6.5 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, at its maximum power control level, as defined in KDB 789033 D02 v01, and at the appropriate frequencies. Method SA-1, as defined in KDB 789033 D02 v01, was used to measure the power spectral density.

In the 5.15 – 5.25GHz, 5.25 – 5.35GHz, 5.47 – 5.725GHz bands, the maximum permissible power spectral density is 11dBm/MHz.

In the 5.725 – 5.850GHz band, the maximum permissible power spectral density is 30dBm/500kHz.

Test Procedure Used

KDB 789033 D02 v01 – 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 for all modes
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.

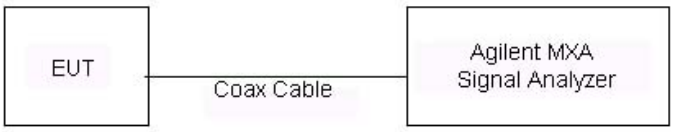


Figure 6-4. Test Instrument & Measurement Setup

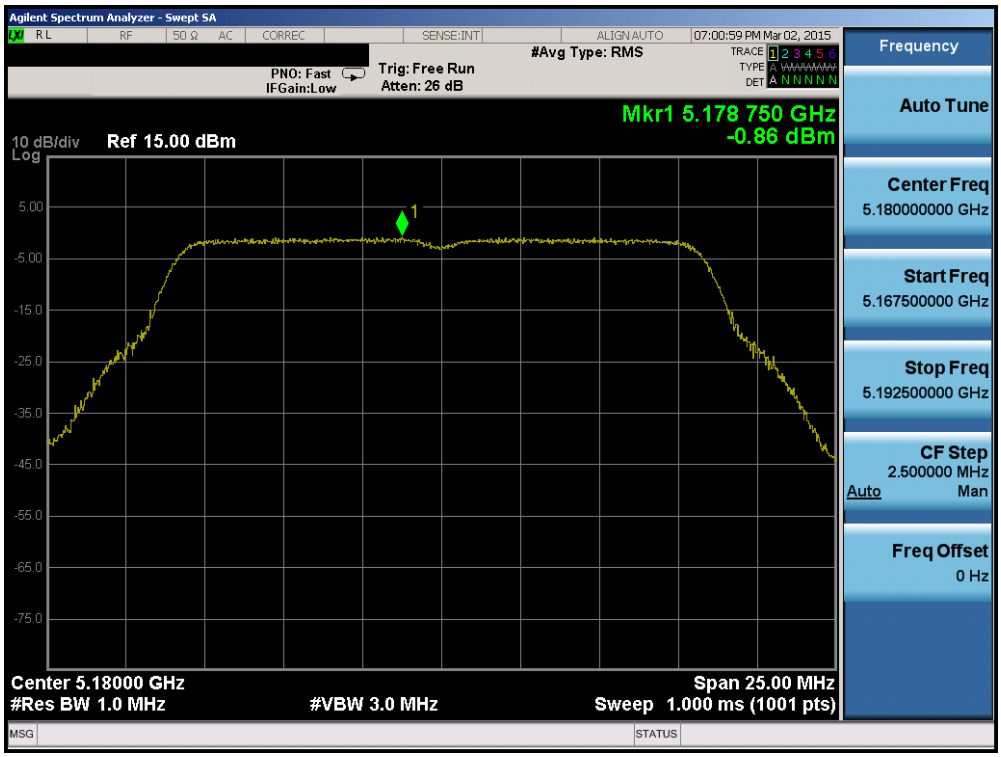
Test Notes

None

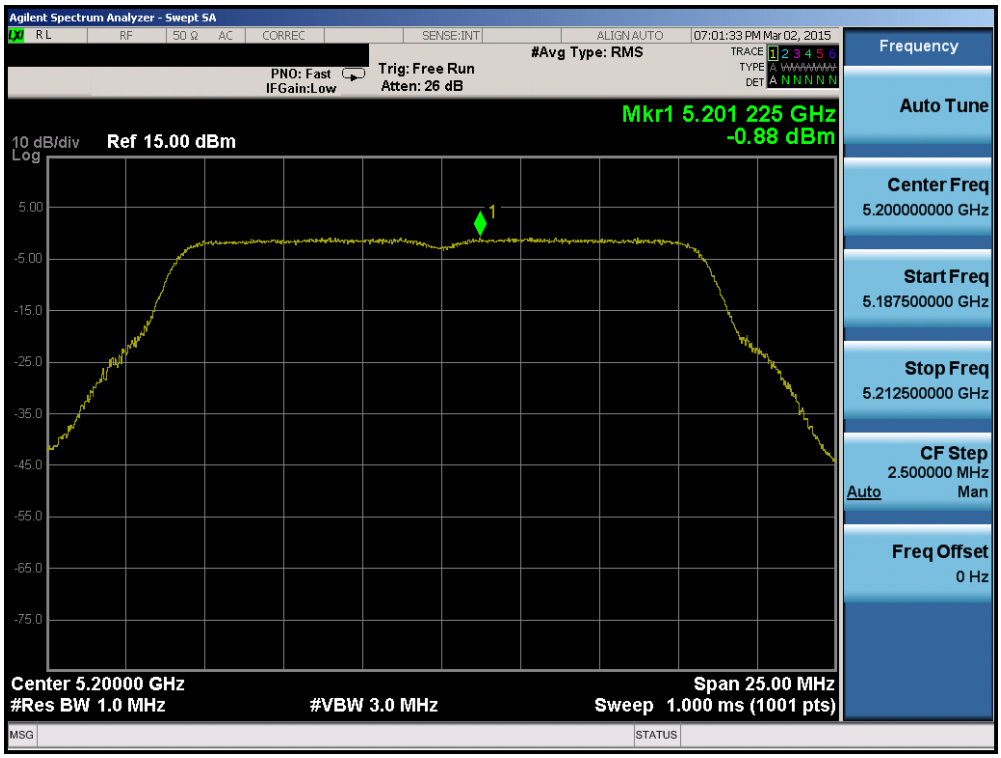
Antenna-1 Power Spectral Density Measurements

	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	-0.86	11.0	-11.86	Pass
	5200	40	a	6	-0.88	11.0	-11.88	Pass
	5240	48	a	6	-0.67	11.0	-11.67	Pass
	5180	36	n (20MHz)	6.5/7.2 (MCS0)	-0.85	11.0	-11.85	Pass
	5200	40	n (20MHz)	6.5/7.2 (MCS0)	-0.80	11.0	-11.80	Pass
	5240	48	n (20MHz)	6.5/7.2 (MCS0)	-0.75	11.0	-11.75	Pass
