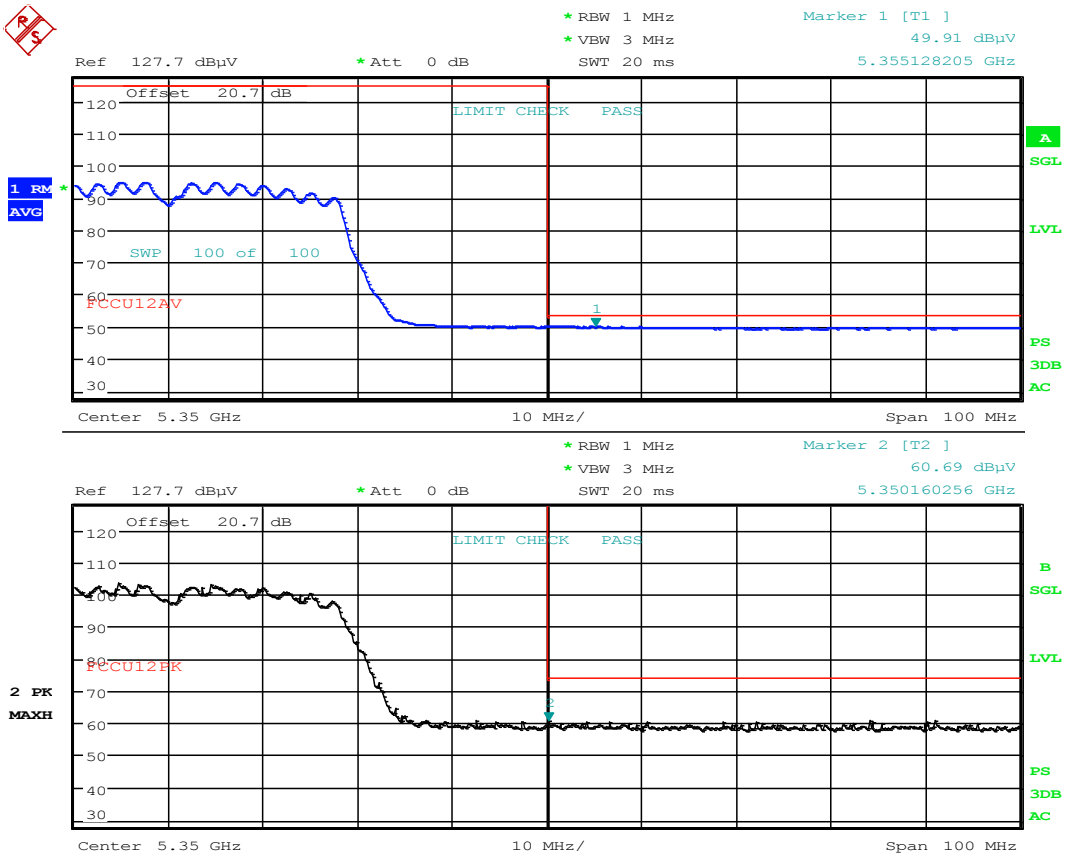
Date: 12.JUL.2016 13:24:34

Plot 7-205. Radiated Restricted Lower Band Edge Plot

MIMO Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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



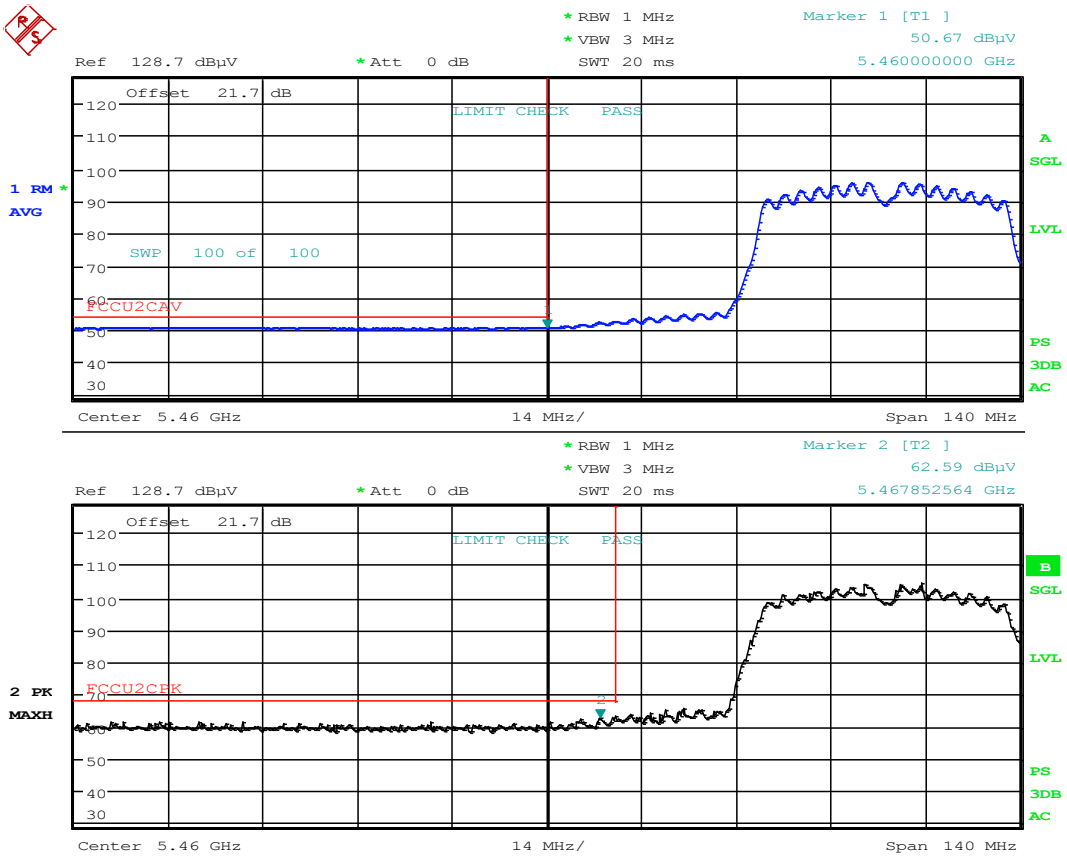
Date: 12.JUL.2016 13:28:22

Plot 7-206. Radiated Restricted Upper Band Edge Plot

MIMO Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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



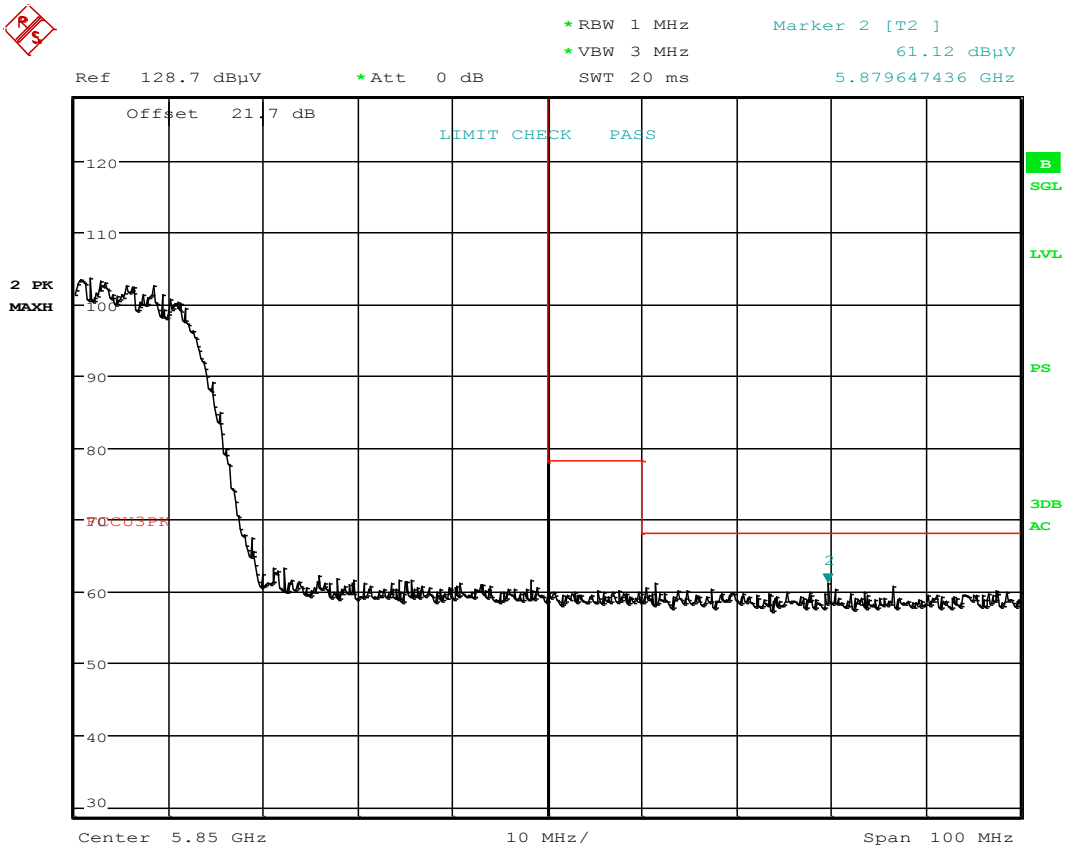
Date: 12.JUL.2016 13:44:31

Plot 7-207. Radiated Restricted Lower Band Edge Plot

MIMO Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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



