6.4 Maximum Power Spectral Density – 802.11a/n/ac

§15.407(a.1)(2.5)

Test Overview and Limit

The spectrum analyzer was connected to the antenna terminal while the EUT was operating at its maximum duty cycle (>98%), at its maximum power control level, as defined in KDB 789033 v01r04, and at the appropriate frequencies. Method SA-1, as defined in KDB 789033 v01r04, was used to measure the power spectral density.

In the 5.15 – 5.25GHz band, the maximum permissible power spectral density is 4dBm/MHz.

In the 5.25 – 5.35GHz, 5.47 – 5.725GHz bands, the maximum permissible power spectral density is 11dBm/MHz.

Test Procedure Used

KDB 789033 v01r04 – Section F
KDB 662911 v02r01 – Section E)2) Measure-and-Sum Technique

Test Settings

1. Analyzer was set to the center frequency of the UNII channel under investigation
2. Span was set to encompass the entire emission bandwidth of the signal
3. RBW = 1MHz
4. VBW = 3MHz
5. Number of sweep points ≥ 2 x (span/RBW)
6. Sweep time = auto
7. Detector = power averaging (RMS)
8. Trigger was set to free run since the EUT was operating at a duty cycle ≥ 98%
9. Trace was averaged over 100 sweeps
10. The peak search function of the spectrum analyzer was used to find the peak of the spectrum.

Test Setup

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

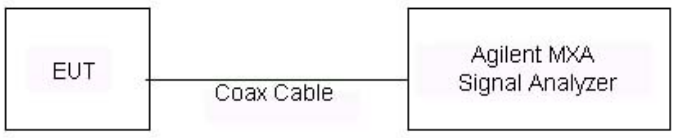


Figure 6-3. Test Instrument & Measurement Setup

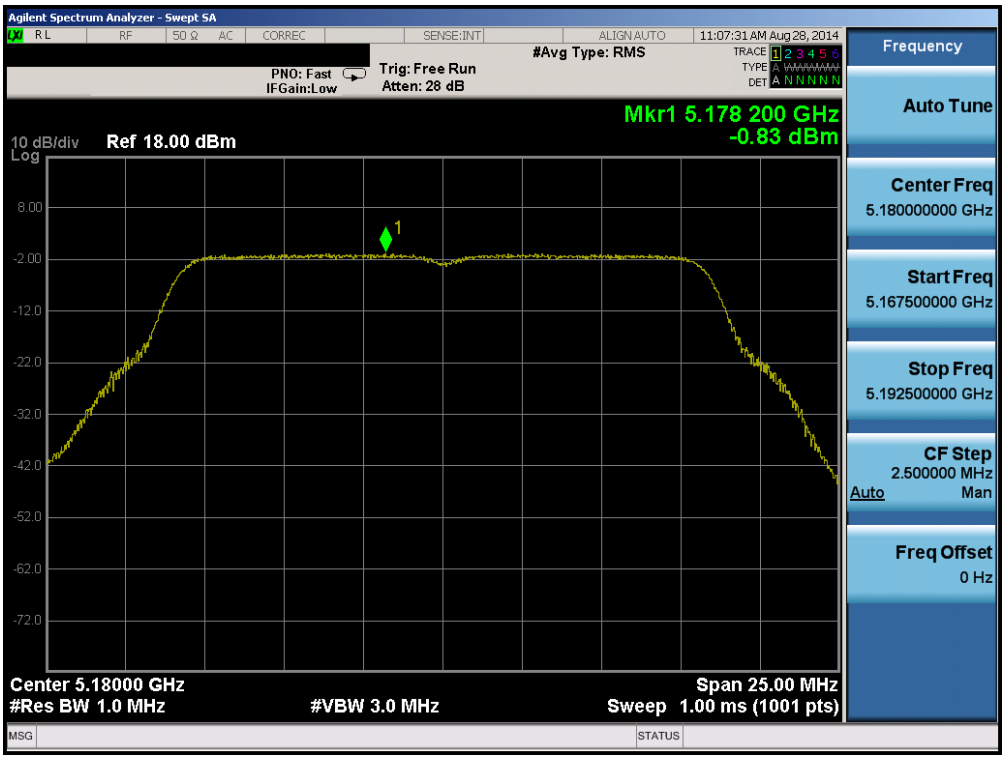
Test Notes

None

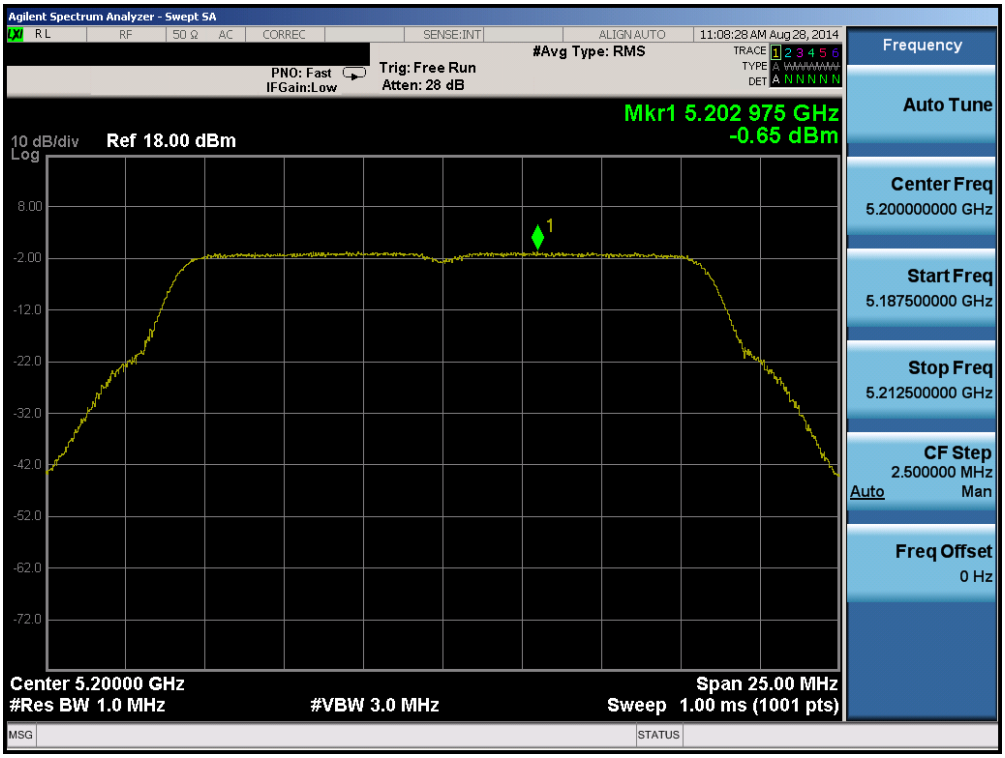
Antenna-1 Power Spectral Density Measurements

	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	-0.83	4.0	-4.83	Pass
	5200	40	a	6	-0.65	4.0	-4.65	Pass
	5240	48	a	6	-0.92	4.0	-4.92	Pass
	5180	36	n (20MHz)	6.5/7.2 (MCS0)	-1.17	4.0	-5.17	Pass
	5200	40	n (20MHz)	6.5/7.2 (MCS0)	-1.30	4.0	-5.30	Pass
	5240	48	n (20MHz)	6.5/7.2 (MCS0)	-1.05	4.0	-5.05	Pass
	5190	38	n (40MHz)	13.5/15 (MCS0)	-4.48	4.0	-8.48	Pass
	5230	46	n (40MHz)	13.5/15 (MCS0)	-4.54	4.0	-8.54	Pass
	5210	42	ac (80MHz)	29.3/32.5 (MCS0)	-7.50	4.0	-11.50	Pass
Band 2A	5260	52	a	6	-0.67	11.0	-11.67	Pass
	5280	56	a	6	-0.74	11.0	-11.74	Pass
	5320	64	a	6	-0.57	11.0	-11.57	Pass
	5260	52	n (20MHz)	6.5/7.2 (MCS0)	-1.17	11.0	-12.17	Pass
	5280	56	n (20MHz)	6.5/7.2 (MCS0)	-0.86	11.0	-11.86	Pass
	5320	64	n (20MHz)	6.5/7.2 (MCS0)	-1.01	11.0	-12.01	Pass
	5270	54	n (40MHz)	13.5/15 (MCS0)	-4.45	11.0	-15.45	Pass
	5310	62	n (40MHz)	13.5/15 (MCS0)	-4.37	11.0	-15.37	Pass
	5290	58	ac (80MHz)	29.3/32.5 (MCS0)	-8.56	11.0	-19.56	Pass
Band 2C	5500	100	a	6	0.26	11.0	-10.74	Pass
	5580	116	a	6	-0.32	11.0	-11.32	Pass
	5700	140	a	6	-0.95	11.0	-11.95	Pass
	5500	100	n (20MHz)	6.5/7.2 (MCS0)	-0.25	11.0	-11.25	Pass
	5580	116	n (20MHz)	6.5/7.2 (MCS0)	-0.73	11.0	-11.73	Pass
	5700	140	n (20MHz)	6.5/7.2 (MCS0)	-1.17	11.0	-12.17	Pass
	5510	102	n (40MHz)	13.5/15 (MCS0)	-4.27	11.0	-15.27	Pass
	5550	110	n (40MHz)	13.5/15 (MCS0)	-4.64	11.0	-15.64	Pass
	5670	134	n (40MHz)	13.5/15 (MCS0)	-5.42	11.0	-16.42	Pass
	5530	106	ac (80MHz)	29.3/32.5 (MCS0)	-8.27	11.0	-19.27	Pass

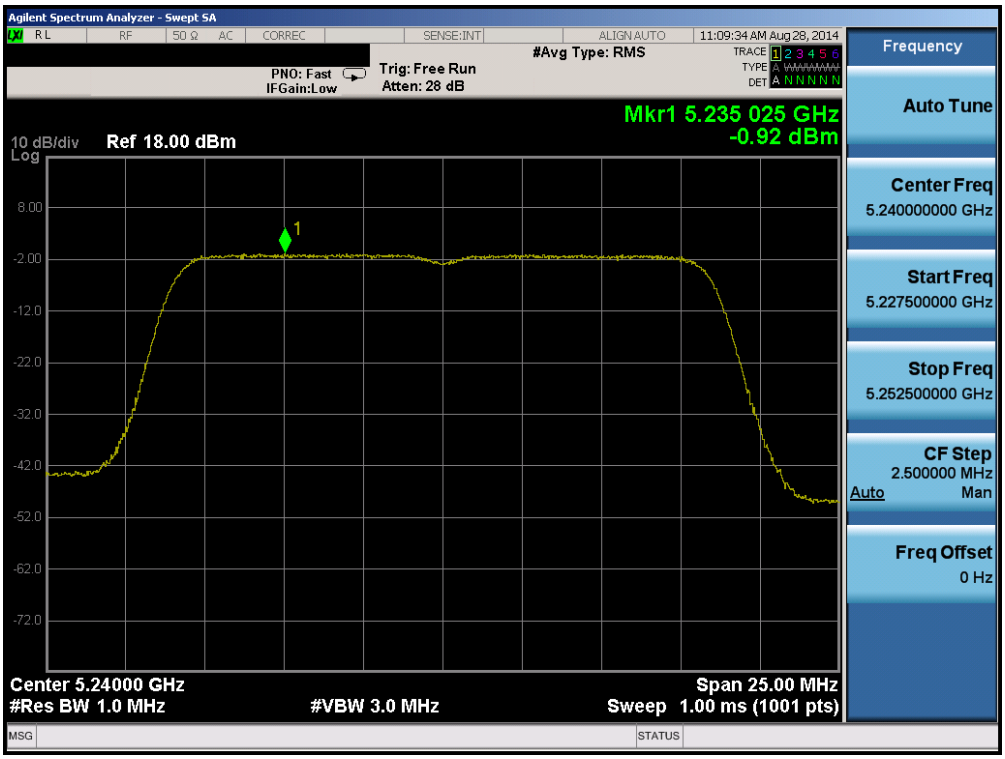
Table 6-21. Conducted Power Spectral Density Measurements



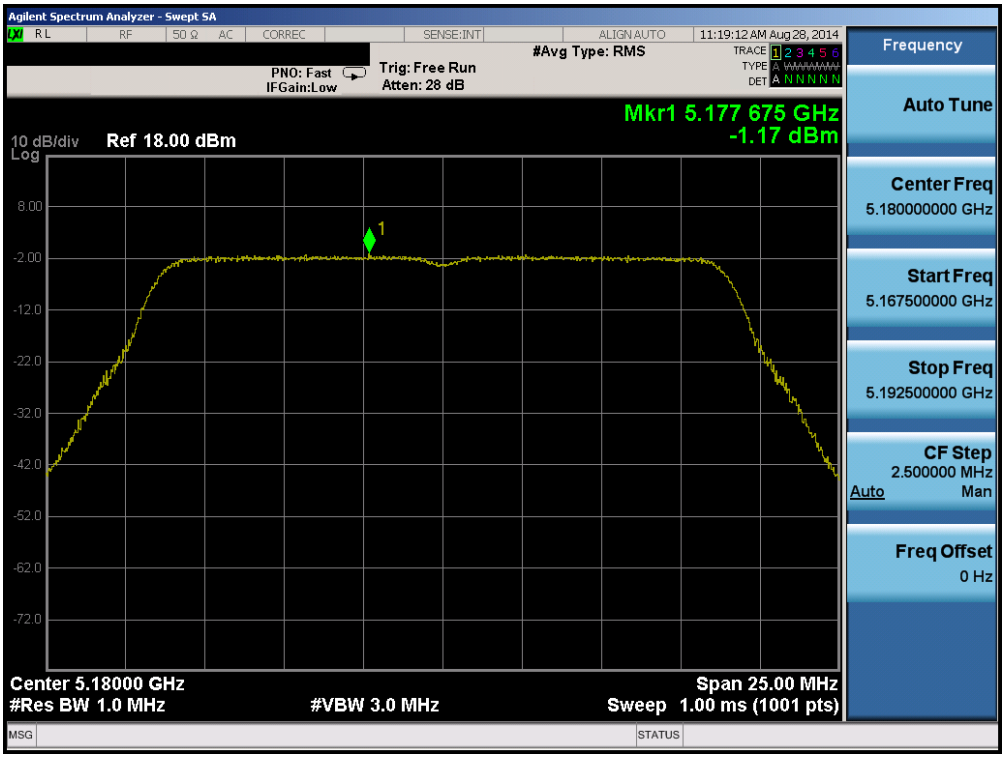
Plot 6-62. Peak Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 36)



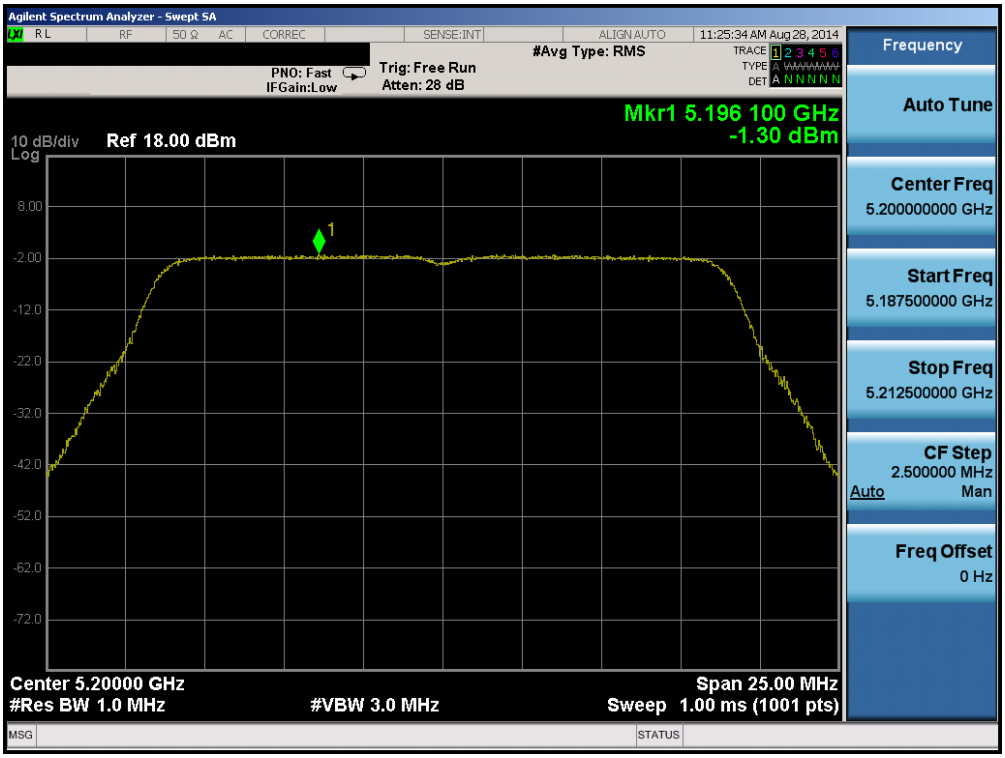
Plot 6-63. Peak Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 40)



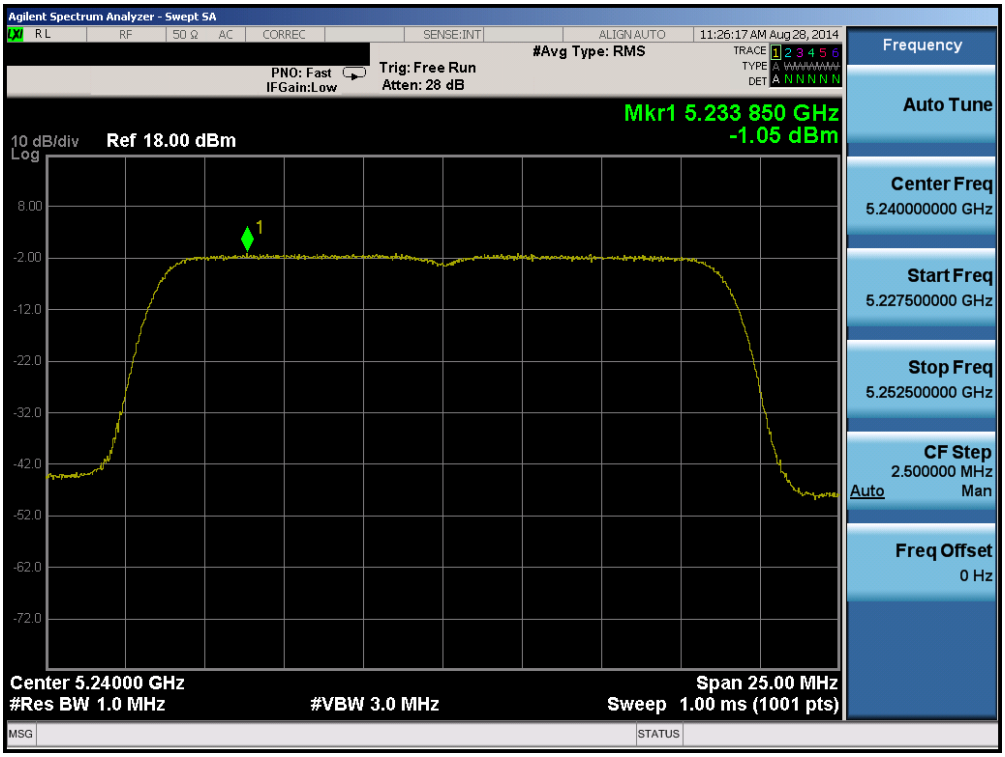
Plot 6-64. Peak Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 48)



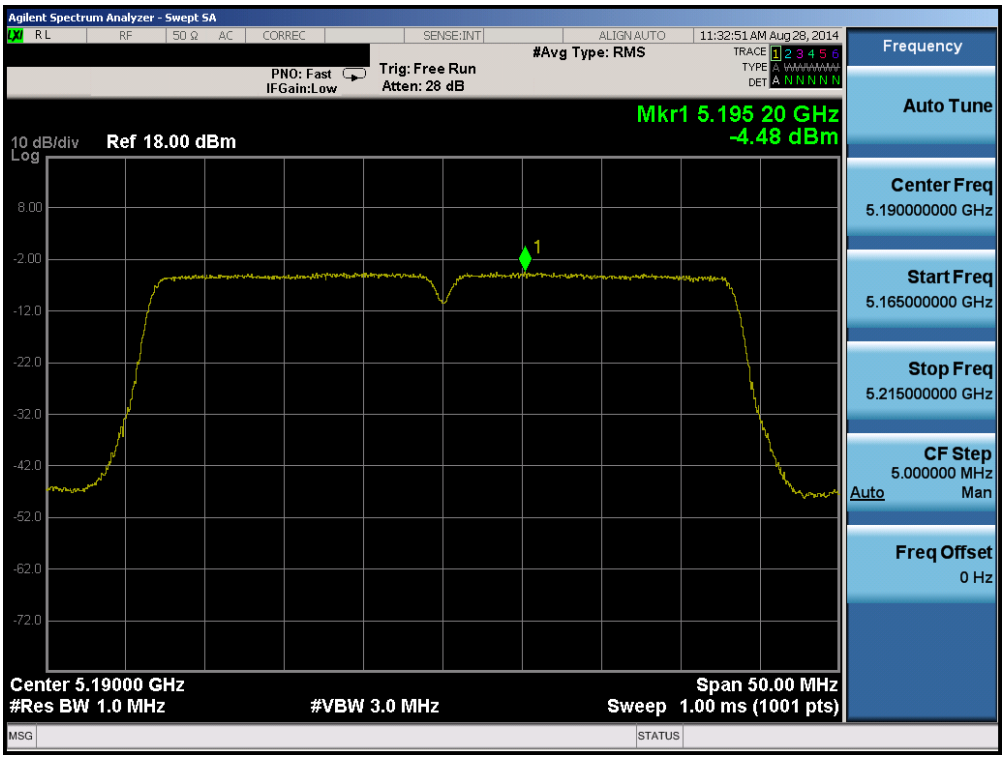
Plot 6-65. Peak Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 36)



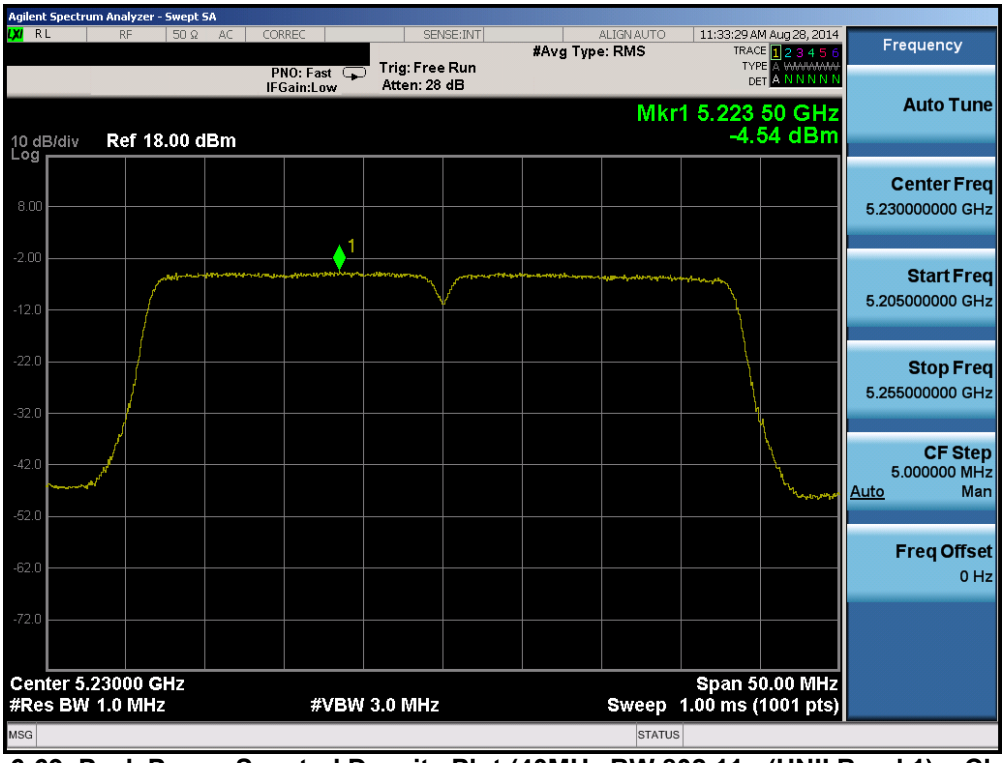
Plot 6-66. Peak Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 40)



Plot 6-67. Peak Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 48)

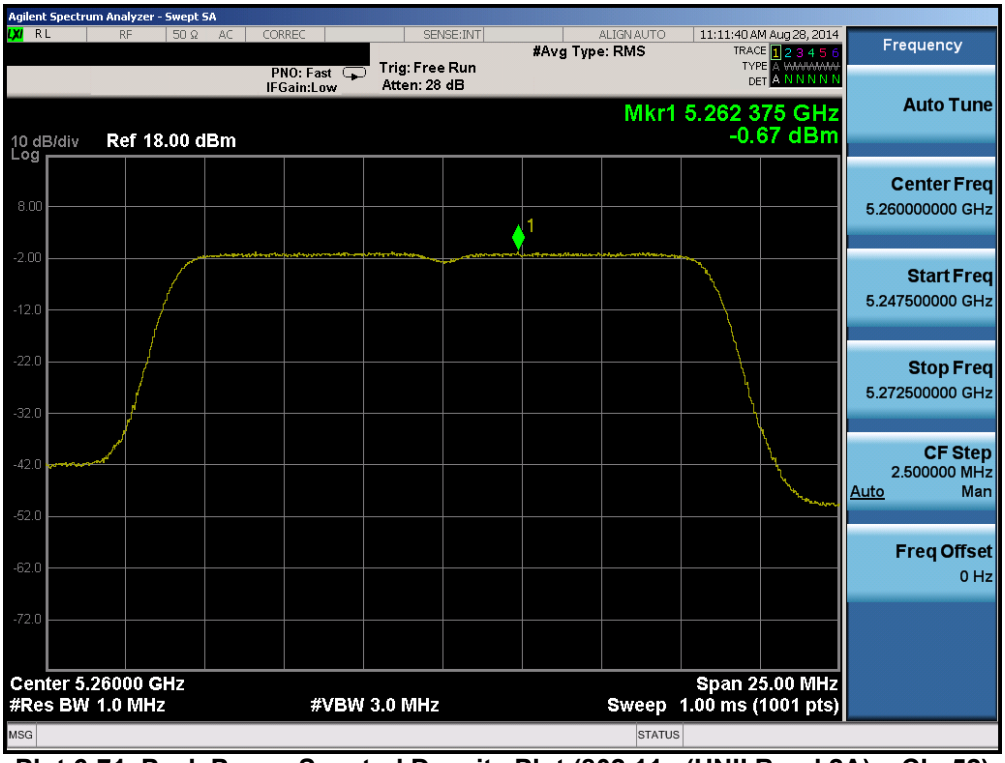


Plot 6-68. Peak Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 1) – Ch. 38)

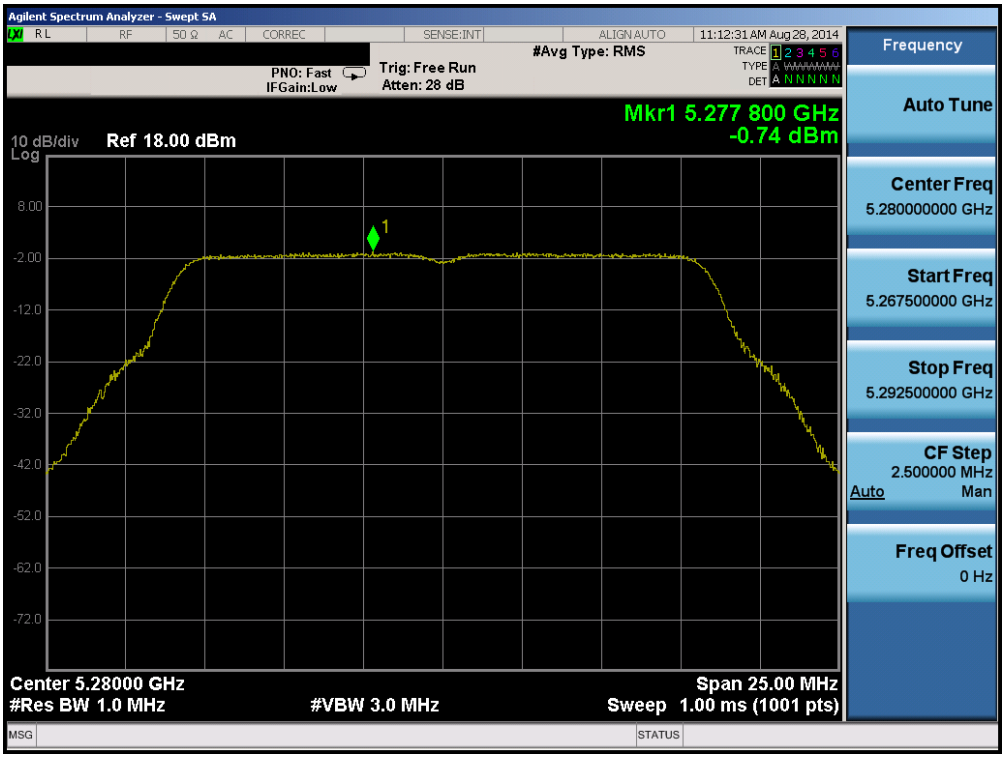


Plot 6-69. Peak Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 1) – Ch. 46)

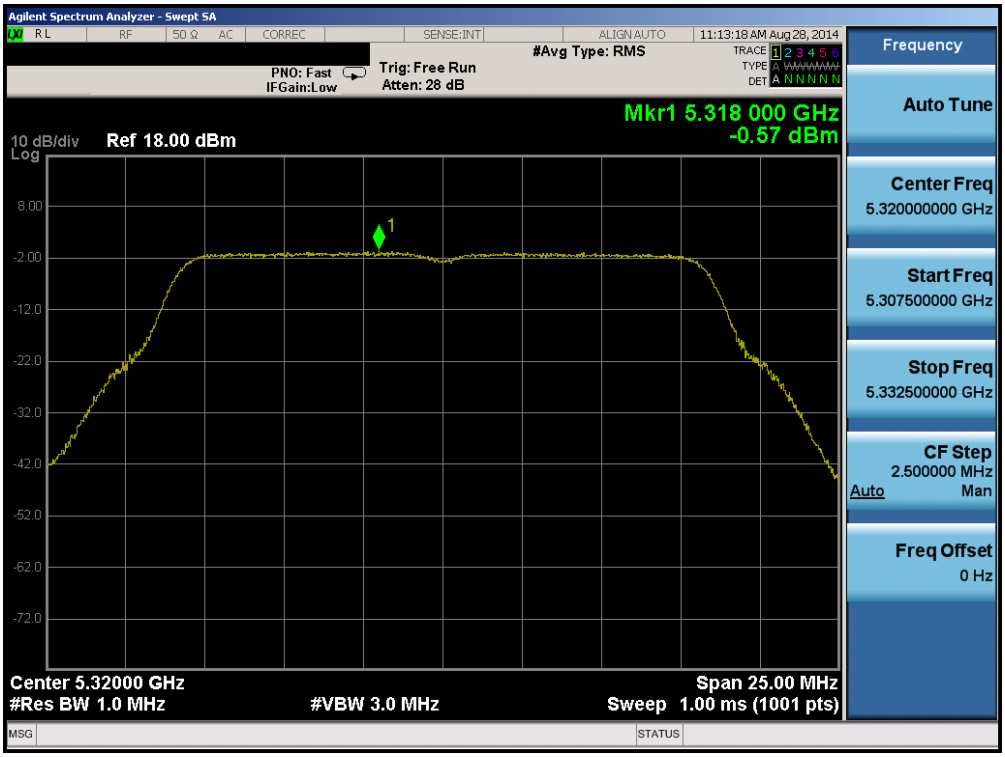
Plot 6-70. Peak Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 1) – Ch. 42)



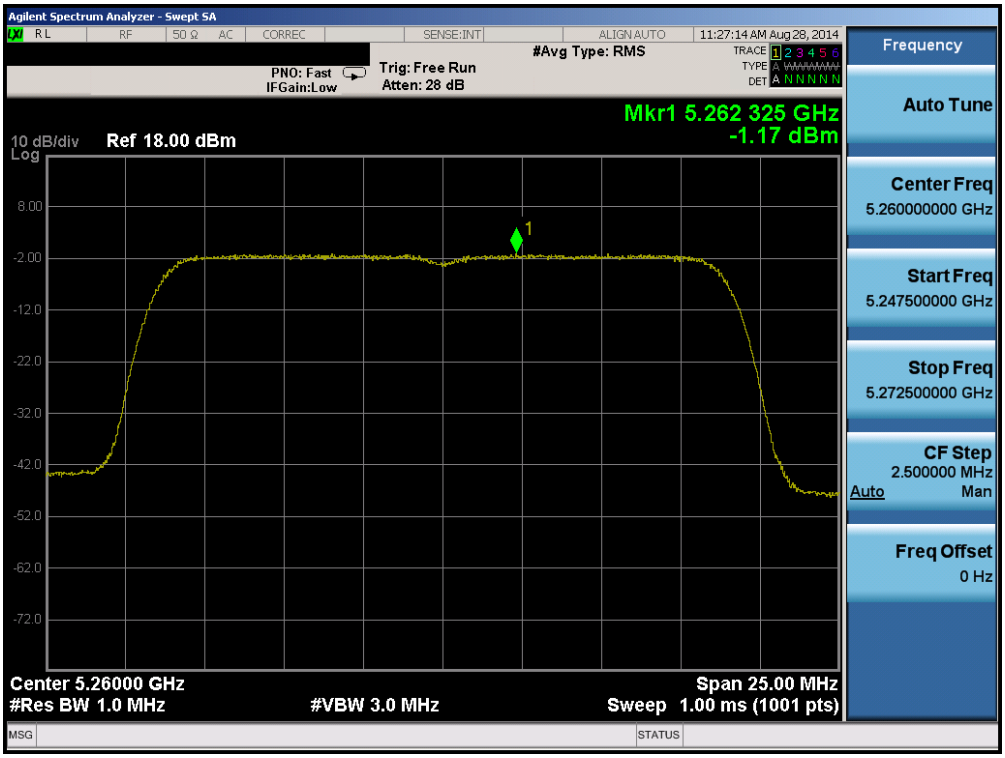
Plot 6-71. Peak Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 52)



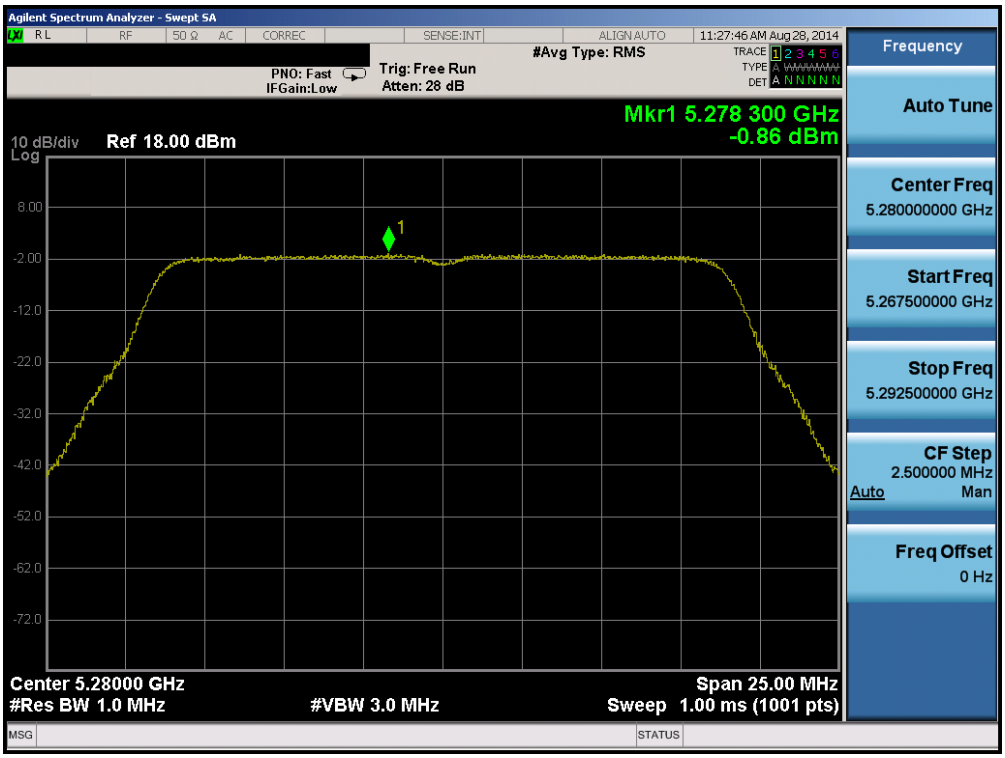
Plot 6-72. Peak Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 56)



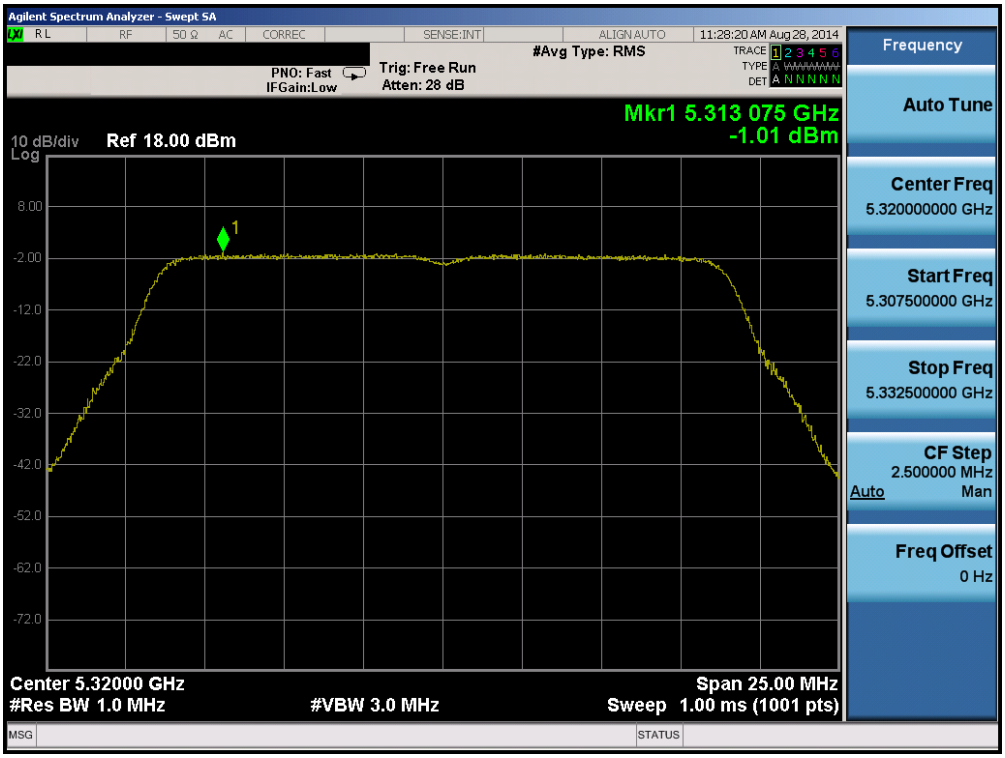
Plot 6-73. Peak Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 64)



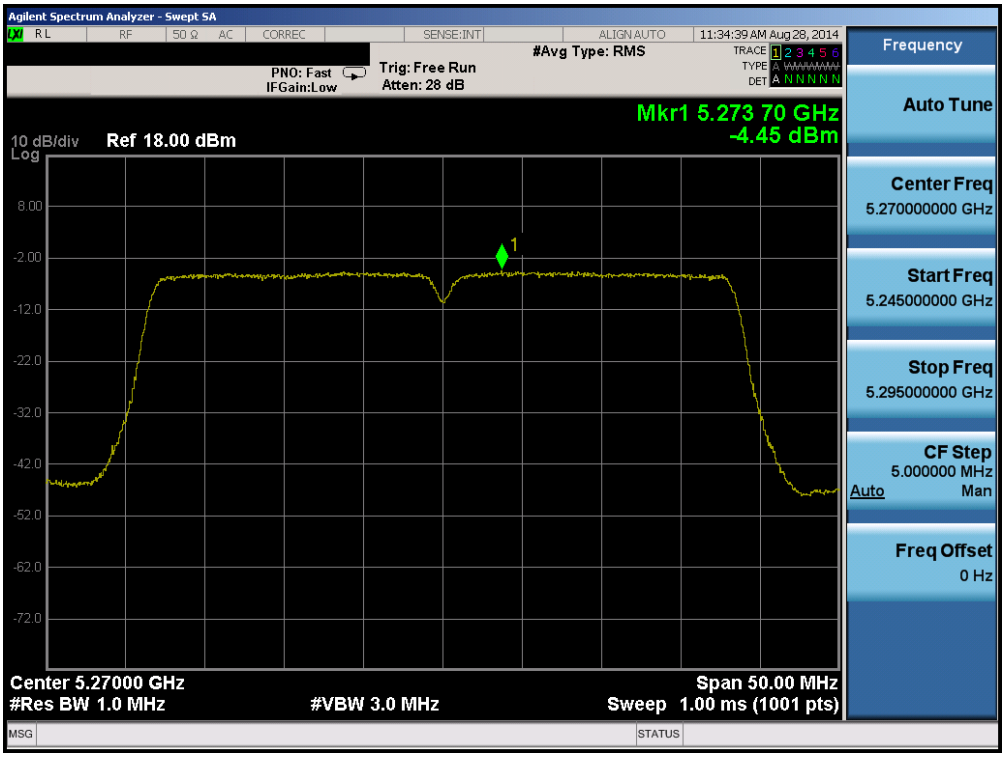
Plot 6-74. Peak Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 52)



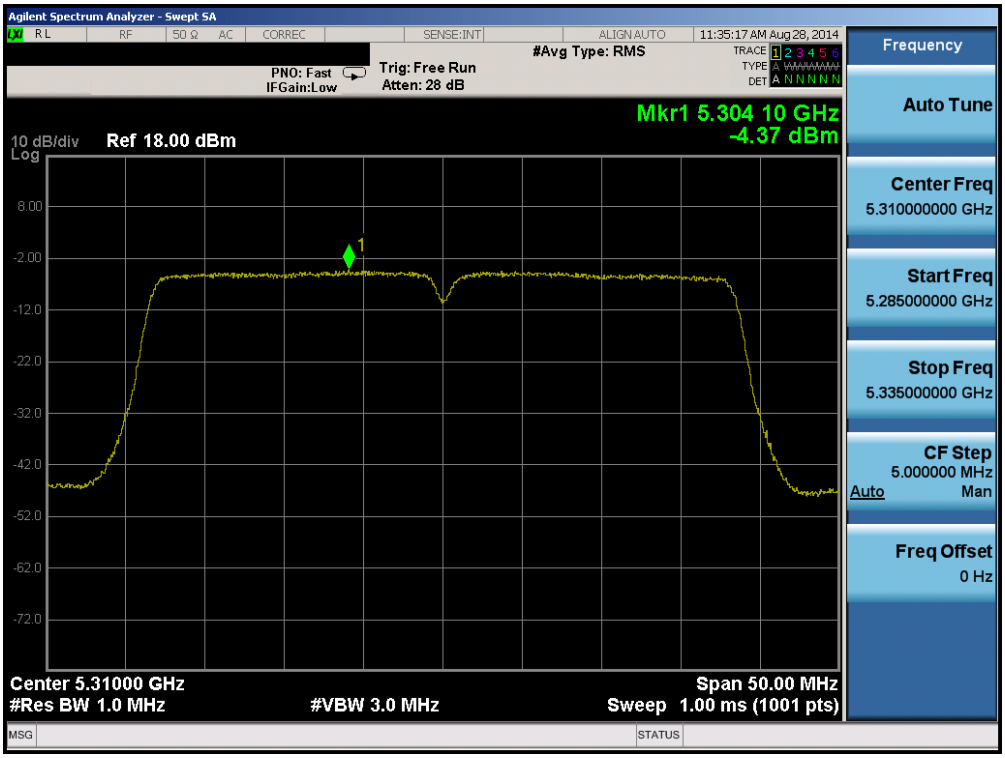
Plot 6-75. Peak Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 56)



Plot 6-76. Peak Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 64)

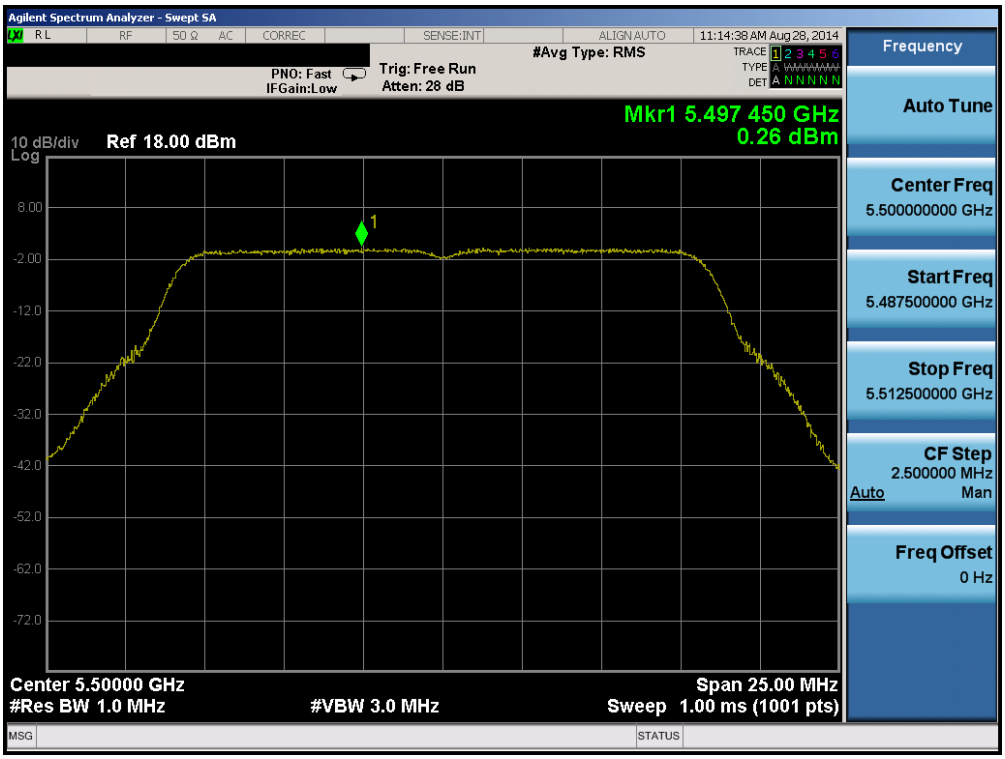


Plot 6-77. Peak Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2A) – Ch. 54)

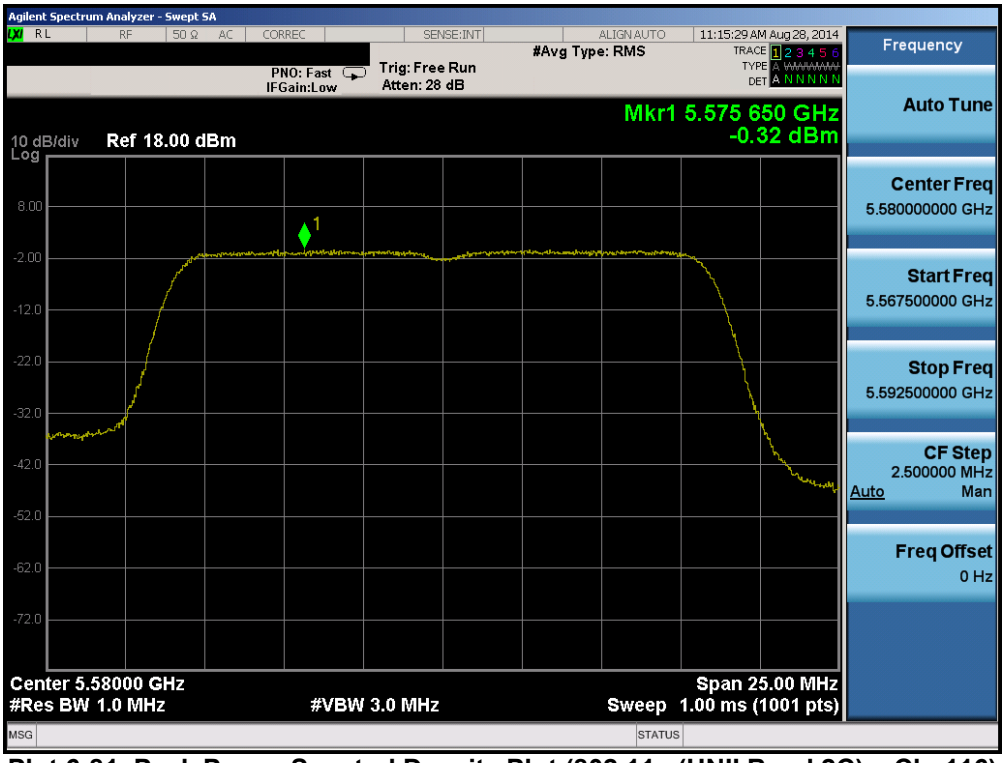


Plot 6-78. Peak Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2A) – Ch. 62)