	5190	38	n (40MHz)	13.5/15 (MCS0)	-4.36	11.0	-15.36	Pass
	5230	46	n (40MHz)	13.5/15 (MCS0)	-4.08	11.0	-15.08	Pass
	5210	42	ac (80MHz)	29.3/32.5 (MCS0)	-7.08	11.0	-18.08	Pass
Band 2A	5260	52	a	6	-0.55	11.0	-11.55	Pass
	5280	56	a	6	-0.95	11.0	-11.95	Pass
	5320	64	a	6	-1.15	11.0	-12.15	Pass
	5260	52	n (20MHz)	6.5/7.2 (MCS0)	-0.39	11.0	-11.39	Pass
	5280	56	n (20MHz)	6.5/7.2 (MCS0)	-1.07	11.0	-12.07	Pass
	5320	64	n (20MHz)	6.5/7.2 (MCS0)	-0.92	11.0	-11.92	Pass
	5270	54	n (40MHz)	13.5/15 (MCS0)	-3.10	11.0	-14.10	Pass
	5310	62	n (40MHz)	13.5/15 (MCS0)	-3.47	11.0	-14.47	Pass
	5290	58	ac (80MHz)	29.3/32.5 (MCS0)	-7.53	11.0	-18.53	Pass
Band 2C	5500	100	a	6	-0.80	11.0	-11.80	Pass
	5580	116	a	6	-1.16	11.0	-12.16	Pass
	5720	144	a	6	-0.70	11.0	-11.70	Pass
	5500	100	n (20MHz)	6.5/7.2 (MCS0)	-0.90	11.0	-11.90	Pass
	5580	116	n (20MHz)	6.5/7.2 (MCS0)	-1.19	11.0	-12.19	Pass
	5720	144	n (20MHz)	6.5/7.2 (MCS0)	-0.34	11.0	-11.34	Pass
	5510	102	n (40MHz)	13.5/15 (MCS0)	-4.46	11.0	-15.46	Pass
	5550	110	n (40MHz)	13.5/15 (MCS0)	-4.28	11.0	-15.28	Pass
	5710	142	n (40MHz)	13.5/15 (MCS0)	-4.33	11.0	-15.33	Pass
	5530	106	ac (80MHz)	29.3/32.5 (MCS0)	-6.75	11.0	-17.75	Pass
	5690	138	ac (80MHz)	29.3/32.5 (MCS0)	-7.34	11.0	-18.34	Pass