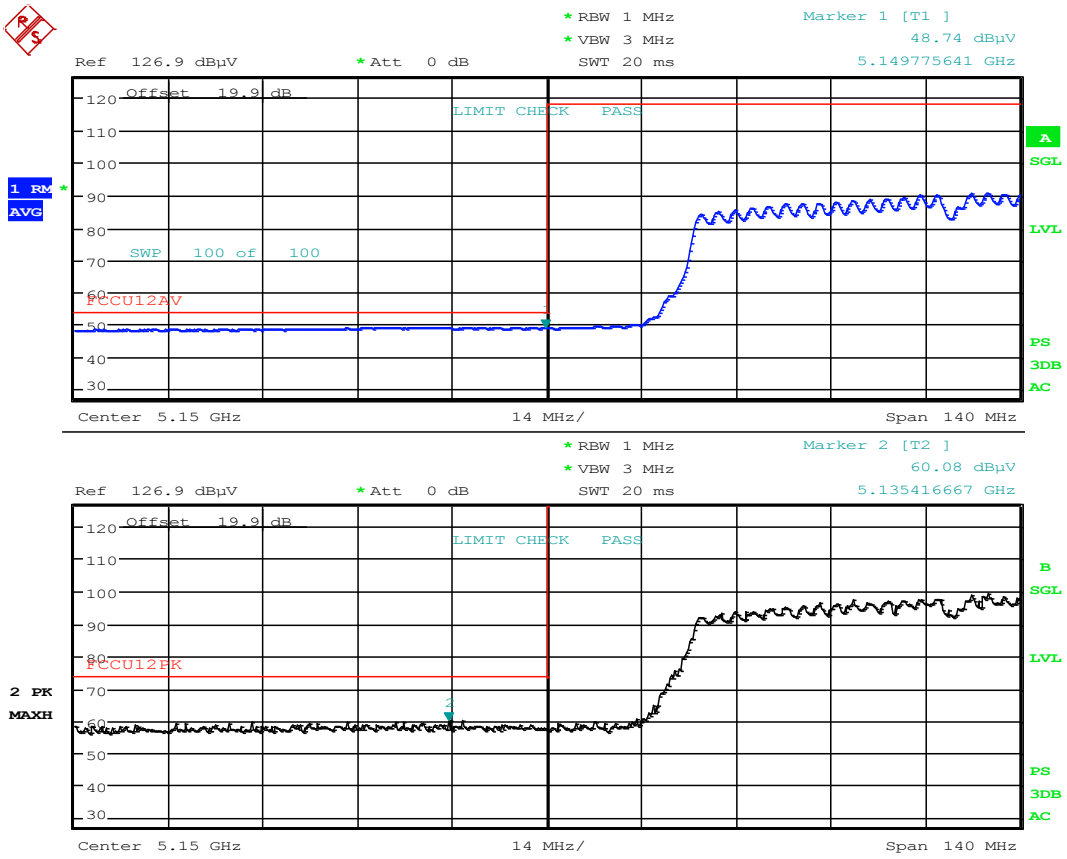
Date: 12.JUL.2016 13:48:44

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

7.7.11 MIMO Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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



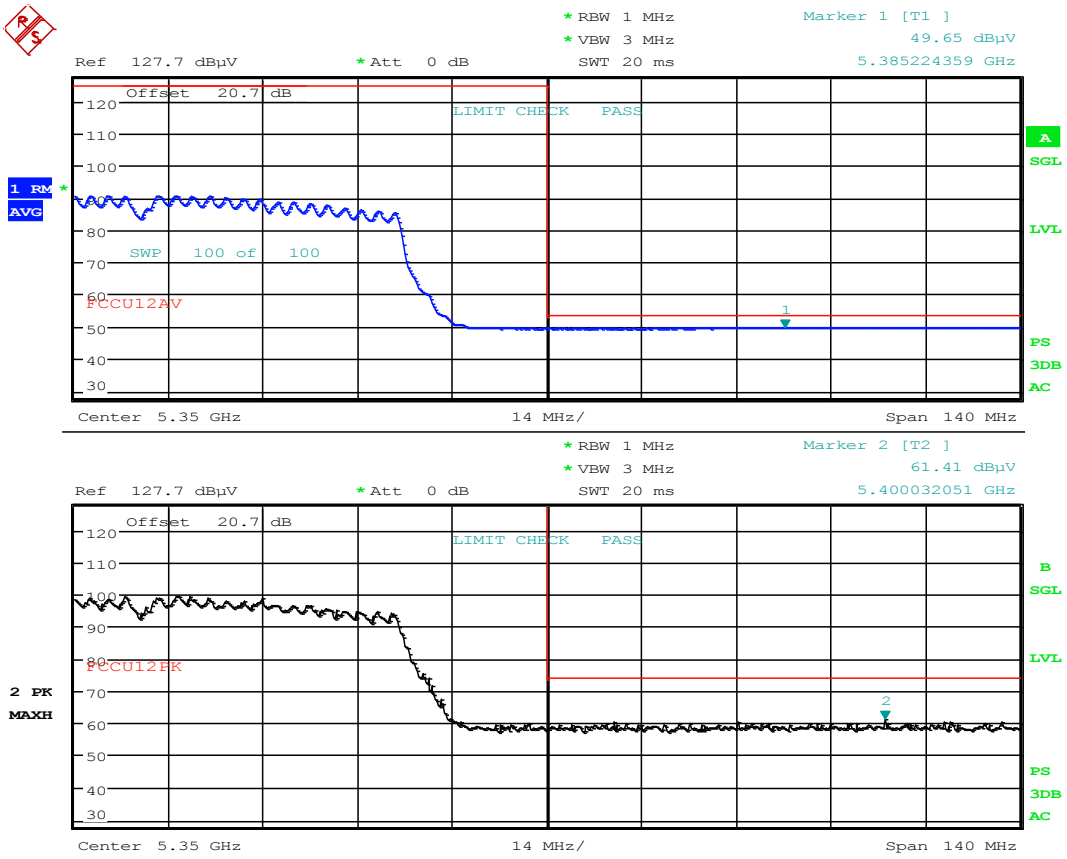
Date: 12.JUL.2016 13:53:52

Plot 7-209. Radiated Restricted Lower Band Edge Plot

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



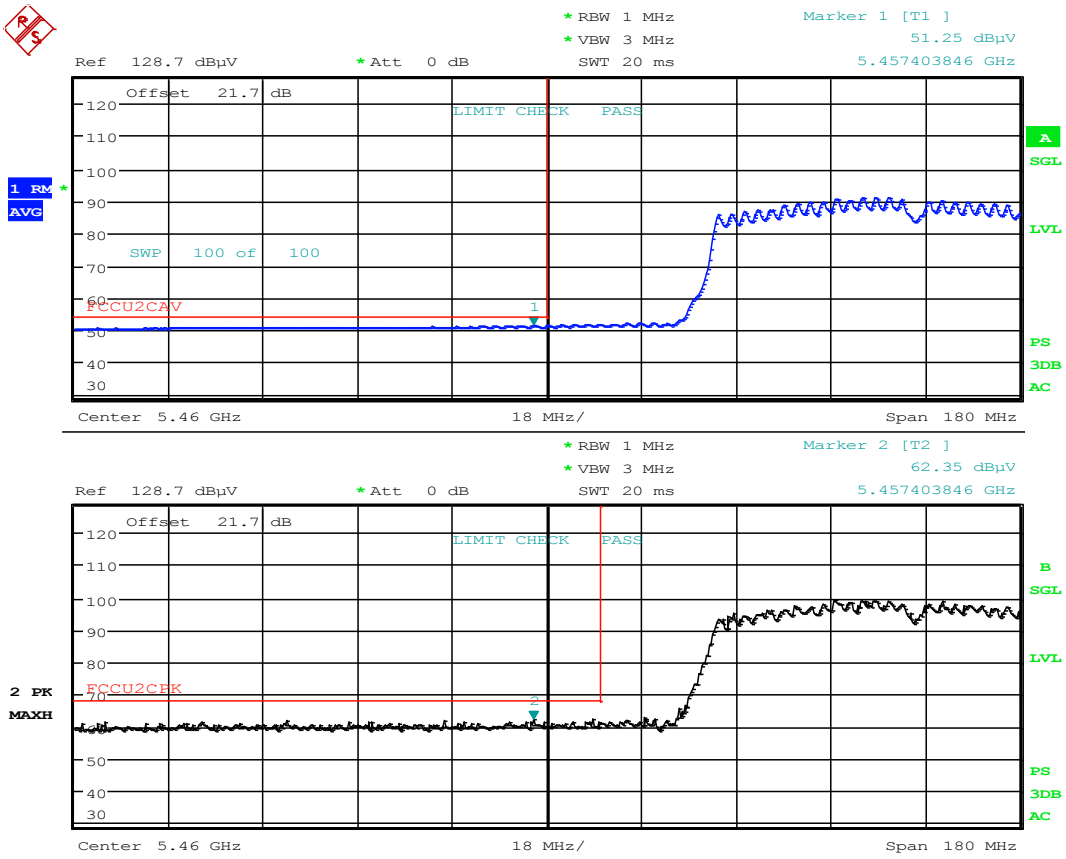
Date: 12.JUL.2016 13:57:38

Plot 7-210. Radiated Restricted Upper Band Edge Plot

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



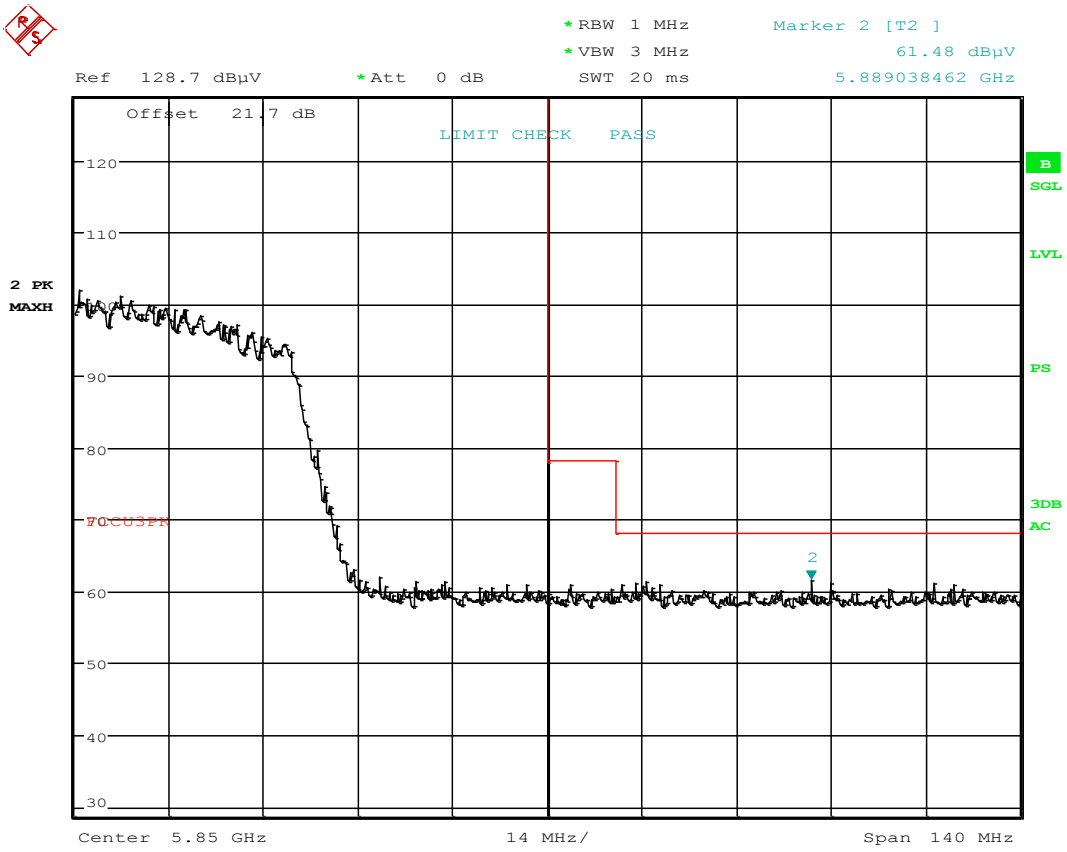
Date: 12.JUL.2016 14:02:01

Plot 7-211. Radiated Restricted Lower Band Edge Plot

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: 12.JUL.2016 14:05:34