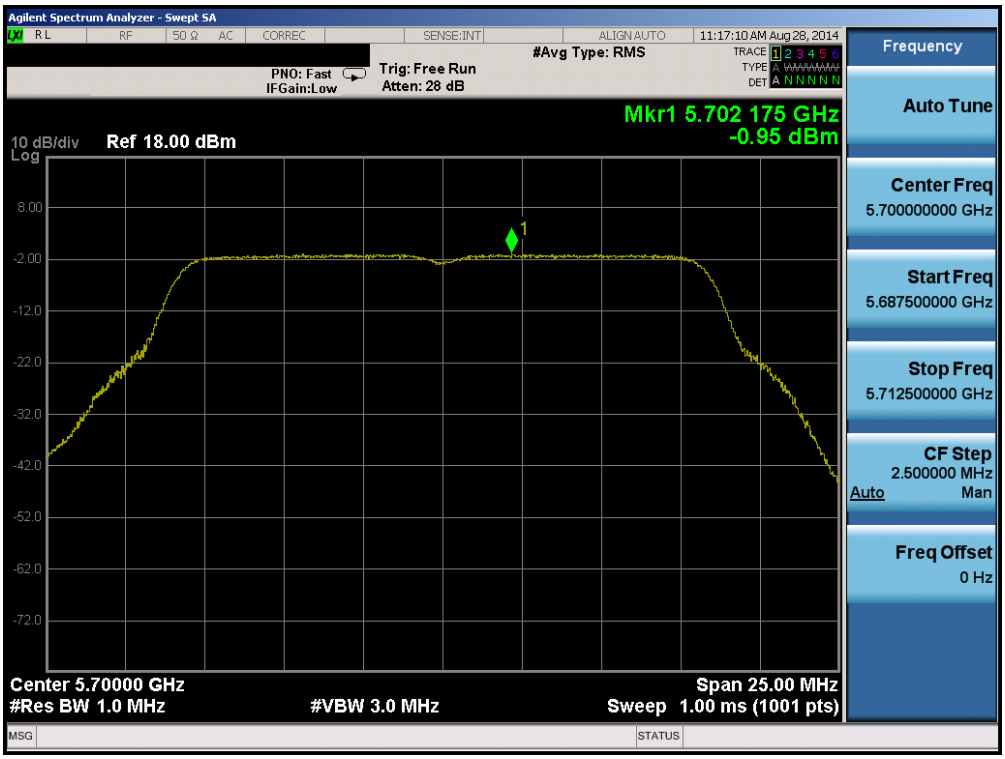
Plot 6-79. Peak Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2A) – Ch. 58)



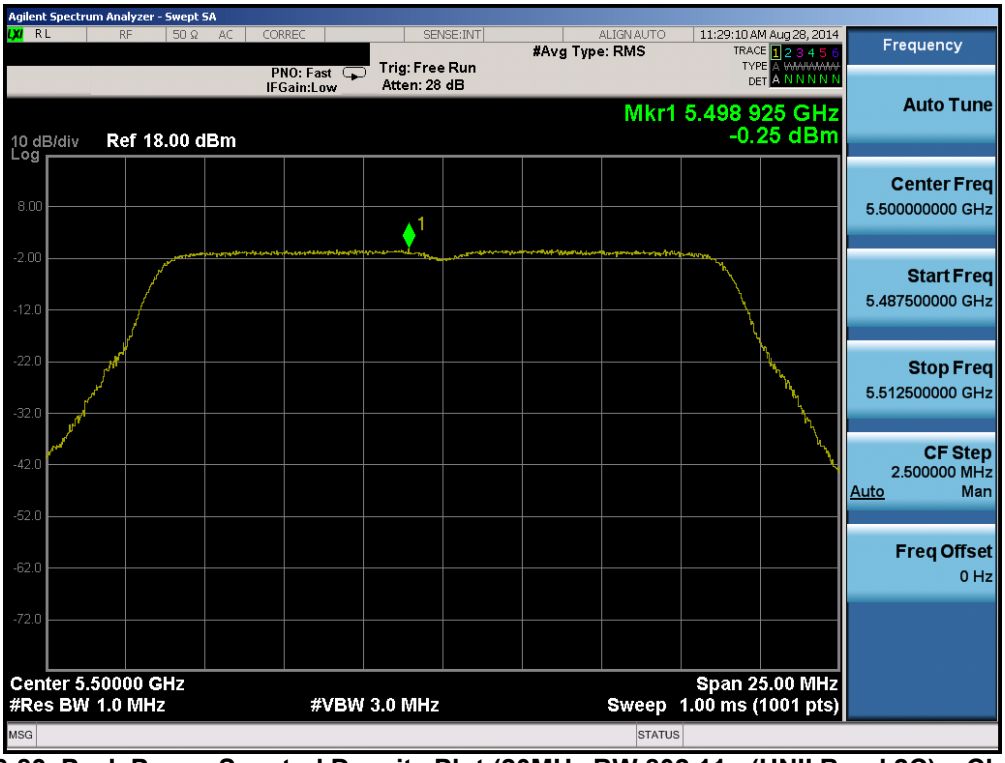
Plot 6-80. Peak Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 100)



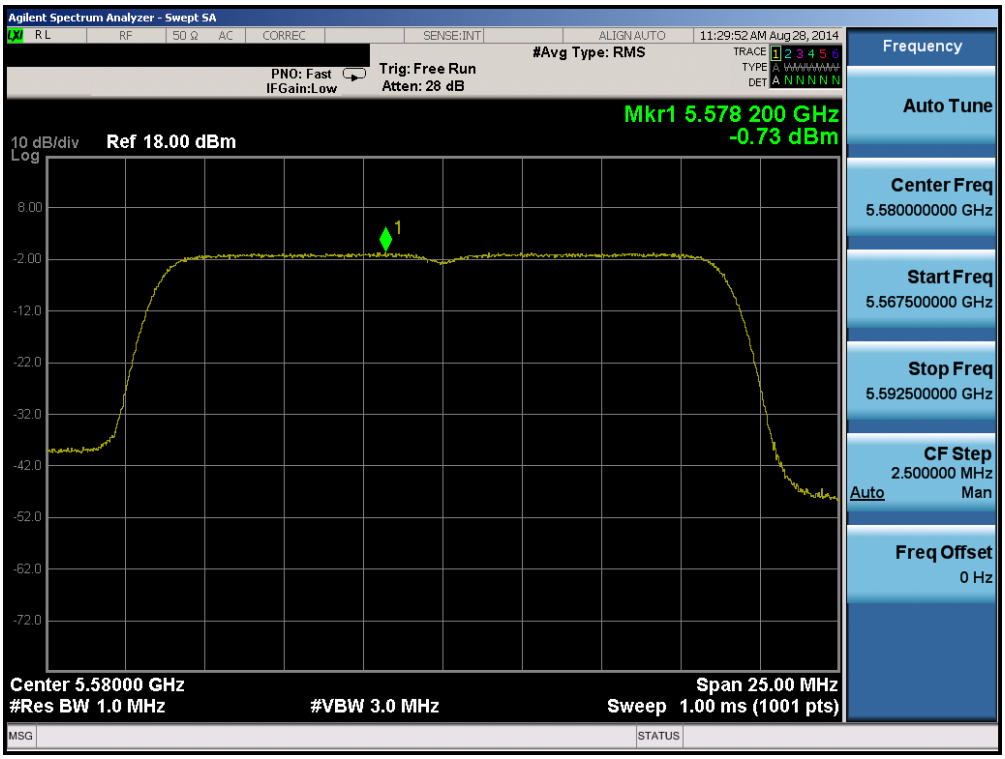
Plot 6-81. Peak Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 116)



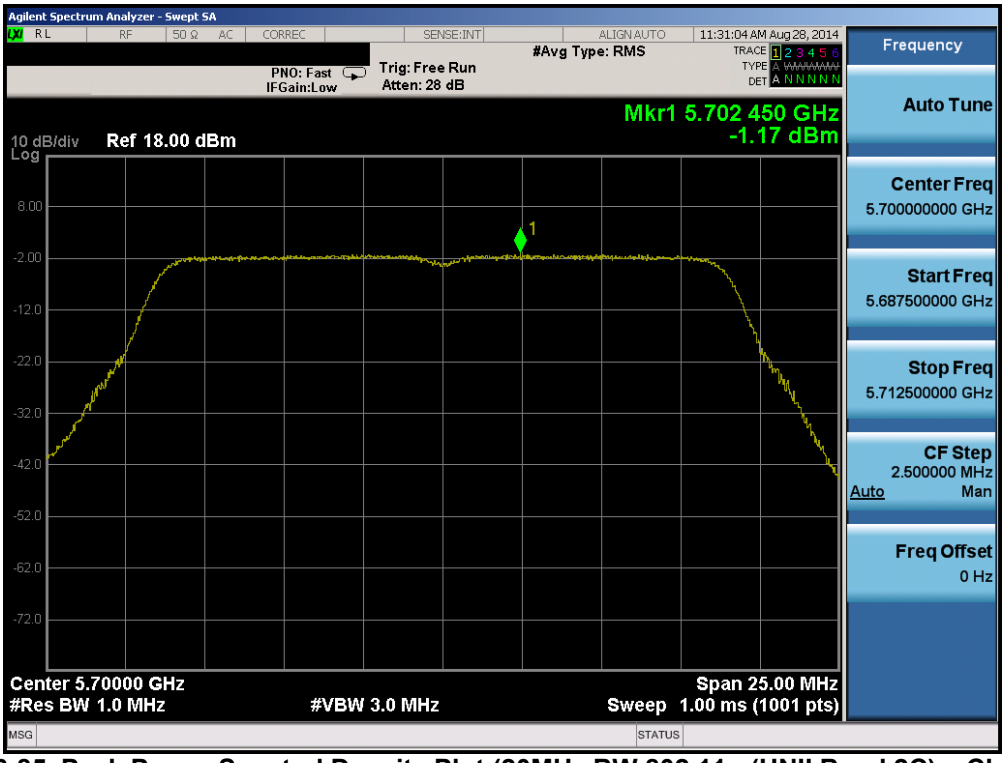
Plot 6-82. Peak Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 140)



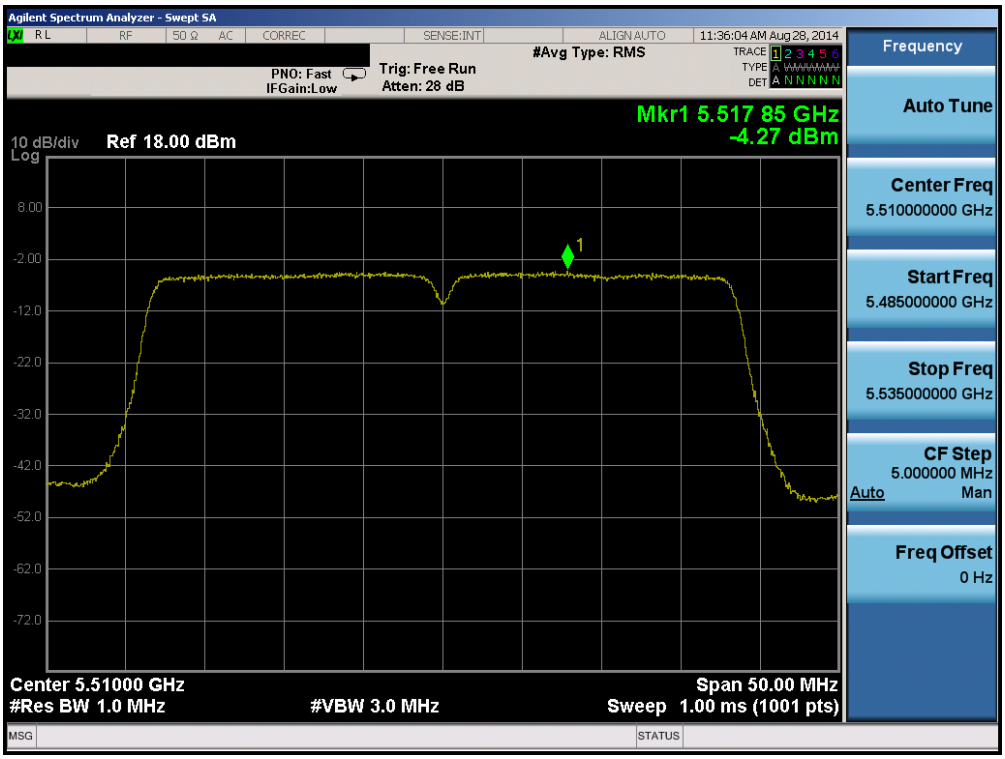
Plot 6-83. Peak Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 100)



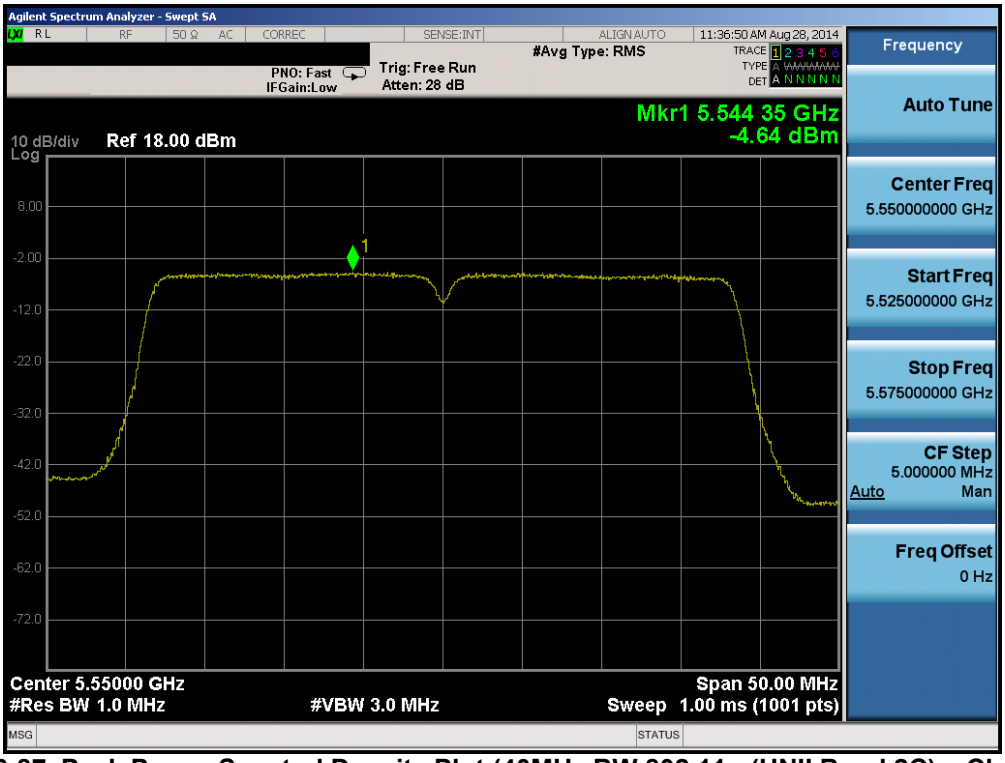
Plot 6-84. Peak Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 116)



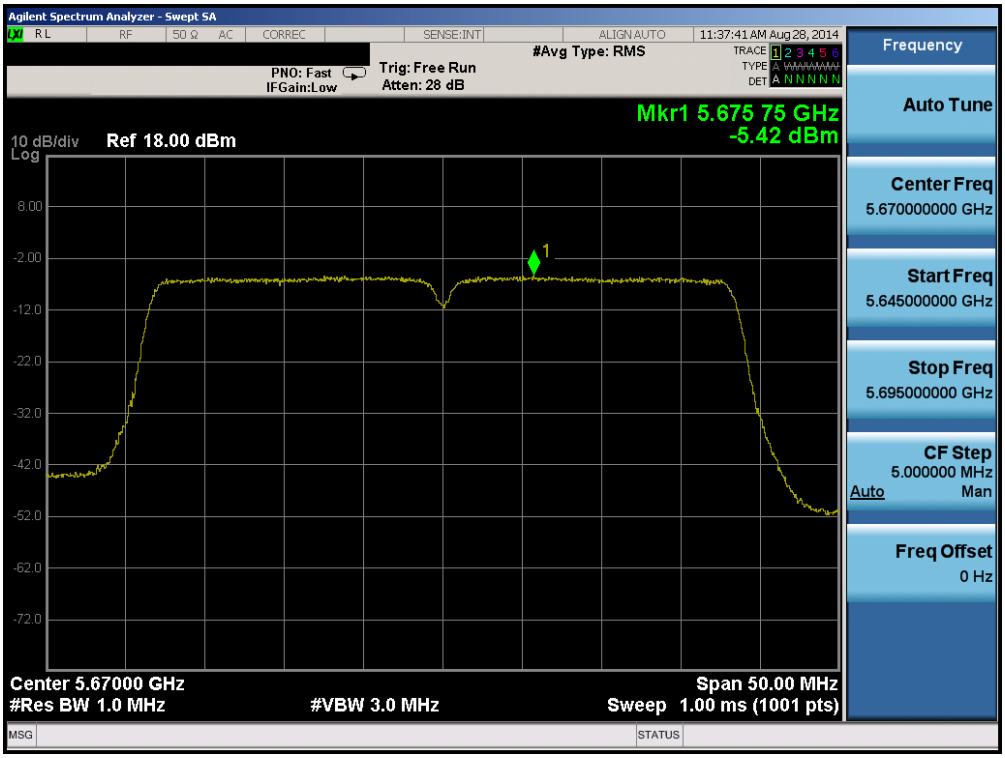
Plot 6-85. Peak Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 140)



Plot 6-86. Peak Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 102)



Plot 6-87. Peak Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 110)



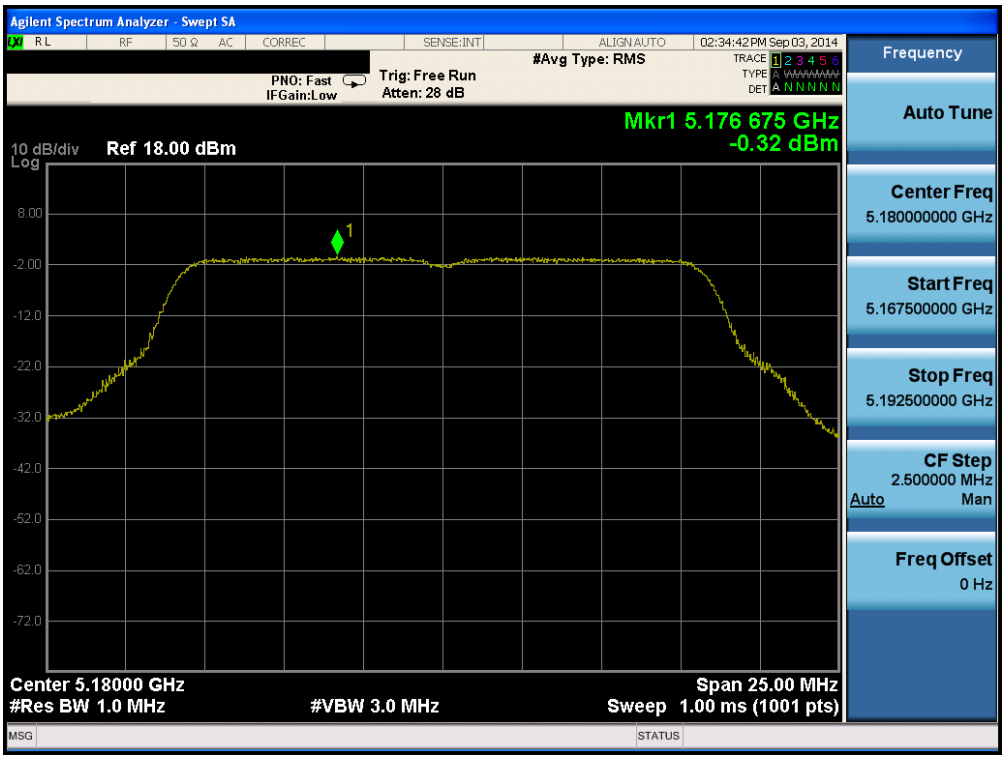
Plot 6-88. Peak Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 134)

Plot 6-89. Peak Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2C) – Ch. 106)

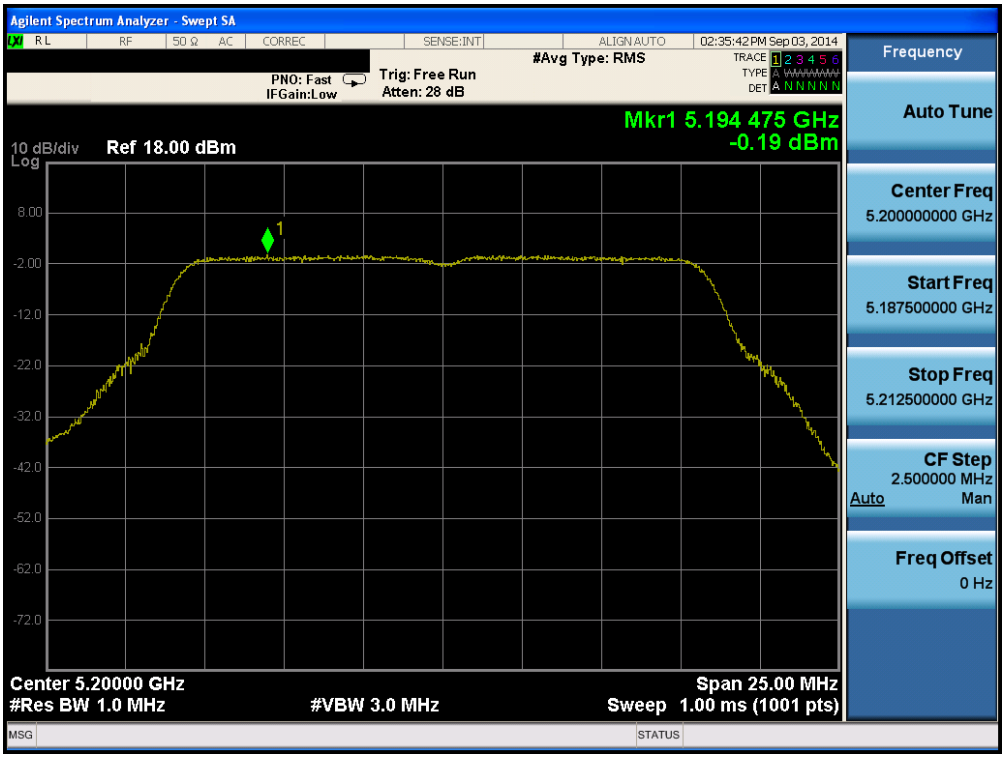
Antenna-2 Power Spectral Density Measurements

	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured Power Density [dBm]	Max Permissible Power Density [dBm/MHz]	Margin [dB]	Pass / Fail
Band 1	5180	36	a	6	-0.32	4.0	-4.32	Pass
	5200	40	a	6	-0.19	4.0	-4.19	Pass
	5240	48	a	6	-0.20	4.0	-4.20	Pass
	5180	36	n (20MHz)	6.5/7.2 (MCS0)	-0.69	4.0	-4.69	Pass
	5200	40	n (20MHz)	6.5/7.2 (MCS0)	-0.95	4.0	-4.95	Pass
	5240	48	n (20MHz)	6.5/7.2 (MCS0)	-0.63	4.0	-4.63	Pass
	5190	38	n (40MHz)	13.5/15 (MCS0)	-4.08	4.0	-8.08	Pass
	5230	46	n (40MHz)	13.5/15 (MCS0)	-3.87	4.0	-7.87	Pass
	5210	42	ac (80MHz)	29.3/32.5 (MCS0)	-7.20	4.0	-11.20	Pass
Band 2A	5260	52	a	6	-0.37	11.0	-11.37	Pass
	5280	56	a	6	-0.12	11.0	-11.12	Pass
	5320	64	a	6	0.08	11.0	-10.92	Pass
	5260	52	n (20MHz)	6.5/7.2 (MCS0)	-0.74	11.0	-11.74	Pass
	5280	56	n (20MHz)	6.5/7.2 (MCS0)	-0.57	11.0	-11.57	Pass
	5320	64	n (20MHz)	6.5/7.2 (MCS0)	-0.47	11.0	-11.47	Pass
	5270	54	n (40MHz)	13.5/15 (MCS0)	-5.20	11.0	-16.20	Pass
	5310	62	n (40MHz)	13.5/15 (MCS0)	-4.78	11.0	-15.78	Pass
	5290	58	ac (80MHz)	29.3/32.5 (MCS0)	-7.08	11.0	-18.08	Pass
Band 2C	5500	100	a	6	-0.39	11.0	-11.39	Pass
	5580	116	a	6	-1.07	11.0	-12.07	Pass
	5700	140	a	6	-0.85	11.0	-11.85	Pass
	5500	100	n (20MHz)	6.5/7.2 (MCS0)	-0.87	11.0	-11.87	Pass
	5580	116	n (20MHz)	6.5/7.2 (MCS0)	-1.40	11.0	-12.40	Pass
	5700	140	n (20MHz)	6.5/7.2 (MCS0)	-1.14	11.0	-12.14	Pass
	5510	102	n (40MHz)	13.5/15 (MCS0)	-4.22	11.0	-15.22	Pass
	5550	110	n (40MHz)	13.5/15 (MCS0)	-4.36	11.0	-15.36	Pass
	5670	134	n (40MHz)	13.5/15 (MCS0)	-4.16	11.0	-15.16	Pass
	5530	106	ac (80MHz)	29.3/32.5 (MCS0)	-7.60	11.0	-18.60	Pass

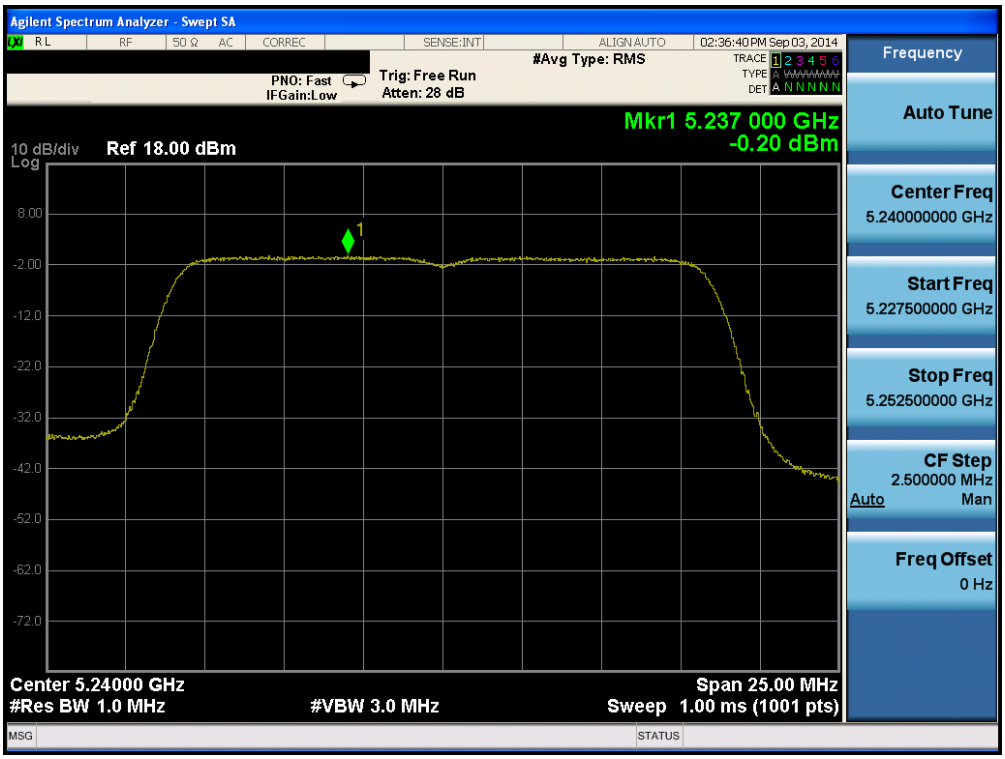
Table 6-22. Conducted Power Spectral Density Measurements



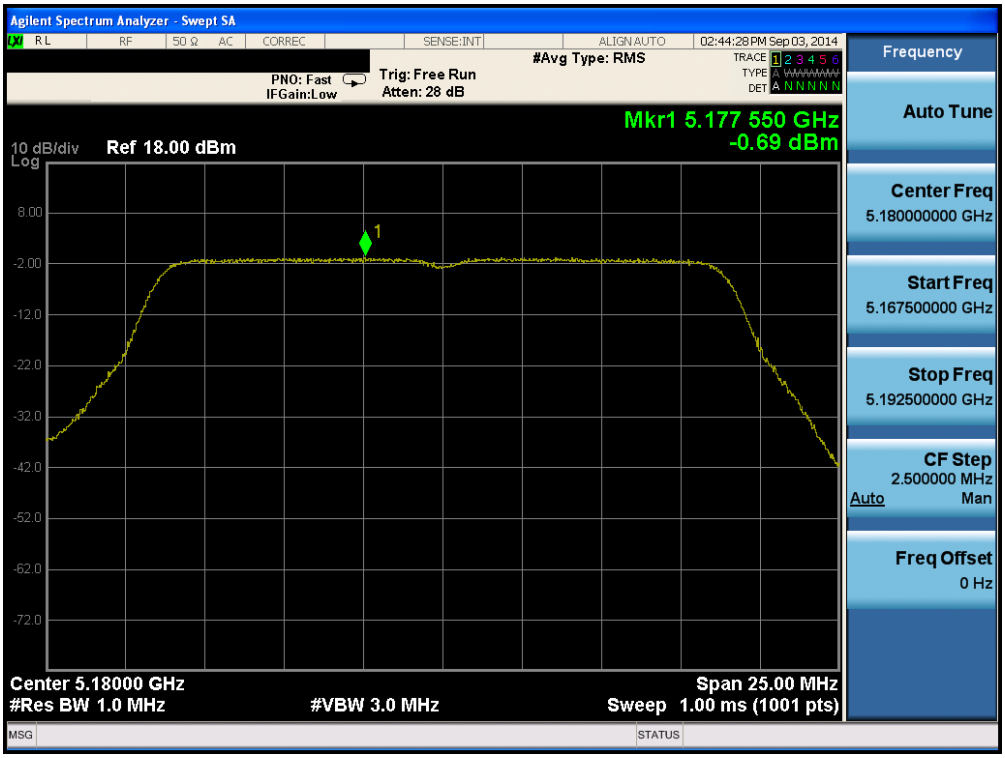
Plot 6-90. Peak Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 36)



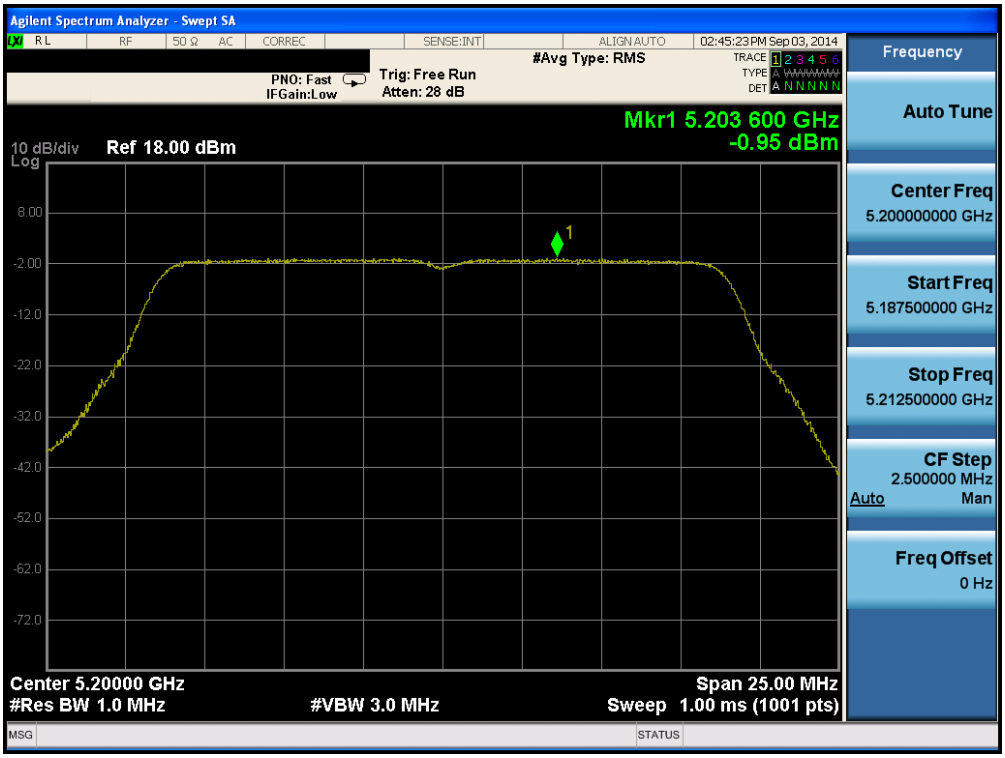
Plot 6-91. Peak Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 40)



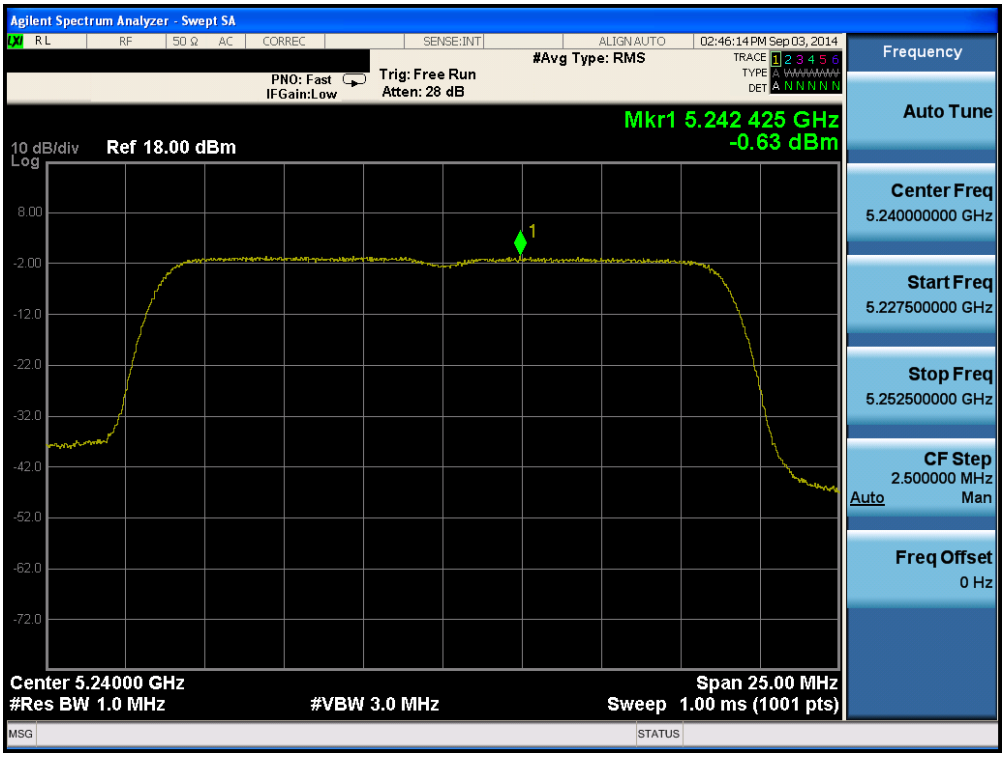
Plot 6-92. Peak Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 48)



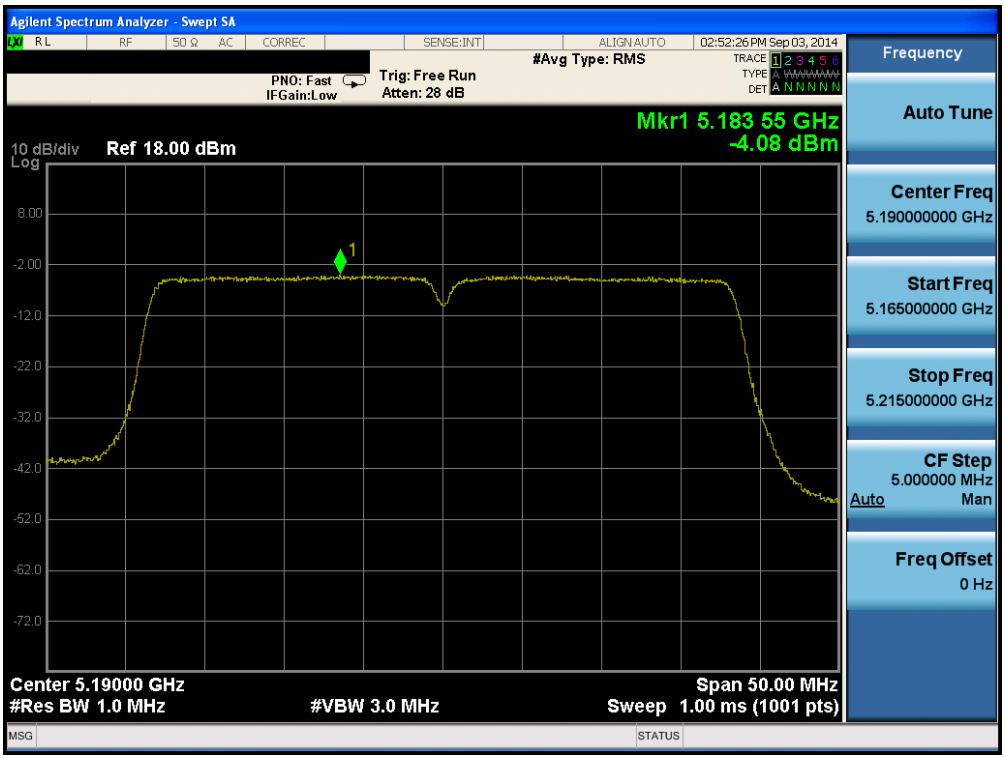
Plot 6-93. Peak Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 36)



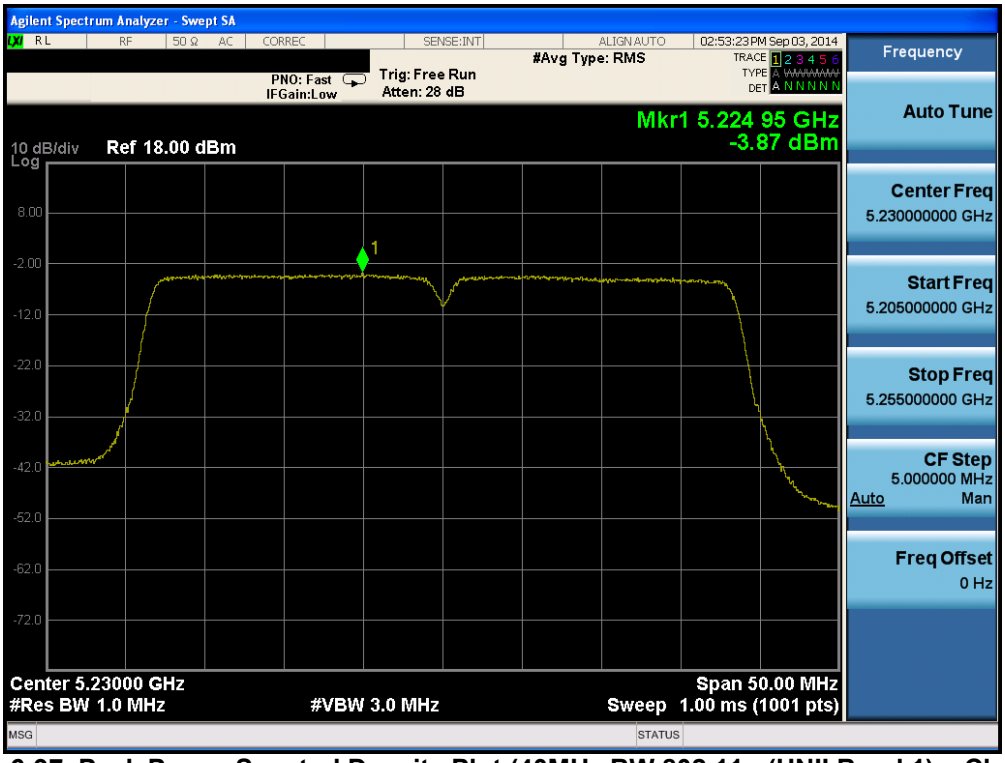
Plot 6-94. Peak Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 40)



Plot 6-95. Peak Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 48)

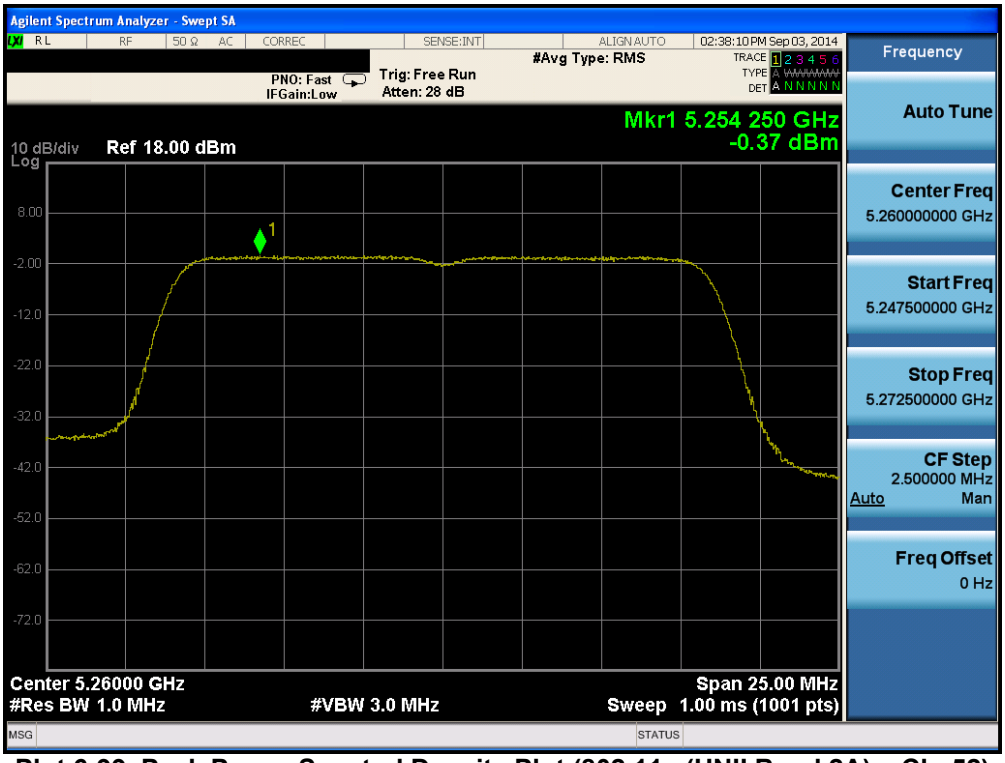


Plot 6-96. Peak Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 1) – Ch. 38)

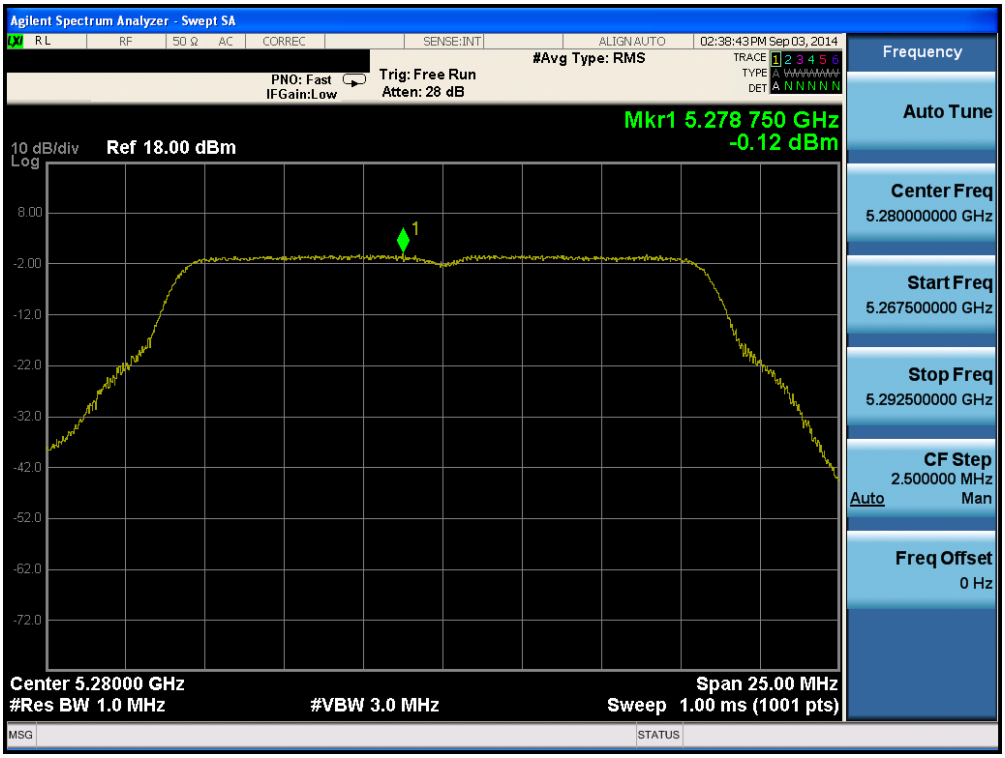


Plot 6-97. Peak Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 1) – Ch. 46)

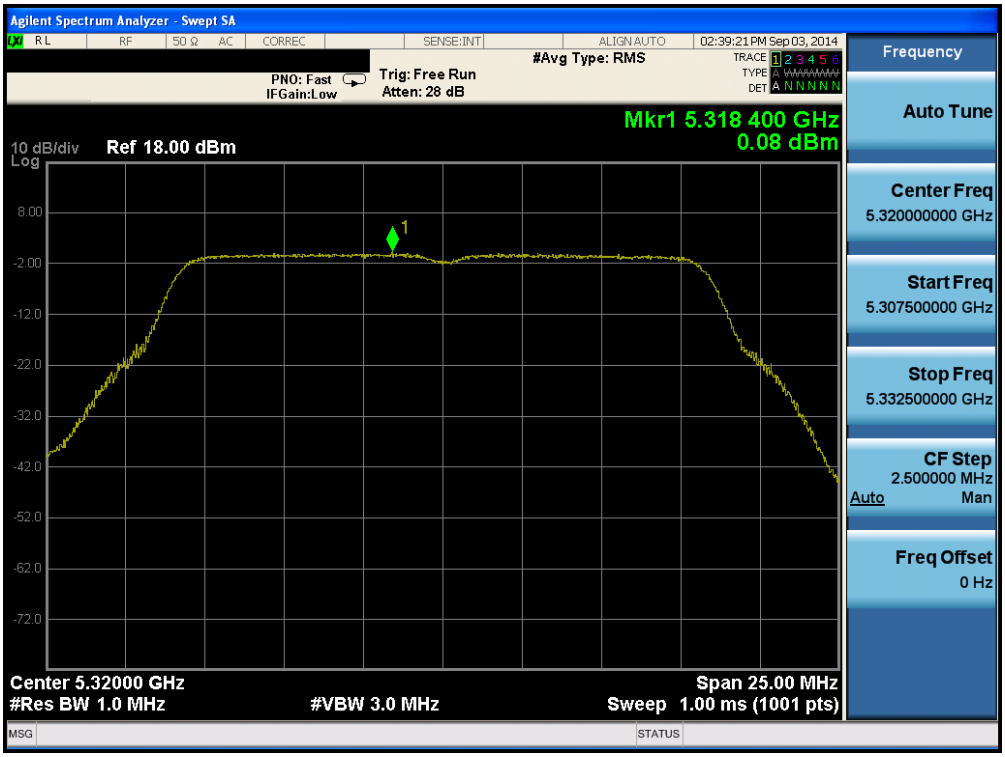
Plot 6-98. Peak Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 1) – Ch. 42)