Plot 7-212. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

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 7-52 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 7-52. Radiated Limits

Test Procedures Used

ANSI C63.4-2014

Test Settings

Quasi-Peak Field Strength Measurements

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

Test Setup

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

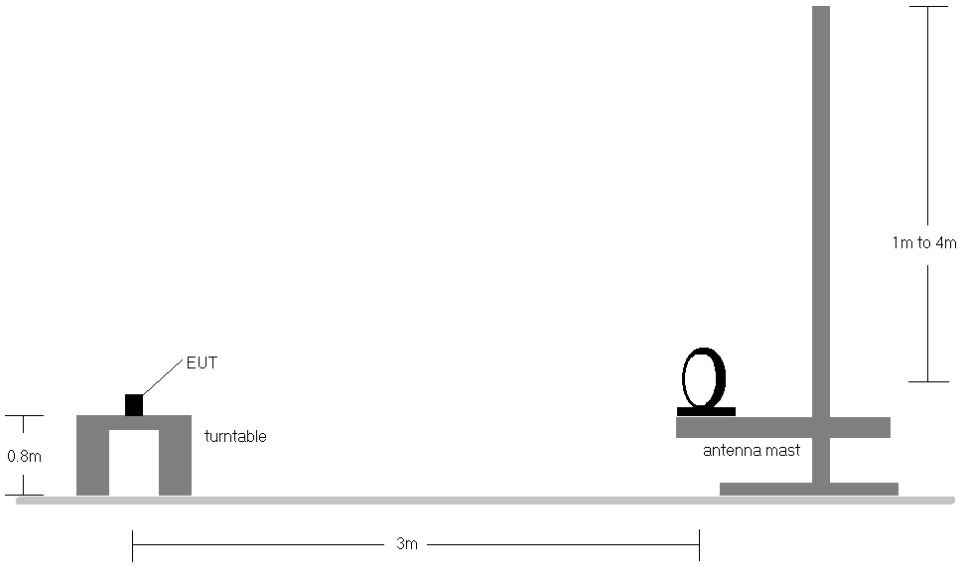


Figure 7-6. Radiated Test Setup < 30MHz

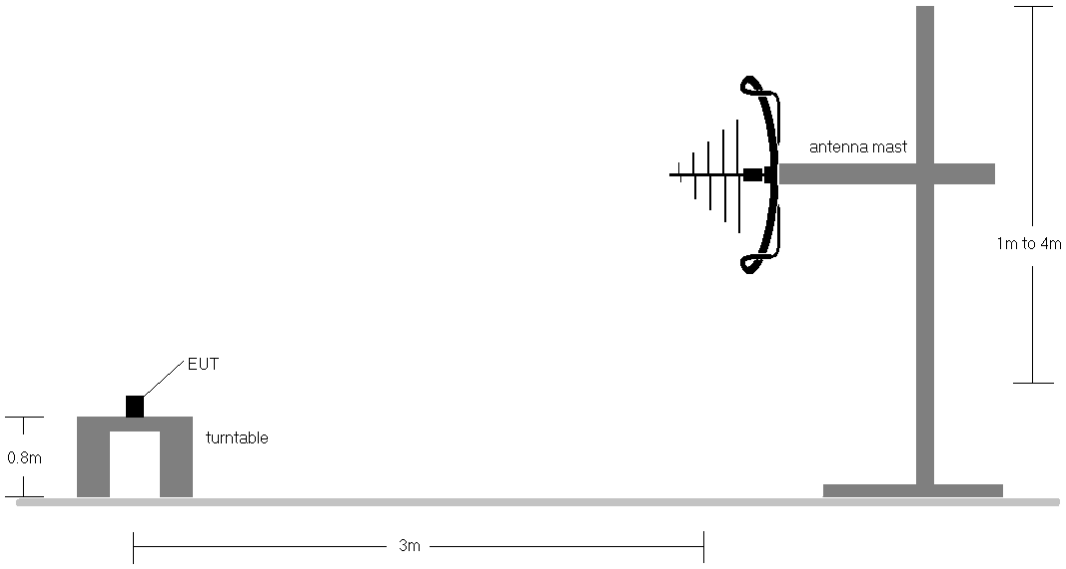


Figure 7-7. Radiated Test Setup < 1GHz

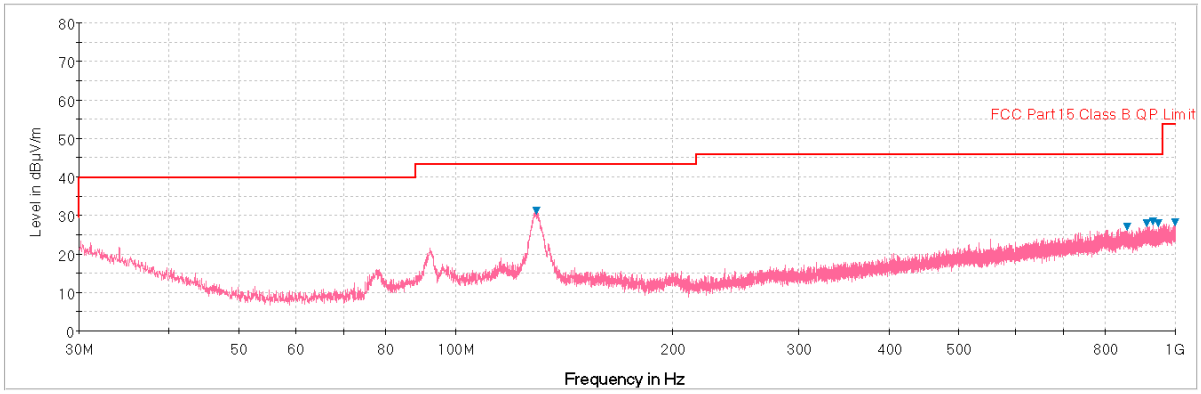
Test Notes

1. All emissions lying in restricted bands specified in §15.205 are below the limit shown in Table 7-52.
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.

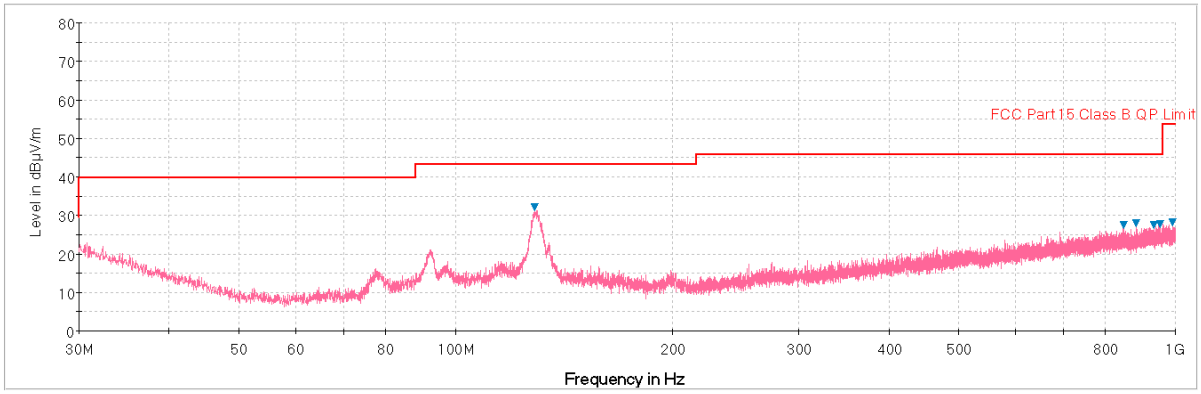
4. The spectrum is investigated using a peak detector and final measurements are recorded using CISPR quasi peak detector. The worst-case emissions are reported however emissions whose levels were not within 20dB of the respective limits were not reported.
5. Emissions were measured at a 3 meter test 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.

Primary Antenna Radiated Spurious Emissions Measurements (Below 1GHz)

§15.209



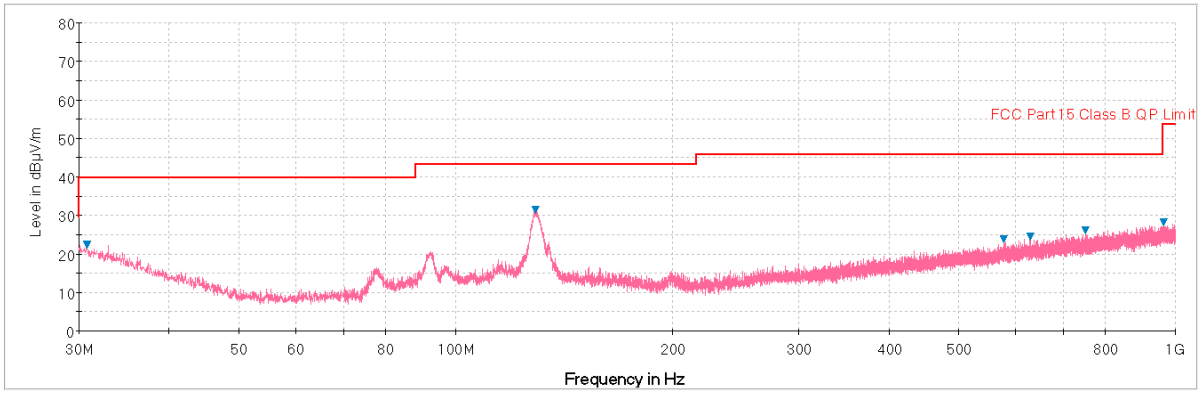
Plot 7-213. Radiated Spurious Plot below 1GHz (802.11a – U3 Ch. 157, Ant. Pol. H)



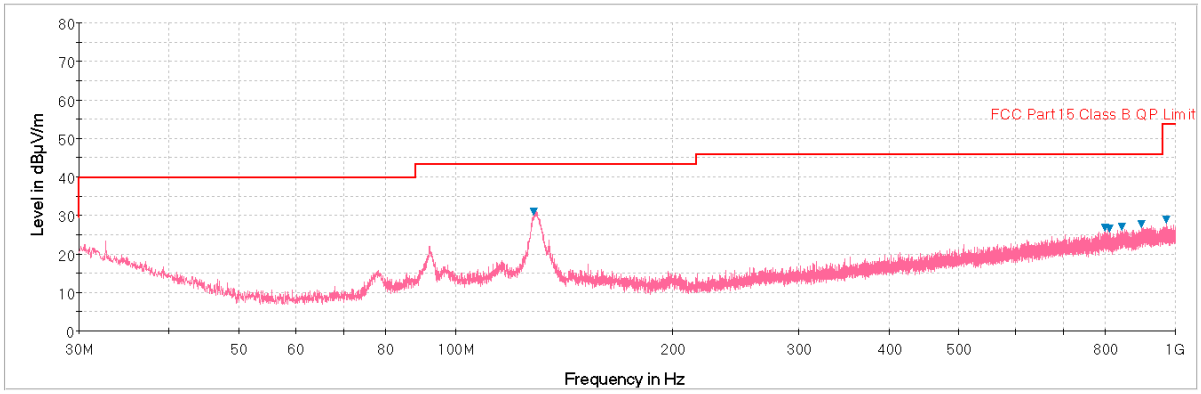
Plot 7-214. Radiated Spurious Plot below 1GHz (802.11a – U3 Ch. 157, Ant. Pol. V)

Secondary Antenna Radiated Spurious Emissions Measurements (Below 1GHz)

§15.209



Plot 7-215. Radiated Spurious Plot below 1GHz (802.11a – U3 Ch. 157, Ant. Pol. H)



Plot 7-216. Radiated Spurious Plot below 1GHz (802.11a – U3 Ch. 157, Ant. Pol. V)

7.9 Line-Conducted Test Data

§15.407

Test Overview and Limit

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

All conducted emissions must not exceed the limits shown in the table below, per Section 15.207.

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

Table 7-53. Conducted Limits

*Decreases with the logarithm of the frequency.

Test Procedures Used

ANSI C63.10-2013, Section 6.2

Test Settings

Quasi-Peak Field Strength Measurements

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

Average Field Strength Measurements

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

Test Setup

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

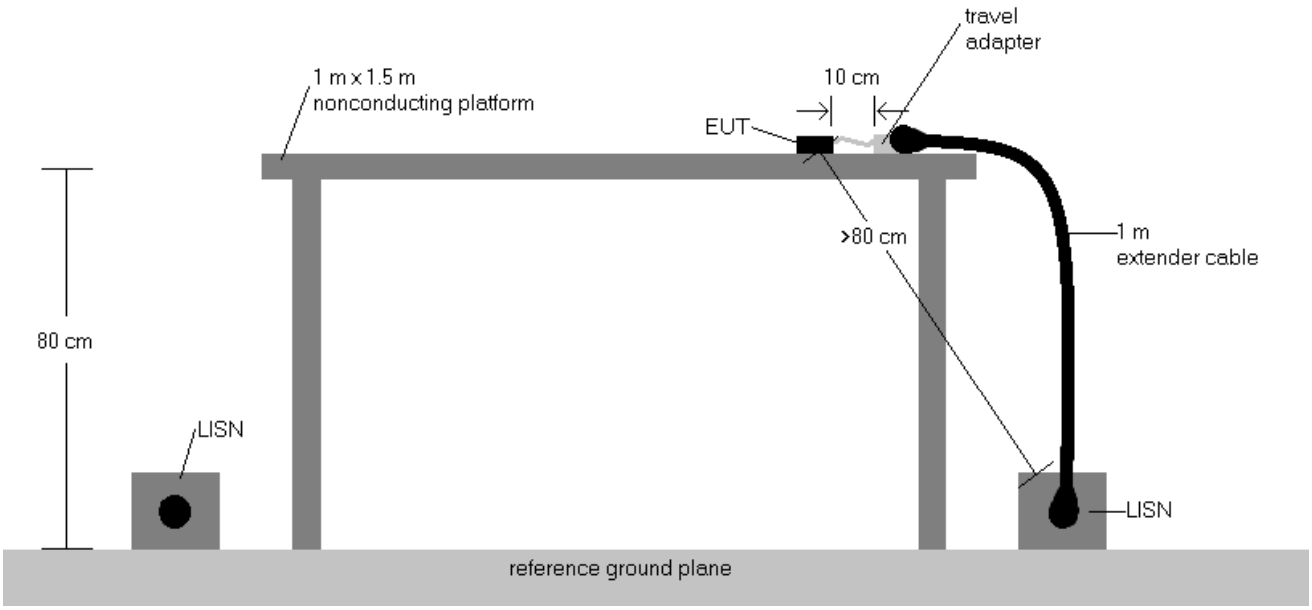


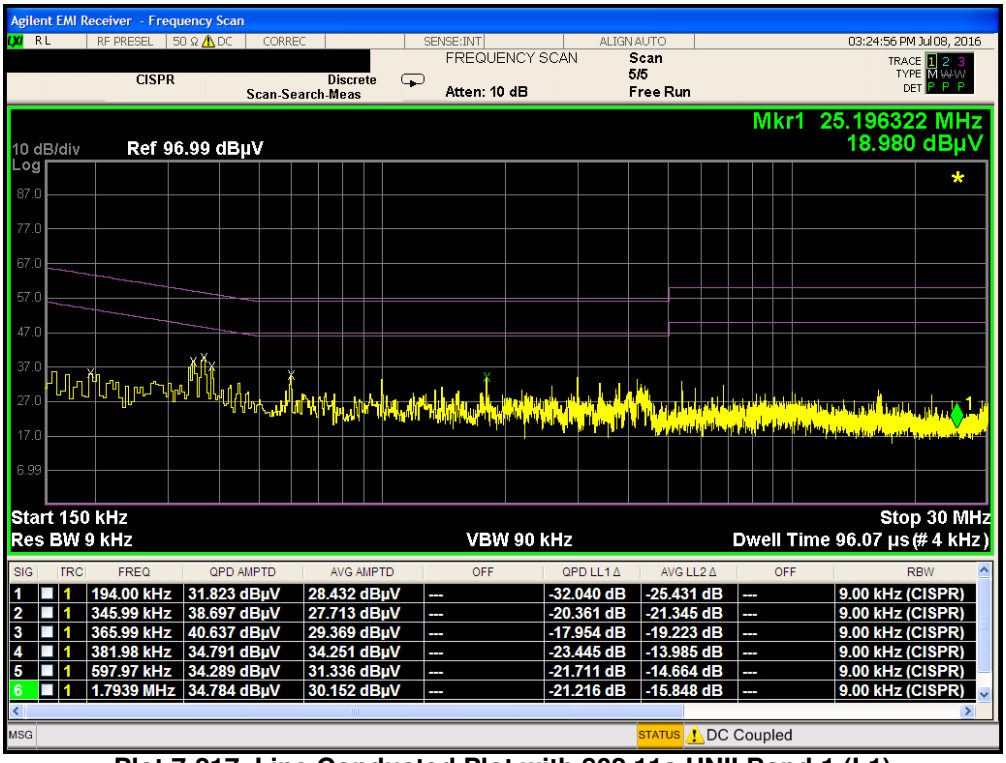
Figure 7-8. Test Instrument & Measurement Setup