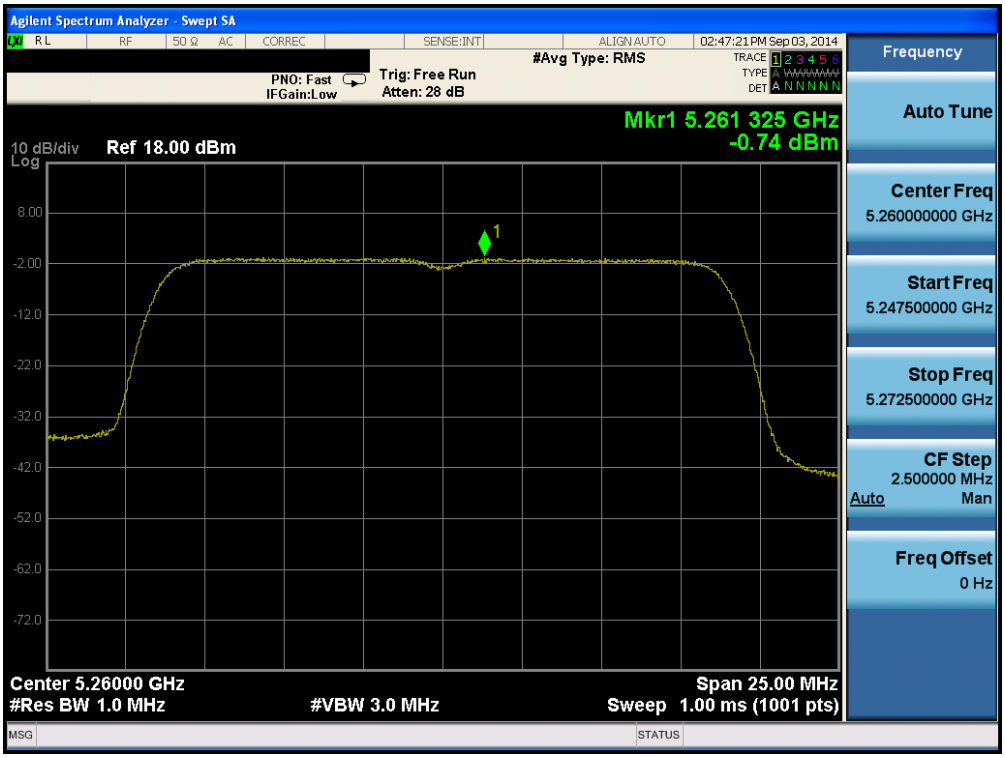
Plot 6-99. Peak Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 52)



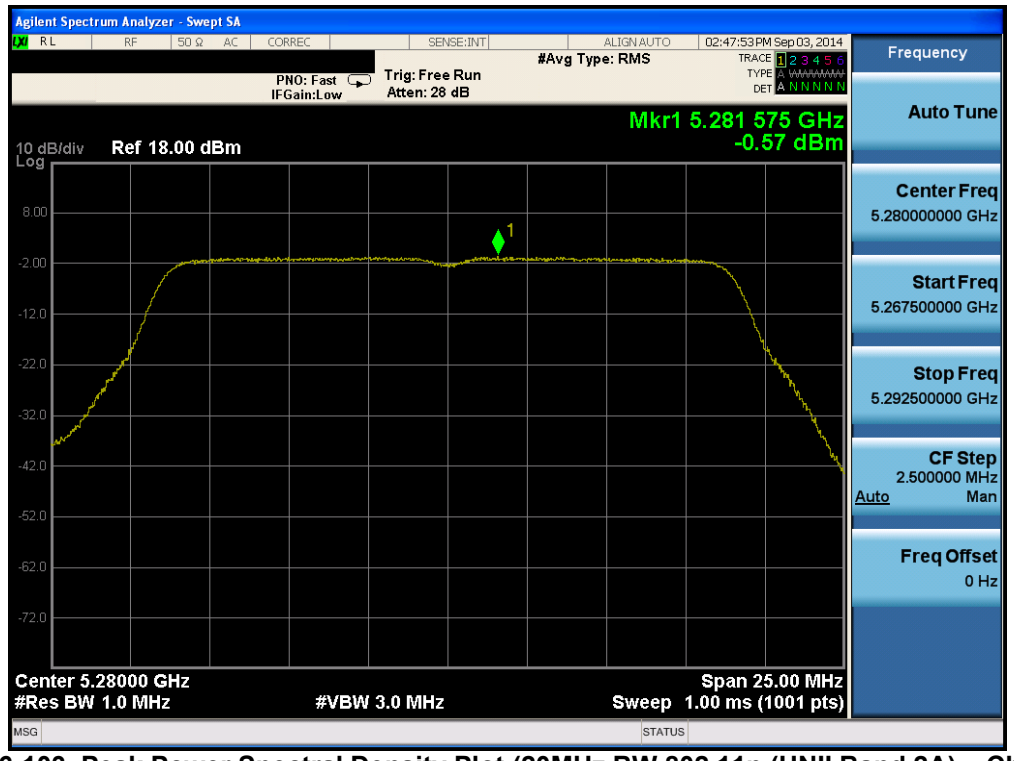
Plot 6-100. Peak Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 56)



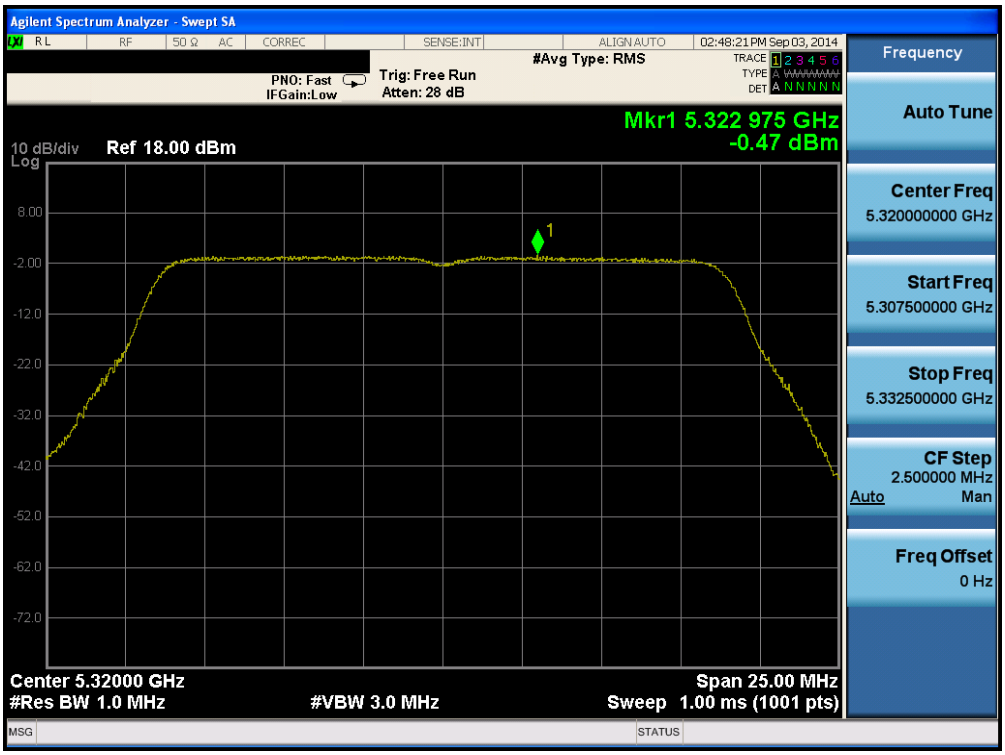
Plot 6-101. Peak Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 64)



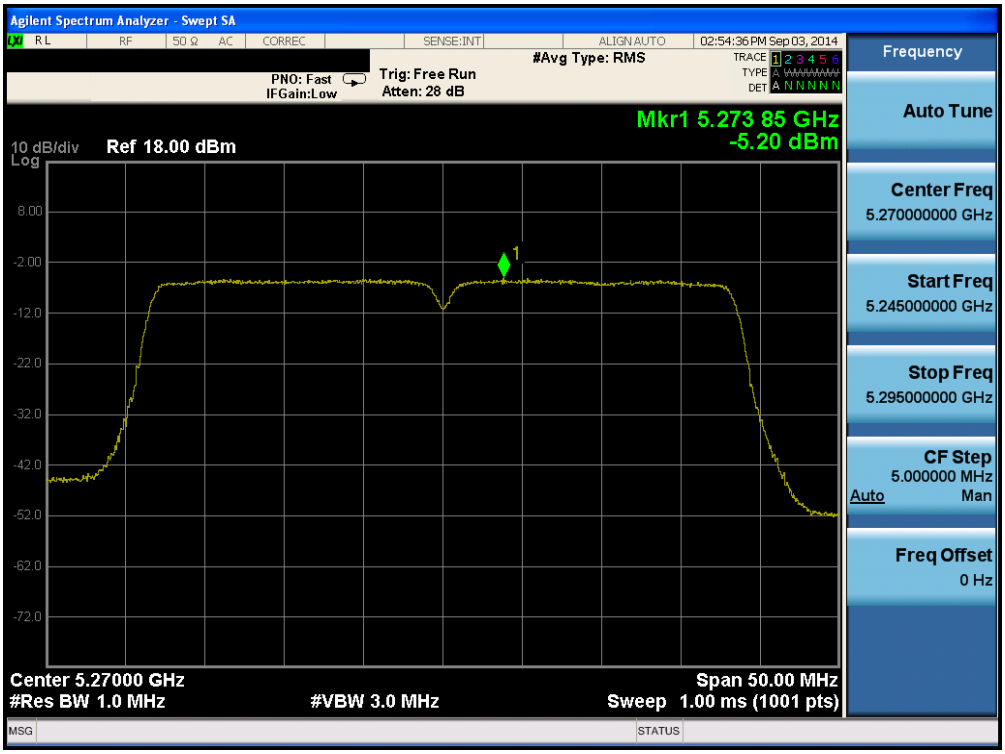
Plot 6-102. Peak Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 52)



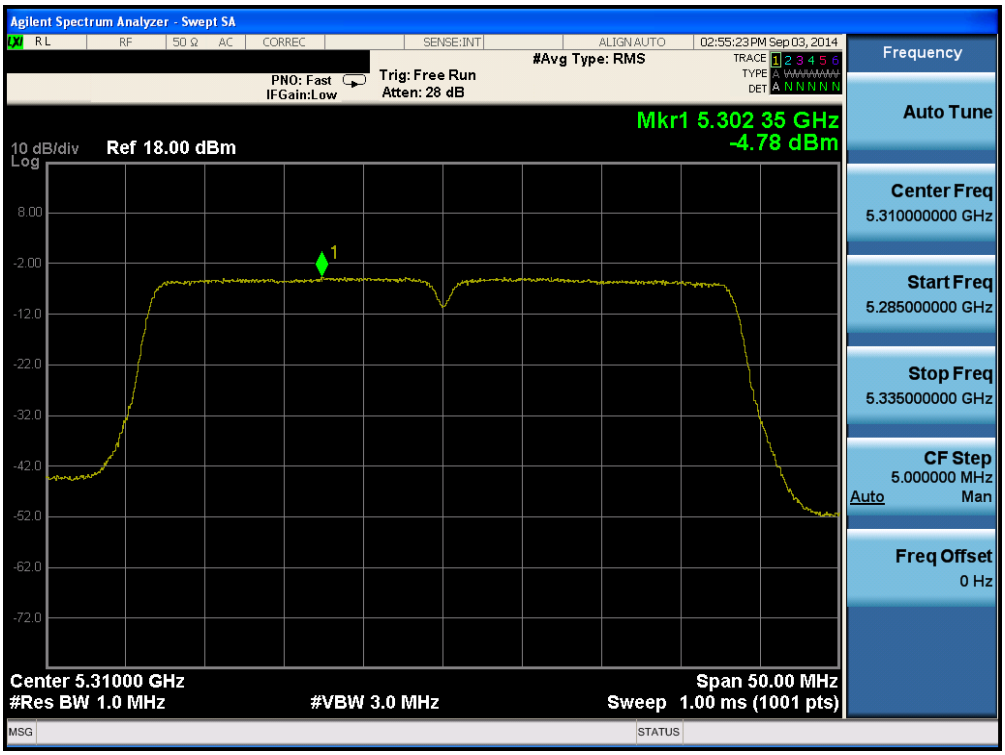
Plot 6-103. Peak Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 56)



Plot 6-104. Peak Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 64)

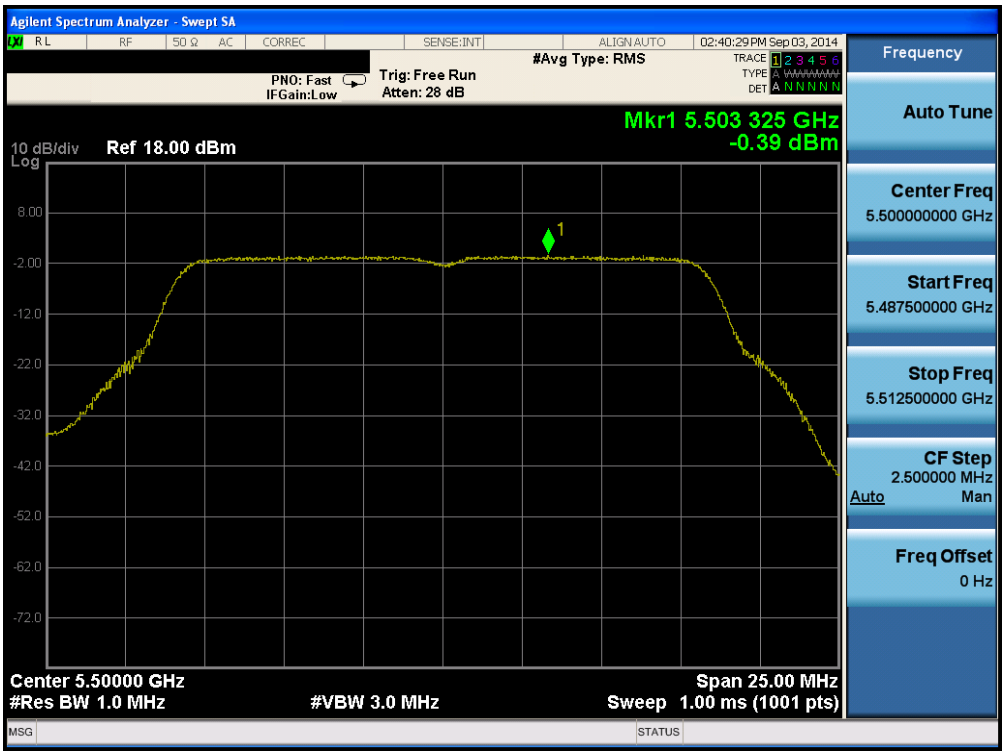


Plot 6-105. Peak Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2A) – Ch. 54)

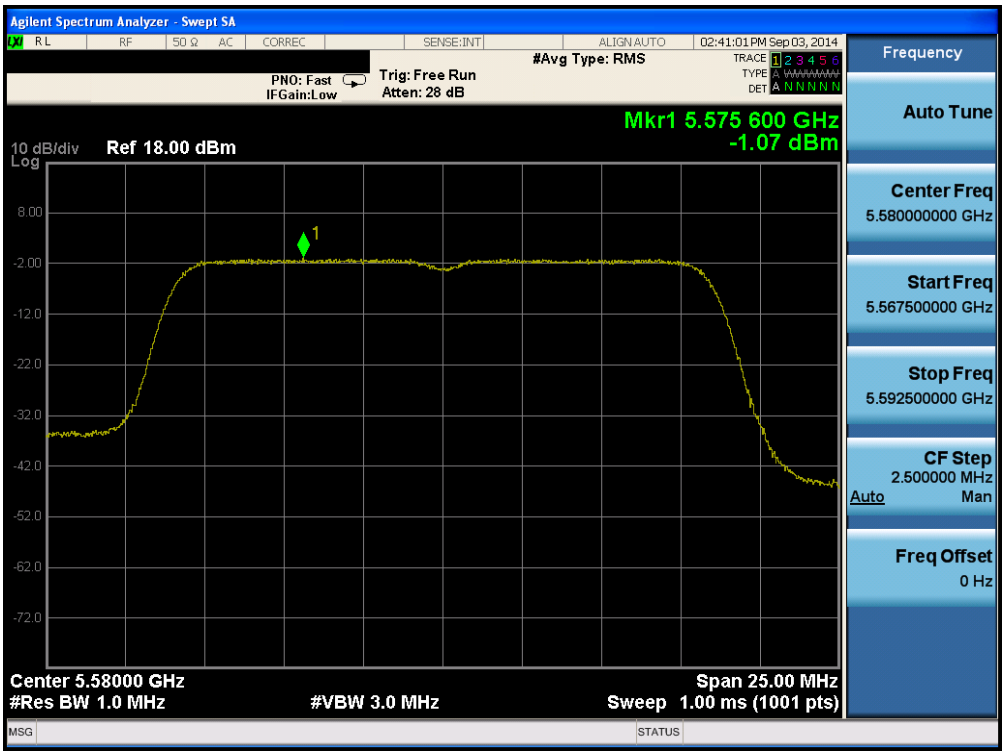


Plot 6-106. Peak Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2A) – Ch. 62)

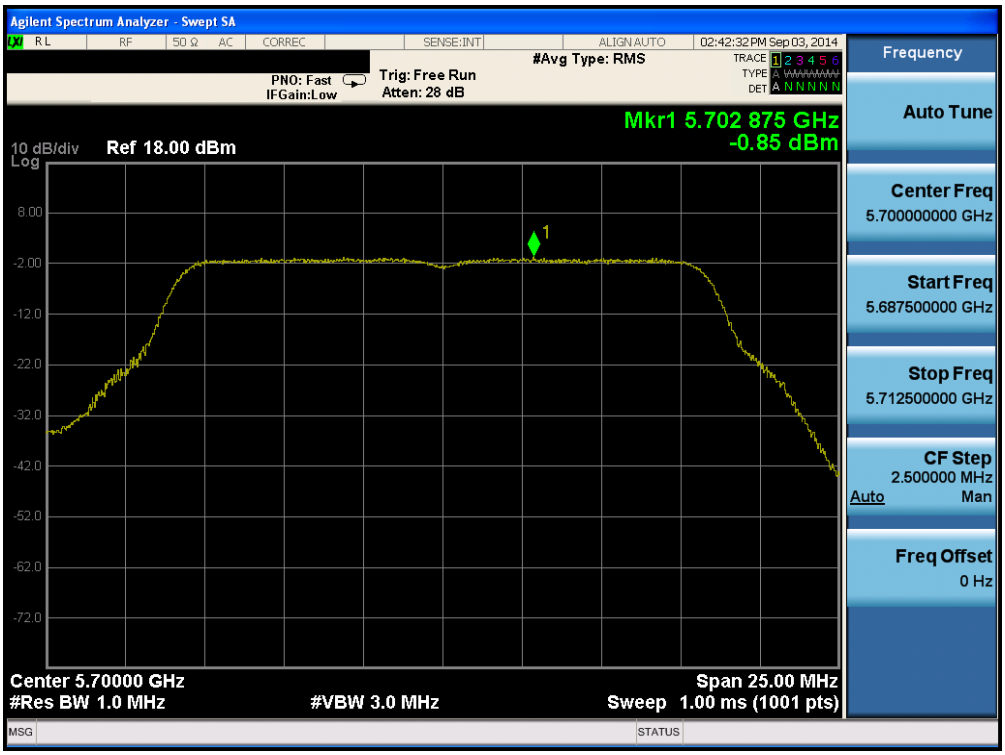
Plot 6-107. Peak Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2A) – Ch. 58)



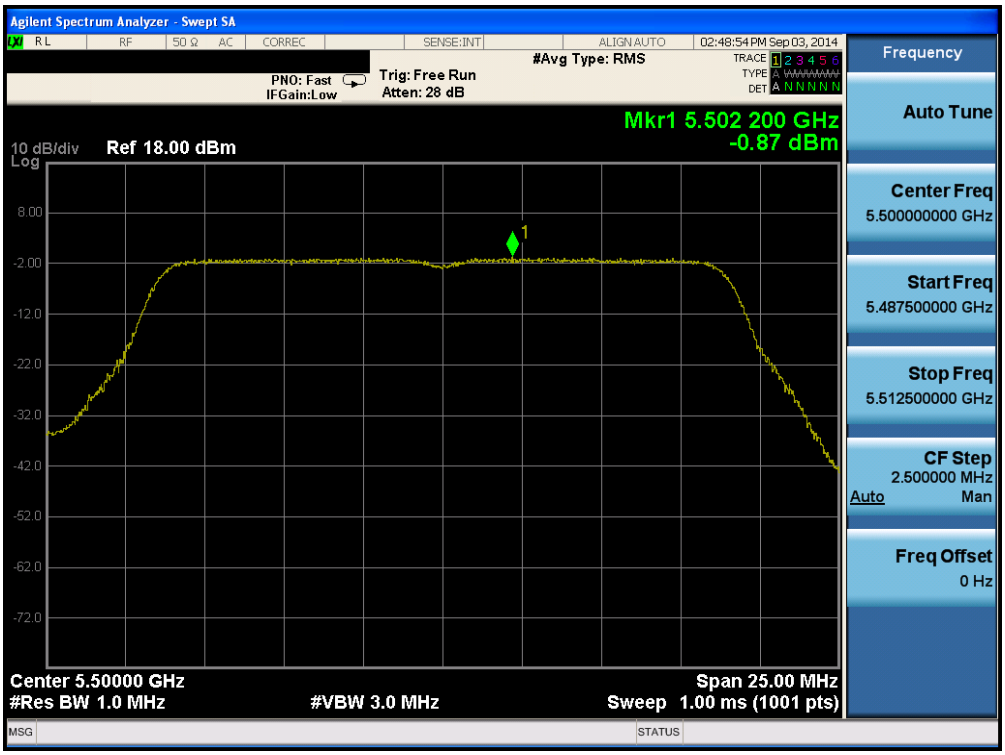
Plot 6-108. Peak Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 100)



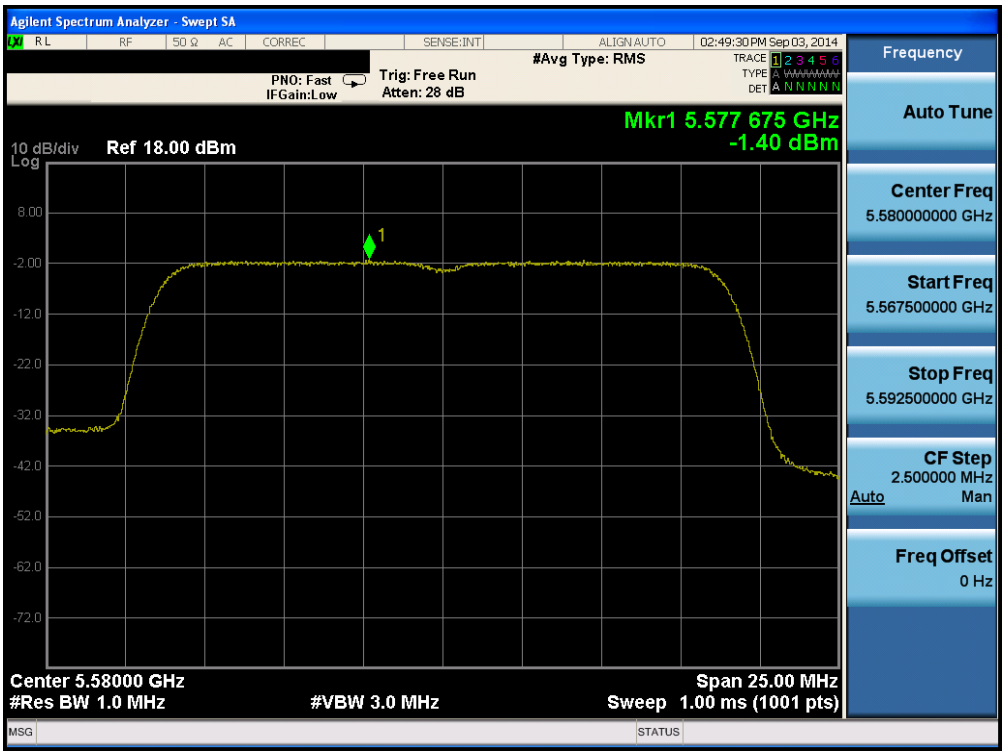
Plot 6-109. Peak Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 116)



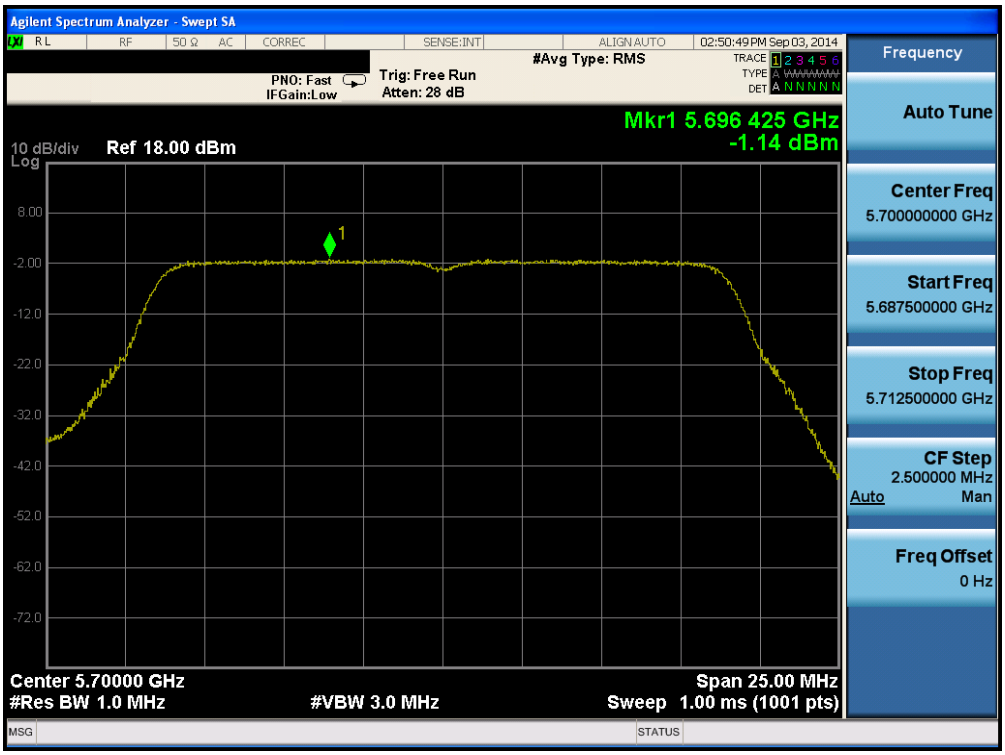
Plot 6-110. Peak Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 140)



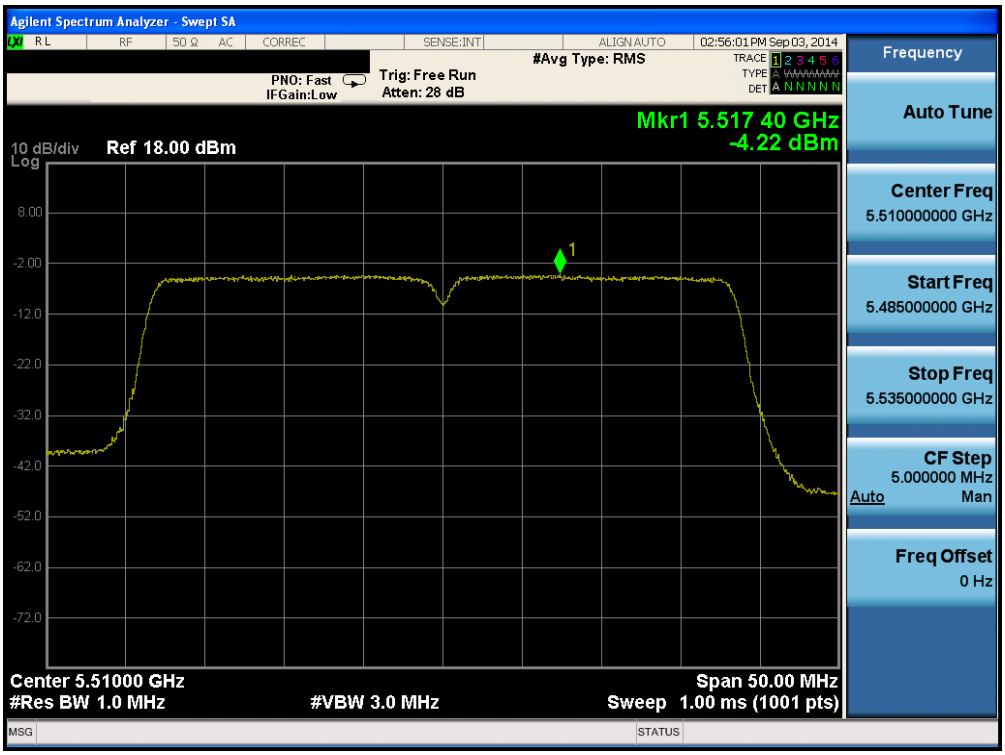
Plot 6-111. Peak Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 100)



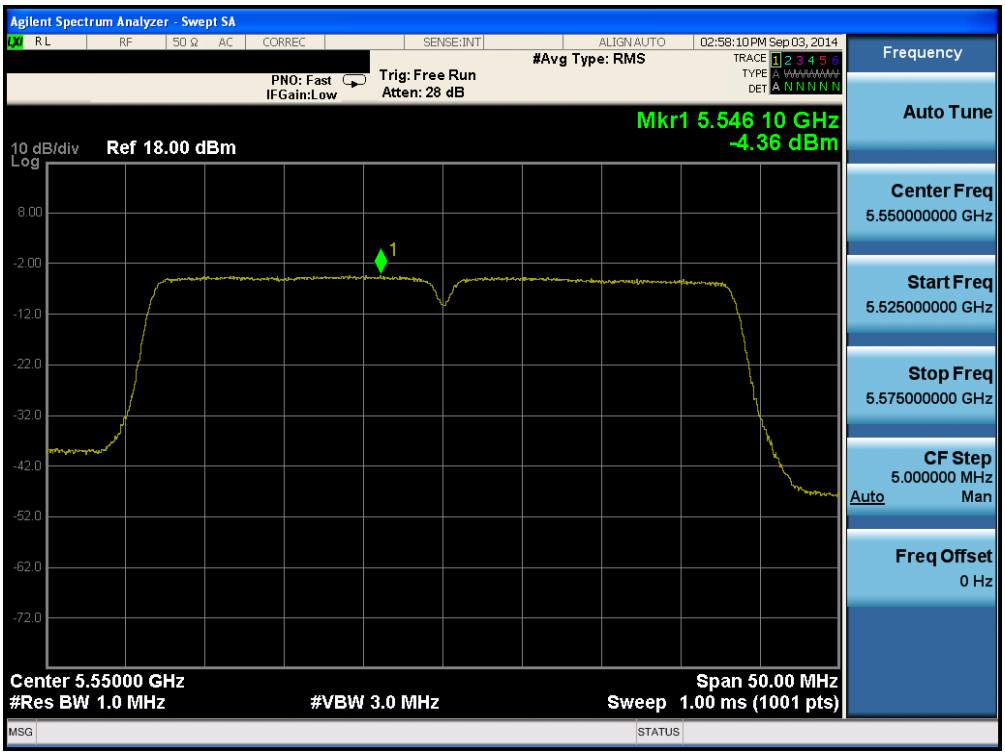
Plot 6-112. Peak Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 116)



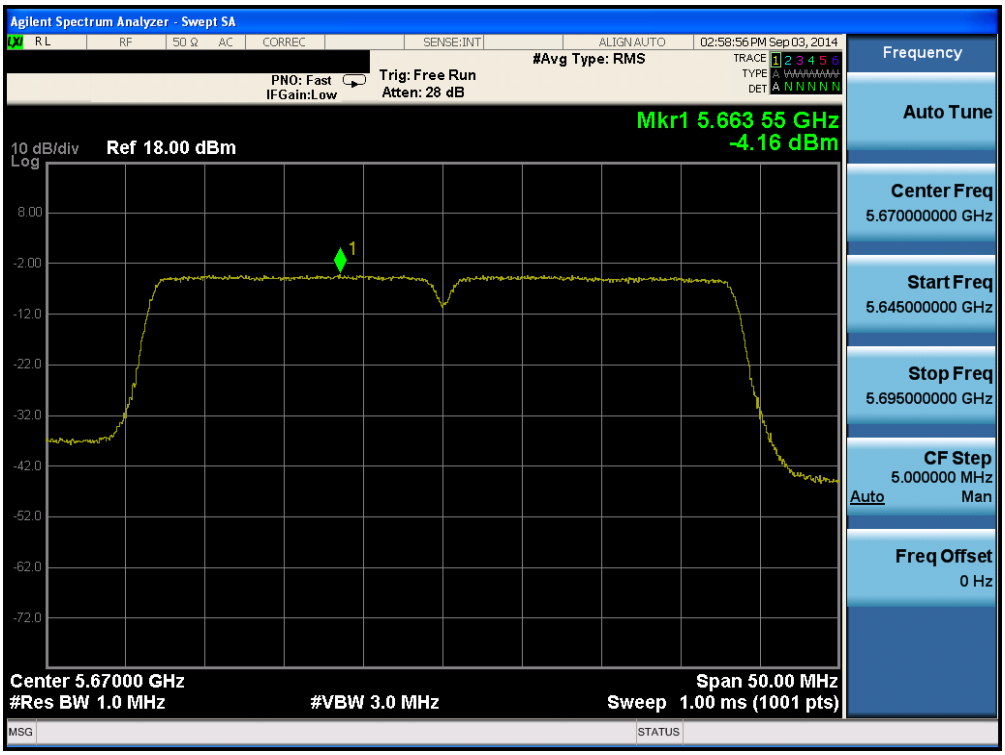
Plot 6-113. Peak Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 140)



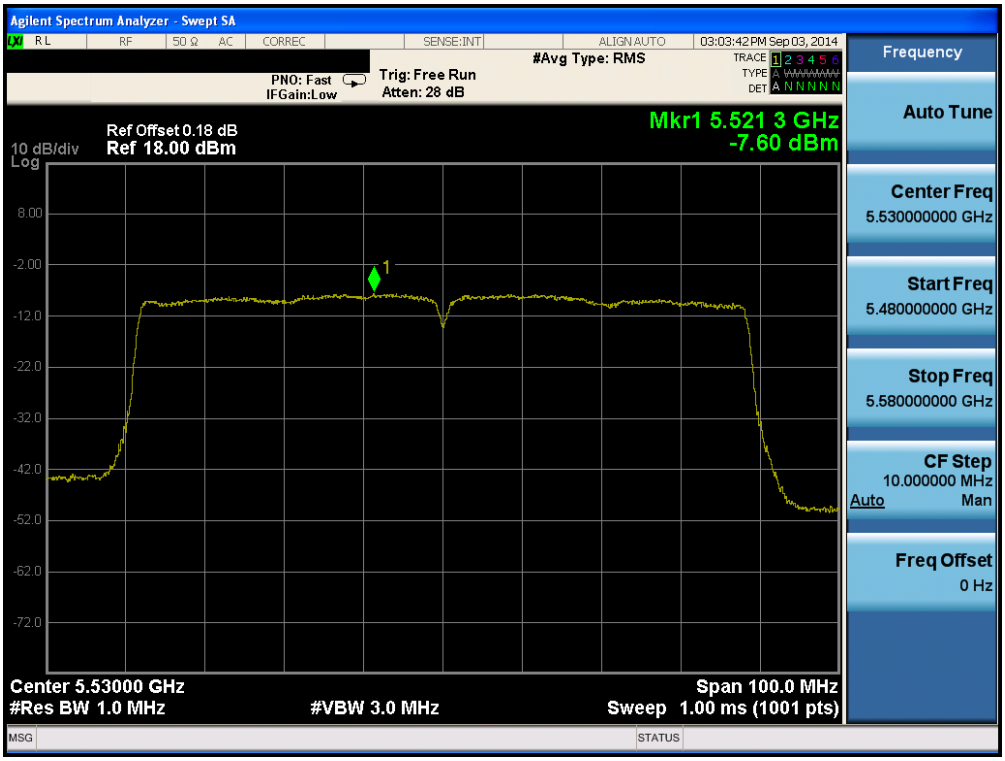
Plot 6-114. Peak Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 102)



Plot 6-115. Peak Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 110)



Plot 6-116. Peak Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 134)



Plot 6-117. Peak Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2C) – Ch. 106)

Summed MIMO Power Spectral Density Measurements

	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Antenn-1 Power Density [dBm]	Antenn-2 Power Density [dBm]	Summed MIMO Power Density [dBm]	Max Permissible Power Density [dBm/MHz]	Margin [dB]	Pass / Fail
Band 1	5180	36	n (20MHz)	6.5/7.2 (MCS0)	-1.17	-0.69	2.08	4.0	-1.92	Pass
	5200	40	n (20MHz)	6.5/7.2 (MCS0)	-1.30	-0.95	1.89	4.0	-2.11	Pass
	5240	48	n (20MHz)	6.5/7.2 (MCS0)	-1.05	-0.63	2.18	4.0	-1.82	Pass
	5190	38	n (40MHz)	13.5/15 (MCS0)	-4.48	-4.08	-1.26	4.0	-5.26	Pass
	5230	46	n (40MHz)	13.5/15 (MCS0)	-4.54	-3.87	-1.18	4.0	-5.18	Pass
	5210	42	ac (80MHz)	29.3/32.5 (MCS0)	-7.50	-7.20	-4.33	4.0	-8.33	Pass
Band 2A	5260	52	n (20MHz)	6.5/7.2 (MCS0)	-1.17	-0.74	2.06	4.0	-1.94	Pass
	5280	56	n (20MHz)	6.5/7.2 (MCS0)	-0.86	-0.57	2.30	4.0	-1.70	Pass
	5320	64	n (20MHz)	6.5/7.2 (MCS0)	-1.01	-0.47	2.28	4.0	-1.72	Pass
	5270	54	n (40MHz)	13.5/15 (MCS0)	-4.45	-5.20	-1.80	11.0	-12.80	Pass
	5310	62	n (40MHz)	13.5/15 (MCS0)	-4.37	-4.78	-1.56	11.0	-12.56	Pass
	5290	58	ac (80MHz)	29.3/32.5 (MCS0)	-8.56	-7.08	-4.75	11.0	-15.75	Pass
Band 2C	5500	100	n (20MHz)	6.5/7.2 (MCS0)	-0.25	-0.88	2.46	11.0	-8.54	Pass
	5580	116	n (20MHz)	6.5/7.2 (MCS0)	-0.73	-1.40	1.96	11.0	-9.04	Pass
	5700	140	n (20MHz)	6.5/7.2 (MCS0)	-1.17	-1.14	1.86	11.0	-9.14	Pass
	5510	102	n (40MHz)	13.5/15 (MCS0)	-4.27	-4.22	-1.24	11.0	-12.24	Pass
	5550	110	n (40MHz)	13.5/15 (MCS0)	-4.64	-4.36	-1.49	11.0	-12.49	Pass
	5670	134	n (40MHz)	13.5/15 (MCS0)	-5.42	-4.16	-1.74	11.0	-12.74	Pass

Table 6-23. MIMO Conducted Power Spectral Density Measurements

Note:

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

Sample MIMO Calculation:

At 5180MHz the average conducted power spectral density was measured to be -1.17 dBm for Antenna-1 and -0.69 dBm for Antenna-2.

Antenna 1 + Antenna 2 = MIMO

(-1.17 dBm + -0.69 dBm) = (0.76 mW + 0.85 mW) = 1.62 mW = 2.08 dBm

6.5 Peak Excursion Ratio – 802.11a/n/ac

§15.407(a.6)

Test Overview and Limit

The spectrum analyzer was connected to the antenna terminal while the EUT was operating at its maximum duty cycle (>98%), at its maximum power control level, as defined in KDB 789033 v01r04, and at the appropriate frequencies. Method SA-1, as defined in KDB 789033 v01r04, was used to capture the average trace used to make the peak excursion measurement.

The largest permissible difference between the modulation envelope (measured using a peak hold function) and the maximum power spectral density is 13 dBm/MHz.

Test Procedure Used

KDB 789033 v01r04 – Section G

Test Settings

1. Analyzer was set to the center frequency of the UNII channel under investigation
2. Span was set to encompass the entire emission bandwidth of the signal
3. RBW = 1MHz
4. VBW = 3MHz
5. Detector = peak
6. Trace mode = max hold
7. Trace was allowed to stabilize
8. The peak search function of the spectrum analyzer was used to find the peak of the spectrum. This level was compared to the peak power density level found from the previous section to determine the peak excursion.

Test Setup

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

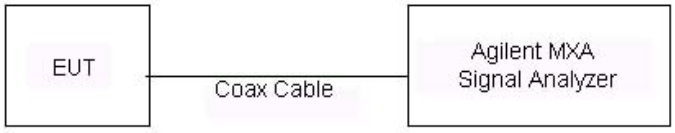


Figure 6-4. Test Instrument & Measurement Setup

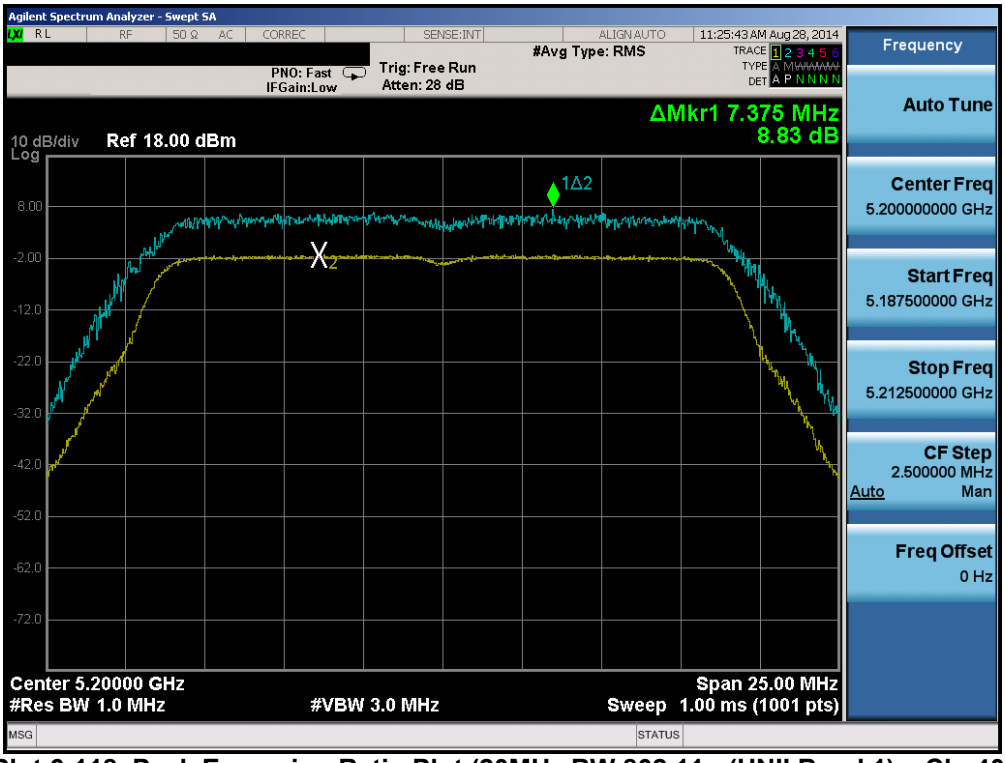
Test Notes

The peak excursion was investigated for all signal types, modulation types, channel bandwidths, and variations in signal parameters and the worst case data is shown below. Only the worst case modulation mode on a single channel among all bands is reported since that is sufficient to demonstrate compliance to the peak excursion requirement per KDB 789033 v01r04.