Test Notes

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

Line-Conducted Test Data

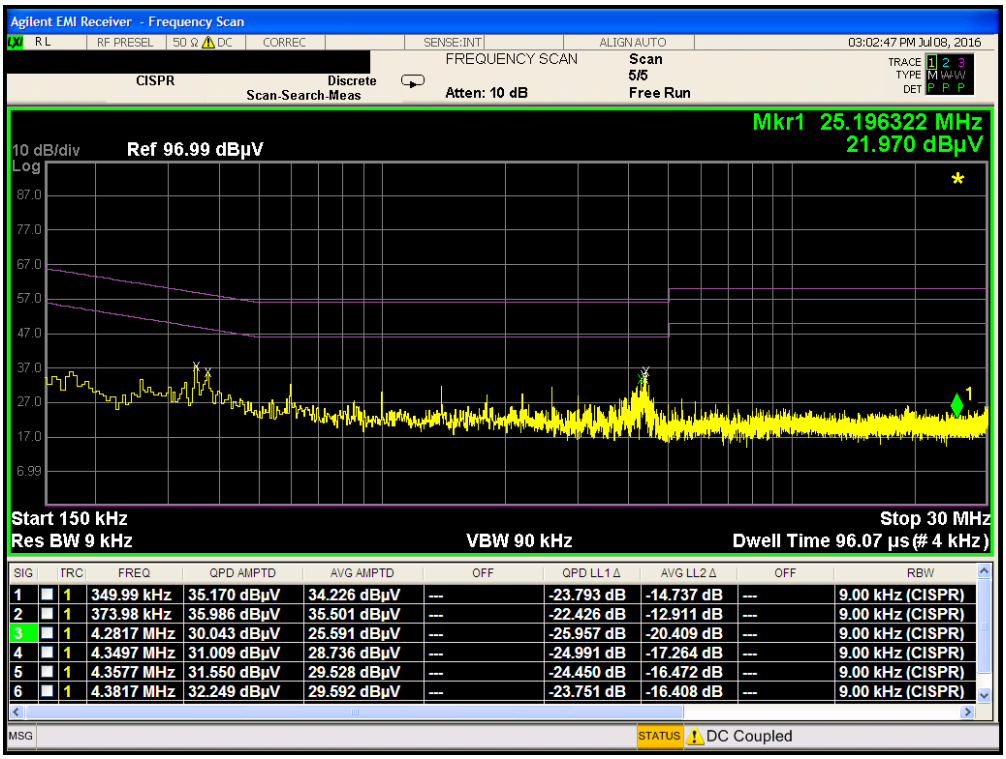
§15.407



Plot 7-217. Line Conducted Plot with 802.11a UNII Band 1 (L1)

Line-Conducted Test Data

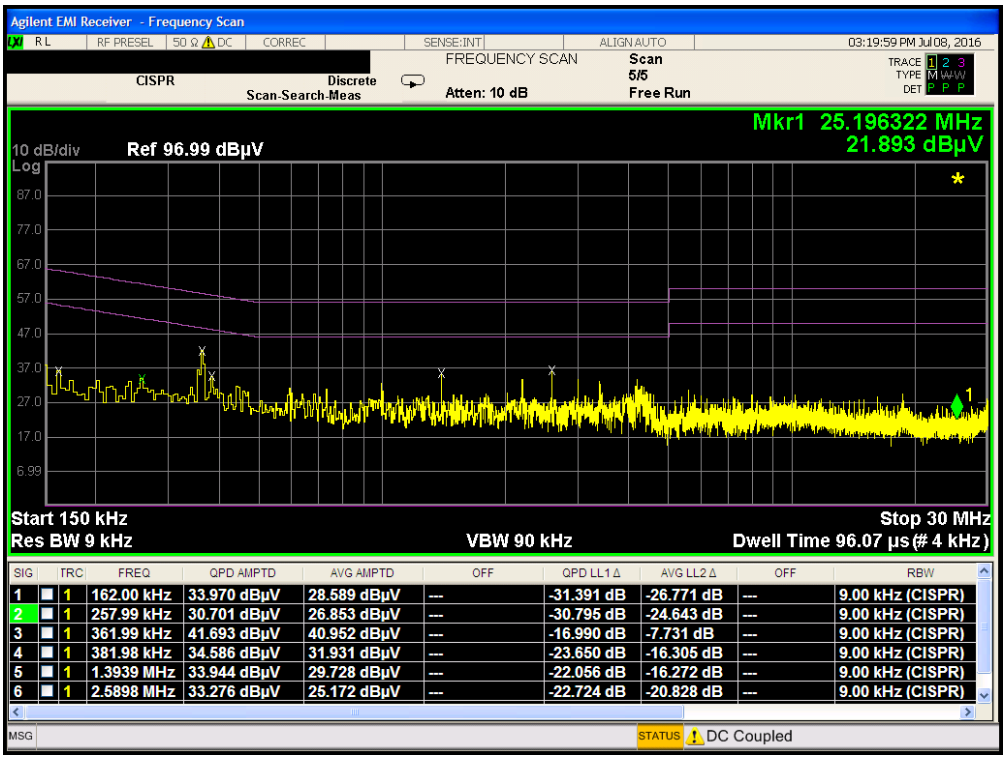
§15.407



Plot 7-218. Line Conducted Plot with 802.11a UNII Band 1 (N)

Line-Conducted Test Data

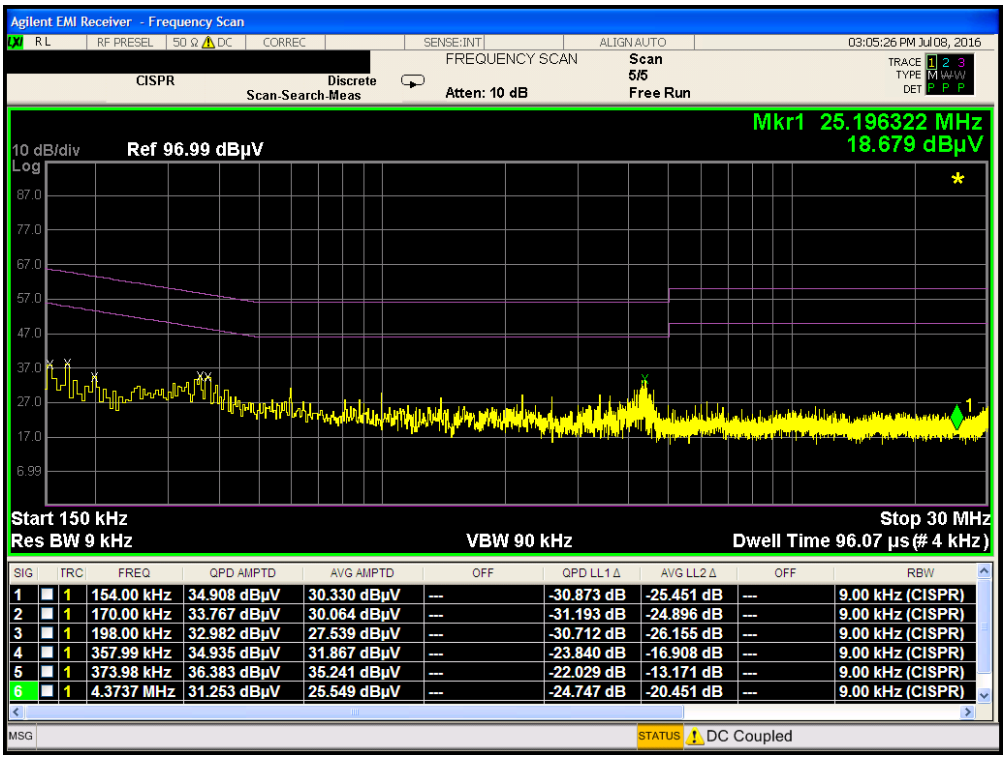
§15.407



Plot 7-219. Line Conducted Plot with 802.11a UNII Band 2A (L1)

Line-Conducted Test Data

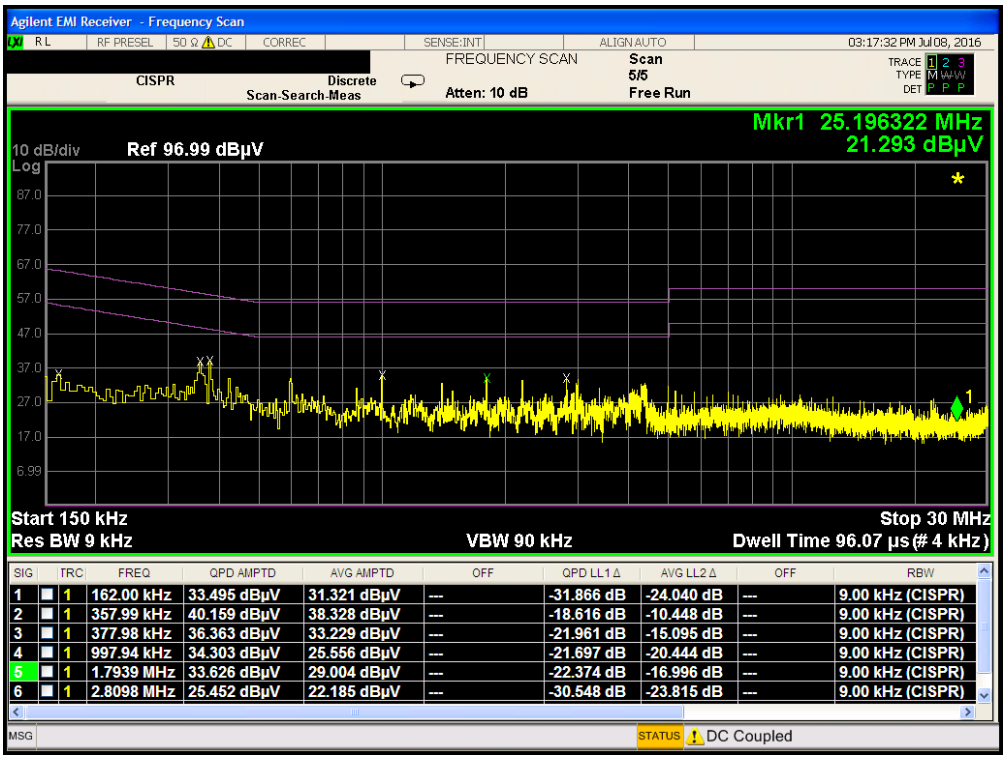
§15.407



Plot 7-220. Line Conducted Plot with 802.11a UNII Band 2A (N)

Line-Conducted Test Data

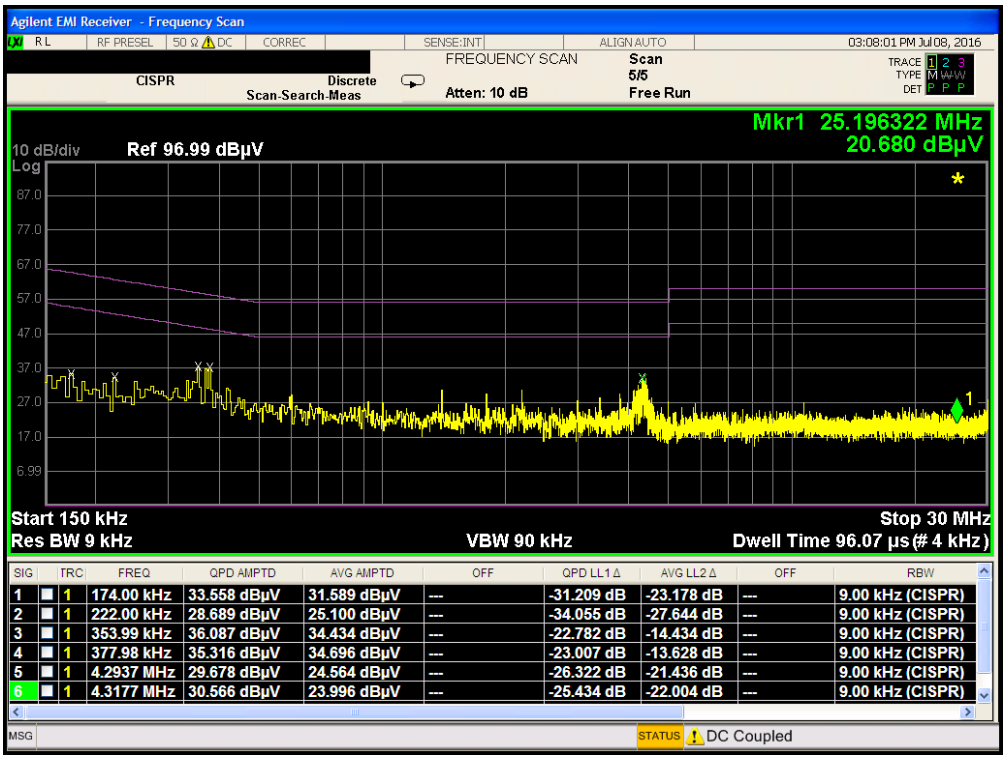
§15.407



Plot 7-221. Line Conducted Plot with 802.11a UNII Band 2C (L1)

Line-Conducted Test Data

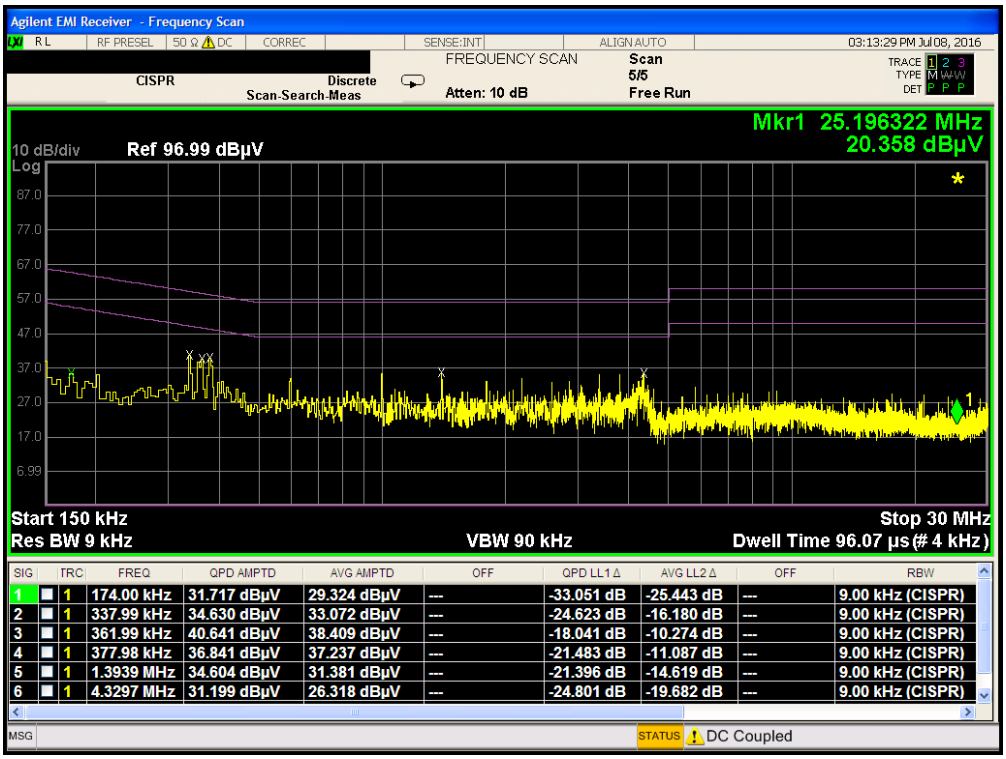
§15.407



Plot 7-222. Line Conducted Plot with 802.11a UNII Band 2C (N)

Line-Conducted Test Data

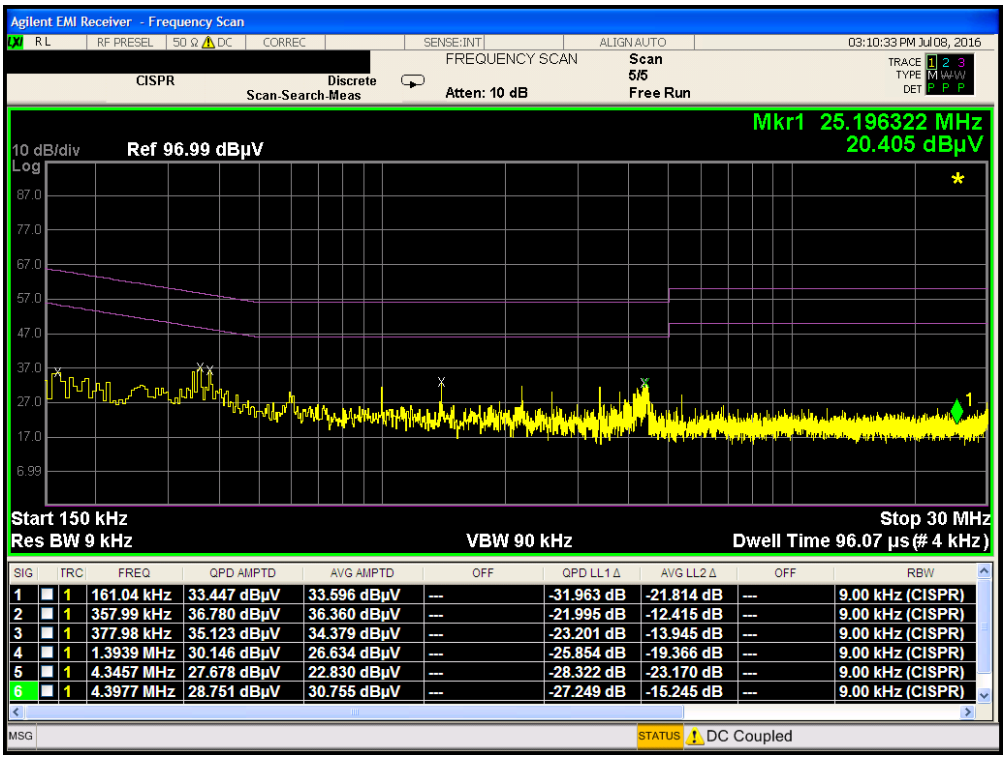
§15.407



Plot 7-223. Line Conducted Plot with 802.11a UNII Band 3 (L1)

Line-Conducted Test Data

§15.407



Plot 7-224. Line Conducted Plot with 802.11a UNII Band 3 (N)

8.0 CONCLUSION

The data collected relate only the item(s) tested and show that the **LG Portable Handset FCC ID: ZNFLS997** is in compliance with Part 15E of the FCC Rules.