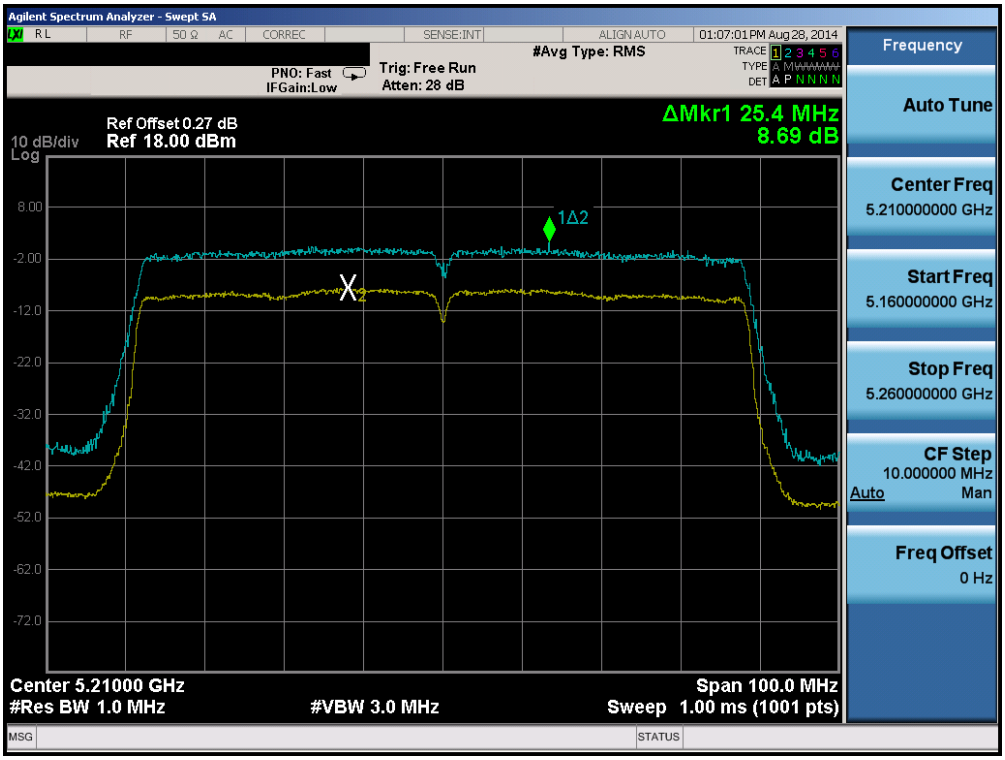
Antenna-1 Peak Excursion Ratio – 802.11a/n/ac

Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured Peak Excursion Ratio [dBm]	Max Permissible Peak Excursion Ratio [dBm/MHz]	Margin [dB]	Pass / Fail
5200	40	n (20MHz)	6.5/7.2 (MCS0)	8.83	13.0	-4.17	Pass
5210	42	ac (80MHz)	58.5/65 (MCS0)	8.69	13.0	-4.31	Pass
5270	54	n (40MHz)	13.5/15 (MCS0)	8.49	13.0	-4.51	Pass
5700	140	a	6	7.95	13.0	-5.05	Pass

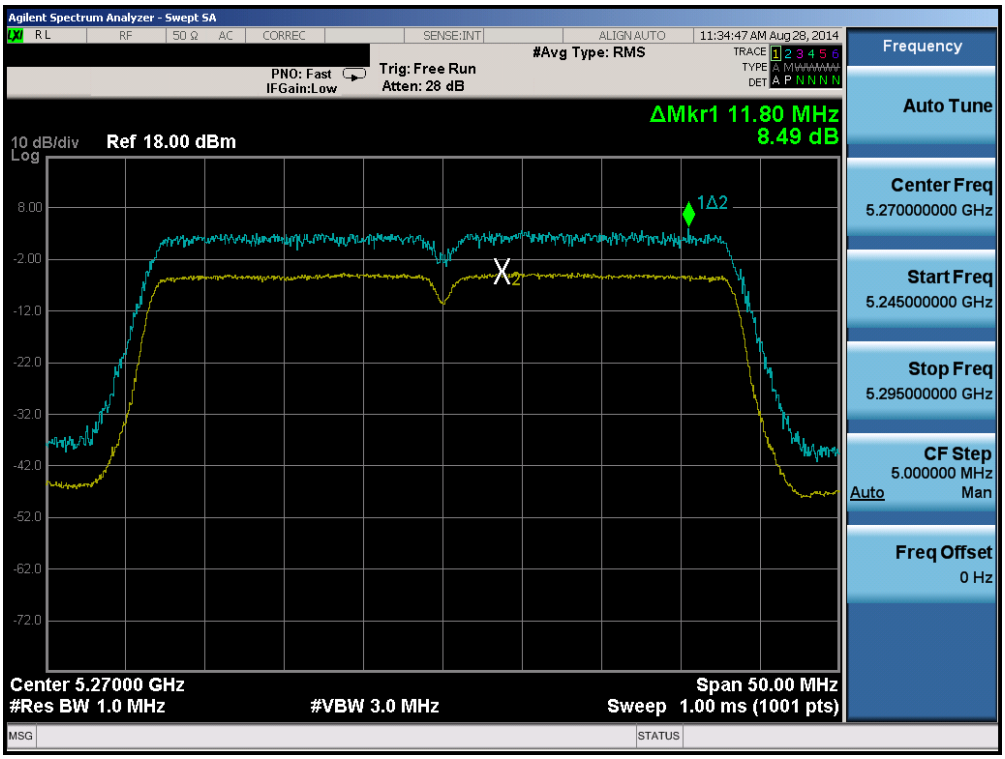
Table 6-24. Conducted Peak Excursion Ratio Measurements



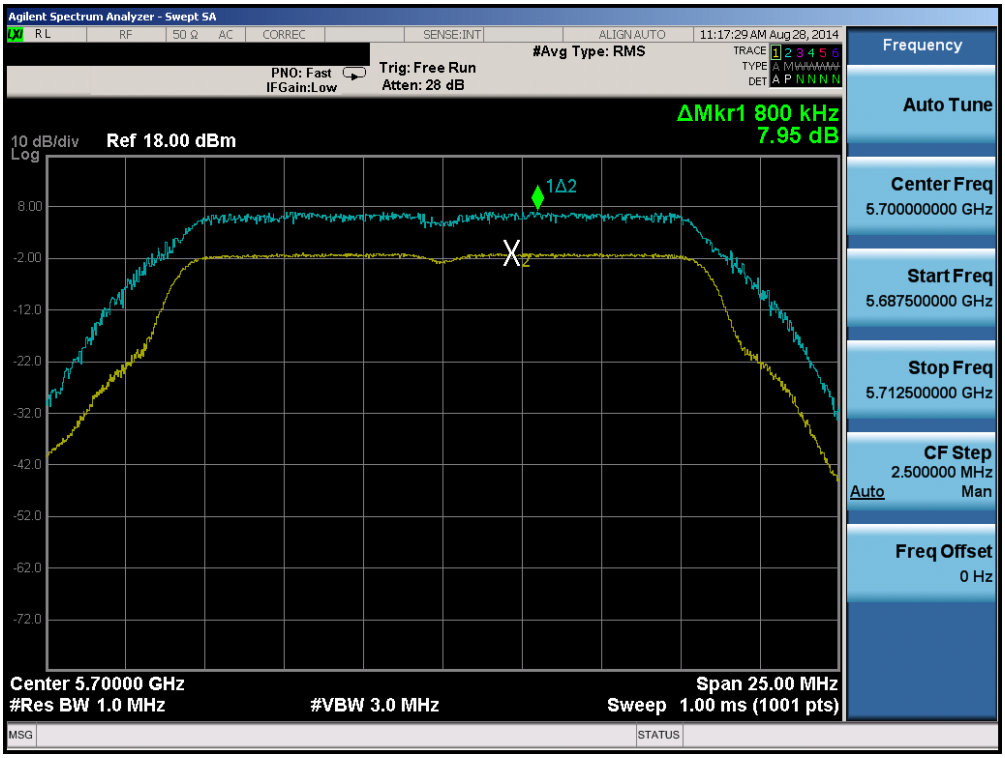
Plot 6-118. Peak Excursion Ratio Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 40)



Plot 6-119. Peak Excursion Ratio Plot (80MHz BW 802.11ac (UNII Band 1) – Ch. 42)



Plot 6-120. Peak Excursion Ratio Plot (40MHz BW 802.11n (UNII Band 2A) – Ch. 54)

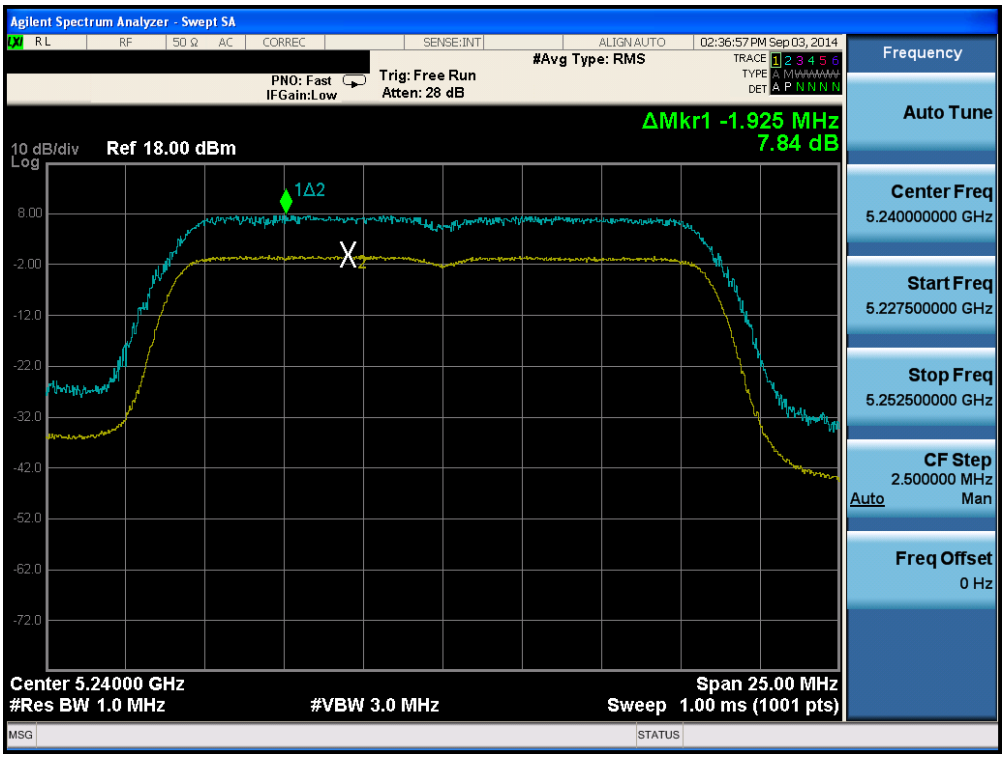


Plot 6-121. Peak Excursion Ratio Plot (802.11a (UNII Band 2C) – Ch. 140)

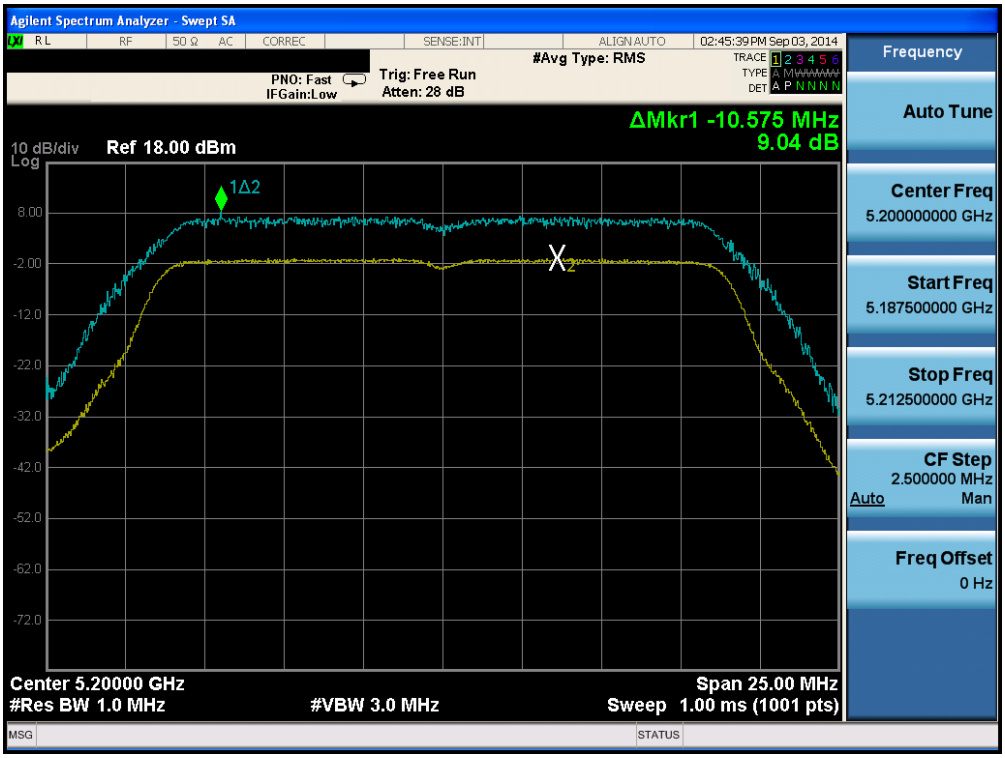
Antenna-2 Peak Excursion Ratio – 802.11a/n/ac

Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured Peak Excursion Ratio [dBm]	Max Permissible Peak Excursion Ratio [dBm/MHz]	Margin [dB]	Pass / Fail
5240	48	a	6	7.84	13.0	-5.16	Pass
5200	40	n (20MHz)	6.5/7.2 (MCS0)	9.04	13.0	-3.96	Pass
5230	46	n (40MHz)	13.5/15 (MCS0)	8.52	13.0	-4.48	Pass
5210	42	ac (80MHz)	29.3/32.5 (MCS0)	8.84	13.0	-4.16	Pass

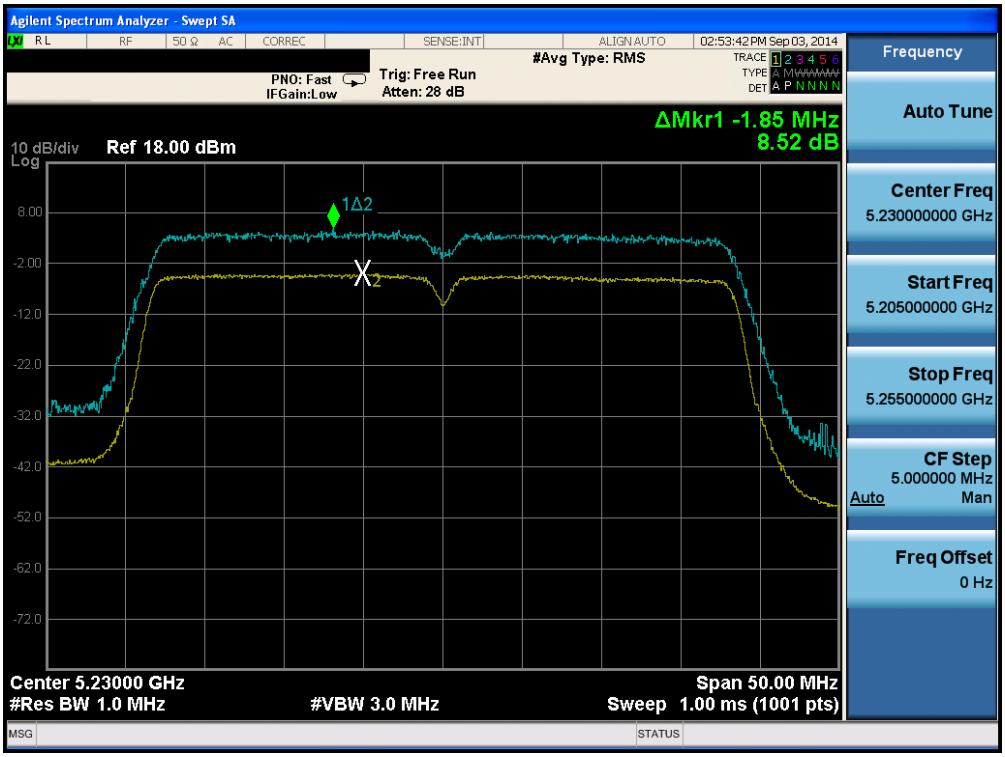
Table 6-25. Conducted Peak Excursion Ratio Measurements



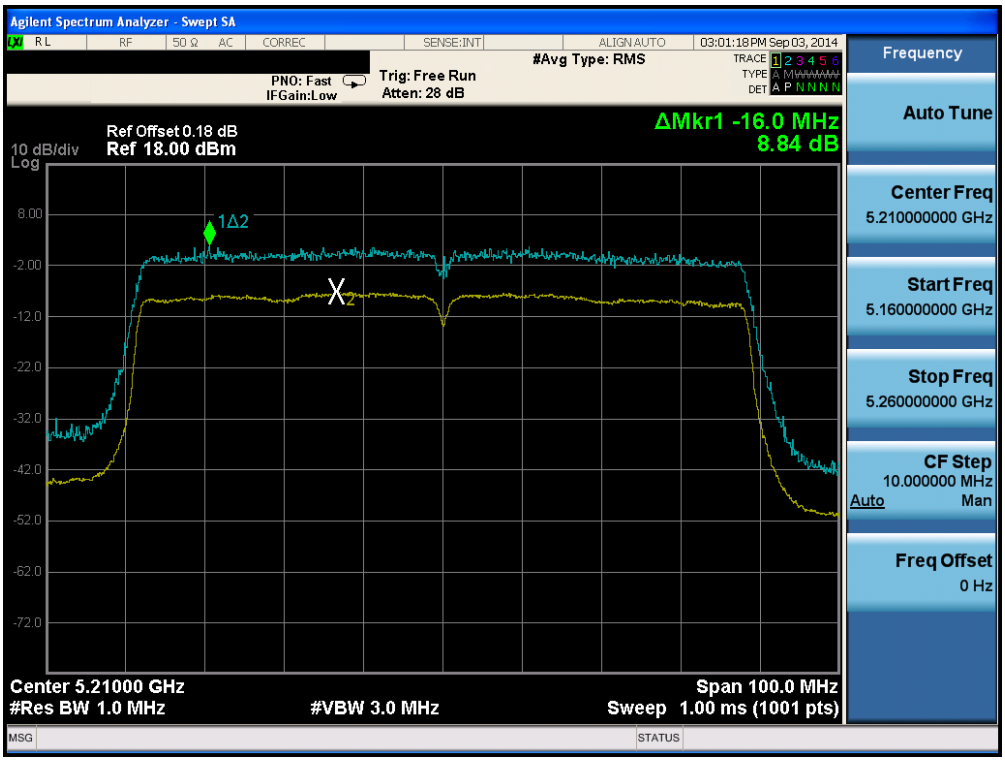
Plot 6-122. Peak Excursion Ratio Plot (802.11a (UNII Band 1) – Ch. 48)



Plot 6-123. Peak Excursion Ratio Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 40)



Plot 6-124. Peak Excursion Ratio Plot (40MHz BW 802.11n (UNII Band 1) – Ch. 46)



Plot 6-125. Peak Excursion Ratio Plot (80MHz BW 802.11ac (UNII Band 1) – Ch. 42)

6.6 Frequency Stability

§15.407(g)

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

OPERATING FREQUENCY: 5,180,000,000 Hz

CHANNEL: 36

REFERENCE VOLTAGE: 3.85 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	5,179,999,988	-12	-0.00000023
100 %		- 30	5,180,000,017	17	0.00000033
100 %		- 20	5,180,000,019	19	0.00000037
100 %		- 10	5,179,999,991	-9	-0.00000017
100 %		0	5,179,999,989	-11	-0.00000021
100 %		+ 10	5,179,999,986	-14	-0.00000027
100 %		+ 20	5,179,999,984	-16	-0.00000031
100 %		+ 30	5,180,000,017	17	0.00000033
100 %		+ 40	5,179,999,998	-2	-0.00000004
100 %		+ 50	5,180,000,003	3	0.00000006
BATT. ENDPOINT	3.40	+ 20	5,180,000,001	1	0.00000002

Table 6-26. Frequency Stability Measurements for UNII Band 1 (Ch. 36)

Note:

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

Frequency Stability
§15.407(g)

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

OPERATING FREQUENCY: 5,260,000,000 Hz

CHANNEL: 52

REFERENCE VOLTAGE: 3.85 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	5,260,000,008	8	0.00000015
100 %		- 30	5,259,999,973	-27	-0.00000051
100 %		- 20	5,259,999,993	-7	-0.00000013
100 %		- 10	5,259,999,988	-12	-0.00000023
100 %		0	5,259,999,973	-27	-0.00000051
100 %		+ 10	5,259,999,991	-9	-0.00000017
100 %		+ 20	5,260,000,006	6	0.00000011
100 %		+ 30	5,259,999,992	-8	-0.00000015
100 %		+ 40	5,259,999,993	-7	-0.00000013
100 %		+ 50	5,260,000,009	9	0.00000017
BATT. ENDPOINT	3.40	+ 20	5,259,999,991	-9	-0.00000017

Table 6-27. 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)	5,499,999,977	-23	-0.00000042
100 %		- 30	5,499,999,996	-4	-0.00000007
100 %		- 20	5,499,999,975	-25	-0.00000045
100 %		- 10	5,500,000,023	23	0.00000042
100 %		0	5,499,999,982	-18	-0.00000033
100 %		+ 10	5,500,000,004	4	0.00000007
100 %		+ 20	5,500,000,017	17	0.00000031
100 %		+ 30	5,500,000,017	17	0.00000031
100 %		+ 40	5,500,000,008	8	0.00000015
100 %		+ 50	5,500,000,015	15	0.00000027
BATT. ENDPOINT	3.40	+ 20	5,499,999,983	-17	-0.00000031

Table 6-28. 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.

6.7 Radiated Spurious Emission Measurements

§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 (>98%), at its maximum power control level, as defined in KDB 789033 v01r04, and at the appropriate frequencies. All channels, modes (e.g. 802.11a, 802.11n (20MHz BW), 802.11n (40MHz BW) and 802.11ac (80MHz BW)), 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 6-29 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 6-29. Radiated Limits

Test Procedures Used

KDB 789033 v01r04 – Section H

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.

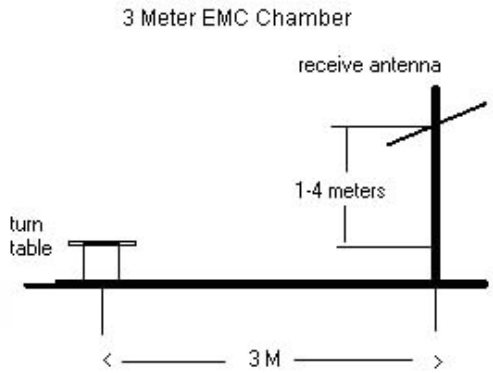


Figure 6-5. Test Instrument & Measurement Setup

Test Notes

1. All radiated spurious emissions levels were measured in a radiated test setup per the guidance of KDB 789033 v01r04 Section H.
2. All emissions that lie in the restricted bands (denoted by a * next to the frequency) specified in §15.205 are below the limit shown in Table 6-29.
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. The battery used with this device for testing (Model: EB-BN915BBD) contains an embedded NFC antenna.
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.

Sample Calculations

Determining Spurious Emissions Levels

- Field Strength Level $_{[dB\mu V/m]}$ = Analyzer Level $_{[dBm]}$ + 107 + AFCL $_{[dB/m]}$ + DCCF $_{[dB\mu V/m]}$
- AFCL $_{[dB/m]}$ = Antenna Factor $_{[dB/m]}$ + Cable Loss $_{[dB]}$
- DCCF$_{[dB\mu V/m]}$ = 20 log (1/x), where x is the duty cycle
- Margin $_{[dB]}$ = Field Strength Level $_{[dB\mu V/m]}$ – Limit $_{[dB\mu V/m]}$

Radiated Band Edge Measurement Offset

- The amplitude offset shown in the radiated restricted band edge plots in Section 6.8 was calculated using the formula:
  Offset (dB) = (Antenna Factor + Cable Loss + 10 dB Attenuator + DCCF) – Preamplifier Gain
- DCCF = 20 log (1/x), where x is the duty cycle

Antenna-1 Radiated Spurious Emission Measurements

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

	Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	EUT Pol. [H/H2/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10360.00	-97.19	Peak	H	H	44.50	0.00	54.31	68.20	-13.89
*	15540.00	-108.46	Average	H	H	48.84	0.00	47.38	53.98	-6.60
*	15540.00	-95.57	Peak	H	H	48.84	0.00	60.27	73.98	-13.71
*	20720.00	-103.01	Average	V	H2	48.58	-9.54	43.02	53.98	-10.95
*	20720.00	-94.13	Peak	V	H2	48.58	-9.54	51.90	73.98	-22.07
	25900.00	-98.33	Peak	V	H2	50.95	-9.54	50.08	68.20	-18.12

Table 6-30. 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]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	EUT Pol. [H/H2/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10400.00	-97.04	Peak	H	H	44.55	0.00	54.51	68.20	-13.69
*	15600.00	-108.72	Average	H	H	48.84	0.00	47.11	53.98	-6.87
*	15600.00	-98.09	Peak	H	H	48.84	0.00	57.74	73.98	-16.24
*	20800.00	-103.85	Average	V	H2	48.66	-9.54	42.27	53.98	-11.71
*	20800.00	-94.51	Peak	V	H2	48.66	-9.54	51.61	73.98	-22.37
	26000.00	-97.71	Peak	V	H2	51.04	-9.54	50.79	68.20	-17.41

Table 6-31. 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]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	EUT Pol. [H/H2/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10480.00	-97.87	Peak	H	H	44.67	0.00	53.80	68.20	-14.40
*	15720.00	-108.66	Average	H	H	48.87	0.00	47.21	53.98	-6.77
*	15720.00	-97.87	Peak	H	H	48.87	0.00	58.00	73.98	-15.98
*	20960.00	-105.12	Average	V	H2	48.75	-9.54	41.09	53.98	-12.89
*	20960.00	-96.21	Peak	V	H2	48.75	-9.54	50.00	73.98	-23.98
	26200.00	-96.24	Peak	V	H2	51.06	-9.54	52.27	68.20	-15.93

Table 6-32. 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]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	EUT Pol. [H/H2/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10520.00	-97.52	Peak	H	H	44.70	0.00	54.18	68.20	-14.02
*	15780.00	-108.51	Average	H	H	48.90	0.00	47.39	53.98	-6.59
*	15780.00	-96.79	Peak	H	H	48.90	0.00	59.11	73.98	-14.87
*	21040.00	-105.49	Average	V	H2	48.75	-9.54	40.72	53.98	-13.26
*	21040.00	-95.91	Peak	V	H2	48.75	-9.54	50.30	73.98	-23.68
	26300.00	-96.48	Peak	V	H2	51.09	-9.54	52.07	68.20	-16.13

Table 6-33. 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]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	EUT Pol. [H/H2/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10560.00	-97.72	Peak	H	H	44.72	0.00	53.99	68.20	-14.21
*	15840.00	-108.35	Average	H	H	48.98	0.00	47.63	53.98	-6.35
*	15840.00	-98.49	Peak	H	H	48.98	0.00	57.49	73.98	-16.49
*	21120.00	-106.62	Average	V	H2	48.69	-9.54	39.53	53.98	-14.45
*	21120.00	-98.77	Peak	V	H2	48.69	-9.54	47.38	73.98	-26.60
	26400.00	-94.62	Peak	V	H2	51.16	-9.54	53.99	68.20	-14.21

Table 6-34. Radiated Measurements

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

	Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	EUT Pol. [H/H2/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	10640.00	-108.43	Average	H	H	44.78	0.00	43.35	53.98	-10.63
*	10640.00	-98.41	Peak	H	H	44.78	0.00	53.37	73.98	-20.61
*	15960.00	-108.52	Average	H	H	49.16	0.00	47.63	53.98	-6.35
*	15960.00	-97.64	Peak	H	H	49.16	0.00	58.51	73.98	-15.47
*	21280.00	-109.86	Average	V	H2	48.63	-9.54	36.23	53.98	-17.75
*	21280.00	-99.47	Peak	V	H2	48.63	-9.54	46.62	73.98	-27.36
	26600.00	-104.43	Peak	V	H2	47.32	-9.54	40.35	68.20	-27.85

Table 6-35. 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]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	EUT Pol. [H/H2/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11000.00	-108.16	Average	H	H	44.63	0.00	43.47	53.98	-10.51
*	11000.00	-96.64	Peak	H	H	44.63	0.00	54.99	73.98	-18.99
	16500.00	-99.07	Peak	H	H	50.51	0.00	58.44	68.20	-9.76
	22000.00	-97.60	Peak	V	H2	48.96	-9.54	48.82	68.20	-19.38
	27500.00	-106.16	Peak	V	H2	48.36	-9.54	39.66	68.20	-28.54

Table 6-36. 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]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	EUT Pol. [H/H2/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11160.00	-108.16	Average	H	H	44.72	0.00	43.57	53.98	-10.41
*	11160.00	-97.66	Peak	H	H	44.72	0.00	54.07	73.98	-19.91
	16740.00	-98.58	Peak	H	H	50.00	0.00	58.42	68.20	-9.78
*	22320.00	-109.69	Average	V	H2	49.73	-9.54	37.50	53.98	-16.48
*	22320.00	-96.79	Peak	V	H2	49.73	-9.54	50.40	73.98	-23.58
	27900.00	-105.79	Peak	V	H2	48.05	-9.54	39.72	68.20	-28.48

Table 6-37. Radiated Measurements

Worst Case Mode:	802.11a
Worst Case Transfer Rate:	6 Mbps
Distance of Measurements:	1 & 3 Meters
Operating Frequency:	5700MHz
Channel:	140

	Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	EUT Pol. [H/H2/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11400.00	-107.84	Average	H	H	45.03	0.00	44.19	53.98	-9.79
*	11400.00	-96.87	Peak	H	H	45.03	0.00	55.16	73.98	-18.82
	17100.00	-98.18	Peak	H	H	49.99	0.00	58.80	68.20	-9.40
*	22800.00	-105.40	Average	V	H2	49.82	-9.54	41.87	53.98	-12.10
*	22800.00	-94.04	Peak	V	H2	49.82	-9.54	53.23	73.98	-20.74
	28500.00	-105.40	Peak	V	H2	48.01	-9.54	40.07	68.20	-28.13

Table 6-38. Radiated Measurements

Antenna-2 Radiated Spurious Emission Measurements

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

	Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	EUT Pol. [H/H2/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10360.00	-96.53	Peak	V	H2	44.50	0.00	54.97	68.20	-13.23
*	15540.00	-108.40	Average	V	H2	48.84	0.00	47.44	53.98	-6.54
*	15540.00	-97.19	Peak	V	H2	48.84	0.00	58.65	73.98	-15.33
*	20720.00	-99.63	Average	V	H2	48.58	-9.54	46.40	53.98	-7.58
*	20720.00	-94.07	Peak	V	H2	48.58	-9.54	51.96	73.98	-22.01
	25900.00	-97.76	Peak	V	H2	50.95	-9.54	50.65	68.20	-17.55

Table 6-39. 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]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	EUT Pol. [H/H2/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10400.00	-96.84	Peak	V	H2	44.55	0.00	54.71	68.20	-13.49
*	15600.00	-108.53	Average	V	H2	48.84	0.00	47.30	53.98	-6.68
*	15600.00	-98.22	Peak	V	H2	48.84	0.00	57.61	73.98	-16.37
*	20800.00	-98.53	Average	V	H2	48.66	-9.54	47.59	53.98	-6.39
*	20800.00	-93.04	Peak	V	H2	48.66	-9.54	53.08	73.98	-20.90
	26000.00	-97.92	Peak	V	H2	51.04	-9.54	50.58	68.20	-17.62

Table 6-40. 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]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	EUT Pol. [H/H2/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10480.00	-96.53	Peak	V	H2	44.67	0.00	55.14	68.20	-13.06
*	15720.00	-108.34	Average	V	H2	48.87	0.00	47.53	53.98	-6.45
*	15720.00	-97.83	Peak	V	H2	48.87	0.00	58.04	73.98	-15.94
*	20960.00	-98.23	Average	V	H2	48.75	-9.54	47.98	53.98	-6.00
*	20960.00	-92.04	Peak	V	H2	48.75	-9.54	54.17	73.98	-19.81
	26200.00	-96.51	Peak	V	H2	51.06	-9.54	52.00	68.20	-16.20

Table 6-41. 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]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	EUT Pol. [H/H2/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10520.00	-97.25	Peak	V	H2	44.70	0.00	54.45	68.20	-13.75
*	15780.00	-108.36	Average	V	H2	48.90	0.00	47.54	53.98	-6.44
*	15780.00	-98.54	Peak	V	H2	48.90	0.00	57.36	73.98	-16.62
*	21040.00	-102.48	Average	V	H2	48.75	-9.54	43.72	53.98	-10.26
*	21040.00	-93.23	Peak	V	H2	48.75	-9.54	52.98	73.98	-21.00
	26300.00	-95.40	Peak	V	H2	51.09	-9.54	53.15	68.20	-15.05

Table 6-42. 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]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	EUT Pol. [H/H2/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10560.00	-97.56	Peak	V	H2	44.72	0.00	54.15	68.20	-14.05
*	15840.00	-108.47	Average	V	H2	48.98	0.00	47.51	53.98	-6.47
*	15840.00	-98.08	Peak	V	H2	48.98	0.00	57.90	73.98	-16.08
*	21120.00	-101.66	Average	V	H2	48.69	-9.54	44.49	53.98	-9.49
*	21120.00	-94.06	Peak	V	H2	48.69	-9.54	52.09	73.98	-21.89
	26400.00	-93.92	Peak	V	H2	51.16	-9.54	54.69	68.20	-13.51

Table 6-43. 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]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	EUT Pol. [H/H2/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	10640.00	-108.15	Average	V	H2	44.78	0.00	43.63	53.98	-10.35
*	10640.00	-97.57	Peak	V	H2	44.78	0.00	54.21	73.98	-19.77
*	15960.00	-108.72	Average	V	H2	49.16	0.00	47.43	53.98	-6.55
*	15960.00	-97.64	Peak	V	H2	49.16	0.00	58.51	73.98	-15.47
*	21280.00	-101.86	Average	V	H2	48.63	-9.54	44.23	53.98	-9.75
*	21280.00	-92.56	Peak	V	H2	48.63	-9.54	53.53	73.98	-20.45
	26600.00	-102.60	Peak	V	H2	47.32	-9.54	42.18	68.20	-26.02

Table 6-44. 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]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	EUT Pol. [H/H2/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11000.00	-108.34	Average	V	H2	44.63	0.00	43.29	53.98	-10.69
*	11000.00	-97.07	Peak	V	H2	44.63	0.00	54.56	73.98	-19.42
	16500.00	-98.02	Peak	V	H2	50.51	0.00	59.49	68.20	-8.71
	22000.00	-97.93	Peak	V	H2	48.96	-9.54	48.49	68.20	-19.71
	27500.00	-107.12	Peak	V	H2	48.36	-9.54	38.70	68.20	-29.50

Table 6-45. 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]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	EUT Pol. [H/H2/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11160.00	-108.11	Average	V	H2	44.72	0.00	43.62	53.98	-10.36
*	11160.00	-97.56	Peak	V	H2	44.72	0.00	54.17	73.98	-19.81
	16740.00	-98.10	Peak	V	H2	50.00	0.00	58.90	68.20	-9.30
*	22320.00	-98.85	Average	V	H2	49.73	-9.54	48.33	53.98	-5.65
*	22320.00	-93.17	Peak	V	H2	49.73	-9.54	54.02	73.98	-19.96
	27900.00	-105.15	Peak	V	H2	48.05	-9.54	40.36	68.20	-27.84

Table 6-46. Radiated Measurements

Worst Case Mode:	802.11a
Worst Case Transfer Rate:	6 Mbps
Distance of Measurements:	1 & 3 Meters
Operating Frequency:	5700MHz
Channel:	140

	Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	EUT Pol. [H/H2/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11400.00	-107.84	Average	V	H2	45.03	0.00	44.19	53.98	-9.79
*	11400.00	-96.92	Peak	V	H2	45.03	0.00	55.11	73.98	-18.87
	17100.00	-98.57	Peak	V	H2	49.99	0.00	58.41	68.20	-9.79
*	22800.00	-104.27	Average	V	H2	49.82	-9.54	43.00	53.98	-10.98
*	22800.00	-94.13	Peak	V	H2	49.82	-9.54	53.14	73.98	-20.83
	28500.00	-106.23	Peak	V	H2	48.01	-9.54	39.24	68.20	-28.96

Table 6-47. Radiated Measurements

MIMO Radiated Spurious Emission Measurements

Worst Case Mode:	802.11n
Worst Case Transfer Rate:	MCS8
Distance of Measurements:	1 & 3 Meters
Operating Frequency:	5180MHz
Channel:	36

	Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	EUT Pol. [H/H2/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10360.00	-96.85	Peak	H	H	44.50	0.00	54.65	68.20	-13.55
*	15540.00	-108.44	Average	H	H	48.84	0.00	47.40	53.98	-6.58
*	15540.00	-98.43	Peak	H	H	48.84	0.00	57.41	73.98	-16.57
*	20720.00	-100.99	Average	V	V	48.58	-9.54	45.05	53.98	-8.93
*	20720.00	-93.99	Peak	V	V	48.58	-9.54	52.04	73.98	-21.93
	25900.00	-96.32	Peak	V	V	50.95	-9.54	52.09	68.20	-16.11

Table 6-48. Radiated Measurements

Worst Case Mode:	802.11n
Worst Case Transfer Rate:	MCS8
Distance of Measurements:	1 & 3 Meters
Operating Frequency:	5200MHz
Channel:	40

	Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	EUT Pol. [H/H2/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10400.00	-97.35	Peak	H	H	44.55	0.00	54.20	68.20	-14.00
*	15600.00	-108.38	Average	H	H	48.84	0.00	47.45	53.98	-6.53
*	15600.00	-96.05	Peak	H	H	48.84	0.00	59.78	73.98	-14.20
*	20800.00	-102.81	Average	V	V	48.66	-9.54	43.30	53.98	-10.68
*	20800.00	-94.12	Peak	V	V	48.66	-9.54	52.00	73.98	-21.98
	26000.00	-98.08	Peak	V	V	51.04	-9.54	50.42	68.20	-17.78

Table 6-49. Radiated Measurements

Worst Case Mode:	802.11n
Worst Case Transfer Rate:	MCS8
Distance of Measurements:	1 & 3 Meters
Operating Frequency:	5240MHz
Channel:	48

	Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	EUT Pol. [H/H2/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10480.00	-97.46	Peak	H	H	44.67	0.00	54.21	68.20	-13.99
*	15720.00	-108.27	Average	H	H	48.87	0.00	47.60	53.98	-6.38
*	15720.00	-97.63	Peak	H	H	48.87	0.00	58.24	73.98	-15.74
*	20960.00	-99.33	Average	V	V	48.75	-9.54	46.88	53.98	-7.10
*	20960.00	-93.84	Peak	V	V	48.75	-9.54	52.37	73.98	-21.61
	26200.00	-96.16	Peak	V	V	51.06	-9.54	52.35	68.20	-15.85

Table 6-50. Radiated Measurements

Worst Case Mode:	802.11n
Worst Case Transfer Rate:	MCS8
Distance of Measurements:	1 & 3 Meters
Operating Frequency:	5260MHz
Channel:	52

	Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	EUT Pol. [H/H2/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10520.00	-96.25	Peak	H	H	44.70	0.00	55.45	68.20	-12.75
*	15780.00	-108.40	Average	H	H	48.90	0.00	47.50	53.98	-6.48
*	15780.00	-98.33	Peak	H	H	48.90	0.00	57.57	73.98	-16.41
*	21040.00	-100.79	Average	V	V	48.75	-9.54	45.42	53.98	-8.56
*	21040.00	-94.71	Peak	V	V	48.75	-9.54	51.50	73.98	-22.48
	26300.00	-95.13	Peak	V	V	51.09	-9.54	53.42	68.20	-14.78

Table 6-51. Radiated Measurements

Worst Case Mode:	802.11n
Worst Case Transfer Rate:	MCS8
Distance of Measurements:	1 & 3 Meters
Operating Frequency:	5280MHz
Channel:	56

	Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	EUT Pol. [H/H2/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10560.00	-97.42	Peak	H	H	44.72	0.00	54.29	68.20	-13.91
*	15840.00	-108.51	Average	H	H	48.98	0.00	47.47	53.98	-6.51
*	15840.00	-98.75	Peak	H	H	48.98	0.00	57.23	73.98	-16.75
*	21120.00	-100.35	Average	V	V	48.69	-9.54	45.80	53.98	-8.18
*	21120.00	-93.39	Peak	V	V	48.69	-9.54	52.76	73.98	-21.22
	26400.00	-92.57	Peak	V	V	51.16	-9.54	56.04	68.20	-12.16

Table 6-52. Radiated Measurements

Worst Case Mode:	802.11n
Worst Case Transfer Rate:	MCS8
Distance of Measurements:	1 & 3 Meters
Operating Frequency:	5320MHz
Channel:	64

	Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	EUT Pol. [H/H2/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	10640.00	-108.16	Average	H	H	44.78	0.00	43.62	53.98	-10.36
*	10640.00	-97.09	Peak	H	H	44.78	0.00	54.69	73.98	-19.29
*	15960.00	-108.35	Average	H	H	49.16	0.00	47.80	53.98	-6.18
*	15960.00	-97.05	Peak	H	H	49.16	0.00	59.10	73.98	-14.88
*	21280.00	-99.91	Average	V	V	48.63	-9.54	46.18	53.98	-7.80
*	21280.00	-91.33	Peak	V	V	48.63	-9.54	54.76	73.98	-19.22
	26600.00	-104.45	Peak	V	V	47.32	-9.54	40.33	68.20	-27.87

Table 6-53. Radiated Measurements

Worst Case Mode:	802.11n
Worst Case Transfer Rate:	MCS8
Distance of Measurements:	1 & 3 Meters
Operating Frequency:	5500MHz
Channel:	100

	Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	EUT Pol. [H/H2/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11000.00	-108.43	Average	H	H	44.63	0.00	43.20	53.98	-10.78
*	11000.00	-98.02	Peak	H	H	44.63	0.00	53.61	73.98	-20.37
	16500.00	-99.07	Peak	H	H	50.51	0.00	58.44	68.20	-9.76
	22000.00	-88.85	Peak	V	V	48.96	-9.54	57.57	68.20	-10.63
	27500.00	-106.32	Peak	V	V	48.36	-9.54	39.50	68.20	-28.70

Table 6-54. Radiated Measurements

Worst Case Mode:	802.11n
Worst Case Transfer Rate:	MCS8
Distance of Measurements:	1 & 3 Meters
Operating Frequency:	5580MHz
Channel:	116

	Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	EUT Pol. [H/H2/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11160.00	-108.13	Average	H	H	44.72	0.00	43.60	53.98	-10.38
*	11160.00	-96.85	Peak	H	H	44.72	0.00	54.88	73.98	-19.10
	16740.00	-98.75	Peak	H	H	50.00	0.00	58.25	68.20	-9.95
*	22320.00	-100.09	Average	V	V	49.73	-9.54	47.09	53.98	-6.88
*	22320.00	-89.61	Peak	V	V	49.73	-9.54	57.58	73.98	-16.40
	27900.00	-106.16	Peak	V	V	48.05	-9.54	39.35	68.20	-28.85

Table 6-55. Radiated Measurements

Worst Case Mode:	802.11n
Worst Case Transfer Rate:	MCS8
Distance of Measurements:	1 & 3 Meters
Operating Frequency:	5700MHz
Channel:	140

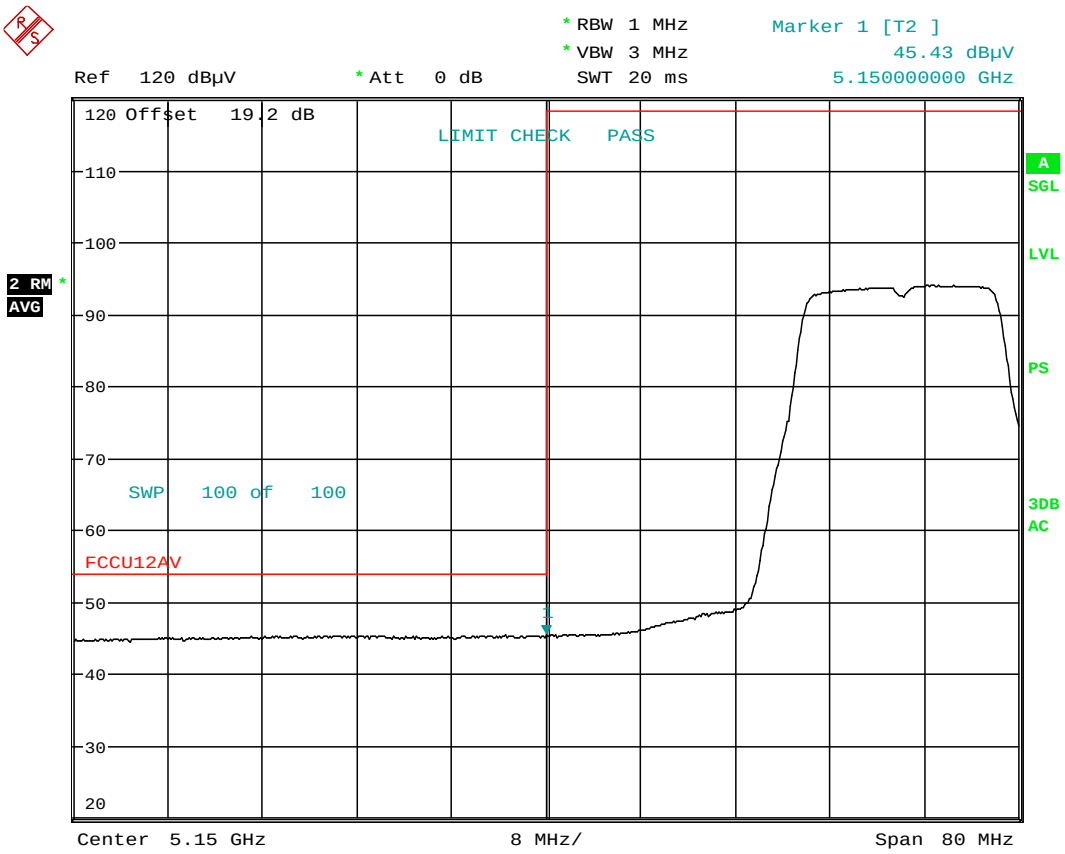
	Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	EUT Pol. [H/H2/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11400.00	-107.78	Average	H	H	45.03	0.00	44.25	53.98	-9.73
*	11400.00	-97.58	Peak	H	H	45.03	0.00	54.45	73.98	-19.53
	17100.00	-98.28	Peak	H	H	49.99	0.00	58.70	68.20	-9.50
*	22800.00	-101.58	Average	V	V	49.82	-9.54	45.70	53.98	-8.28
*	22800.00	-90.46	Peak	V	V	49.82	-9.54	56.81	73.98	-17.16
	28500.00	-107.31	Peak	V	V	48.01	-9.54	38.16	68.20	-30.04

Table 6-56. Radiated Measurements

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

§15.407(b.1)(b.2) §15.205 §15.209

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

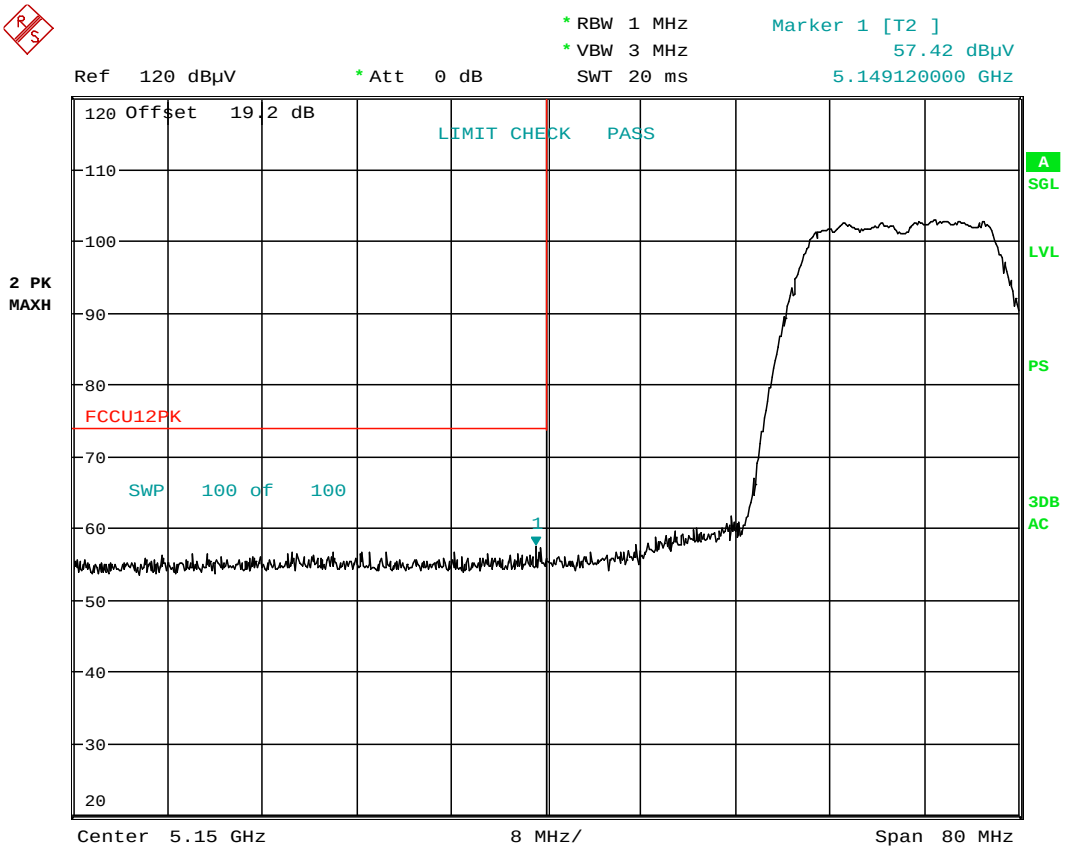


Date: 28.AUG.2014 10:03:54

Plot 6-126. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

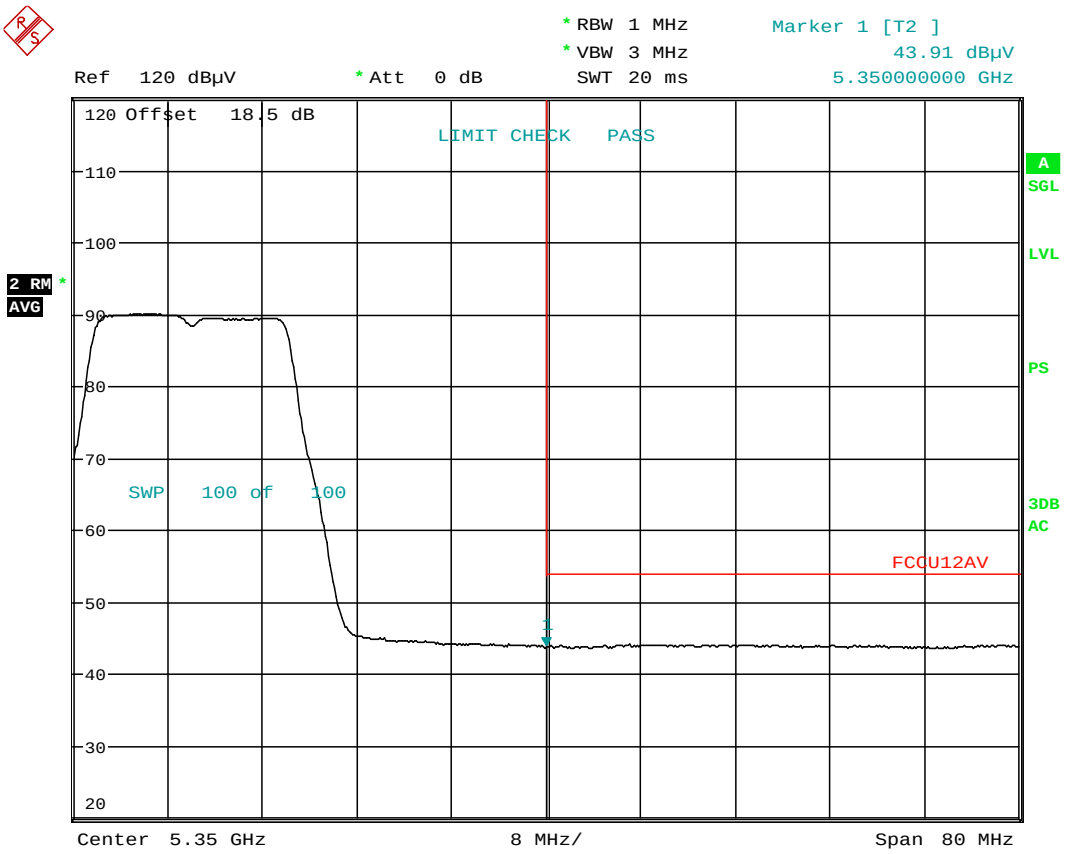


Plot 6-127. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)

Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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