APPENDIX A. 802.11A DUAL TX

A.1 Summary

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
TRANSMITTER MODE (TX)					
15.407 (a.1)	Maximum Conducted Output Power	< 250mW (23.98dBm) (5150-5250MHz) < 250mW (5250-5350MHz) < 250mW (5470-5725MHz) < 1W (30dBm) (5725-5850MHz)	CONDUCTED	PASS	Section A.2
15.407 (a.1), (5)	Maximum Power Spectral Density	< 11 dBm/MHz (5150-5250MHz, 5250-5350MHz, 5470-5725MHz) < 30 dBm/500kHz (5725-5850MHz)		PASS	Section A.3
15.205, 15.407(b.1),(5),(6)	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Emissions in restricted bands must meet the radiated limits detailed in 15.209		PASS	Section A.4

Table A.1-1. Summary of Test Results

Notes:

1) This device employs dual transmission in 802.11a and 802.11g modes using CDD. For all test cases, the device was set to transmit from both antennas simultaneously. The data in this section demonstrates compliance to the dual-transmission requirements specified in KDB 662911 v02r01.
2) All data found in this section is compiled from plots found in the main body of this test report.
3) Since this device is able to transmit the same data through both of its antennas in a given symbol period, then, by the definition specified in KDB 662911 v02r01 Section F)1), the transmission symbols are correlated.
4) Since two antennas are supported in this device and a minimum of N_{ss} = 1 antenna can operate at any given time, the maximum array gain for two correlated signals is $10\log_{10}(N_{ant}/N_{ss})$ = 3dB, where N_{ss} is the number of spatial streams and N_{ant} is the total number of antennas.
5) For conducted spurious emissions, per KDB 662911 v02r01 Section E)3)b), the emissions on each individual output complied with its corresponding relative limit for that output, so additional testing was not required for dual transmission operation.

A.2 Output Power Measurement

§15.247(b.3)

Test Overview

Using the "Measure and Sum" technique, the measured conducted power values were summed in linear power units then converted back to dBm.

Freq [MHz]	Channel	Detector	5GHz (20MHz) Conducted Power [dBm]		
			IEEE Transmission Mode		
			Primary Ant.	Secondary Ant.	CDD
5180	36	AVG	14.38	13.50	16.97
5200	40	AVG	14.38	13.79	17.11
5220	44	AVG	14.32	13.51	16.94
5240	48	AVG	14.51	13.49	17.04
5260	52	AVG	14.88	13.54	17.27
5280	56	AVG	14.70	13.47	17.14
5300	60	AVG	14.73	13.47	17.16
5320	64	AVG	14.68	13.45	17.12
5500	100	AVG	14.42	13.15	16.84
5580	116	AVG	14.39	13.50	16.98
5660	132	AVG	14.40	13.55	17.01
5720	144	AVG	14.21	13.56	16.91
5745	149	AVG	14.56	13.65	17.14
5785	157	AVG	14.48	13.38	16.98
5825	165	AVG	14.53	13.32	16.98

Table A2-1. Dual Tx 802.11a-mode Conducted Output Power Measurements

A.3 Power Spectral Density

§15.247(e)

Test Overview

Using the "Measure and Sum" technique, the measured conducted power density values were summed in linear power units then converted back to dBm. Original measured values are found in Section 7.5 of this report.

	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Primary Antenna Power Density [dBm]	Secondary Antenna Power Density [dBm]	Summed MIMO Power Density [dBm]	Max Permissible Power Density [dBm/500kHz]	Margin [dB]	Pass / Fail
Band 1	5180	36	a	6	2.49	2.12	5.32	11.0	-5.68	Pass
	5200	40	a	6	2.56	1.72	5.17	11.0	-5.83	Pass
	5240	48	a	6	2.62	1.62	5.16	11.0	-5.84	Pass
Band 2A	5260	52	a	6	2.46	1.78	5.14	11.0	-5.86	Pass
	5280	56	a	6	2.52	1.92	5.24	11.0	-5.76	Pass
	5320	64	a	6	2.55	2.00	5.29	11.0	-5.71	Pass
Band 2C	5500	100	a	6	2.74	1.87	5.34	11.0	-5.66	Pass
	5600	120	a	6	2.75	1.64	5.24	11.0	-5.76	Pass
	5720	144	a	6	2.73	1.89	5.34	11.0	-5.66	Pass
Band 3	5745	149	a	6	0.04	-0.84	2.63	30.0	-27.37	Pass
	5785	157	a	6	-0.18	-0.77	2.55	30.0	-27.45	Pass
	5825	165	a	6	-0.04	-0.56	2.72	30.0	-27.28	Pass

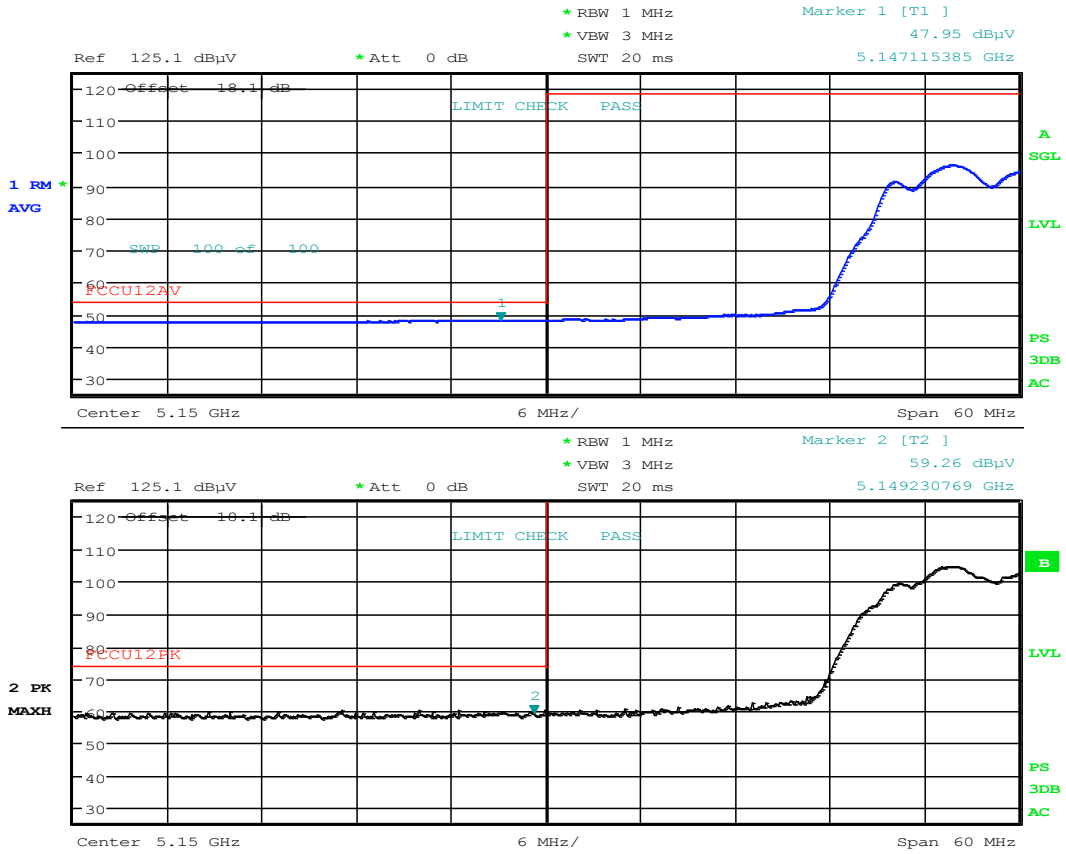
Table A3-1.802.11a Dual Tx Conducted Power Density Measurements

A.4 Dual Tx Radiated Restricted Band Edge Measurements

§15.205 §15.209

The radiated restricted band edge measurements are measured with an EMI test receiver connected to the receive antenna while the EUT is transmitting on both outputs in 802.11a mode.