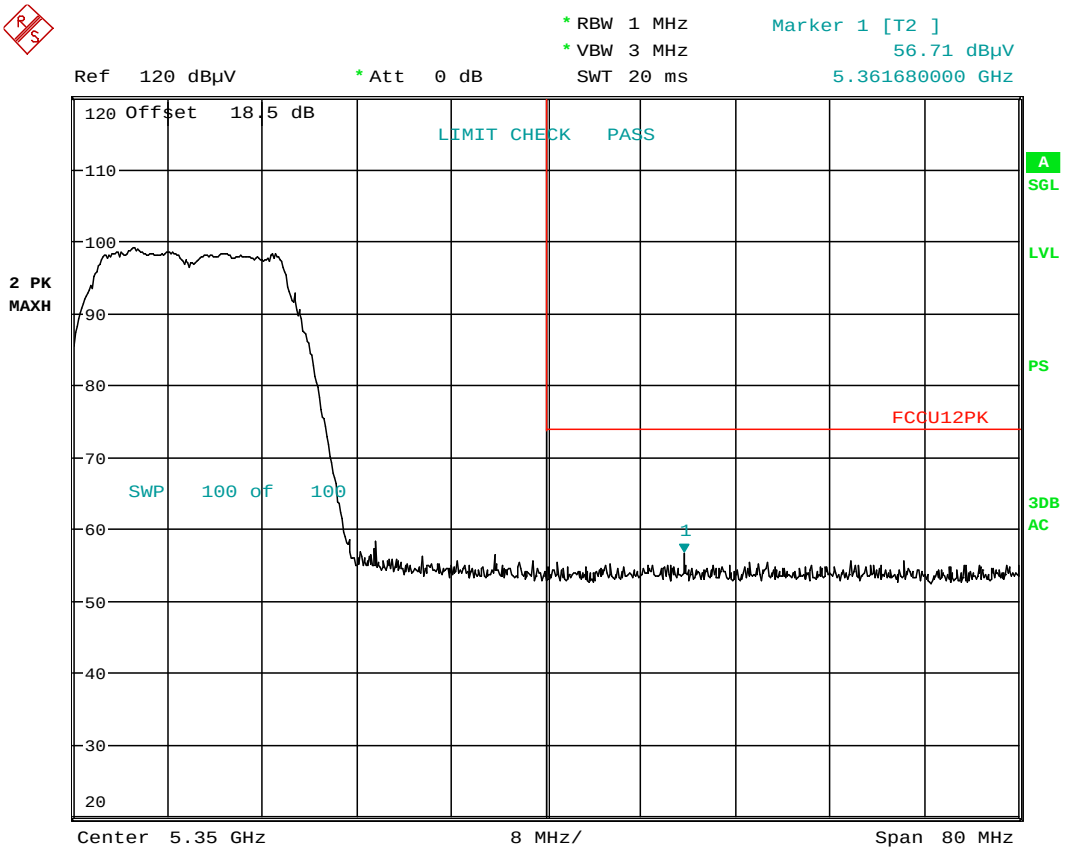


Date: 28.AUG.2014 11:34:27

Plot 6-128. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

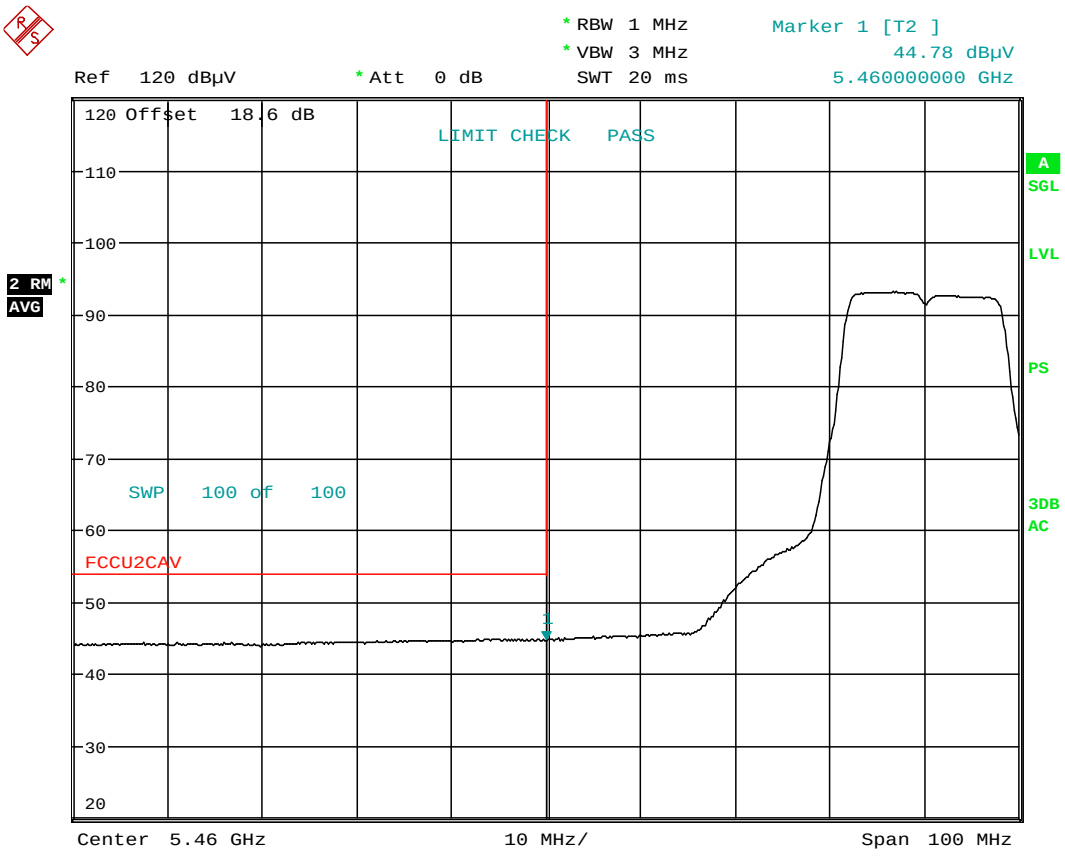


Plot 6-129. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

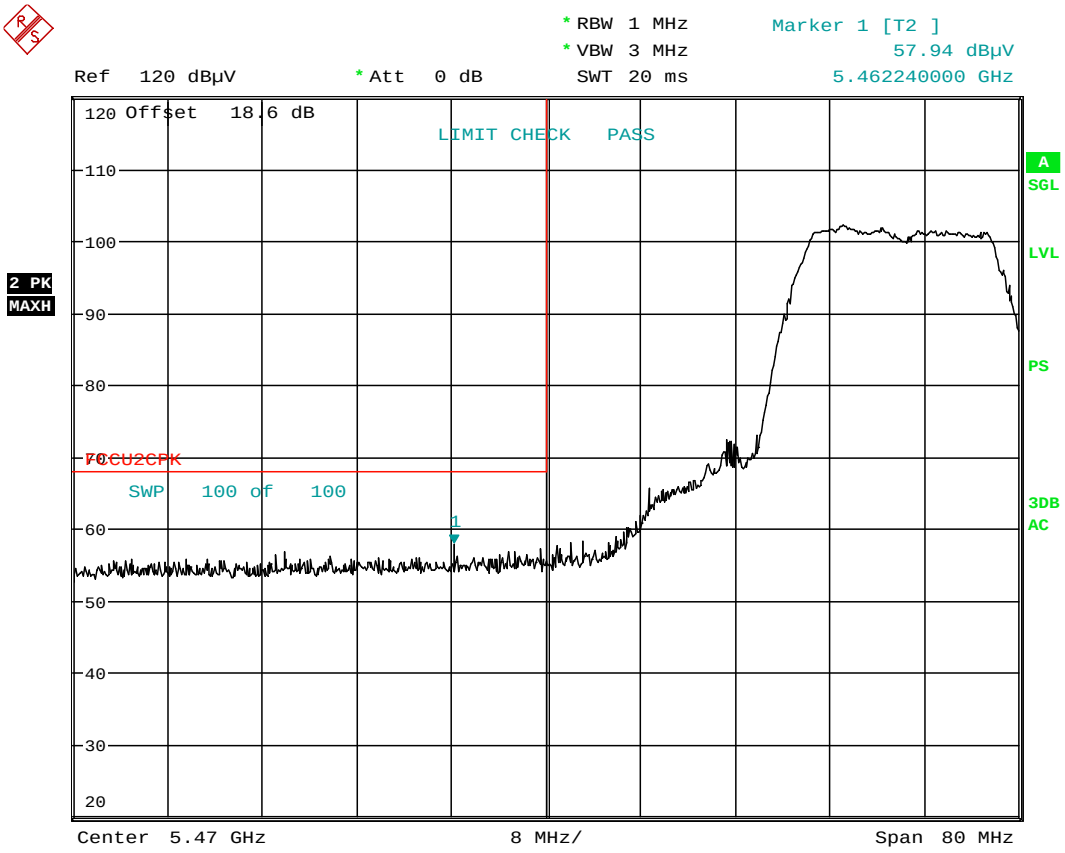
Worst Case Mode:	802.11a
Worst Case Transfer Rate:	6 Mbps
Distance of Measurements:	3 Meters
Operating Frequency:	5500MHz
Channel:	100



Plot 6-130. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



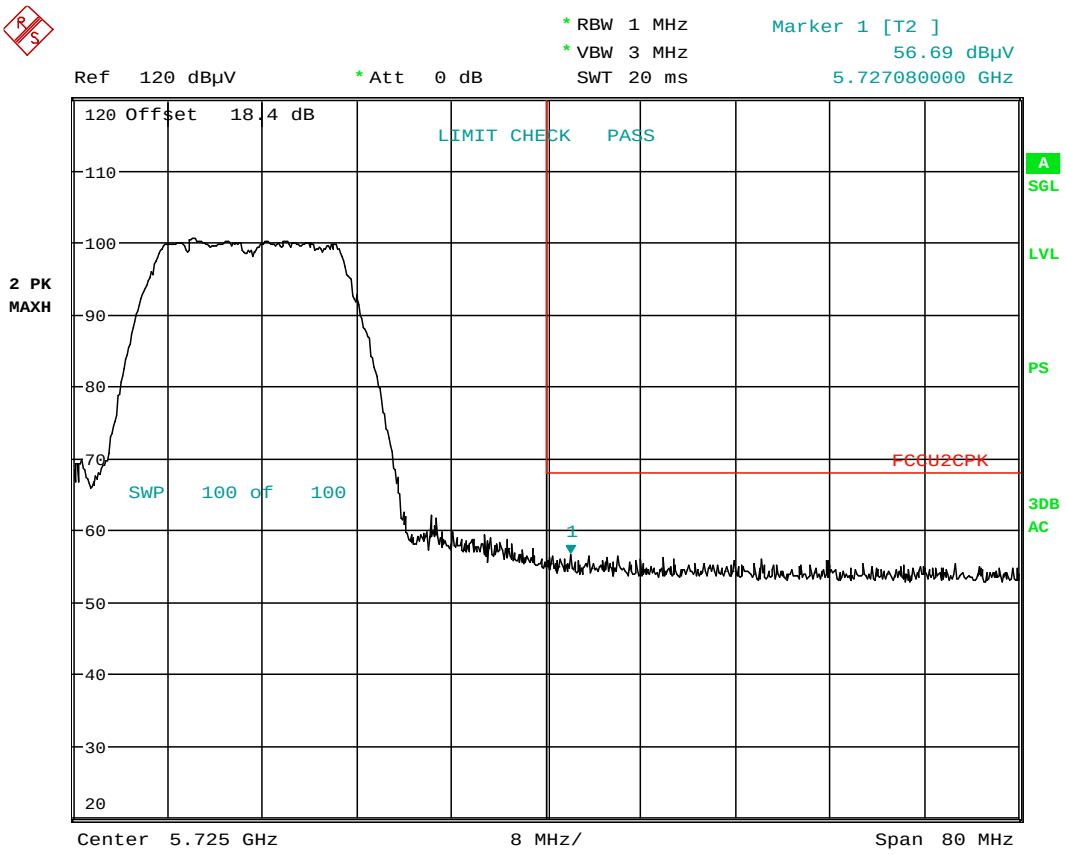
Date: 28.AUG.2014 12:00:00

Plot 6-131. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

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:	5700MHz
Channel:	140



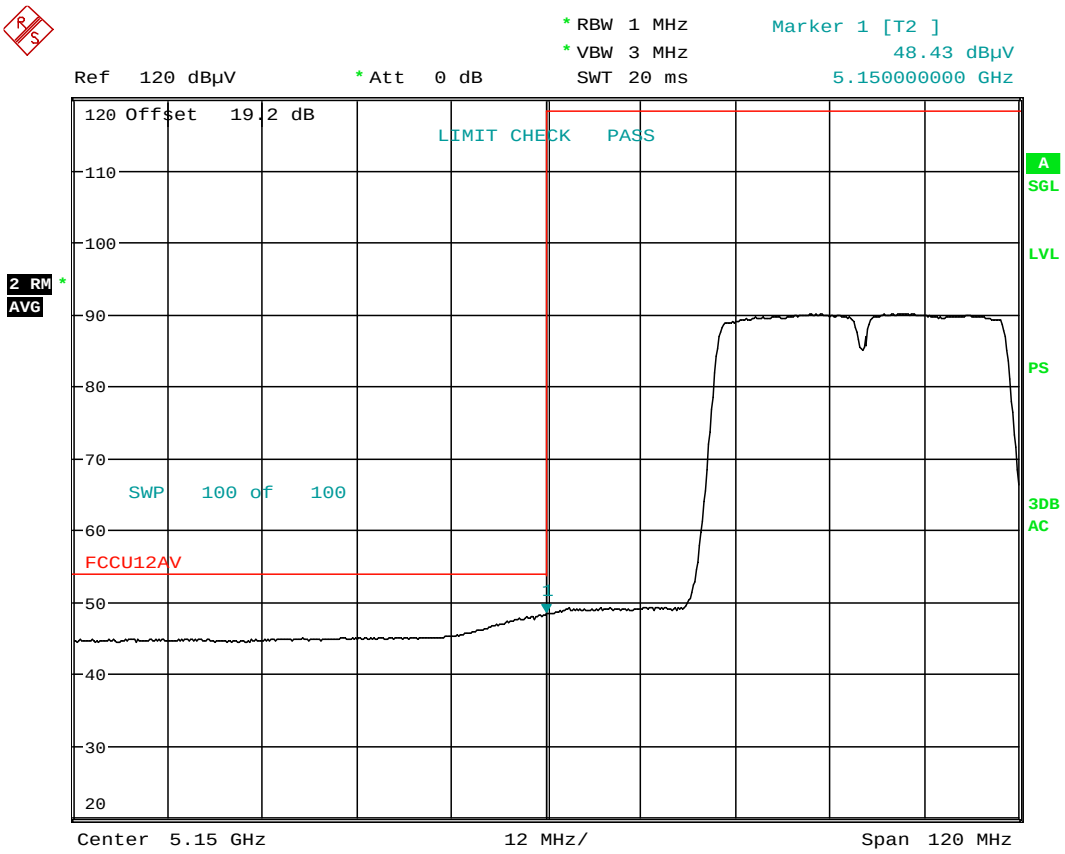
Date: 28.AUG.2014 12:20:12

Plot 6-132. Radiated Upper Band Edge Plot (Peak – UNII Band 2C)

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

§15.407(b.1)(b.2) §15.205 §15.209

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

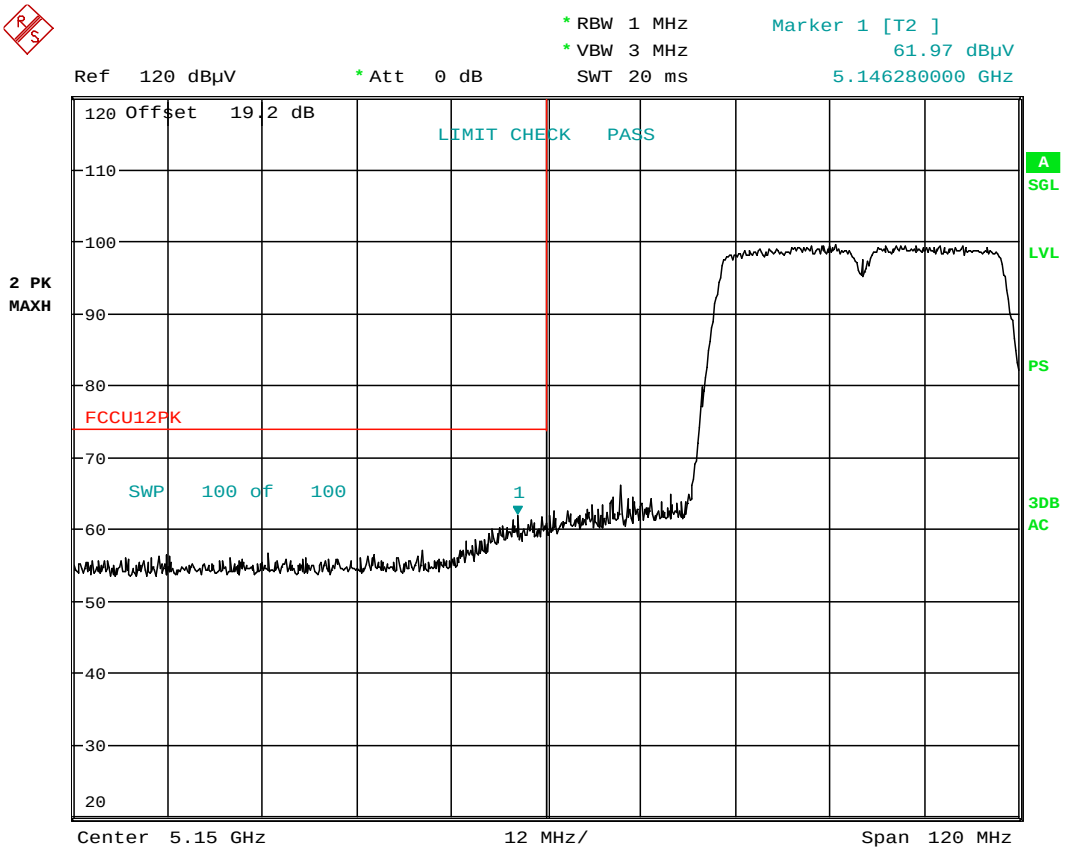


Date: 28.AUG.2014 10:56:03

Plot 6-133. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



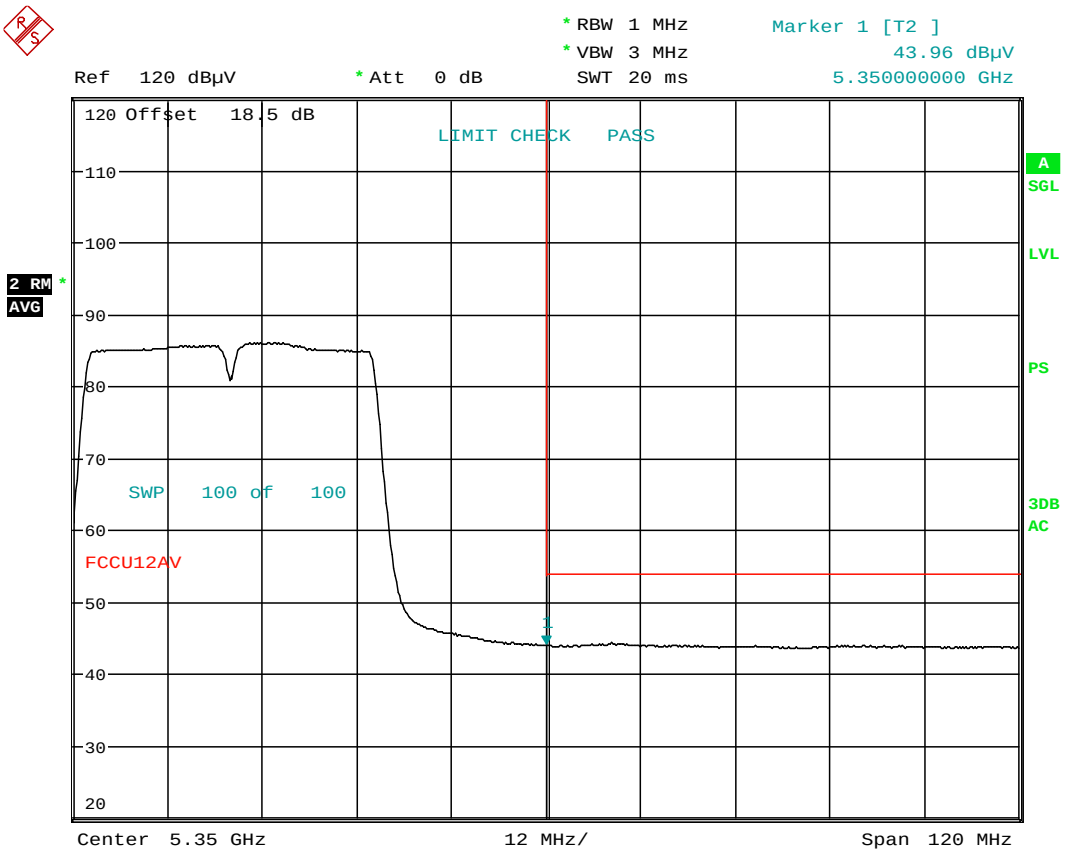
Date: 28.AUG.2014 10:53:35

Plot 6-134. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)

Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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

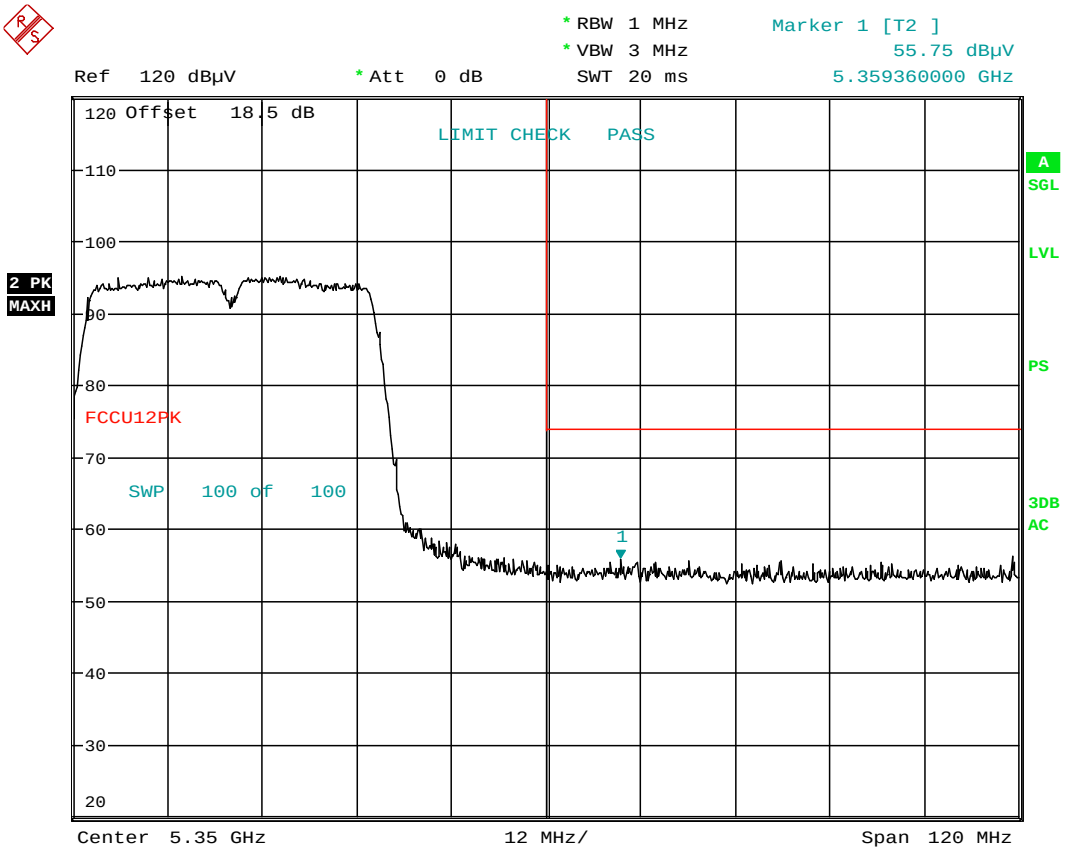


Date: 28.AUG.2014 11:37:23

Plot 6-135. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

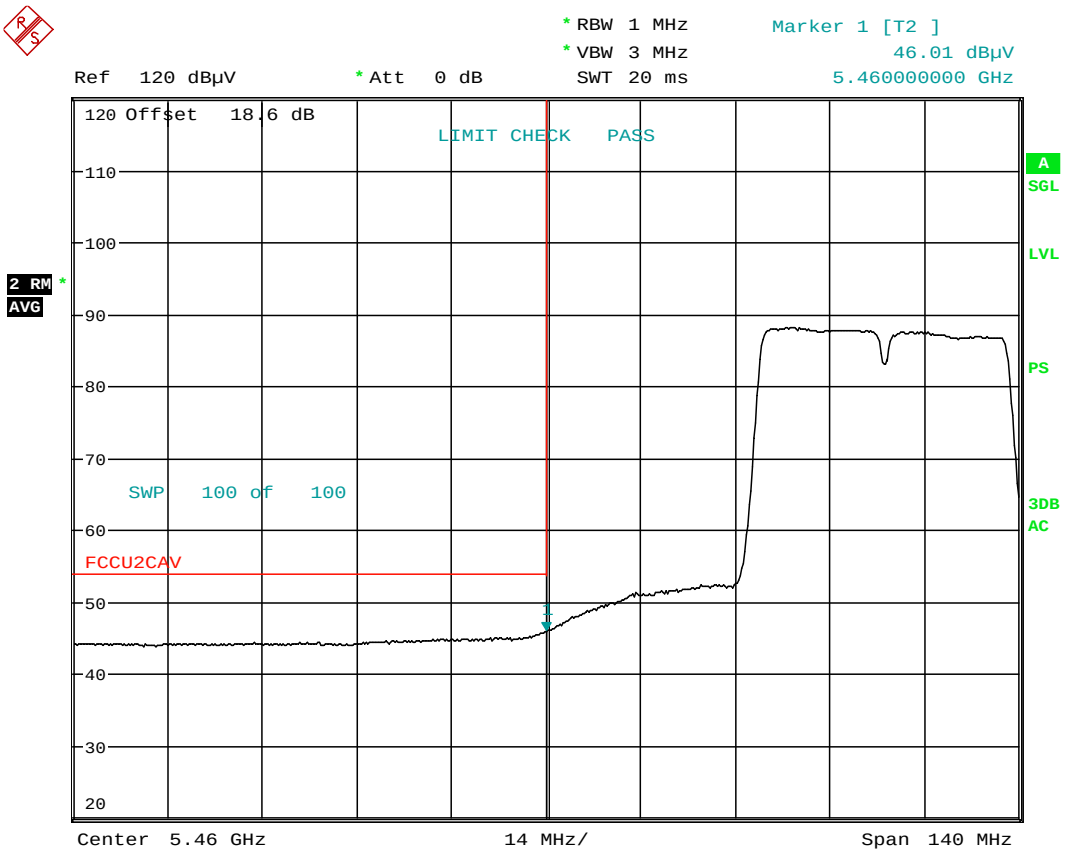


Plot 6-136. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

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

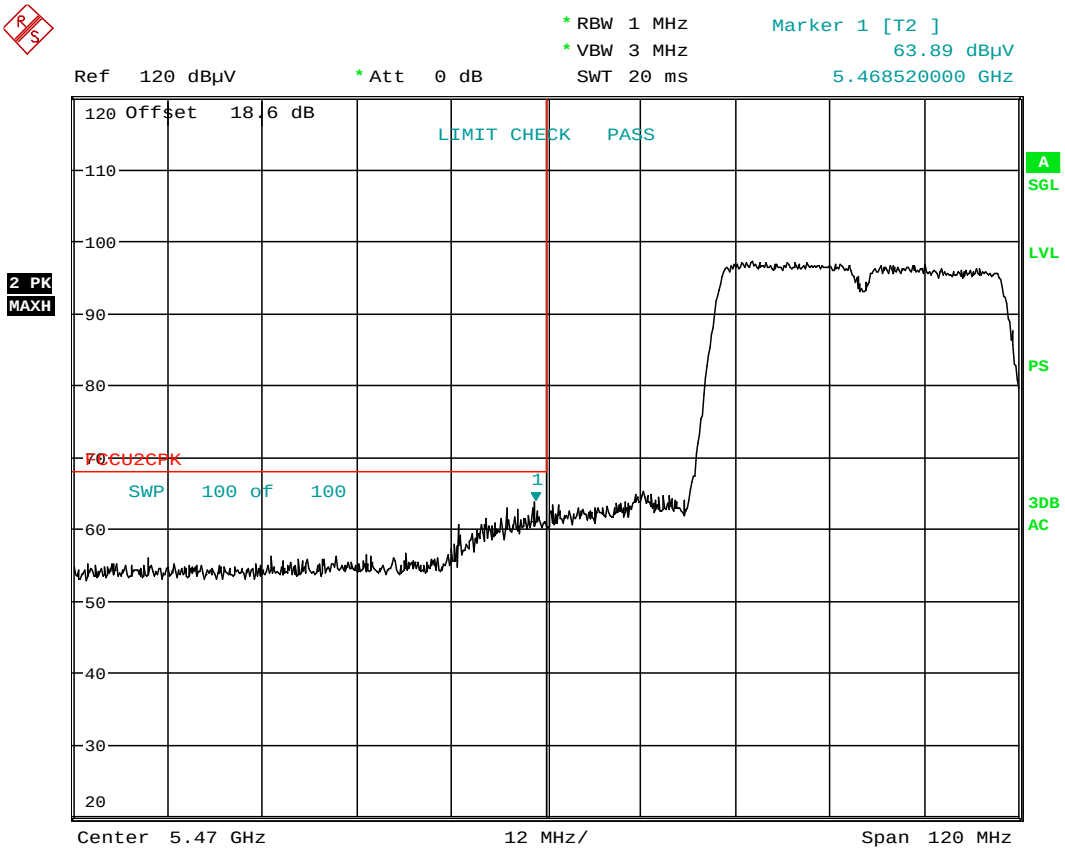


Date: 28.AUG.2014 12:04:49

Plot 6-137. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



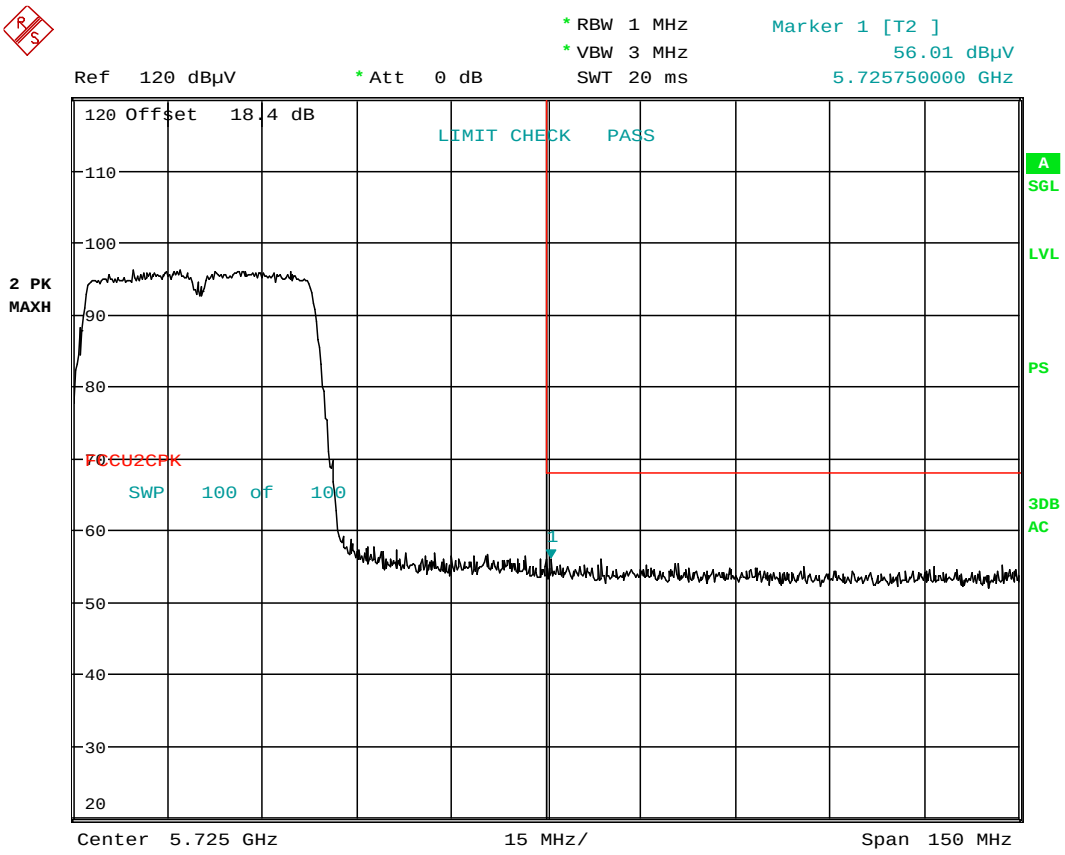
Date: 28.AUG.2014 12:06:35

Plot 6-138. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

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:	5670MHz
Channel:	134



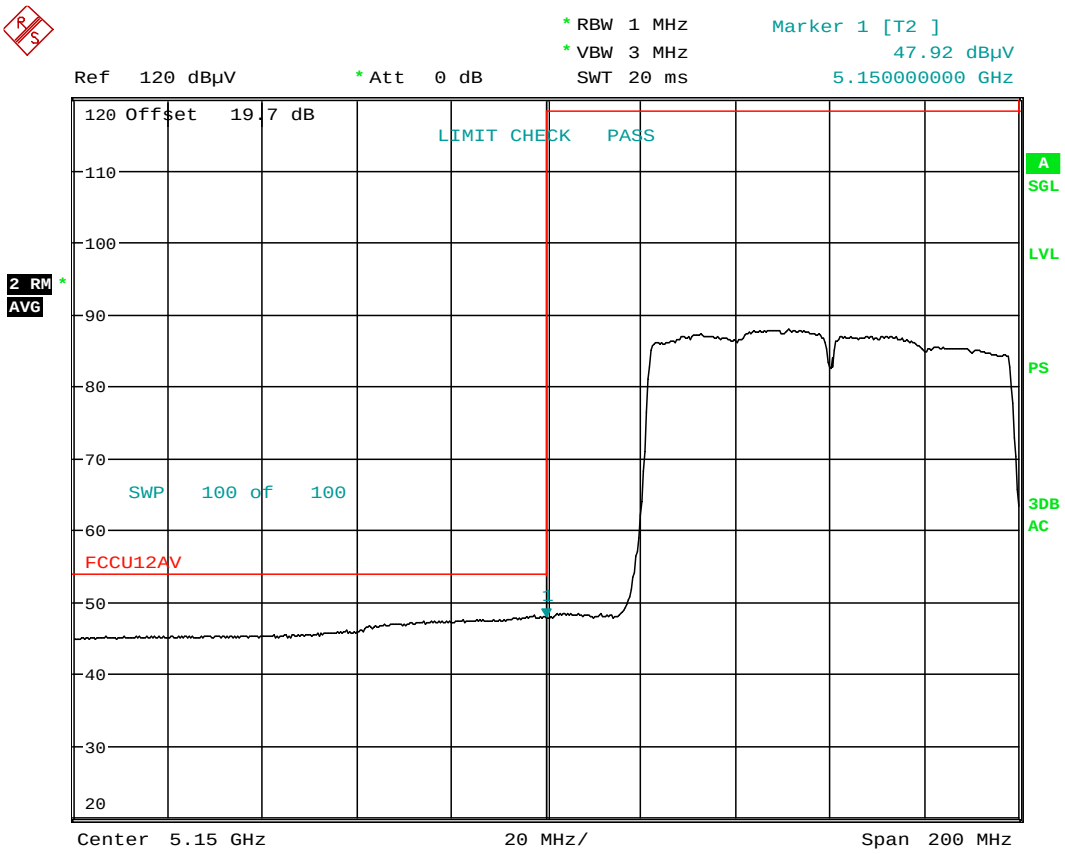
Date: 28.AUG.2014 12:22:54

Plot 6-139. Radiated Upper Band Edge Plot (Peak – UNII Band 2C)

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

§15.407(b.1)(b.2) §15.205 §15.209

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

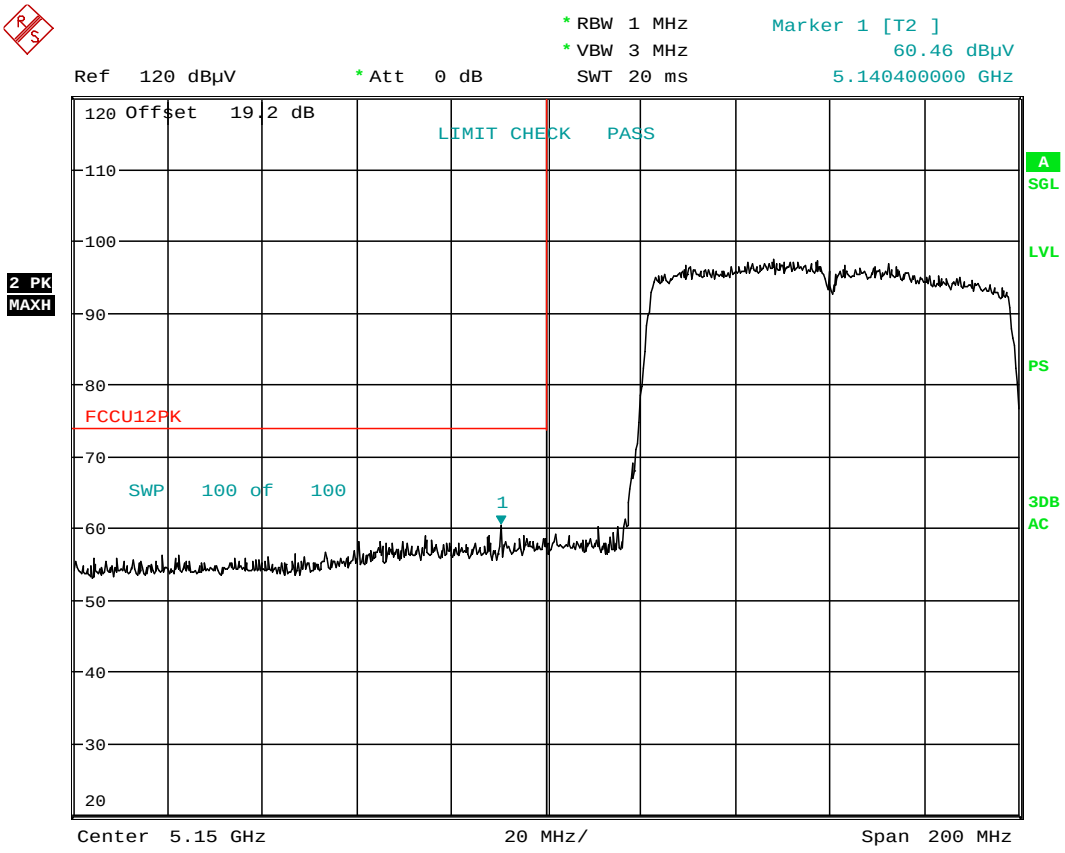


Date: 28.AUG.2014 11:26:01

Plot 6-140. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



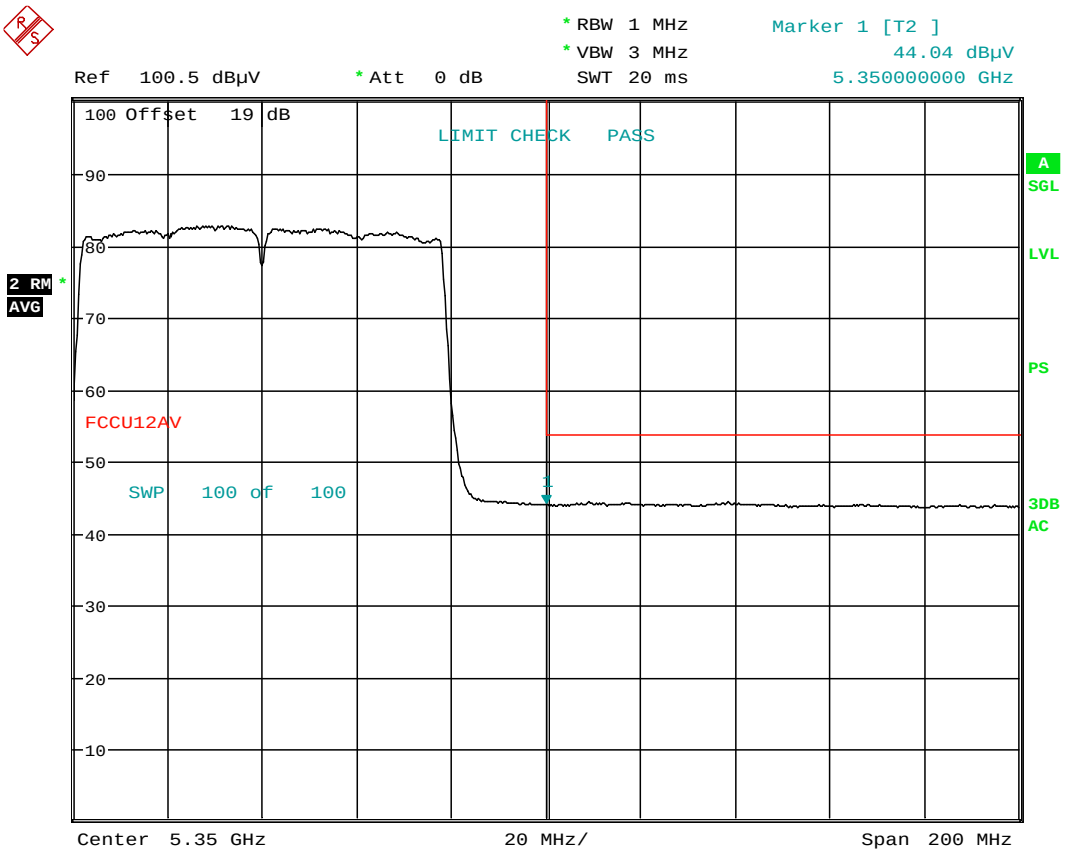
Date: 28.AUG.2014 11:24:59

Plot 6-141. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)

Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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

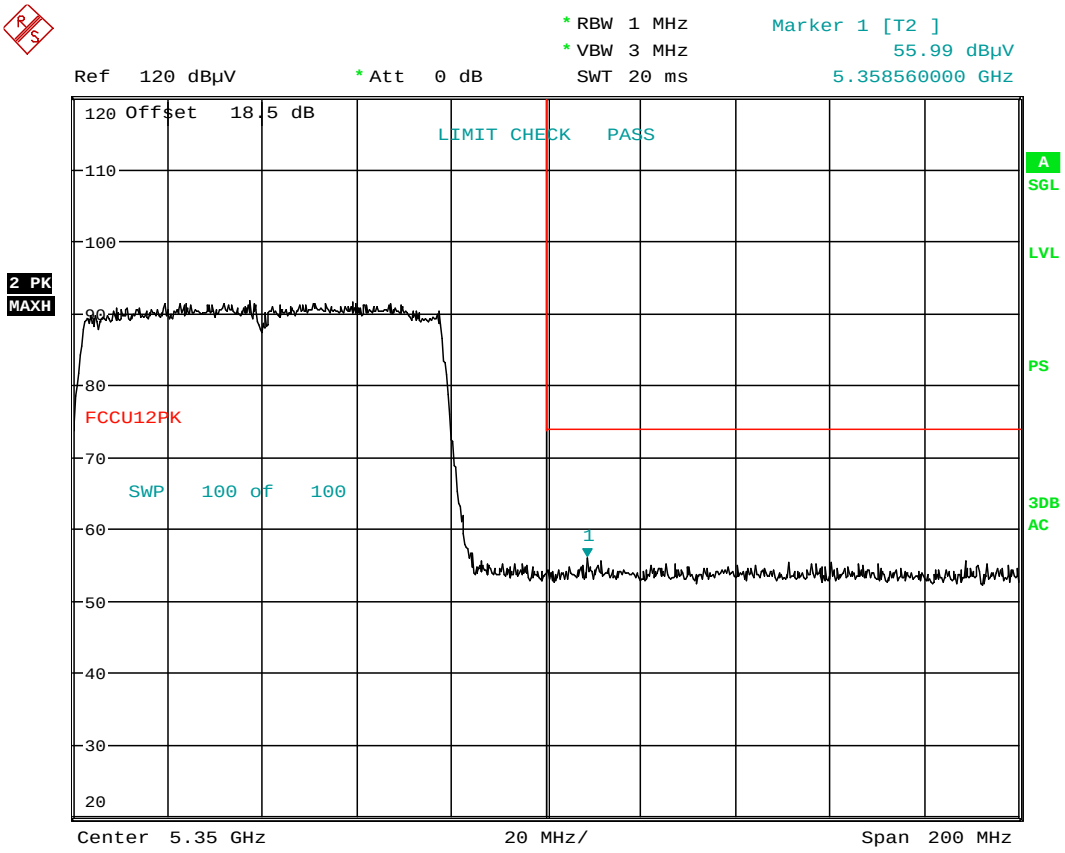


Date: 28.AUG.2014 11:51:03

Plot 6-142. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



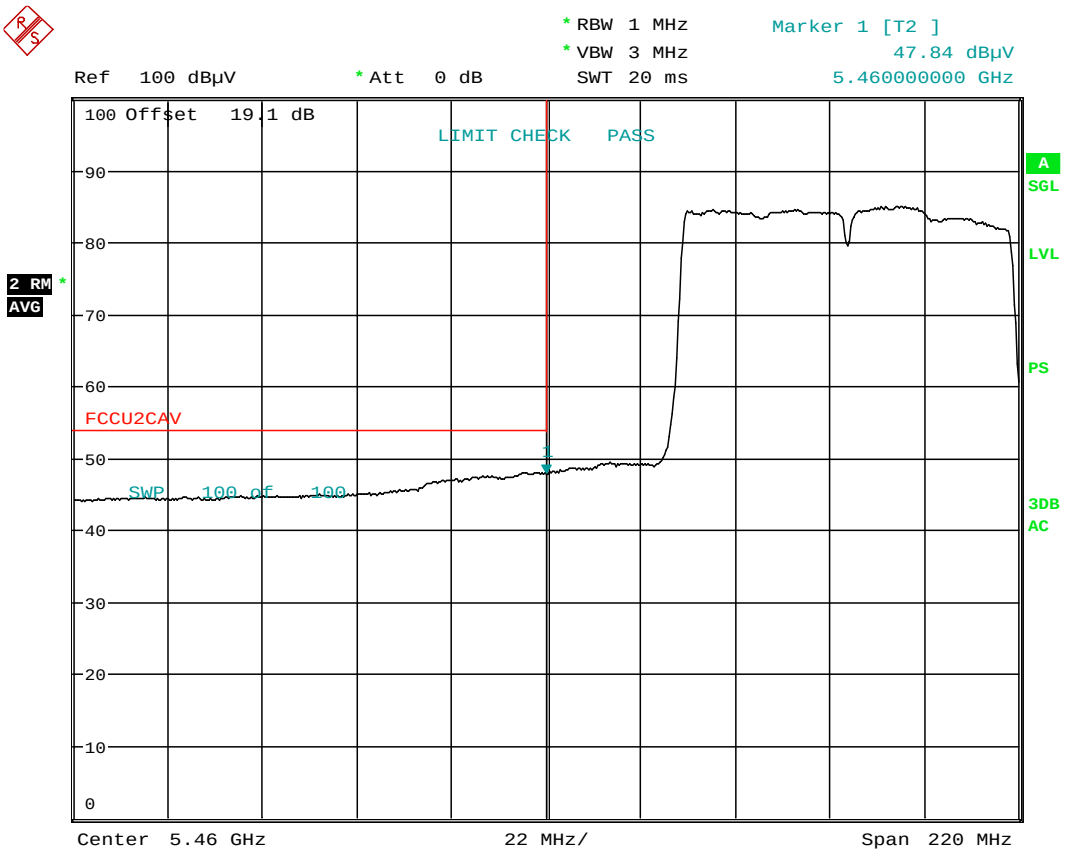
Date: 28.AUG.2014 11:40:53

Plot 6-143. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

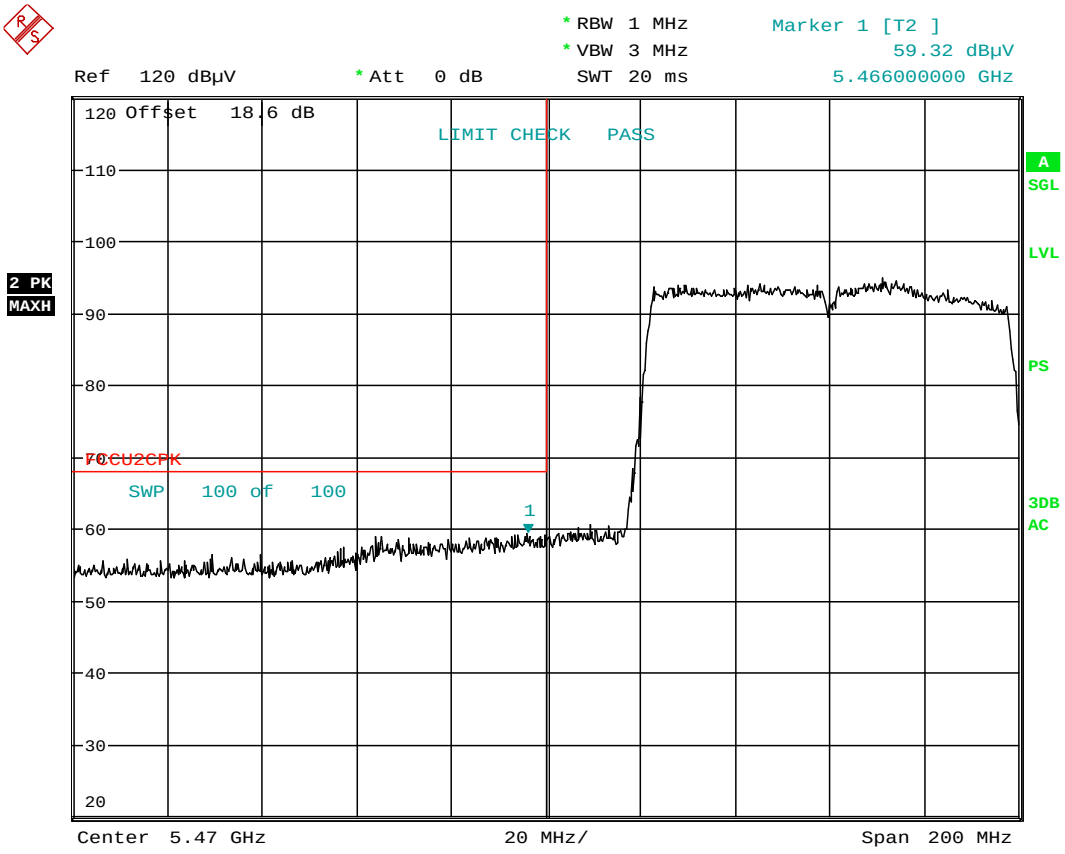
Worst Case Mode:	802.11ac (80MHz)
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5530MHz
Channel:	106