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



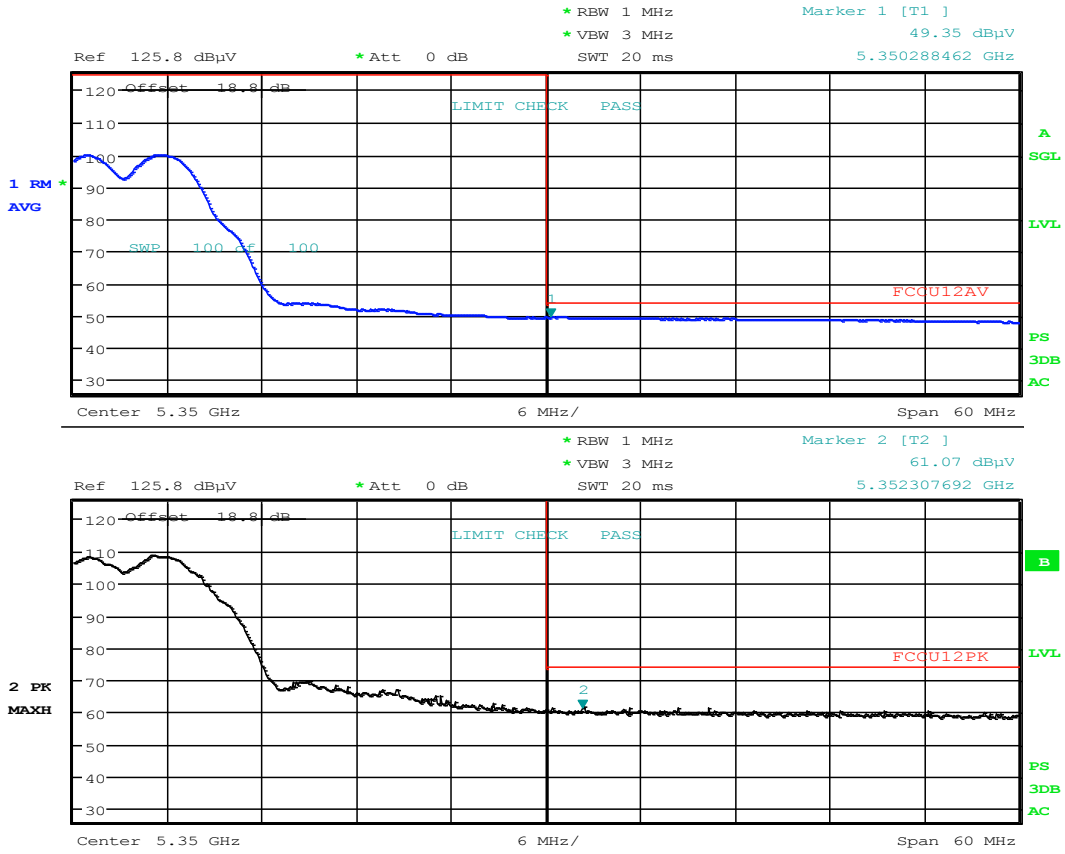
Date: 20.JUL.2016 20:20:03

Plot A.4-1. Radiated Restricted Lower Band Edge Plot

Dual Tx Radiated Restricted Band Edge Measurements

§15.407(b.1)(b.2) §15.205 §15.209

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



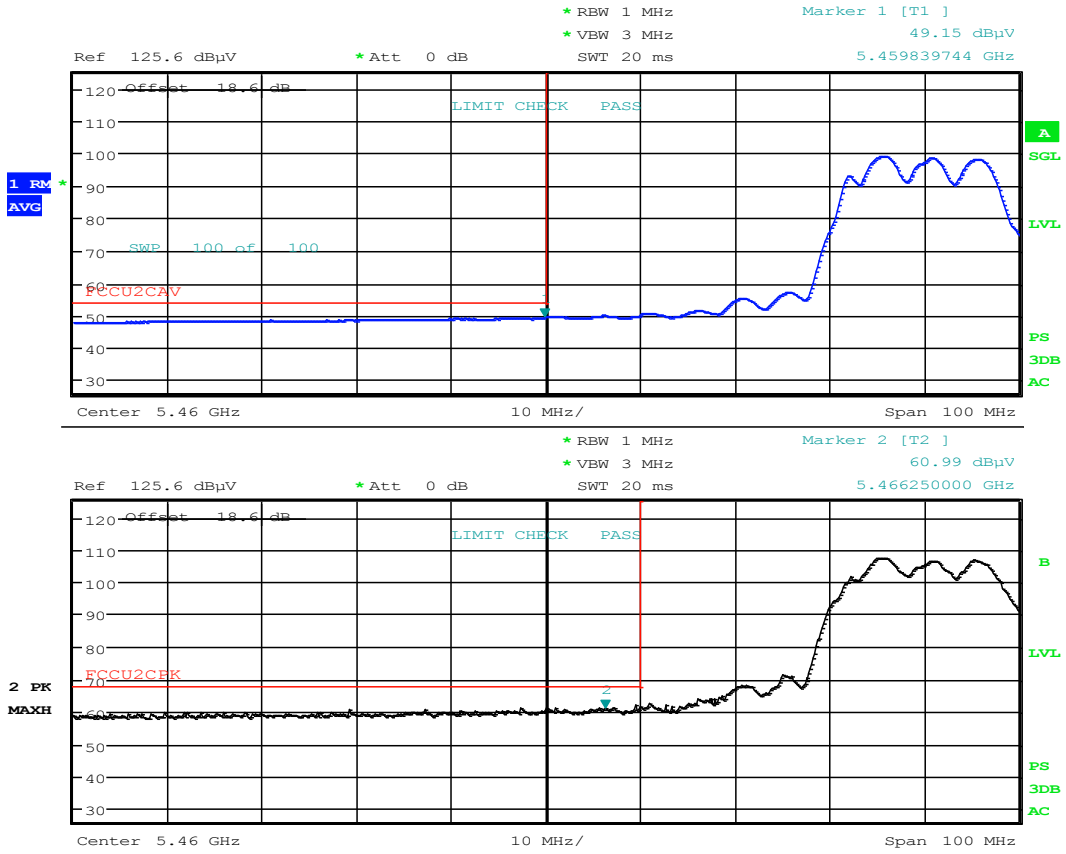
Date: 20.JUL.2016 20:27:37

Plot A.4-3. Radiated Restricted Upper Band Edge Plot

Dual Tx Radiated Restricted Band Edge Measurements

§15.407(b.1)(b.2) §15.205 §15.209

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



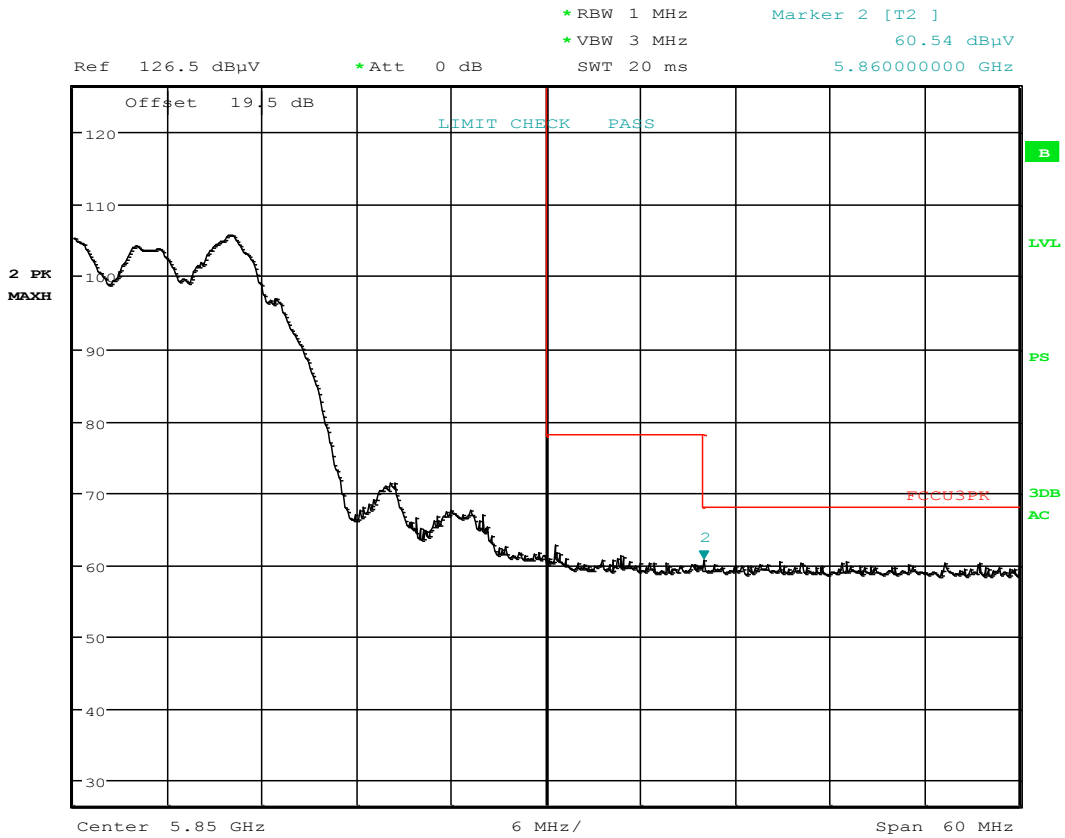
Date: 20.JUL.2016 20:34:14

Plot A.4-5. Radiated Restricted Lower Band Edge Plot

Dual Tx Radiated Restricted Band Edge Measurements

§15.407(b.1)(b.2) §15.205 §15.209

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



Date: 20.JUL.2016 20:38:34

Plot A.4-9. Radiated Upper Band Edge Plot (Peak – UNII Band 3)