Plot 6-144. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



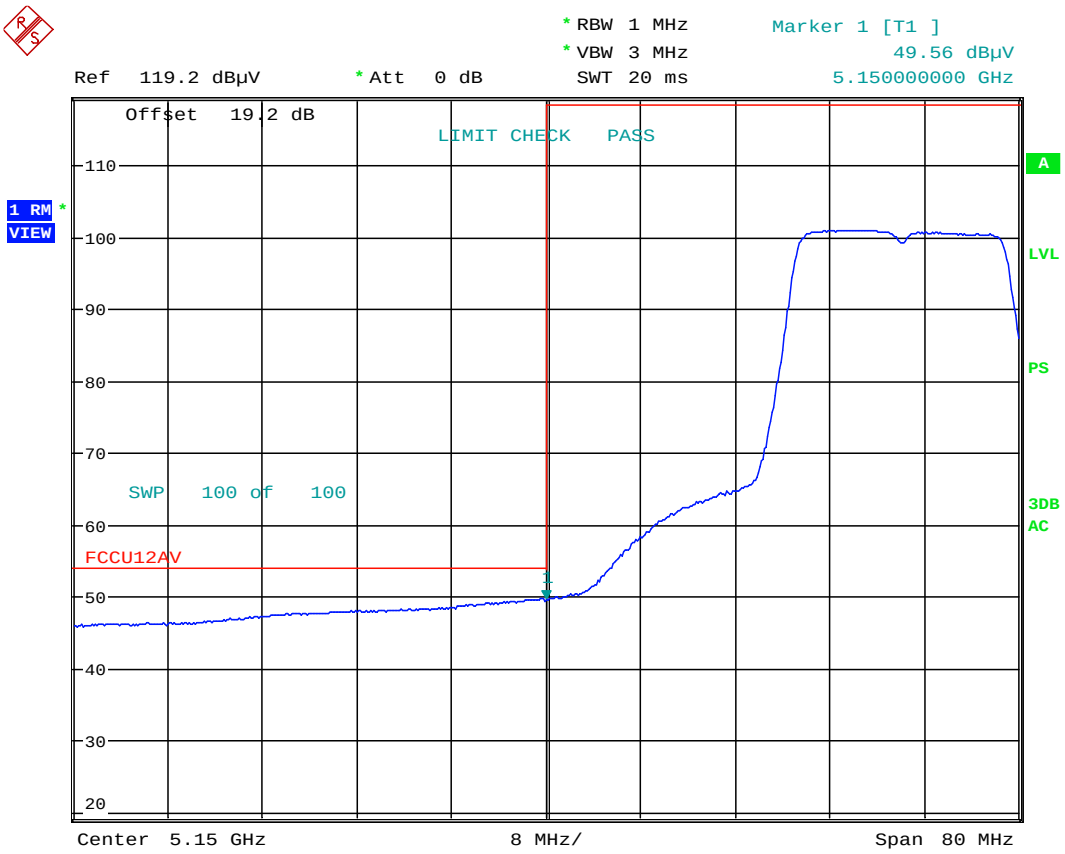
Date: 28.AUG.2014 12:09:55

Plot 6-145. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

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

§15.407(b.1)(b.2) §15.205 §15.209

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

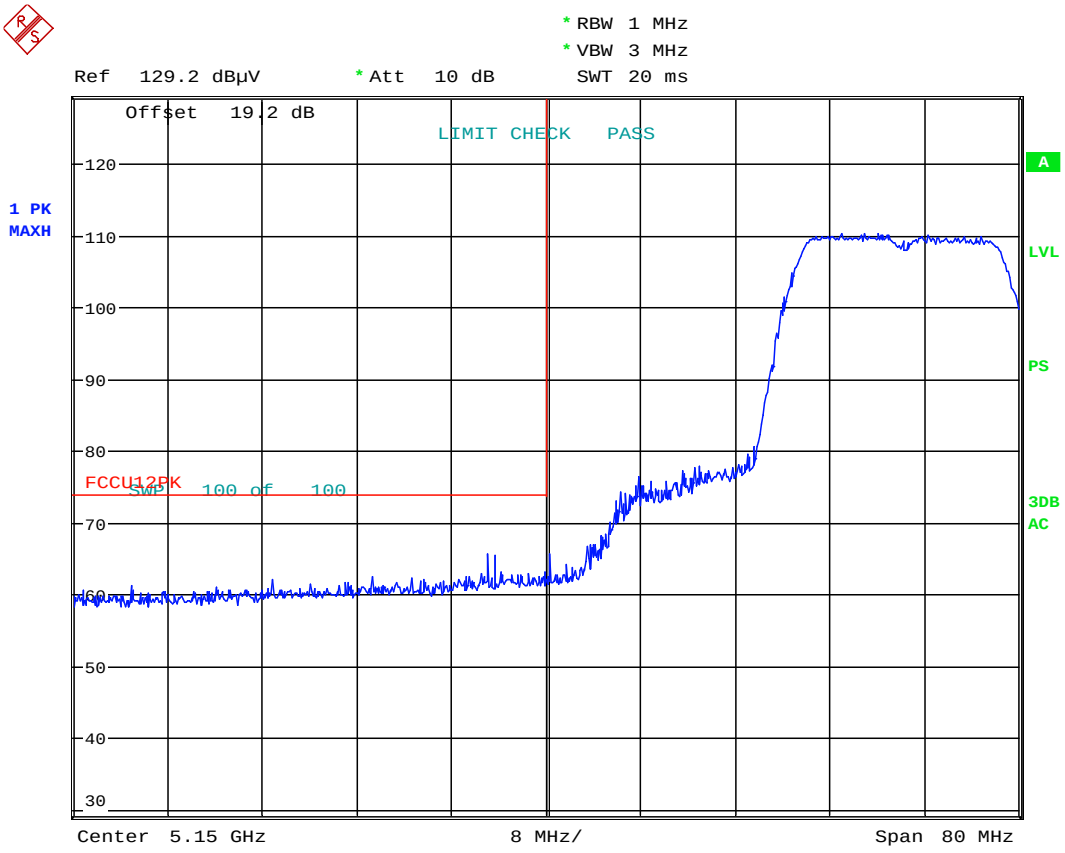


Date: 29.AUG.2014 00:11:39

Plot 6-146. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



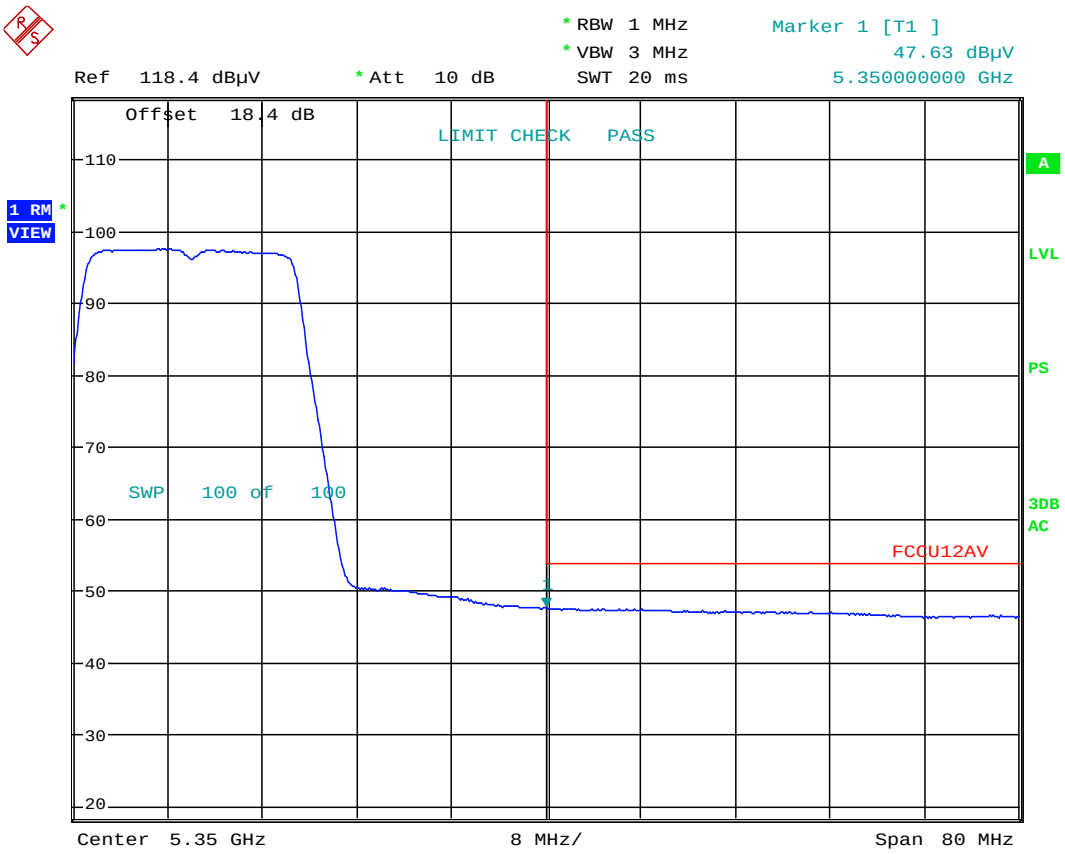
Date: 29.AUG.2014 00:12:08

Plot 6-147. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)

Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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

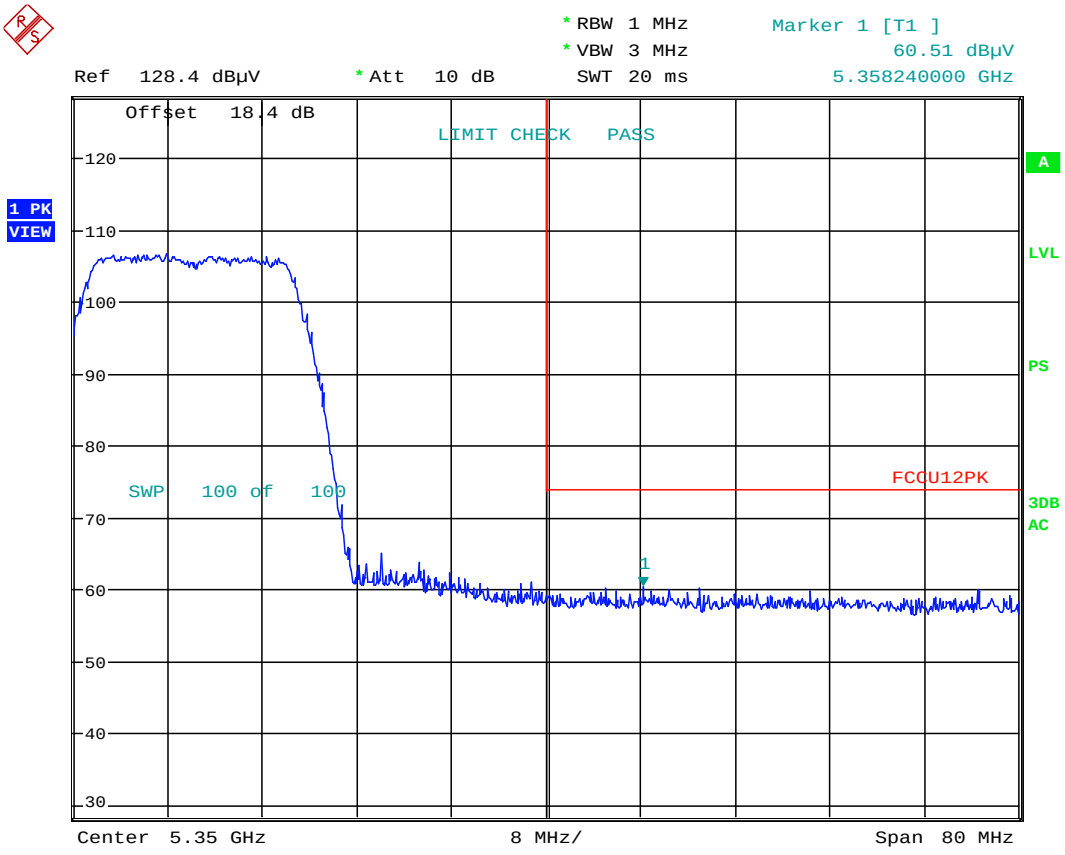


Date: 29.AUG.2014 01:41:10

Plot 6-148. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

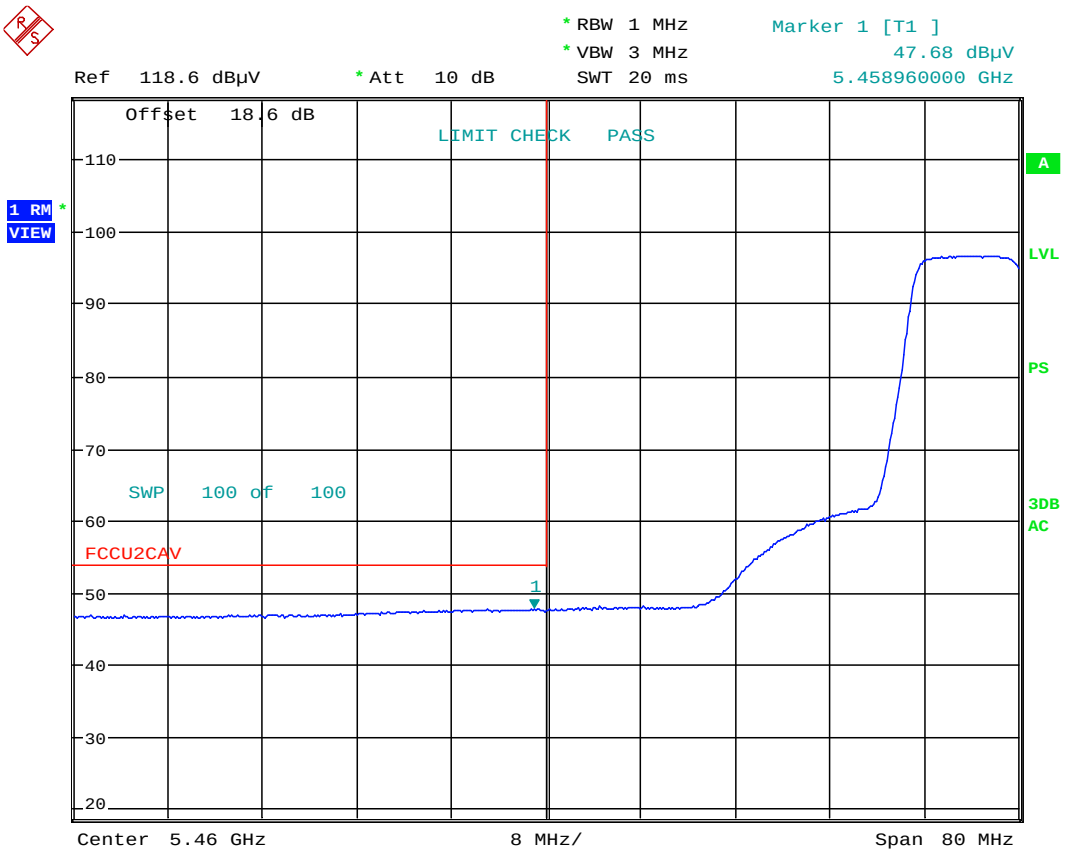


Plot 6-149. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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

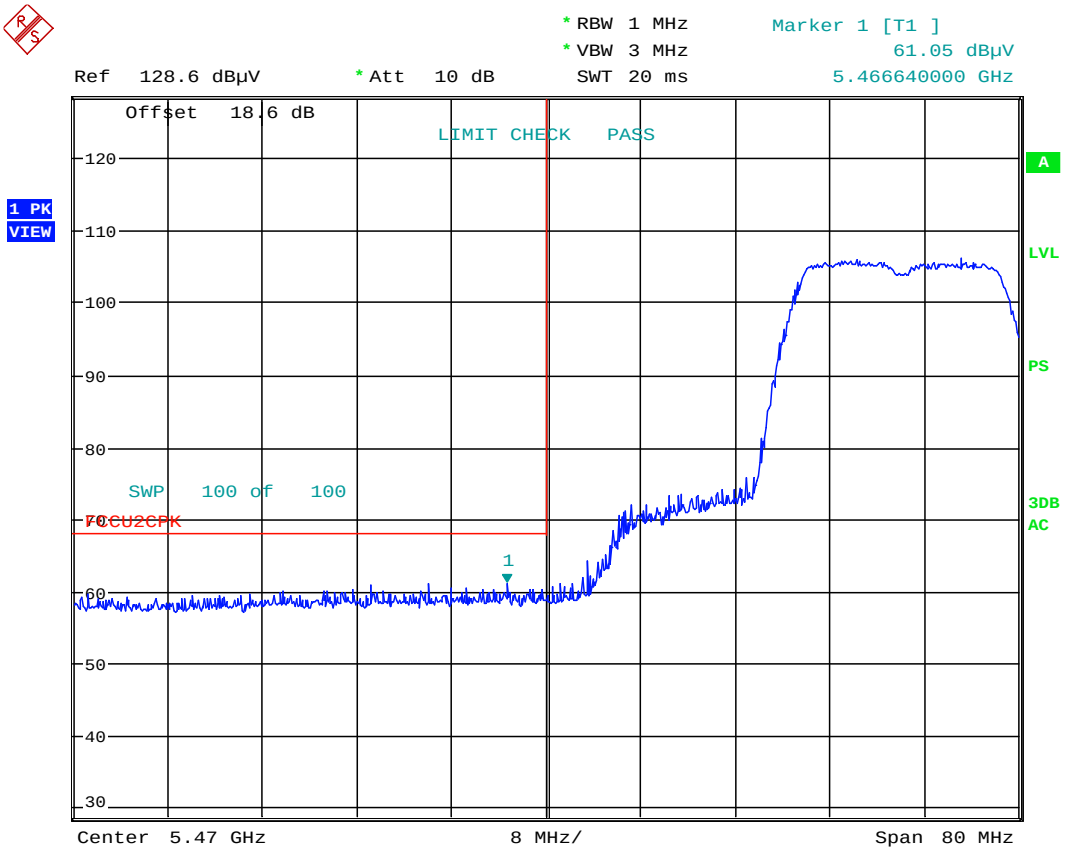


Date: 29.AUG.2014 02:31:16

Plot 6-150. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



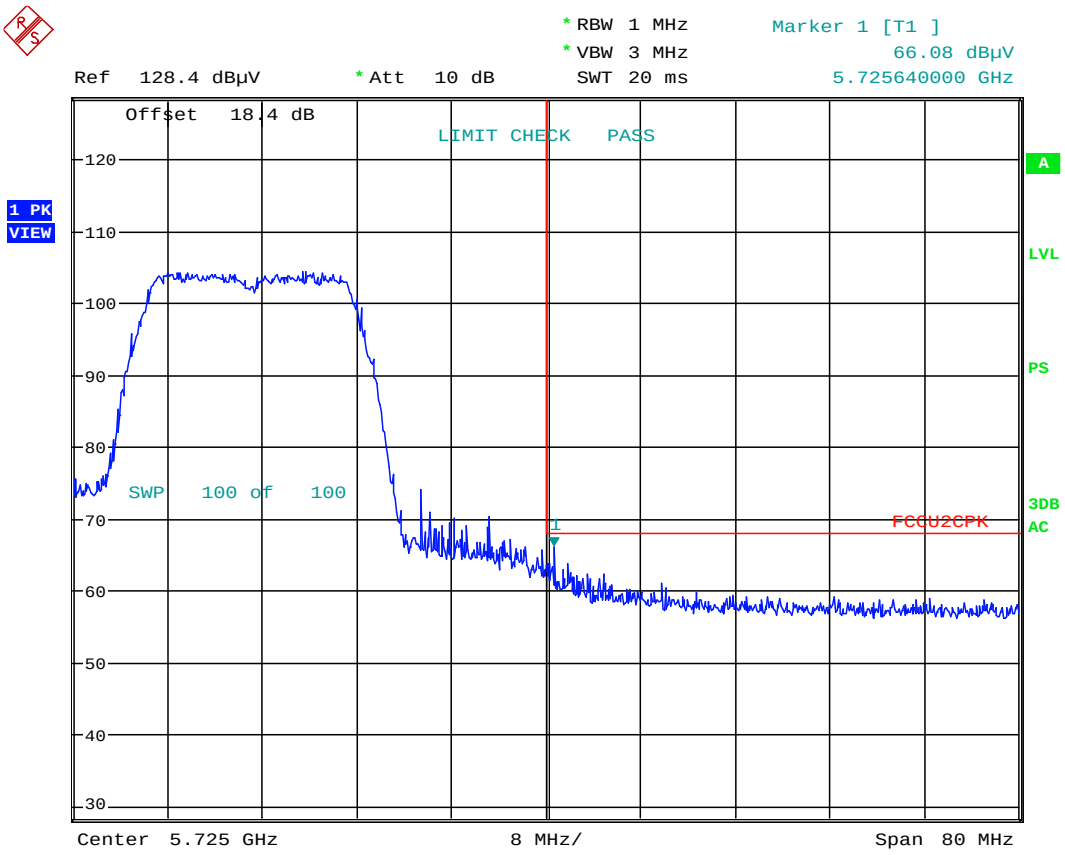
Date: 29.AUG.2014 02:32:00

Plot 6-151. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

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:	5700MHz
Channel:	140



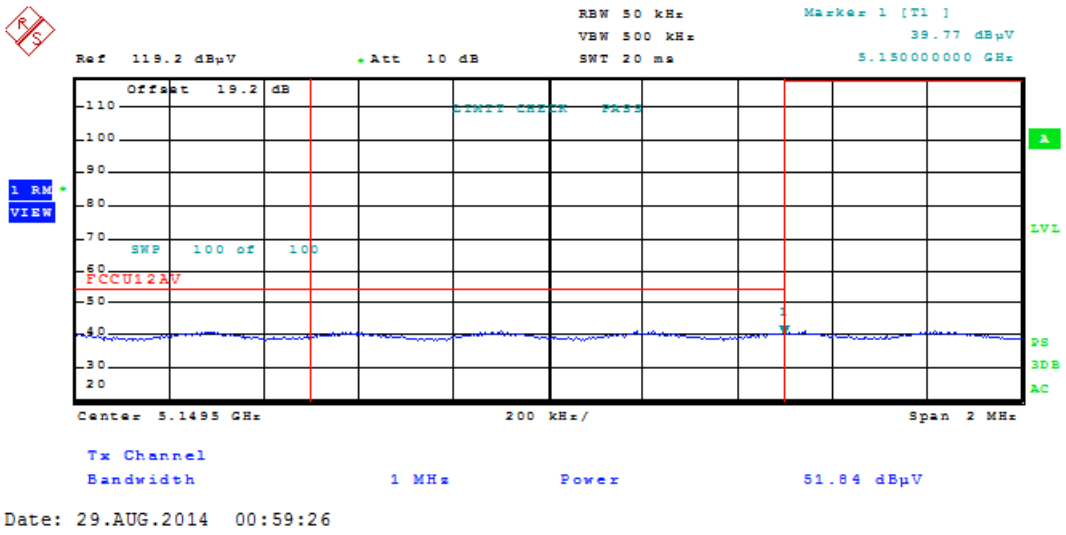
Date: 29.AUG.2014 03:13:59

Plot 6-152. Radiated Upper Band Edge Plot (Peak – UNII Band 2C)

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

§15.407(b.1)(b.2) §15.205 §15.209

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

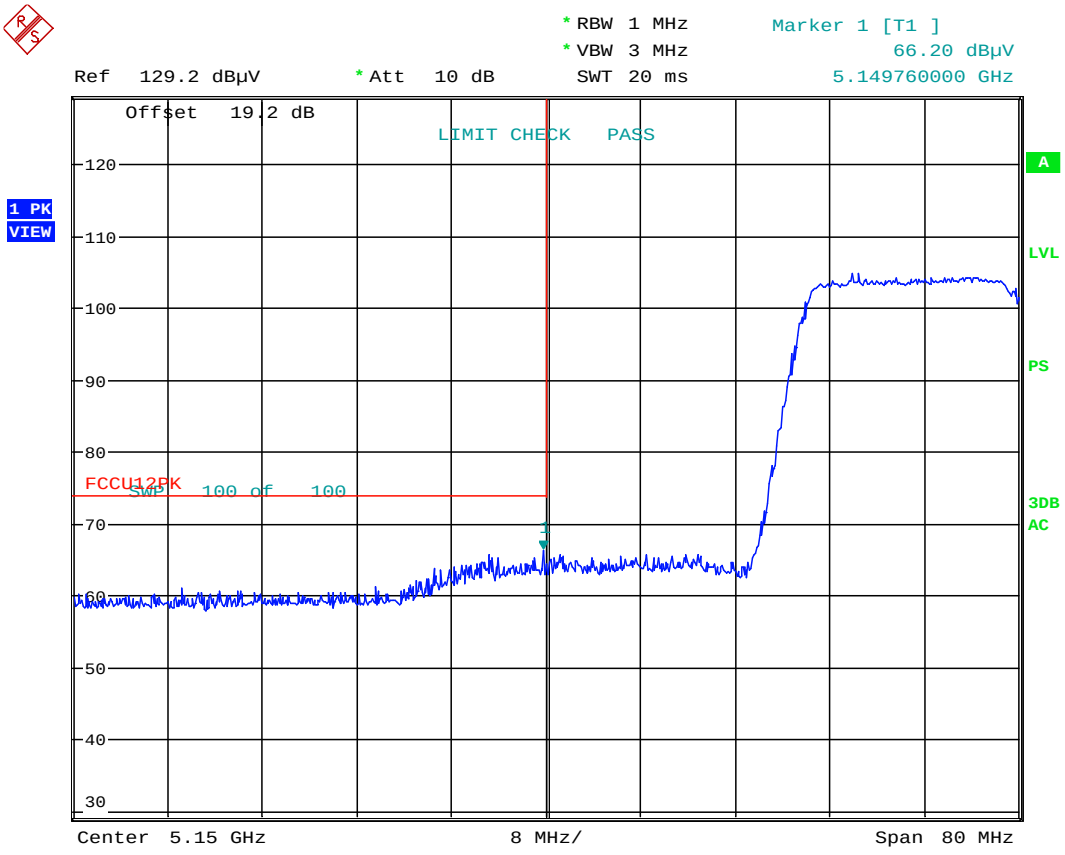


Plot 6-153. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

Note:
A channel integration method was used to determine compliance with the out of band average radiated spurious emissions limit in the 4500 – 5150MHz band. Per KDB 789033 v01r03 Section H, a measurement was performed using a RBW of 100kHz at the 5150MHz band edge. The results were integrated up to the 1MHz reference bandwidth to show compliance with the 15.209 radiated limit for emissions greater than 1GHz.

Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



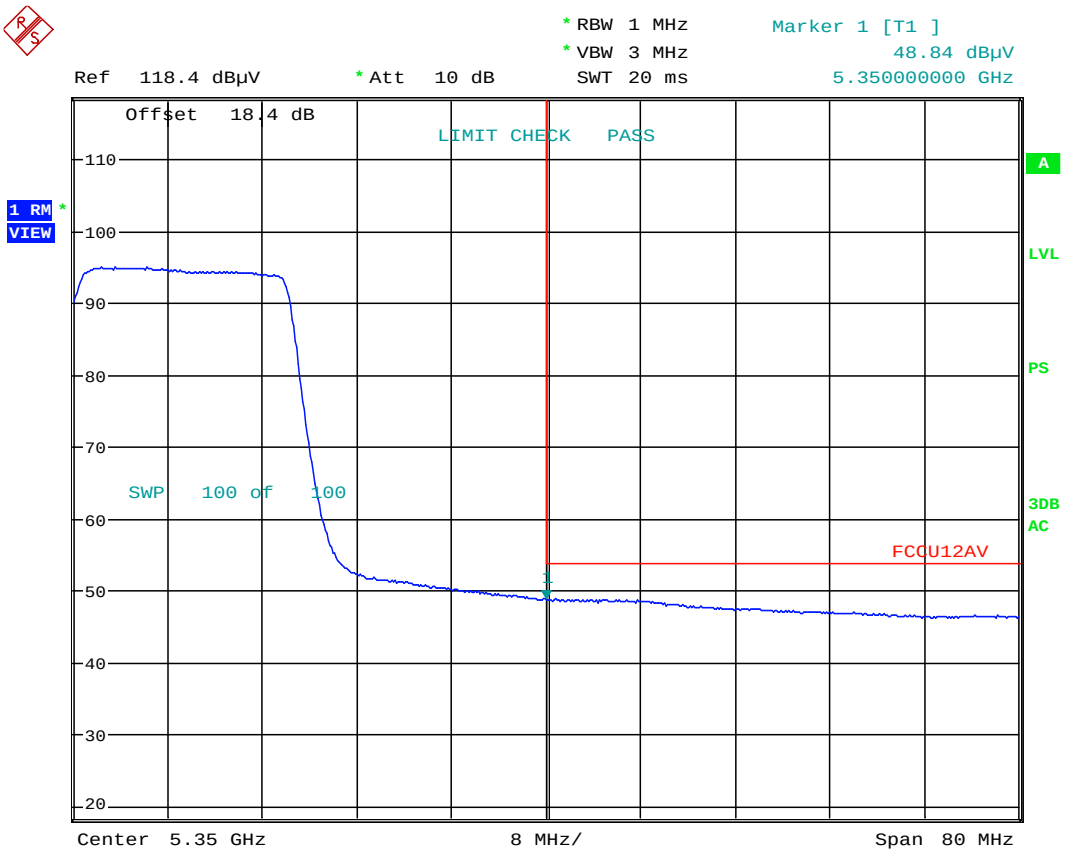
Date: 29.AUG.2014 01:00:25

Plot 6-154. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)

Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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

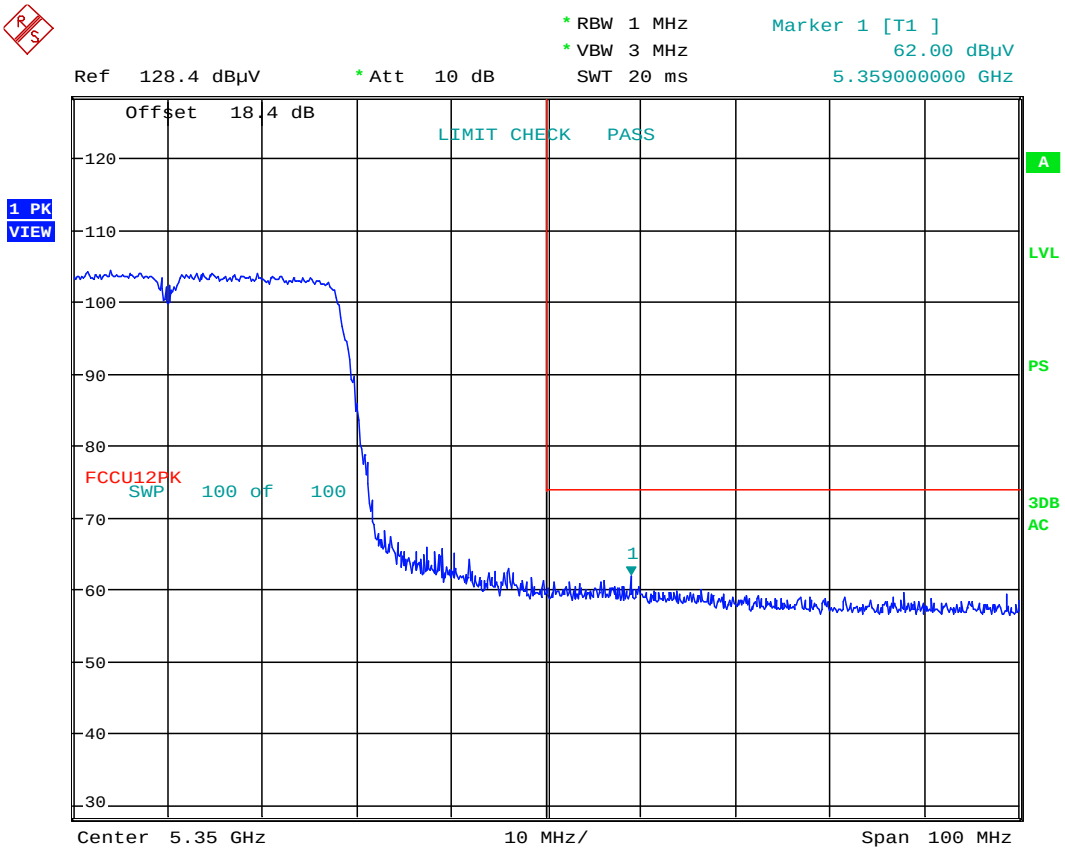


Date: 29.AUG.2014 01:52:15

Plot 6-155. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

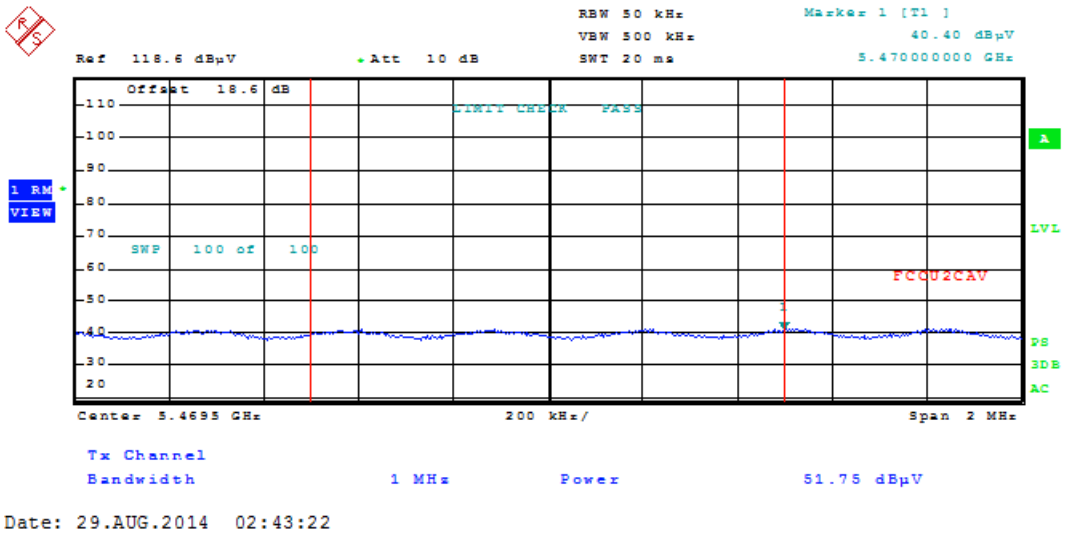


Plot 6-156. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

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

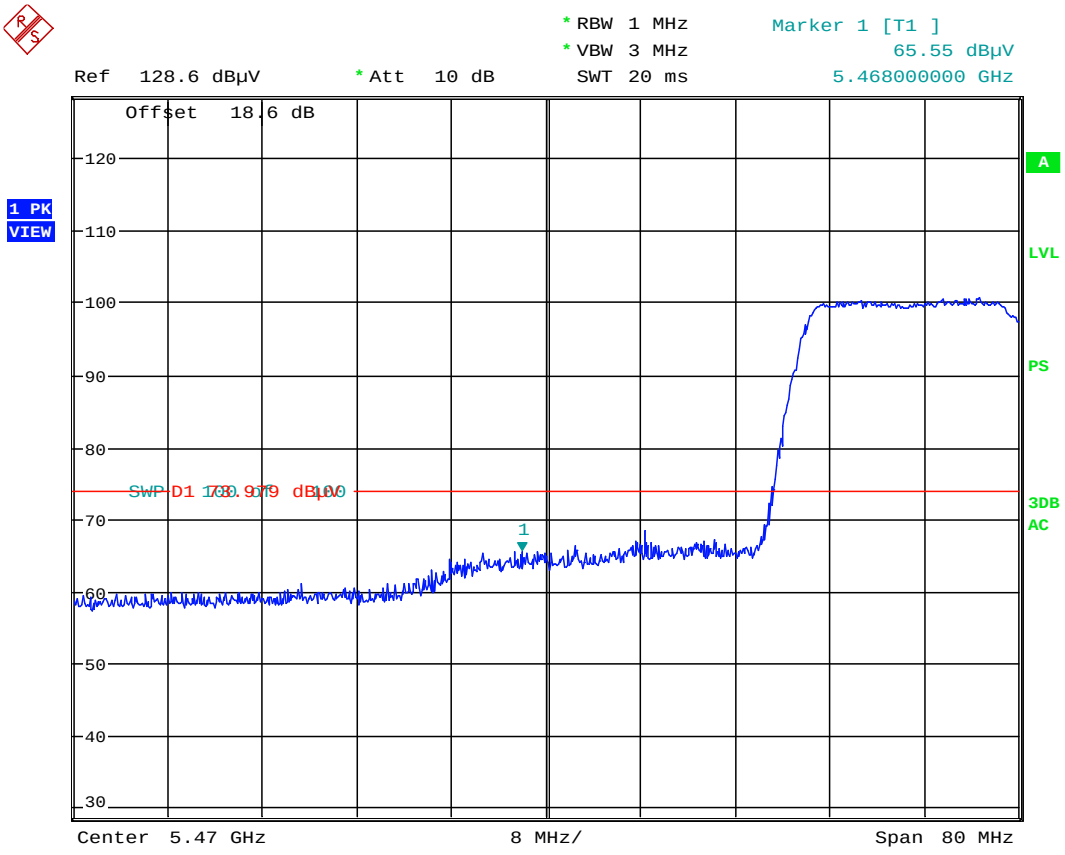


Plot 6-157. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

Note:
A channel integration method was used to determine compliance with the out of band average radiated spurious emissions limit in the 5350 – 5460MHz band. Per KDB 789033 v01r03 Section H, a measurement was performed using a RBW of 100kHz at the 5470MHz band edge. The results were integrated up to the 1MHz reference bandwidth to show compliance with the 15.209 radiated limit for emissions greater than 1GHz.

Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

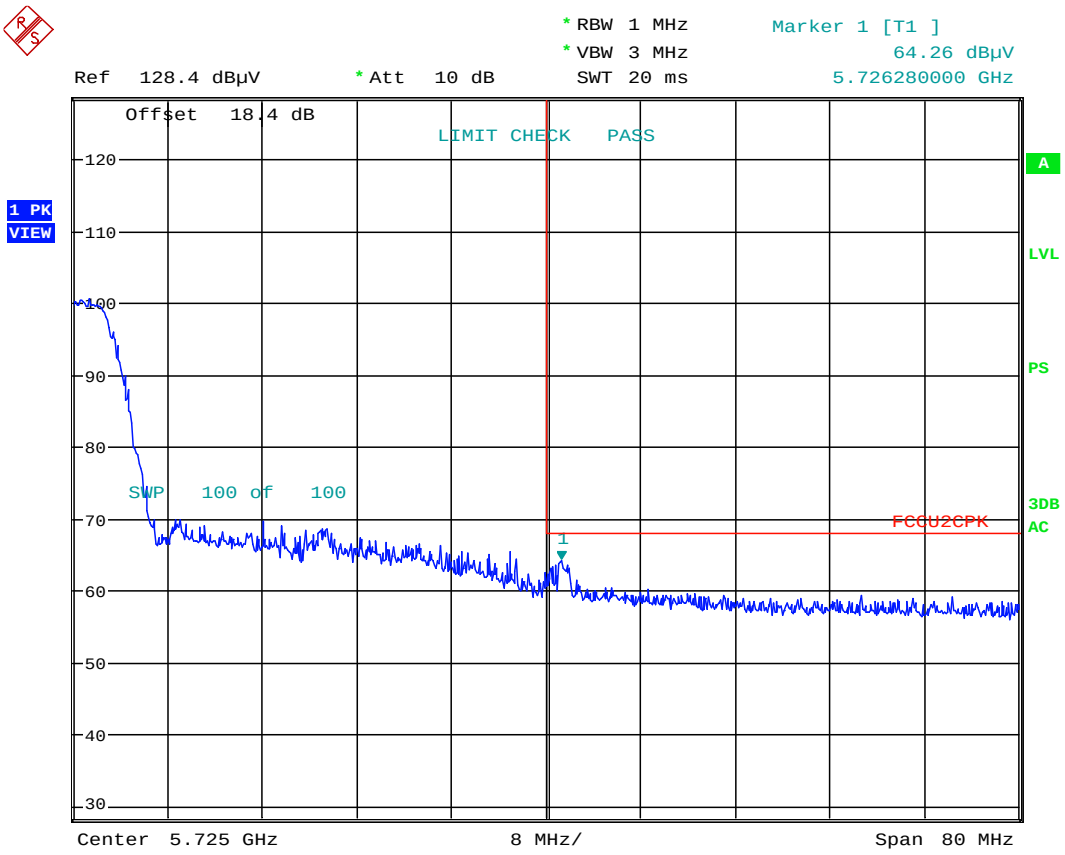


Plot 6-158. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

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:	5670MHz
Channel:	134



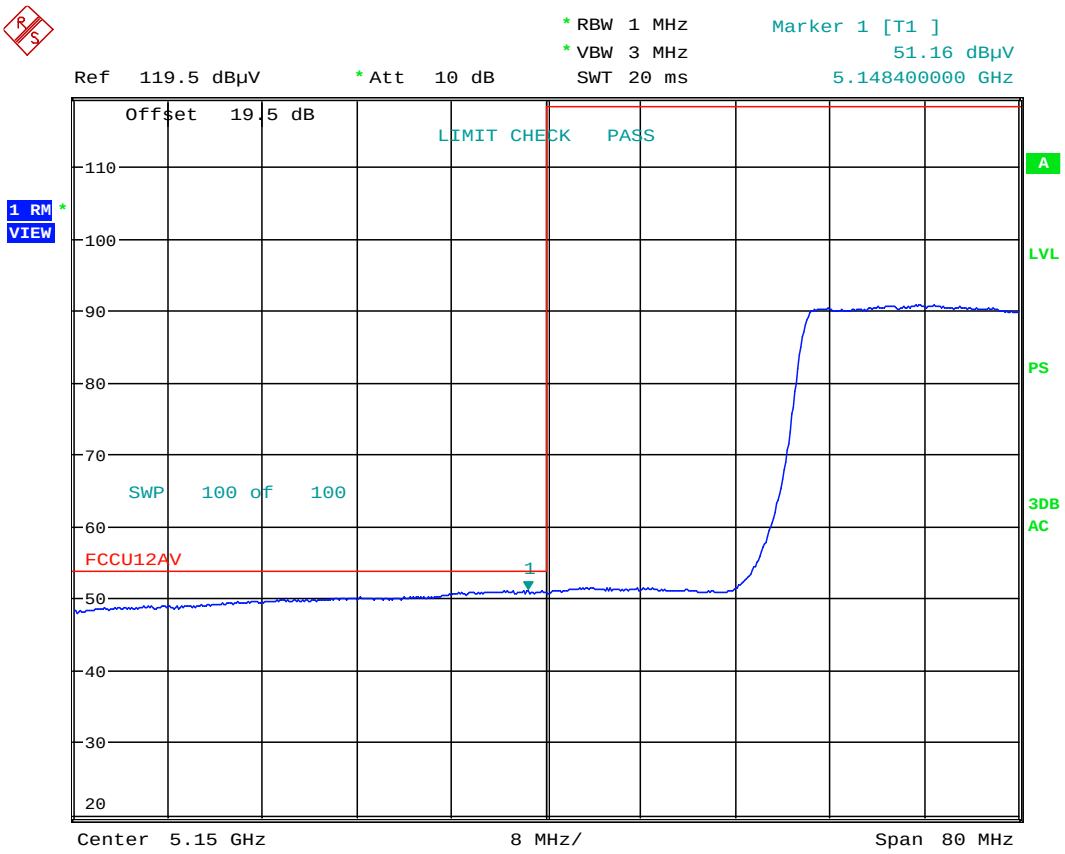
Date: 29.AUG.2014 03:15:56

Plot 6-159. Radiated Upper Band Edge Plot (Peak – UNII Band 2C)

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

§15.407(b.1)(b.2) §15.205 §15.209

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

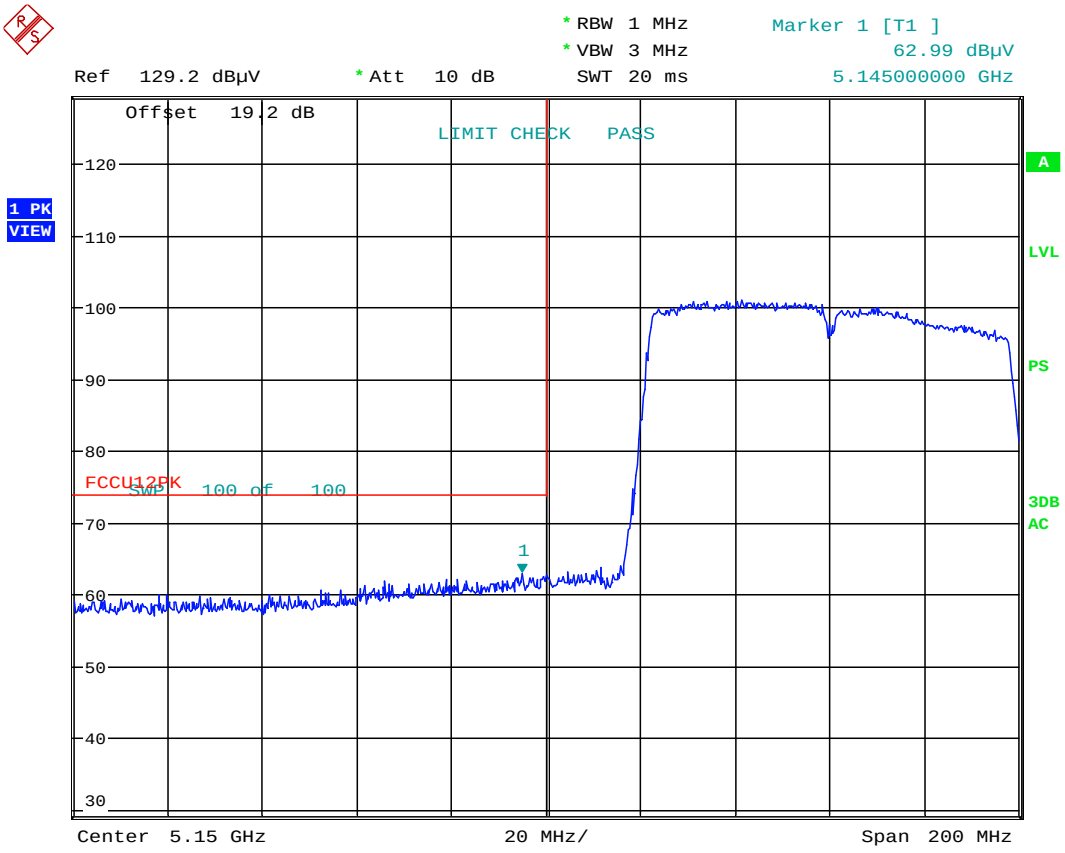


Date: 29.AUG.2014 02:19:03

Plot 6-160. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

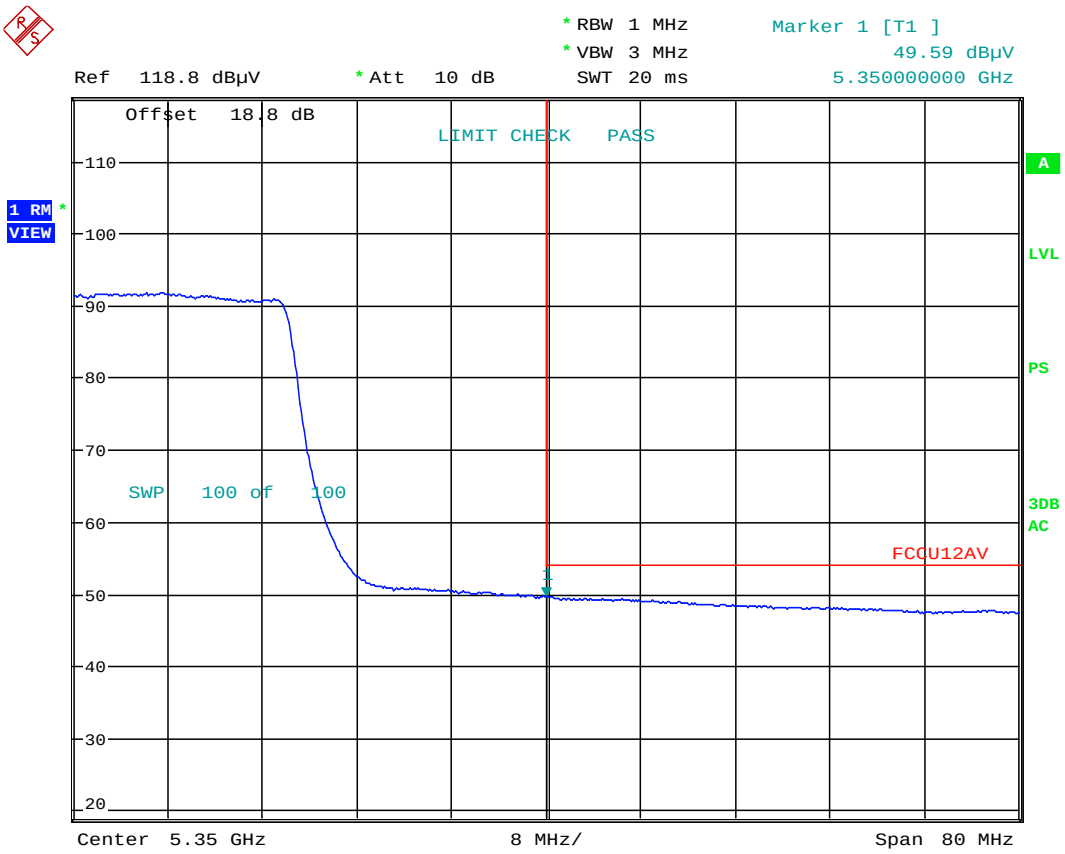


Plot 6-161. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)

Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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

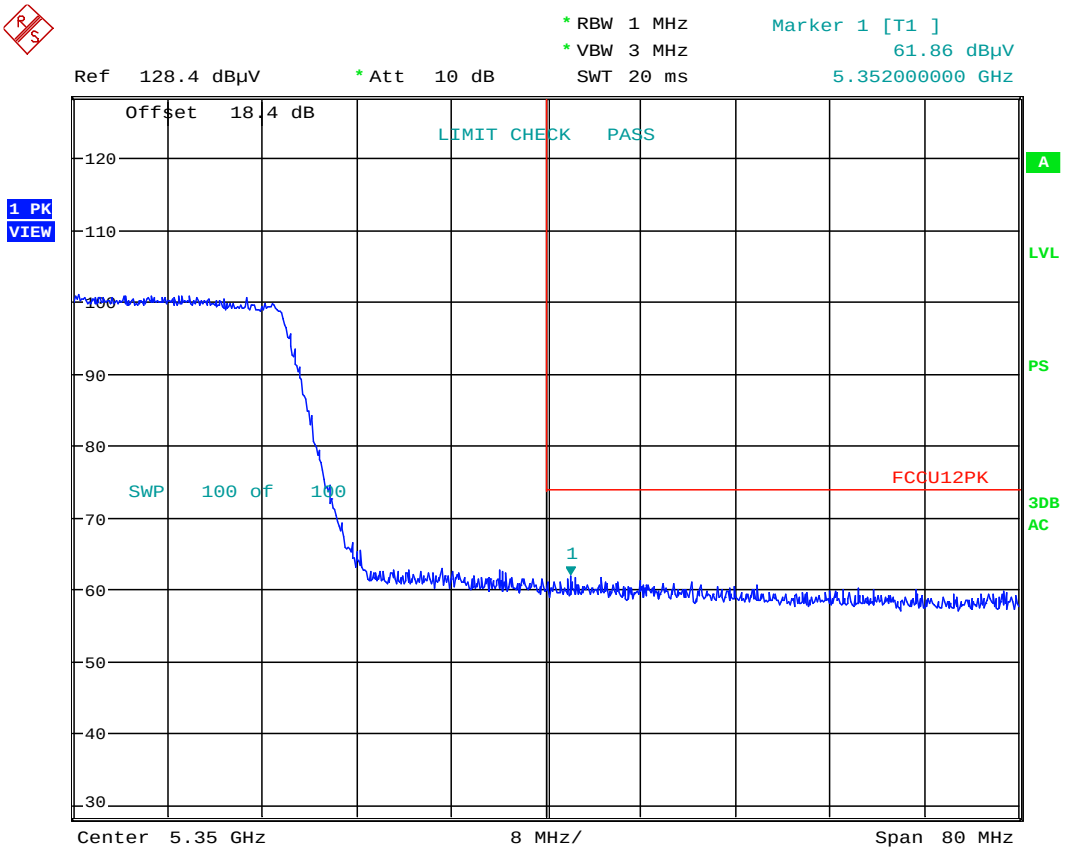


Date: 29.AUG.2014 02:06:46

Plot 6-162. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



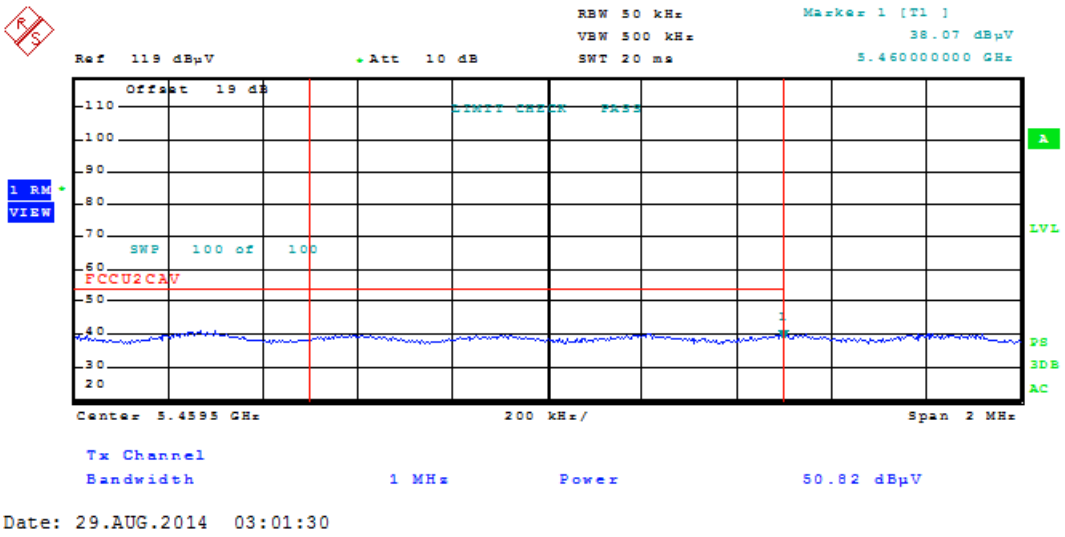
Date: 29.AUG.2014 02:07:26

Plot 6-163. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

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

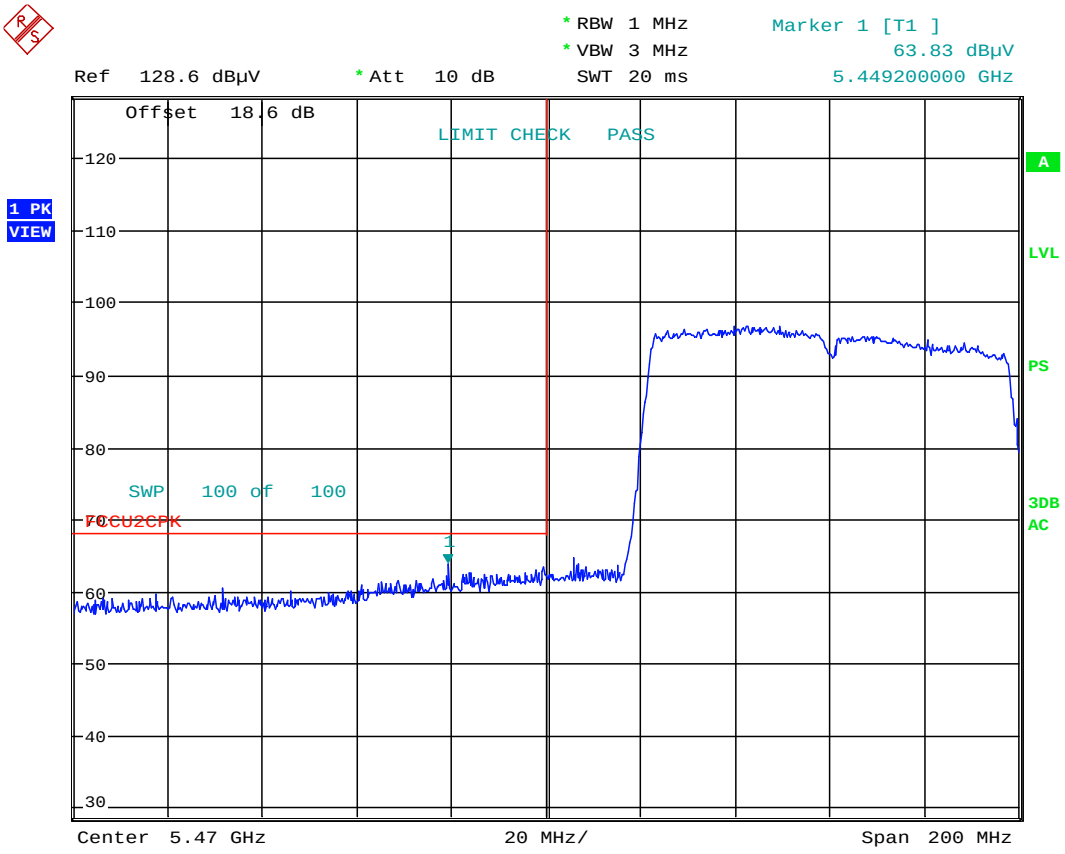


Plot 6-164. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

Note:
A channel integration method was used to determine compliance with the out of band average radiated spurious emissions limit in the 5350 – 5460MHz band. Per KDB 789033 v01r03 Section H, a measurement was performed using a RBW of 100kHz at the 5460MHz band edge. The results were integrated up to the 1MHz reference bandwidth to show compliance with the 15.209 radiated limit for emissions greater than 1GHz.

Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



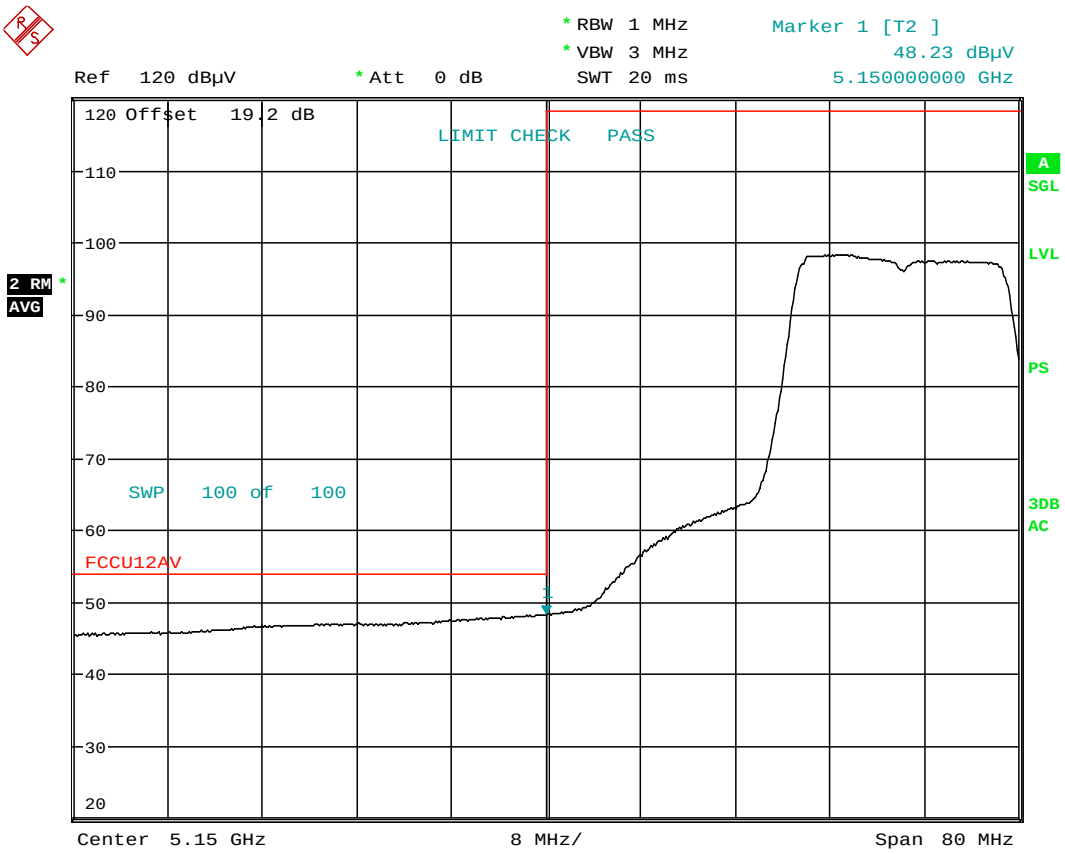
Date: 29.AUG.2014 03:06:15

Plot 6-165. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

6.14 MIMO Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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

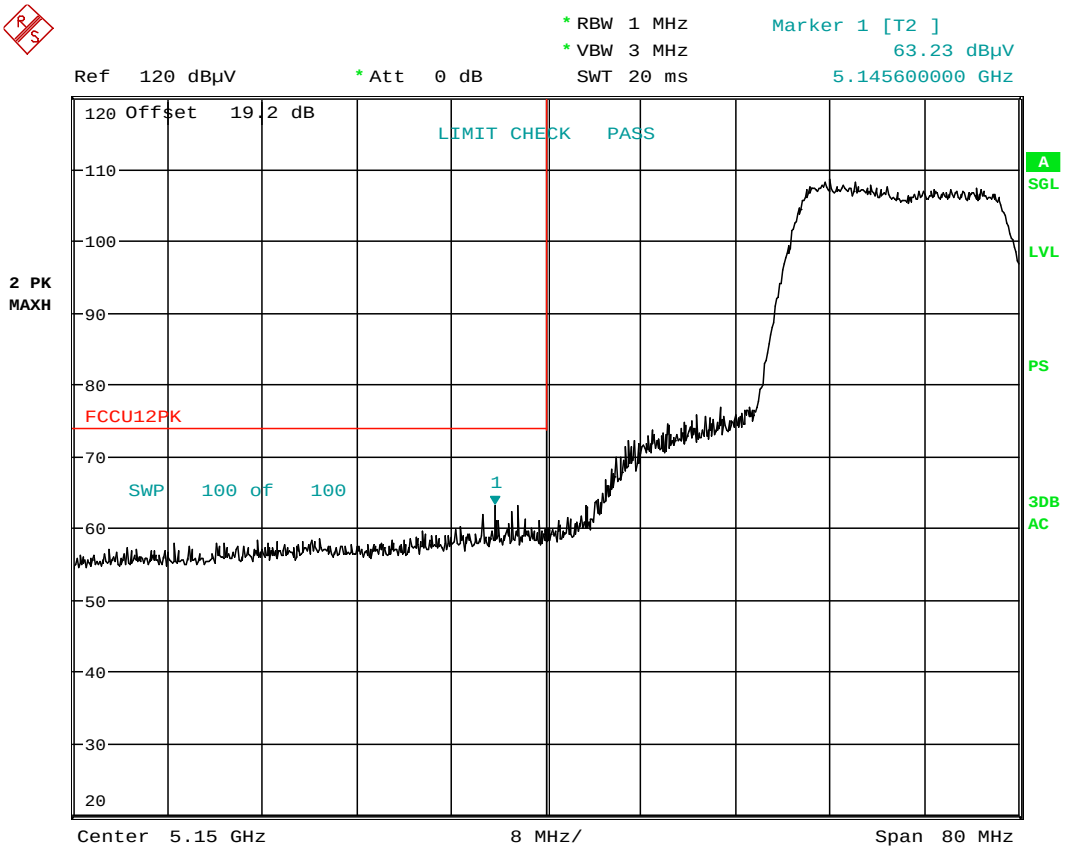


Date: 29.AUG.2014 11:11:16

Plot 6-166. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



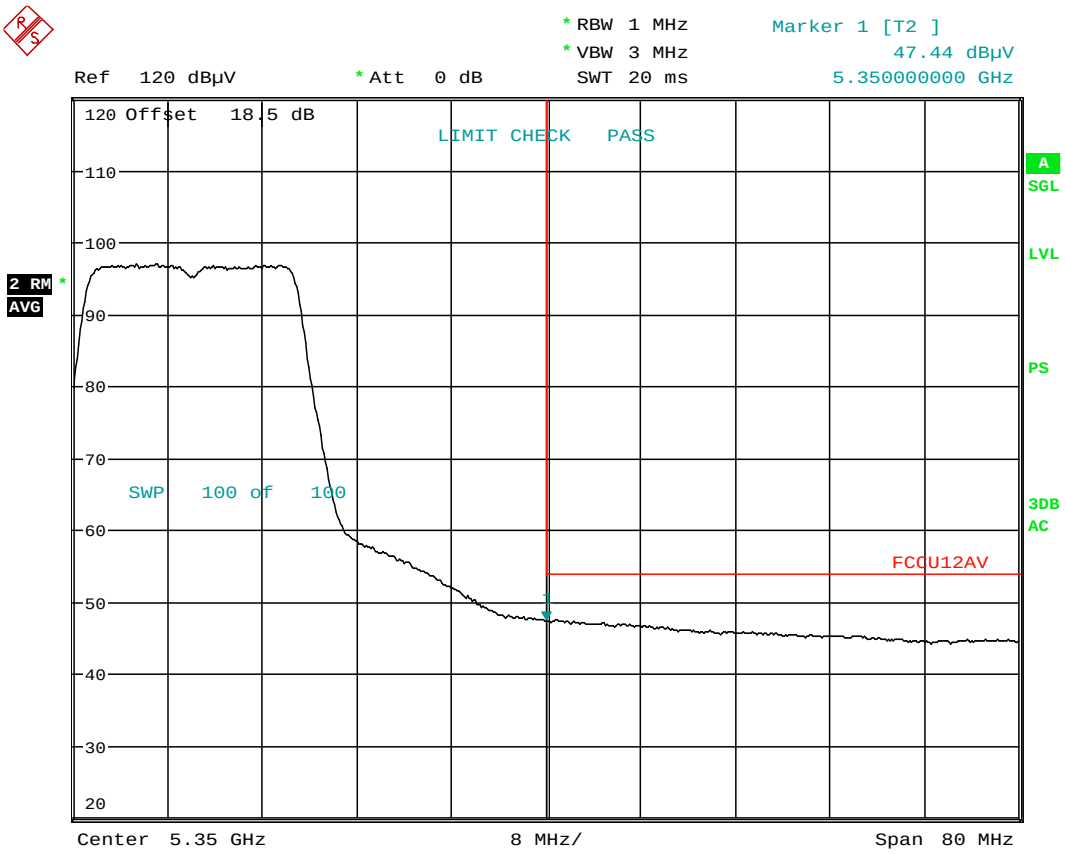
Date: 29.AUG.2014 11:09:57

Plot 6-167. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)

Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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

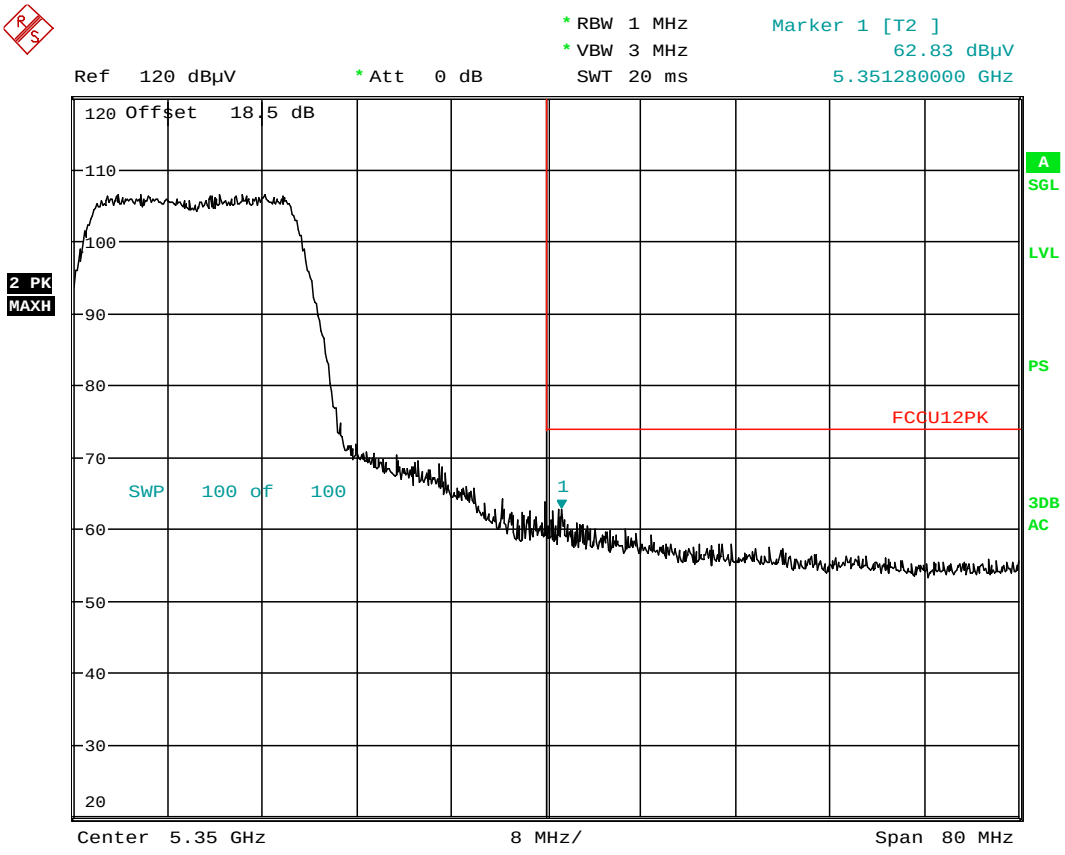


Date: 29.AUG.2014 12:26:55

Plot 6-168. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



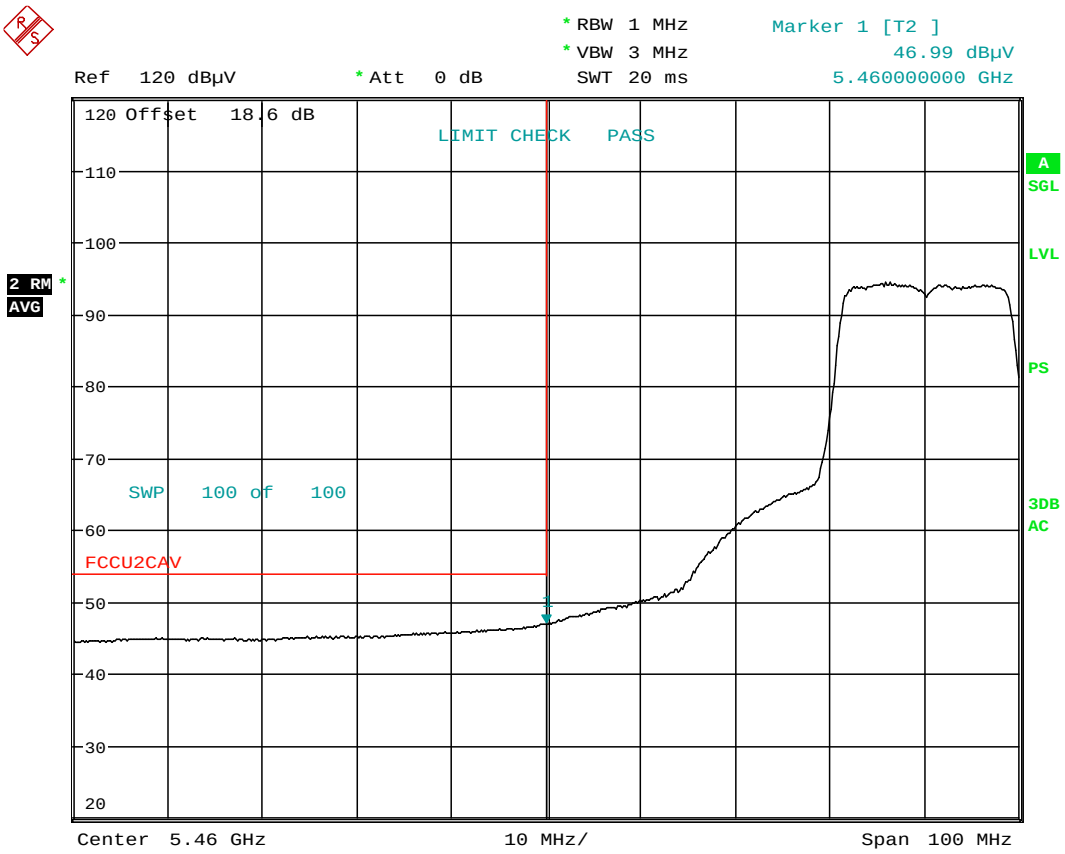
Date: 29.AUG.2014 12:16:43

Plot 6-169. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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

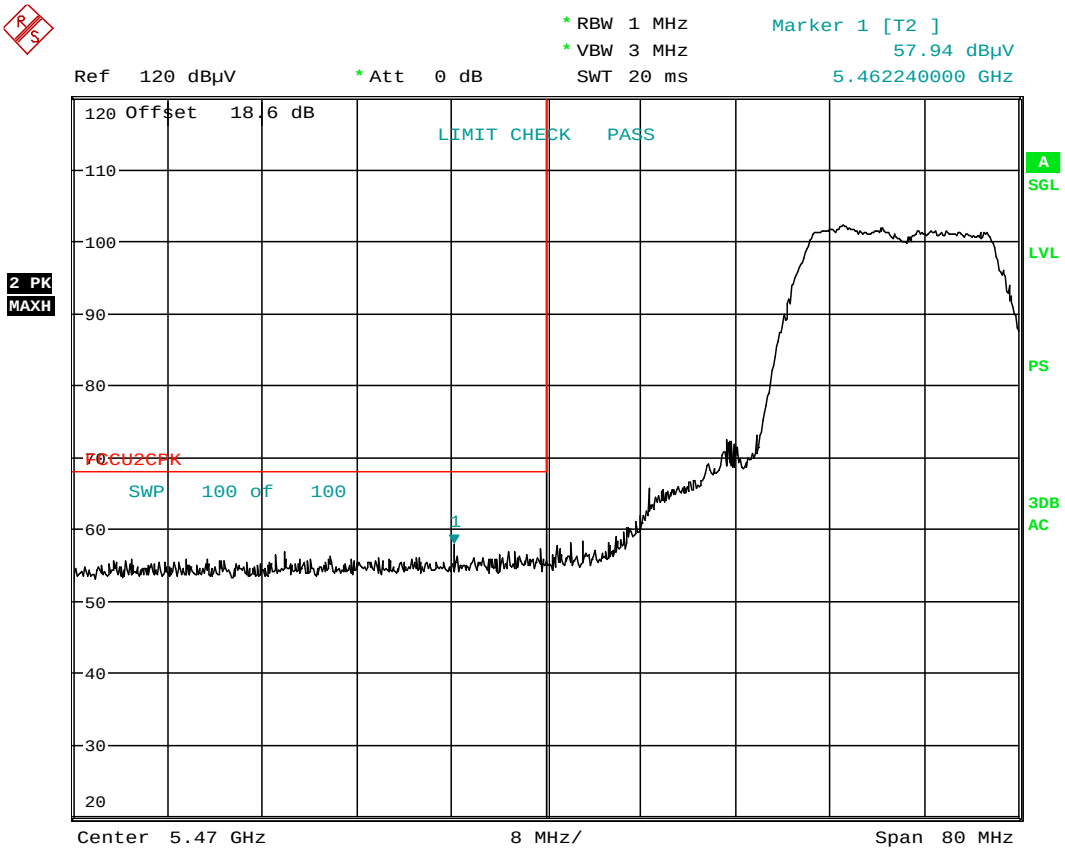


Date: 29.AUG.2014 12:56:08

Plot 6-170. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

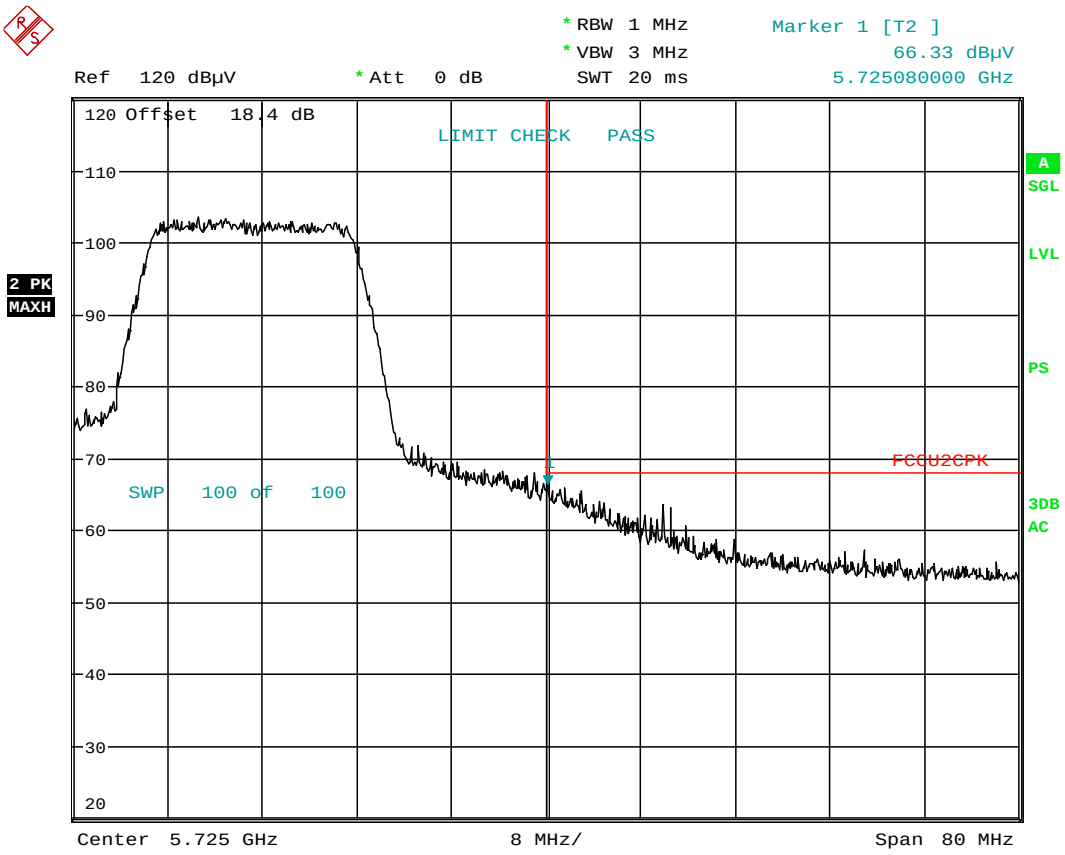


Plot 6-171. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

Worst Case Mode:	802.11n (20MHz)
Worst Case Transfer Rate:	MCS8
Distance of Measurements:	3 Meters
Operating Frequency:	5700MHz
Channel:	140



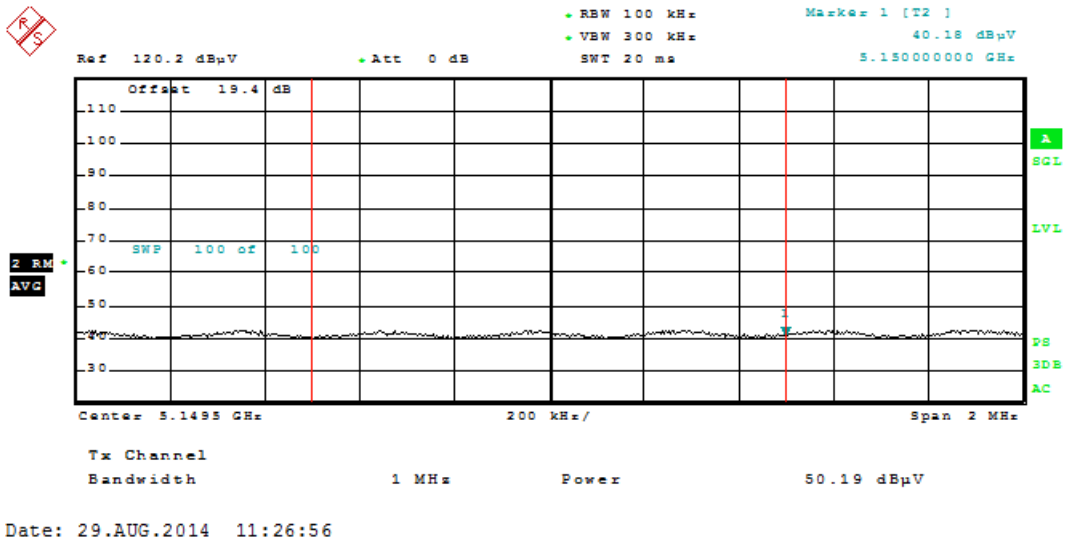
Date: 29.AUG.2014 13:51:10

Plot 6-172. Radiated Upper Band Edge Plot (Peak – UNII Band 2C)

6.15 MIMO Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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

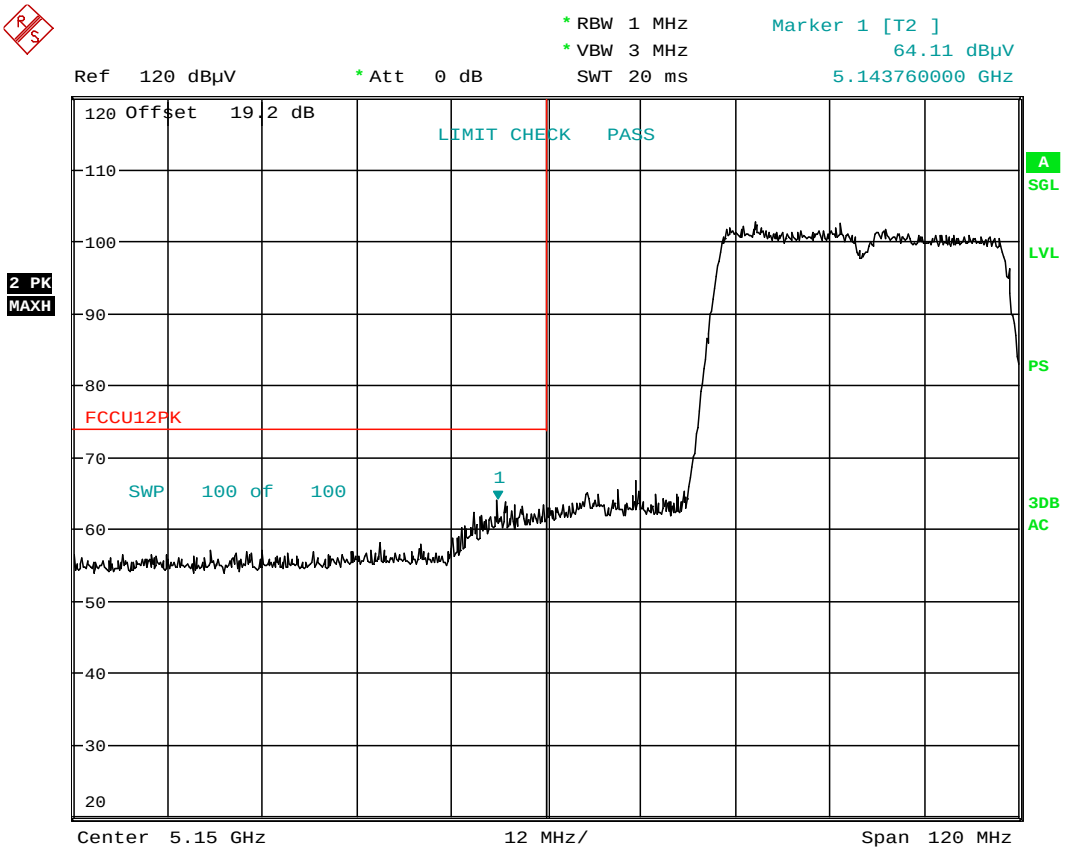


Plot 6-173. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

Note:
A channel integration method was used to determine compliance with the out of band average radiated spurious emissions limit in the 4500 – 5150MHz band. Per KDB 789033 v01r03 Section H, a measurement was performed using a RBW of 100kHz at the 5150MHz band edge. The results were integrated up to the 1MHz reference bandwidth to show compliance with the 15.209 radiated limit for emissions greater than 1GHz.

Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



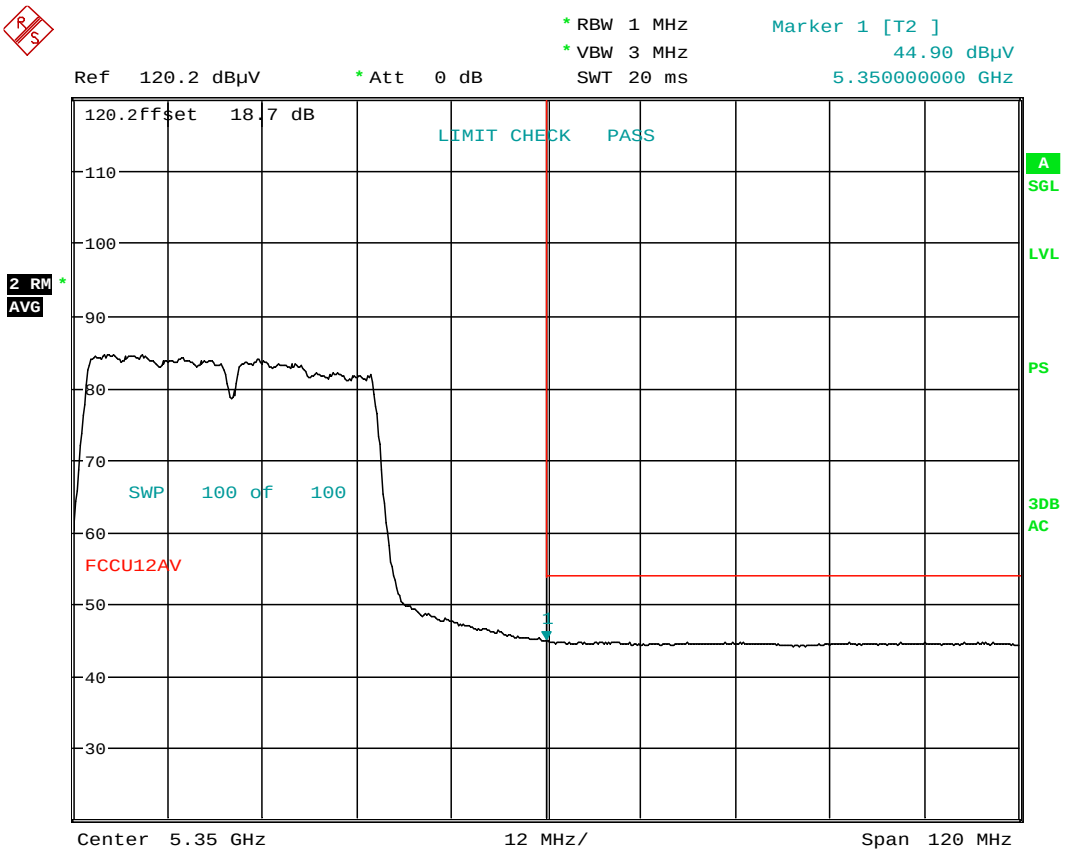
Date: 29.AUG.2014 11:29:56

Plot 6-174. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)

Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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

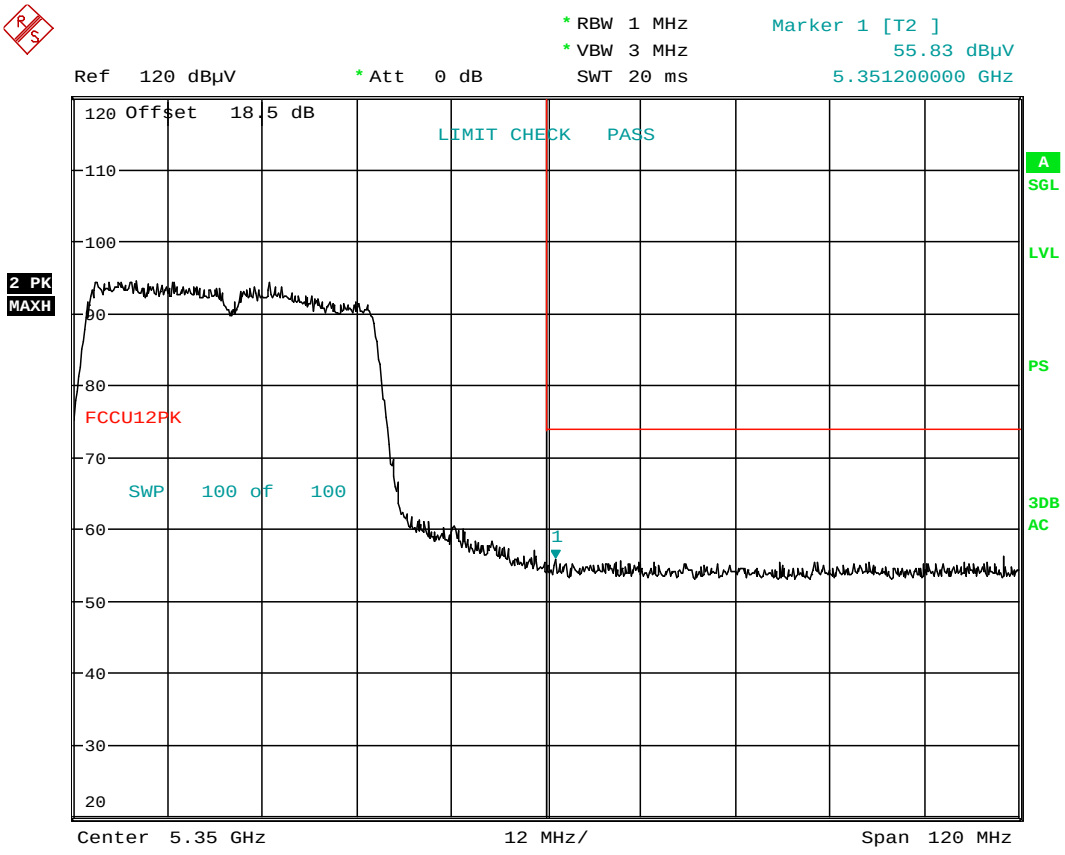


Date: 29.AUG.2014 12:33:42

Plot 6-175. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



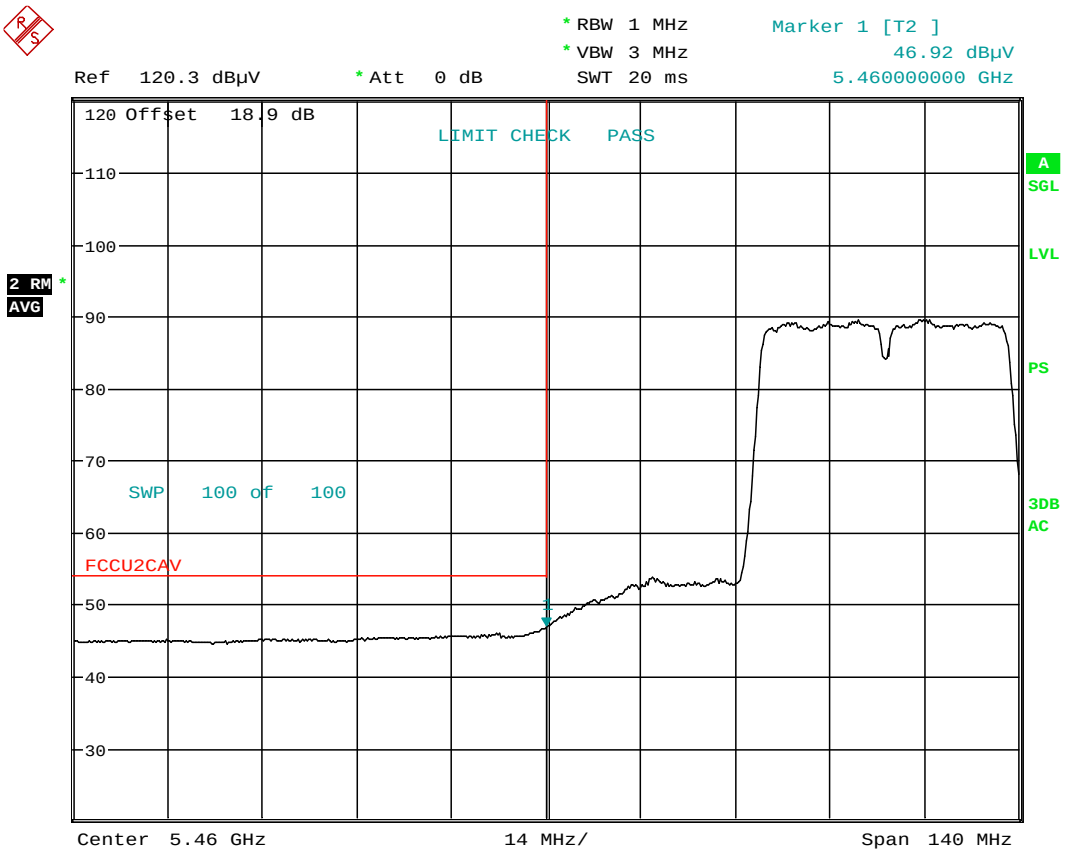
Date: 29.AUG.2014 12:36:52

Plot 6-176. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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

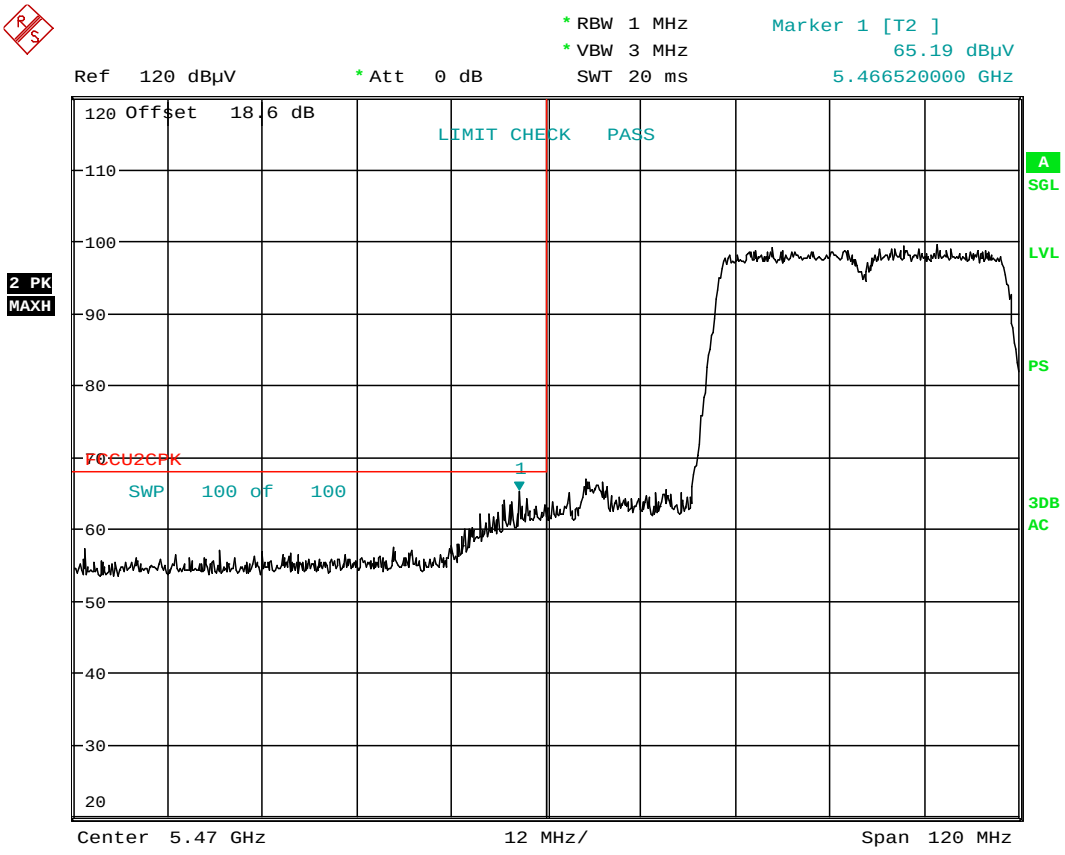


Date: 29.AUG.2014 13:13:04

Plot 6-177. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

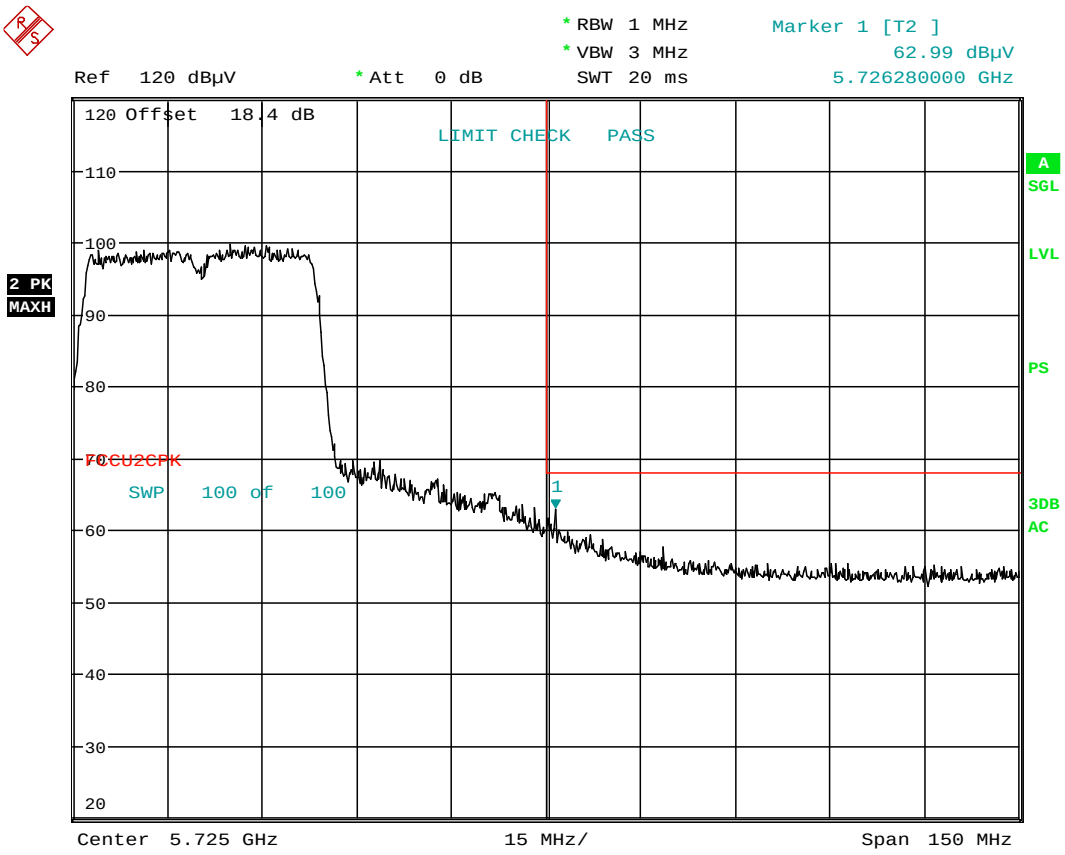


Plot 6-178. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

Worst Case Mode:	802.11n (40MHz)
Worst Case Transfer Rate:	MCS8
Distance of Measurements:	3 Meters
Operating Frequency:	5670MHz
Channel:	134



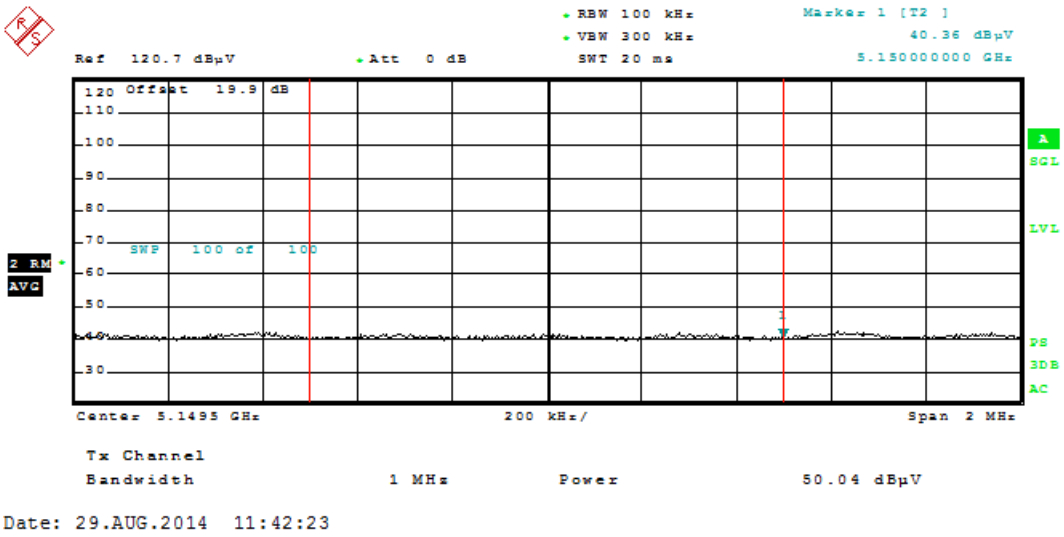
Date: 29.AUG.2014 13:53:02

Plot 6-179. Radiated Upper Band Edge Plot (Peak – UNII Band 2C)

6.16 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

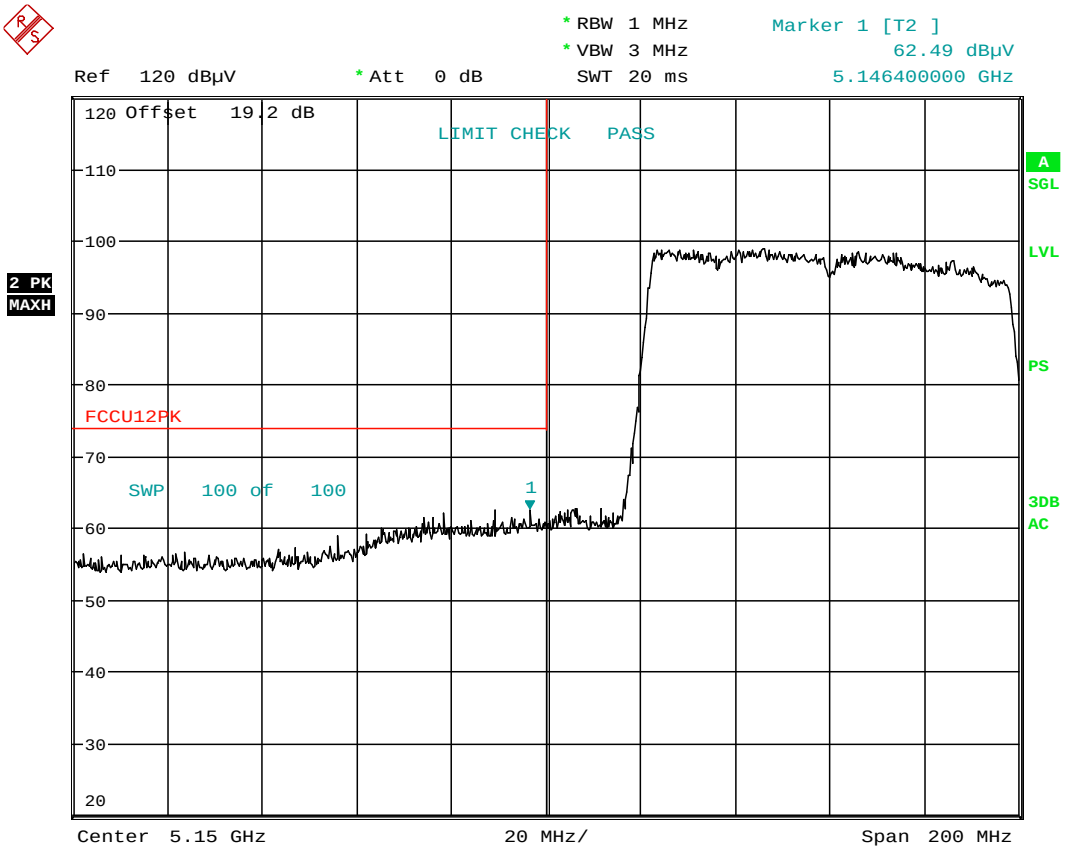


Plot 6-180. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

Note:
A channel integration method was used to determine compliance with the out of band average radiated spurious emissions limit in the 4500 – 5150MHz band. Per KDB 789033 v01r03 Section H, a measurement was performed using a RBW of 100kHz at the 5150MHz band edge. The results were integrated up to the 1MHz reference bandwidth to show compliance with the 15.209 radiated limit for emissions greater than 1GHz.

Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



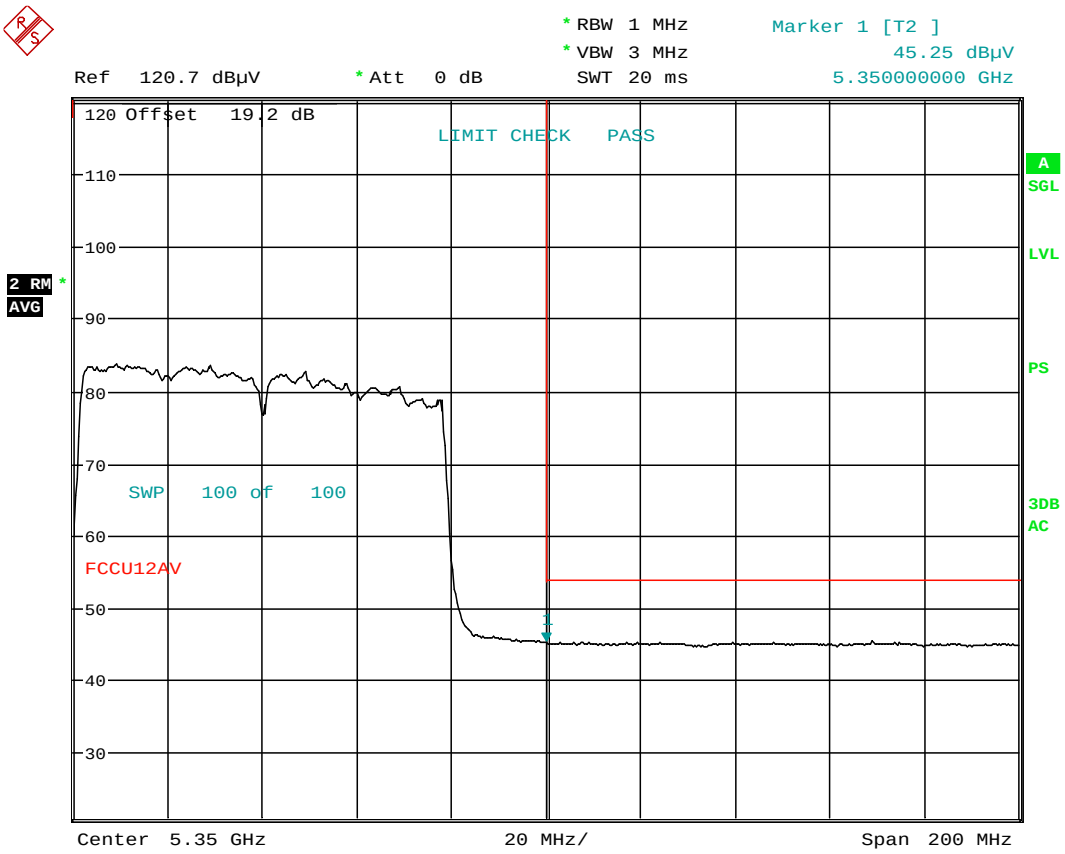
Date: 29.AUG.2014 11:46:45

Plot 6-181. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)

Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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

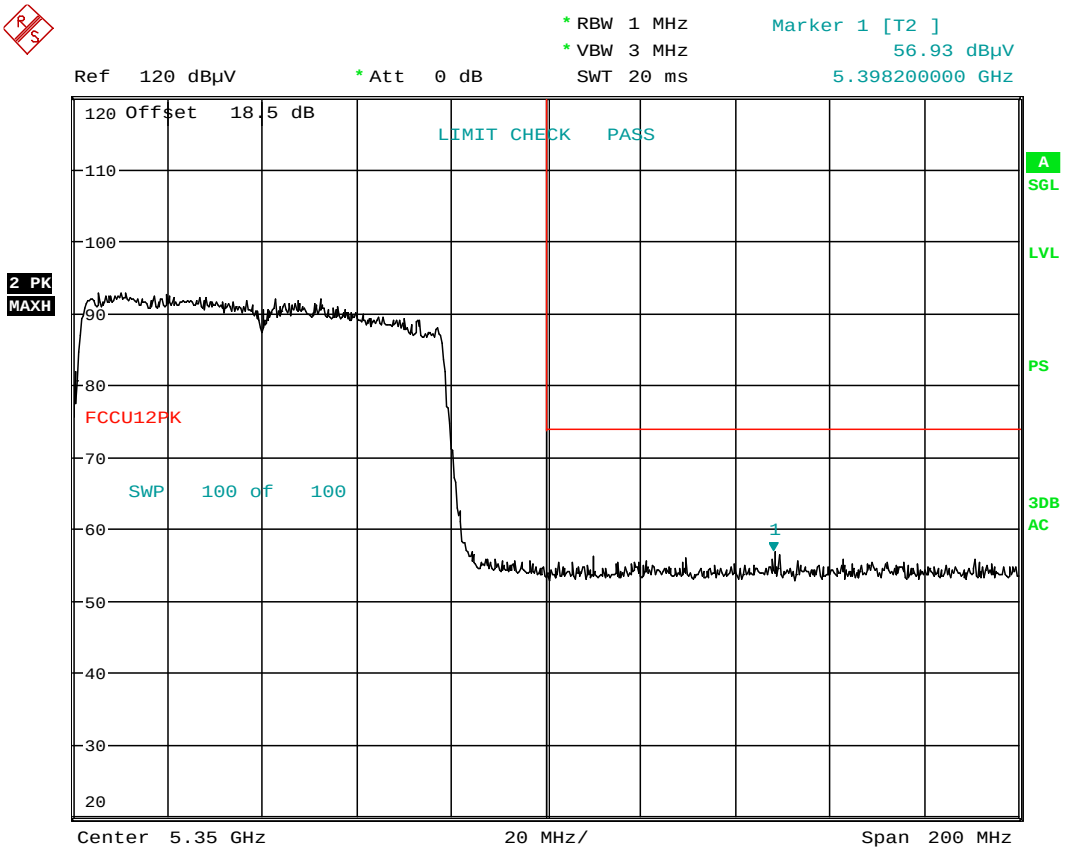


Date: 29.AUG.2014 12:45:40

Plot 6-182. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



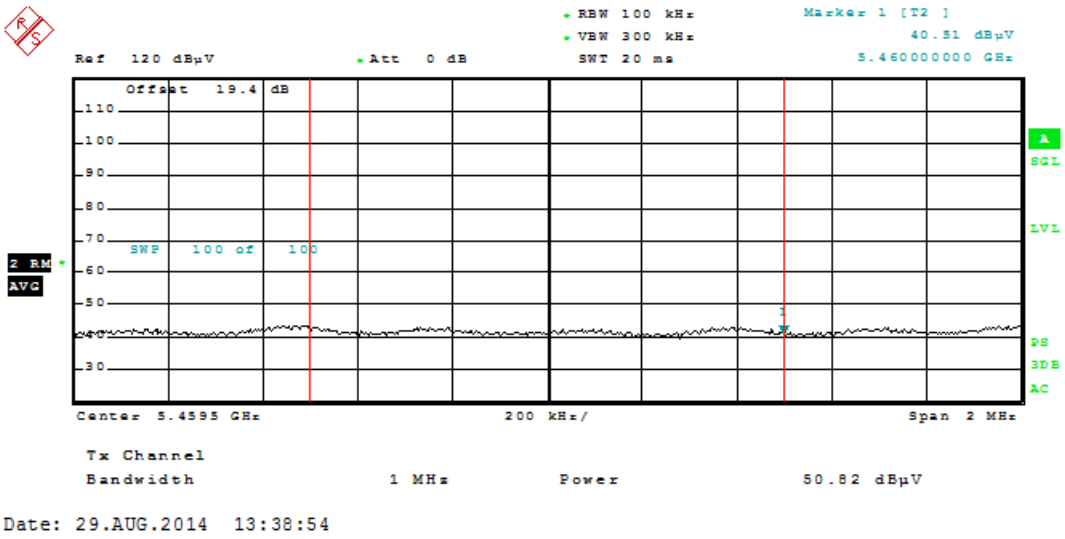
Date: 29.AUG.2014 12:41:11

Plot 6-183. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

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

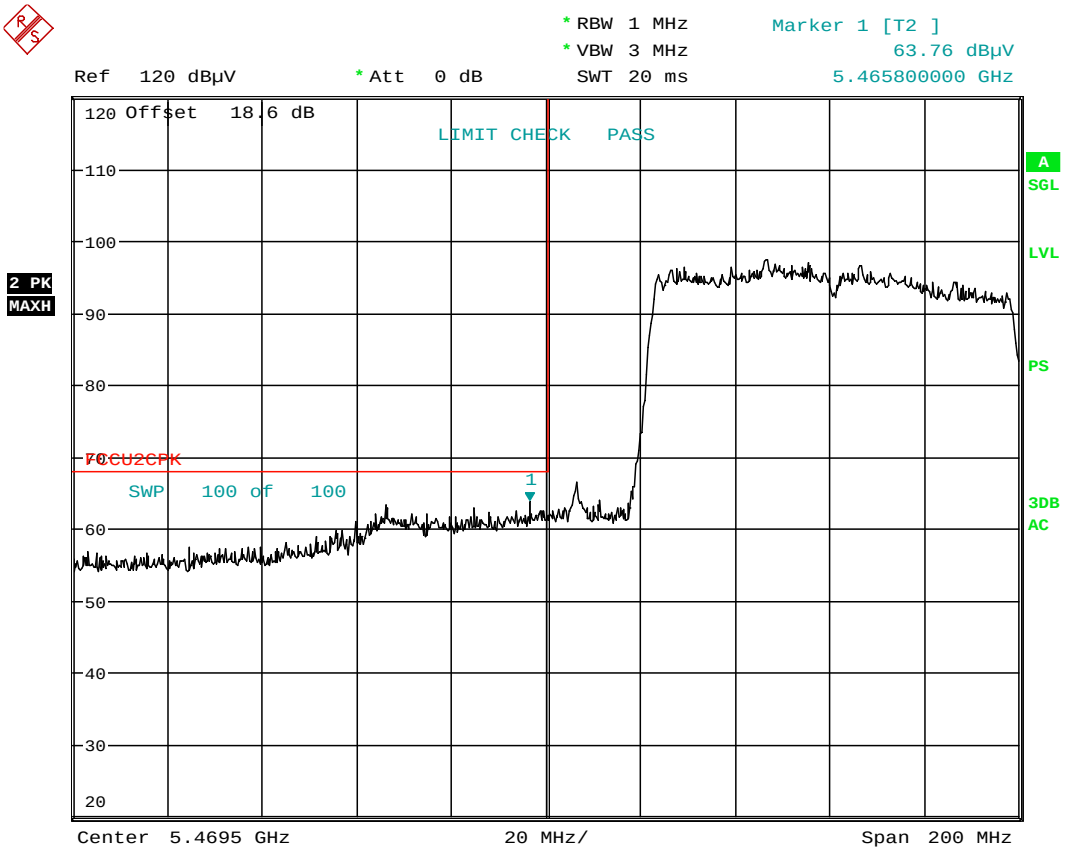


Plot 6-184. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

Note:
A channel integration method was used to determine compliance with the out of band average radiated spurious emissions limit in the 5350 – 5460MHz band. Per KDB 789033 v01r03 Section H, a measurement was performed using a RBW of 100kHz at the 5460MHz band edge. The results were integrated up to the 1MHz reference bandwidth to show compliance with the 15.209 radiated limit for emissions greater than 1GHz.

Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

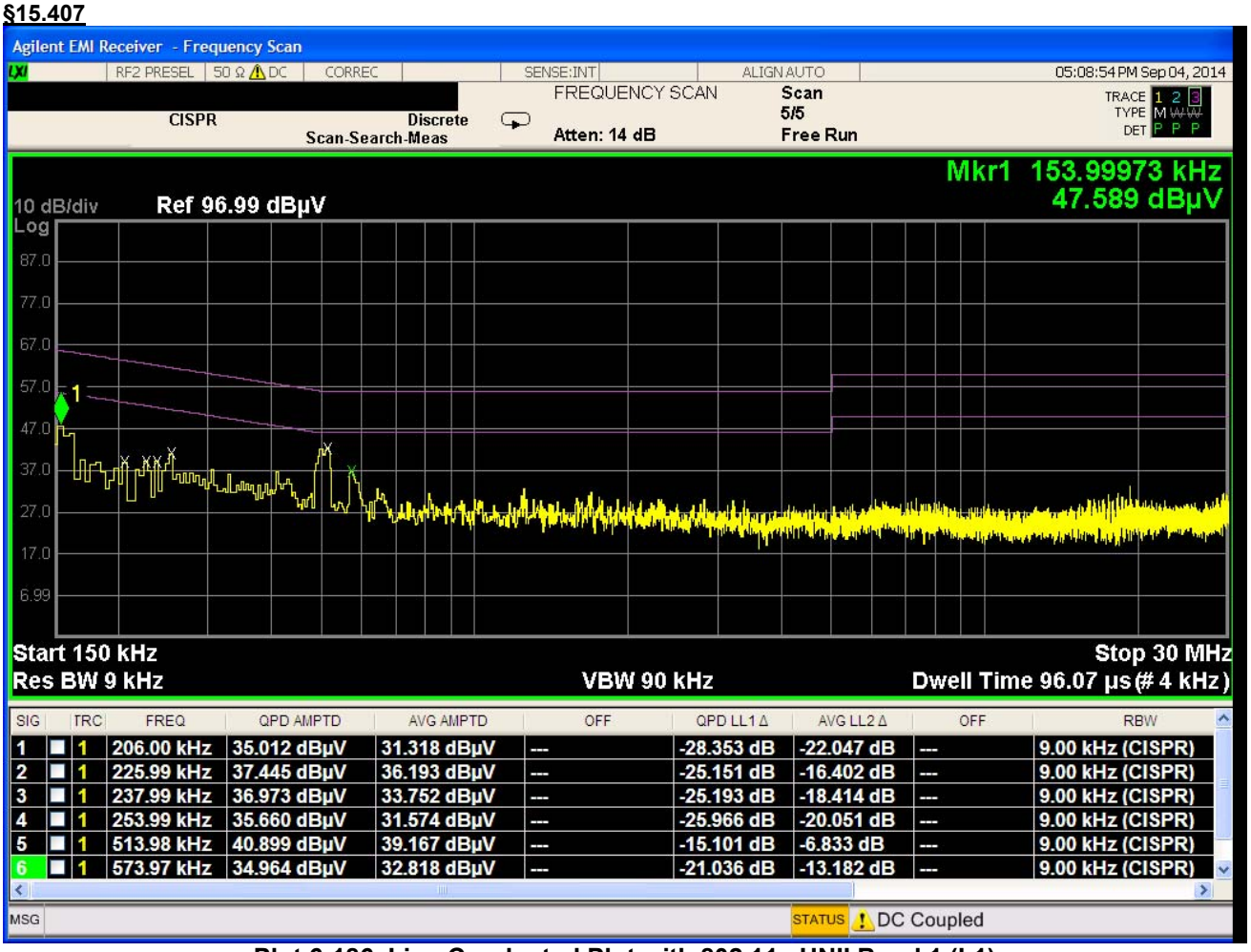


Date: 29.AUG.2014 13:32:32

Plot 6-185. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

6.17 Line-Conducted Test Data

§15.407



SIG		TRC	FREQ	QPD AMPTD	AVG AMPTD	OFF	QPD LL1 Δ	AVG LL2 Δ	OFF	RBW
1		1	206.00 kHz	35.012 dBµV	31.318 dBµV	---	-28.353 dB	-22.047 dB	---	9.00 kHz (CISPR)
2		1	225.99 kHz	37.445 dBµV	36.193 dBµV	---	-25.151 dB	-16.402 dB	---	9.00 kHz (CISPR)
3		1	237.99 kHz	36.973 dBµV	33.752 dBµV	---	-25.193 dB	-18.414 dB	---	9.00 kHz (CISPR)
4		1	253.99 kHz	35.660 dBµV	31.574 dBµV	---	-25.966 dB	-20.051 dB	---	9.00 kHz (CISPR)
5		1	513.98 kHz	40.899 dBµV	39.167 dBµV	---	-15.101 dB	-6.833 dB	---	9.00 kHz (CISPR)
6		1	573.97 kHz	34.964 dBµV	32.818 dBµV	---	-21.036 dB	-13.182 dB	---	9.00 kHz (CISPR)

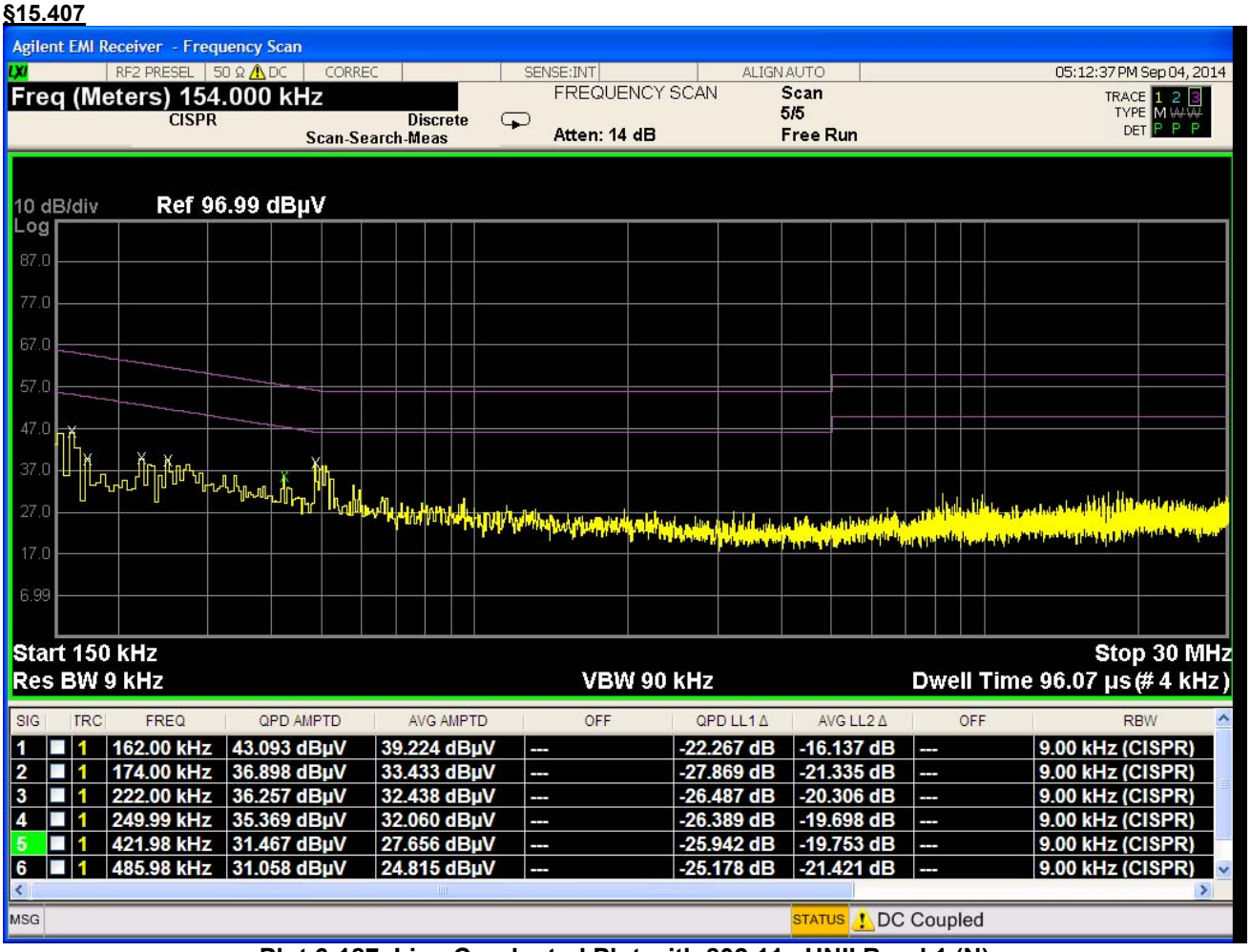
Plot 6-186. Line Conducted Plot with 802.11a UNII Band 1 (L1)

Notes:

1. All modes of operation, data rates, and test channels were investigated and the worst-case emissions are reported in 802.11a mode using 6Mbps on Channel 36. The emissions found were not affected by the choice of channel used during testing.
2. The limit for Class B device(s) from 150kHz to 30MHz are specified in Section 15.207 of the Title 47 CFR.
3. L1 = Phase; N = Neutral
4. Traces shown in plot are made using a peak detector.
5. Deviations to the Specifications: None.

Line-Conducted Test Data

§15.407



SIG	TRC	FREQ	QPD AMPTD	AVG AMPTD	OFF	QPD LL1 Δ	AVG LL2 Δ	OFF	RBW
1	1	162.00 kHz	43.093 dBµV	39.224 dBµV	---	-22.267 dB	-16.137 dB	---	9.00 kHz (CISPR)
2	1	174.00 kHz	36.898 dBµV	33.433 dBµV	---	-27.869 dB	-21.335 dB	---	9.00 kHz (CISPR)
3	1	222.00 kHz	36.257 dBµV	32.438 dBµV	---	-26.487 dB	-20.306 dB	---	9.00 kHz (CISPR)
4	1	249.99 kHz	35.369 dBµV	32.060 dBµV	---	-26.389 dB	-19.698 dB	---	9.00 kHz (CISPR)
5	1	421.98 kHz	31.467 dBµV	27.656 dBµV	---	-25.942 dB	-19.753 dB	---	9.00 kHz (CISPR)
6	1	485.98 kHz	31.058 dBµV	24.815 dBµV	---	-25.178 dB	-21.421 dB	---	9.00 kHz (CISPR)

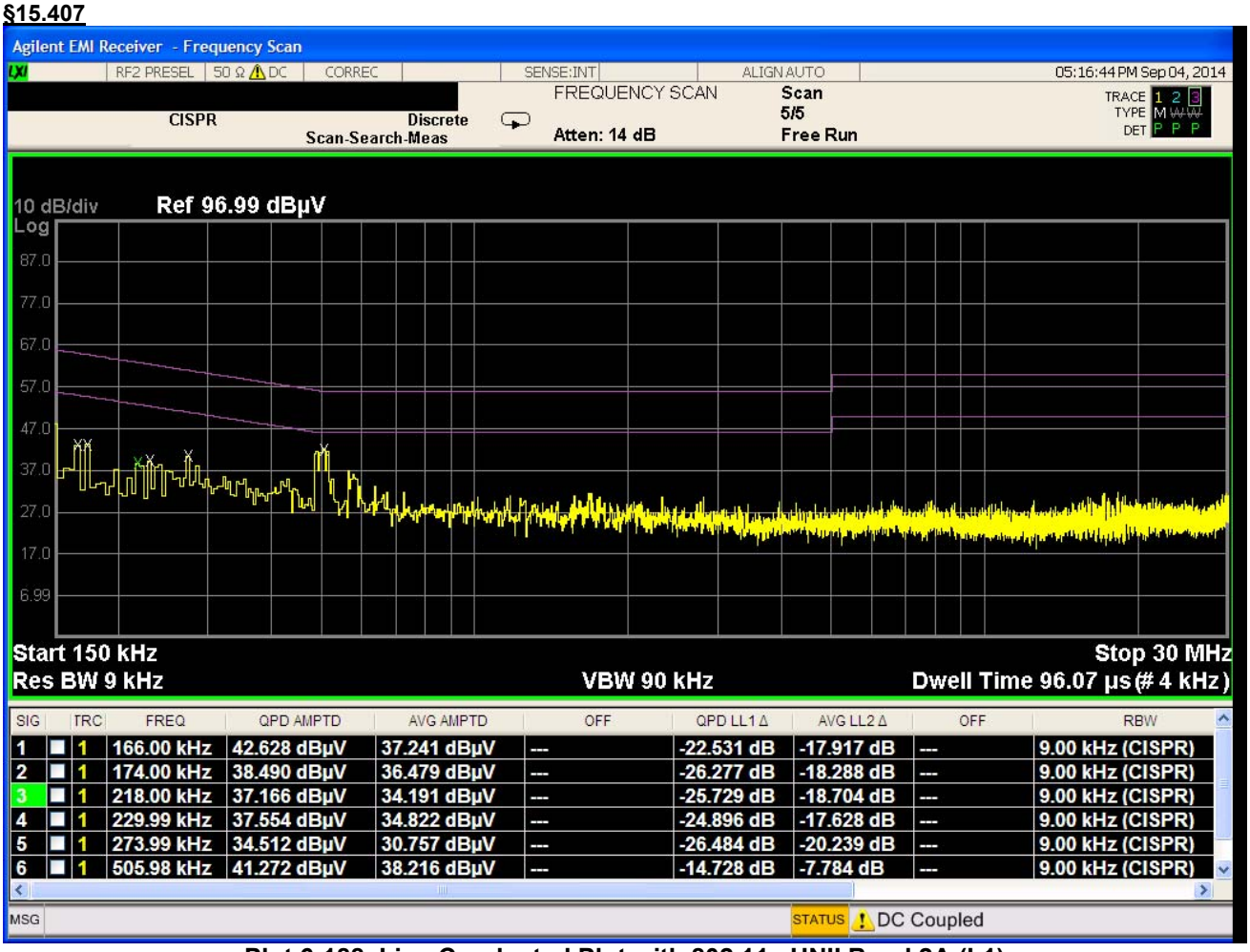
Plot 6-187. Line Conducted Plot with 802.11a UNII Band 1 (N)

Notes:

1. All modes of operation, data rates, and test channels were investigated and the worst-case emissions are reported in 802.11a mode using 6Mbps on Channel 36. The emissions found were not affected by the choice of channel used during testing.
2. The limit for Class B device(s) from 150kHz to 30MHz are specified in Section 15.207 of the Title 47 CFR.
3. L1 = Phase; N = Neutral
4. Traces shown in plot are made using a peak detector.
5. Deviations to the Specifications: None.

Line-Conducted Test Data

§15.407



SIG	TRC	FREQ	QPD AMPTD	AVG AMPTD	OFF	QPD LL1 Δ	AVG LL2 Δ	OFF	RBW
1	1	166.00 kHz	42.628 dBµV	37.241 dBµV	---	-22.531 dB	-17.917 dB	---	9.00 kHz (CISPR)
2	1	174.00 kHz	38.490 dBµV	36.479 dBµV	---	-26.277 dB	-18.288 dB	---	9.00 kHz (CISPR)
3	1	218.00 kHz	37.166 dBµV	34.191 dBµV	---	-25.729 dB	-18.704 dB	---	9.00 kHz (CISPR)
4	1	229.99 kHz	37.554 dBµV	34.822 dBµV	---	-24.896 dB	-17.628 dB	---	9.00 kHz (CISPR)
5	1	273.99 kHz	34.512 dBµV	30.757 dBµV	---	-26.484 dB	-20.239 dB	---	9.00 kHz (CISPR)
6	1	505.98 kHz	41.272 dBµV	38.216 dBµV	---	-14.728 dB	-7.784 dB	---	9.00 kHz (CISPR)

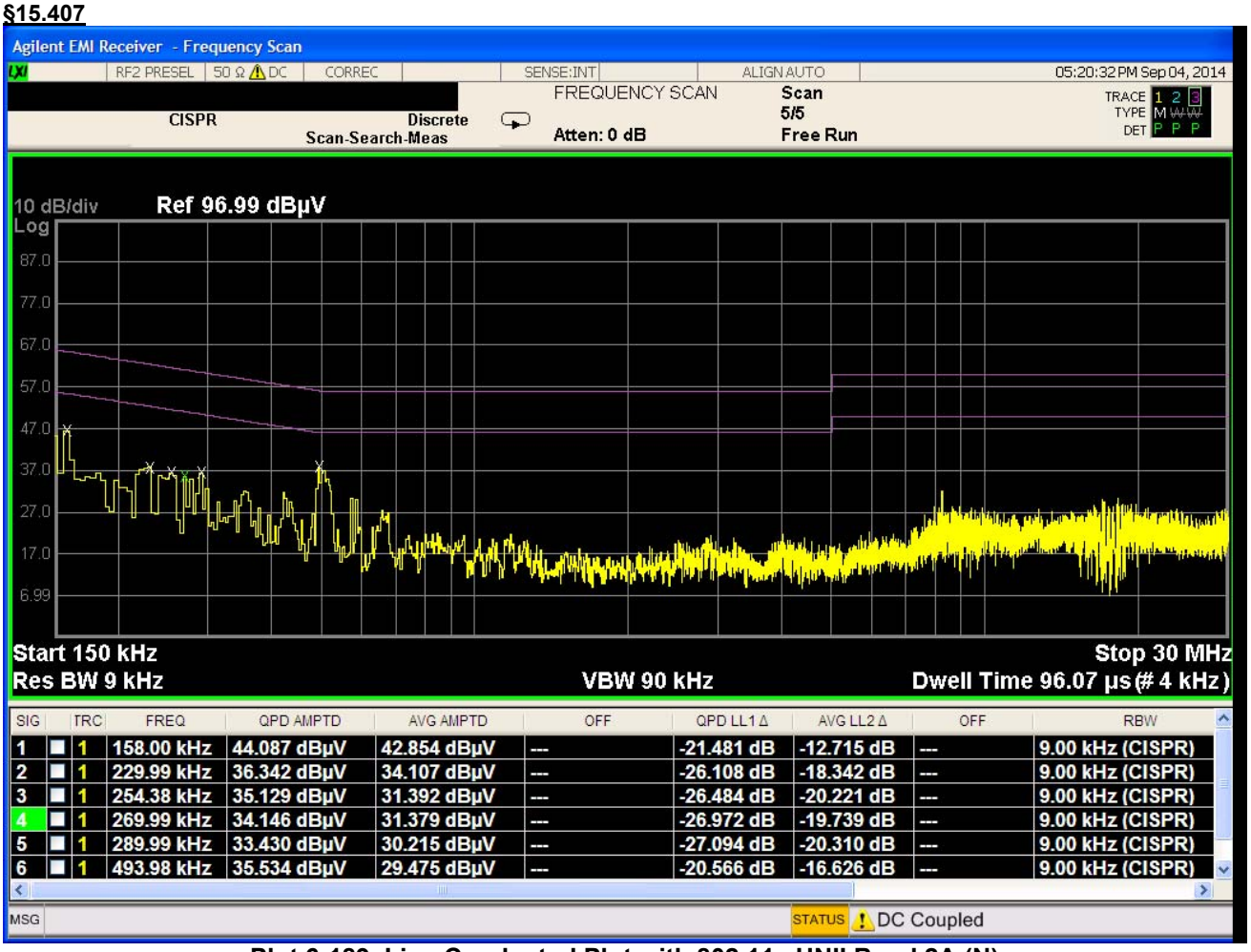
Plot 6-188. Line Conducted Plot with 802.11a UNII Band 2A (L1)

Notes:

1. All modes of operation, data rates, and test channels were investigated and the worst-case emissions are reported in 802.11a mode using 6Mbps on Channel 52. The emissions found were not affected by the choice of channel used during testing.
2. The limit for Class B device(s) from 150kHz to 30MHz are specified in Section 15.207 of the Title 47 CFR.
3. L1 = Phase; N = Neutral
4. Traces shown in plot are made using a peak detector.
5. Deviations to the Specifications: None.

Line-Conducted Test Data

§15.407



SIG	TRC	FREQ	QPD AMPTD	AVG AMPTD	OFF	QPD LL1 Δ	AVG LL2 Δ	OFF	RBW
1	1	158.00 kHz	44.087 dBµV	42.854 dBµV	---	-21.481 dB	-12.715 dB	---	9.00 kHz (CISPR)
2	1	229.99 kHz	36.342 dBµV	34.107 dBµV	---	-26.108 dB	-18.342 dB	---	9.00 kHz (CISPR)
3	1	254.38 kHz	35.129 dBµV	31.392 dBµV	---	-26.484 dB	-20.221 dB	---	9.00 kHz (CISPR)
4	1	269.99 kHz	34.146 dBµV	31.379 dBµV	---	-26.972 dB	-19.739 dB	---	9.00 kHz (CISPR)
5	1	289.99 kHz	33.430 dBµV	30.215 dBµV	---	-27.094 dB	-20.310 dB	---	9.00 kHz (CISPR)
6	1	493.98 kHz	35.534 dBµV	29.475 dBµV	---	-20.566 dB	-16.626 dB	---	9.00 kHz (CISPR)

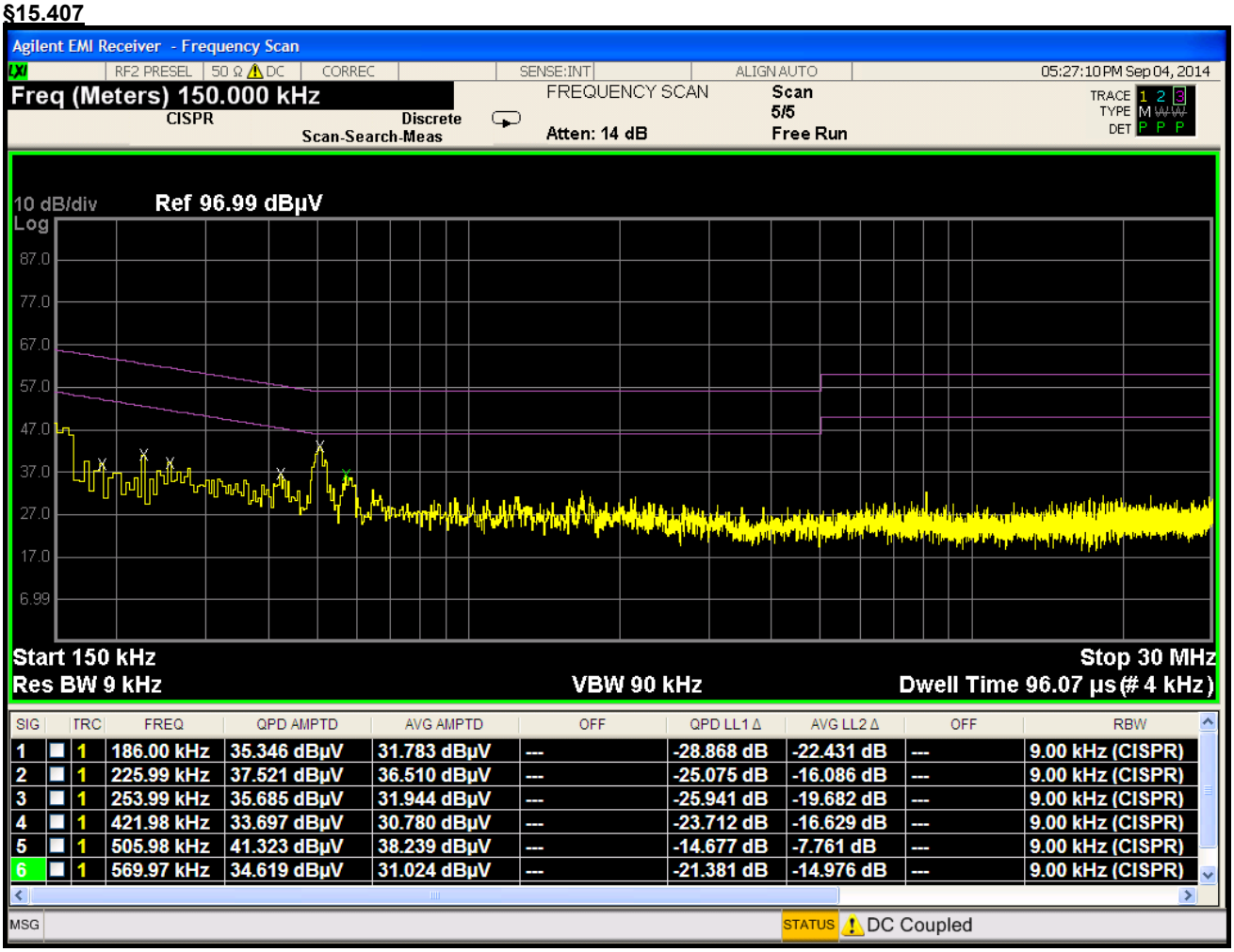
Plot 6-189. Line Conducted Plot with 802.11a UNII Band 2A (N)

Notes:

1. All modes of operation, data rates, and test channels were investigated and the worst-case emissions are reported in 802.11a mode using 6Mbps on Channel 52. The emissions found were not affected by the choice of channel used during testing.
2. The limit for Class B device(s) from 150kHz to 30MHz are specified in Section 15.207 of the Title 47 CFR.
3. L1 = Phase; N = Neutral
4. Traces shown in plot are made using a peak detector.
5. Deviations to the Specifications: None.

Line-Conducted Test Data

§15.407



SIG		TRC	FREQ	QPD AMPTD	AVG AMPTD	OFF	QPD LL1 Δ	AVG LL2 Δ	OFF	RBW
1		1	186.00 kHz	35.346 dBµV	31.783 dBµV	---	-28.868 dB	-22.431 dB	---	9.00 kHz (CISPR)
2		1	225.99 kHz	37.521 dBµV	36.510 dBµV	---	-25.075 dB	-16.086 dB	---	9.00 kHz (CISPR)
3		1	253.99 kHz	35.685 dBµV	31.944 dBµV	---	-25.941 dB	-19.682 dB	---	9.00 kHz (CISPR)
4		1	421.98 kHz	33.697 dBµV	30.780 dBµV	---	-23.712 dB	-16.629 dB	---	9.00 kHz (CISPR)
5		1	505.98 kHz	41.323 dBµV	38.239 dBµV	---	-14.677 dB	-7.761 dB	---	9.00 kHz (CISPR)
6		1	569.97 kHz	34.619 dBµV	31.024 dBµV	---	-21.381 dB	-14.976 dB	---	9.00 kHz (CISPR)

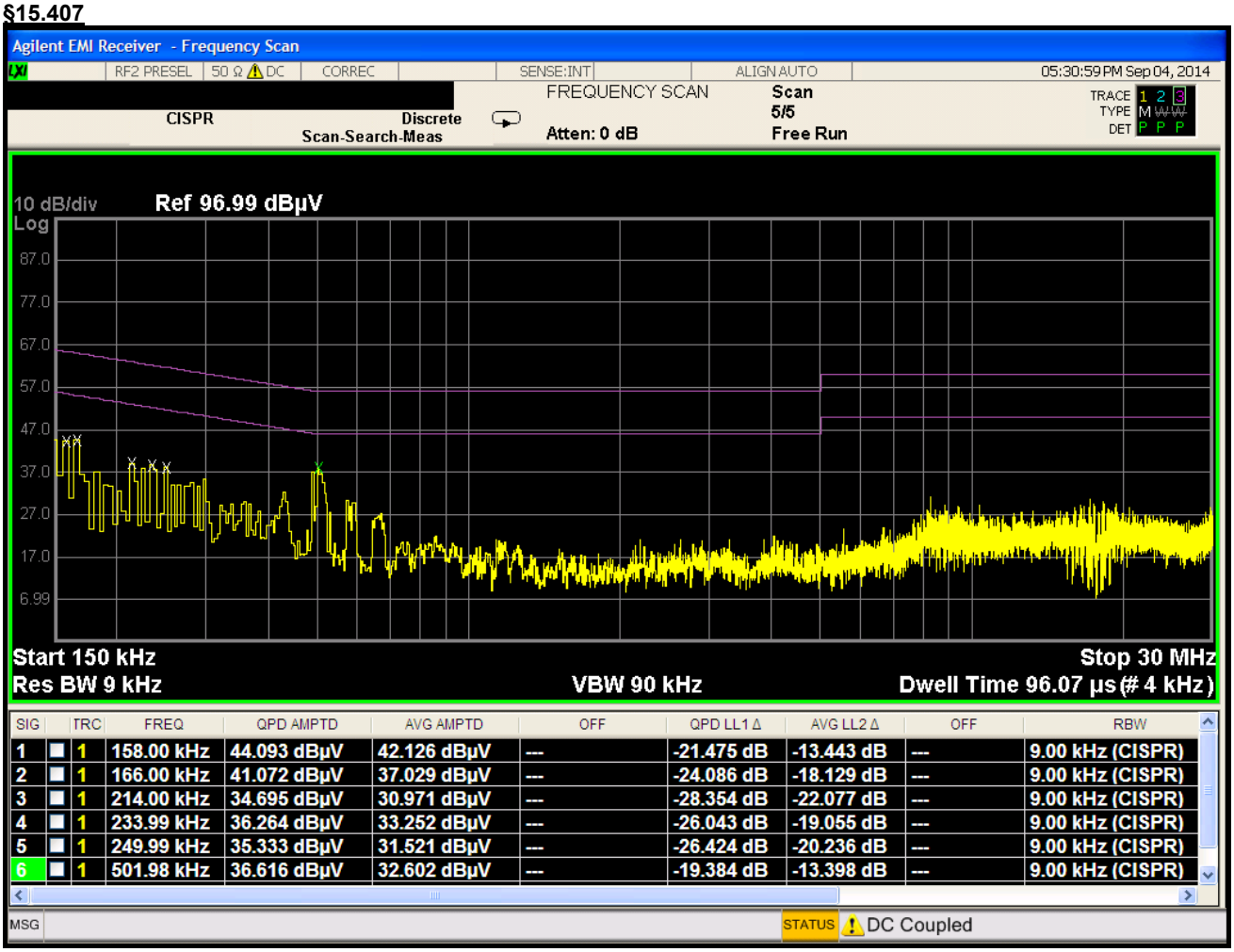
Plot 6-190. Line Conducted Plot with 802.11a UNII Band 2C (L1)

Notes:

1. All modes of operation, data rates, and test channels were investigated and the worst-case emissions are reported in 802.11a mode using 6Mbps on Channel 100. The emissions found were not affected by the choice of channel used during testing.
2. The limit for Class B device(s) from 150kHz to 30MHz are specified in Section 15.207 of the Title 47 CFR.
3. L1 = Phase; N = Neutral
4. Traces shown in plot are made using a peak detector.
5. Deviations to the Specifications: None.

Line-Conducted Test Data

§15.407



Plot 6-191. Line Conducted Plot with 802.11a UNII Band 2C (N)

Notes:

1. All modes of operation, data rates, and test channels were investigated and the worst-case emissions are reported in 802.11a mode using 6Mbps on Channel 100. The emissions found were not affected by the choice of channel used during testing.
2. The limit for Class B device(s) from 150kHz to 30MHz are specified in Section 15.207 of the Title 47 CFR.
3. L1 = Phase; N = Neutral
4. Traces shown in plot are made using a peak detector.
5. Deviations to the Specifications: None.

7.0 CONCLUSION

The data collected relate only the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSWDSC01G** is in compliance with Part 15E of the FCC Rules.