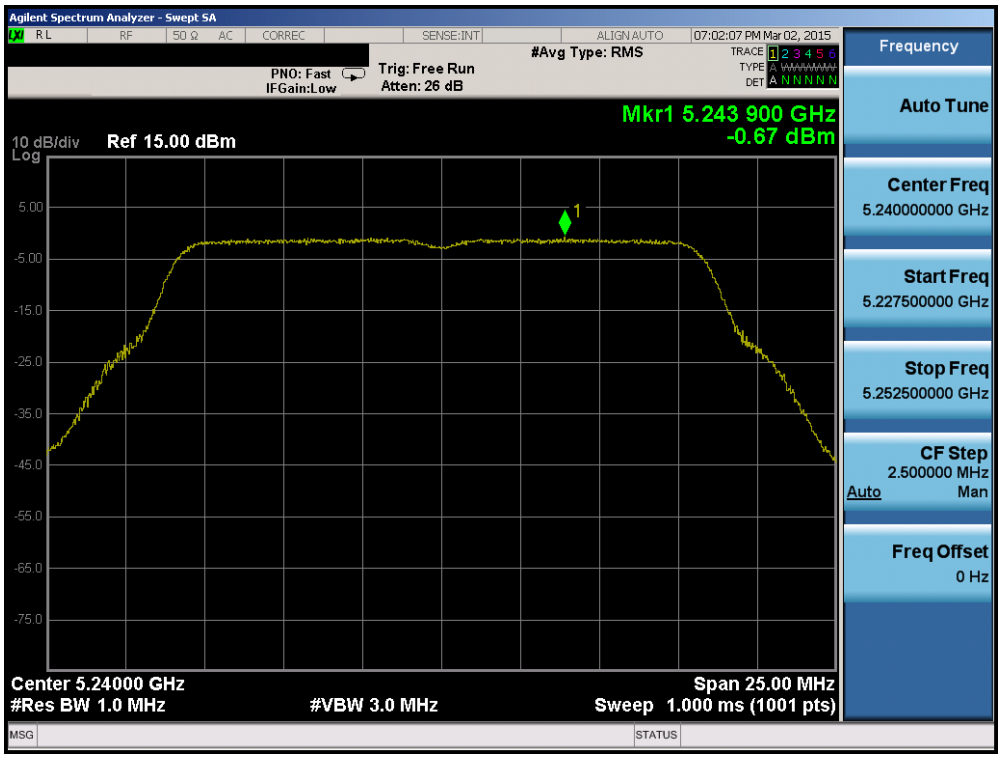
Table 6-17. Bands 1, 2A, 2C Conducted Power Spectral Density Measurements



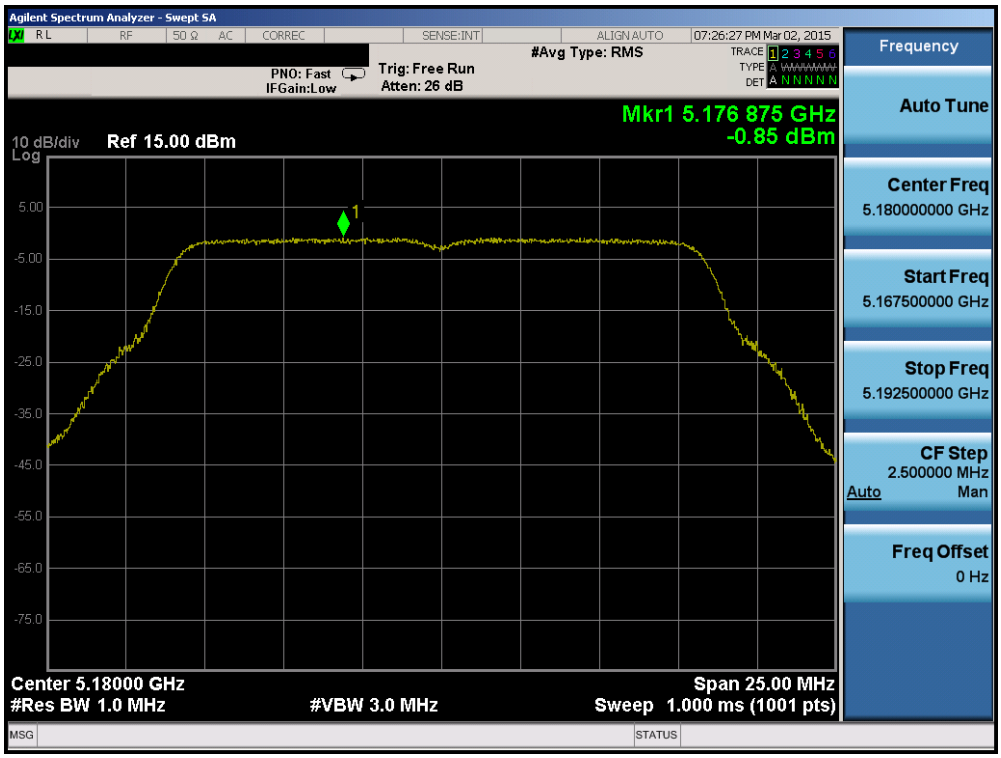
Plot 6-77. Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 36)



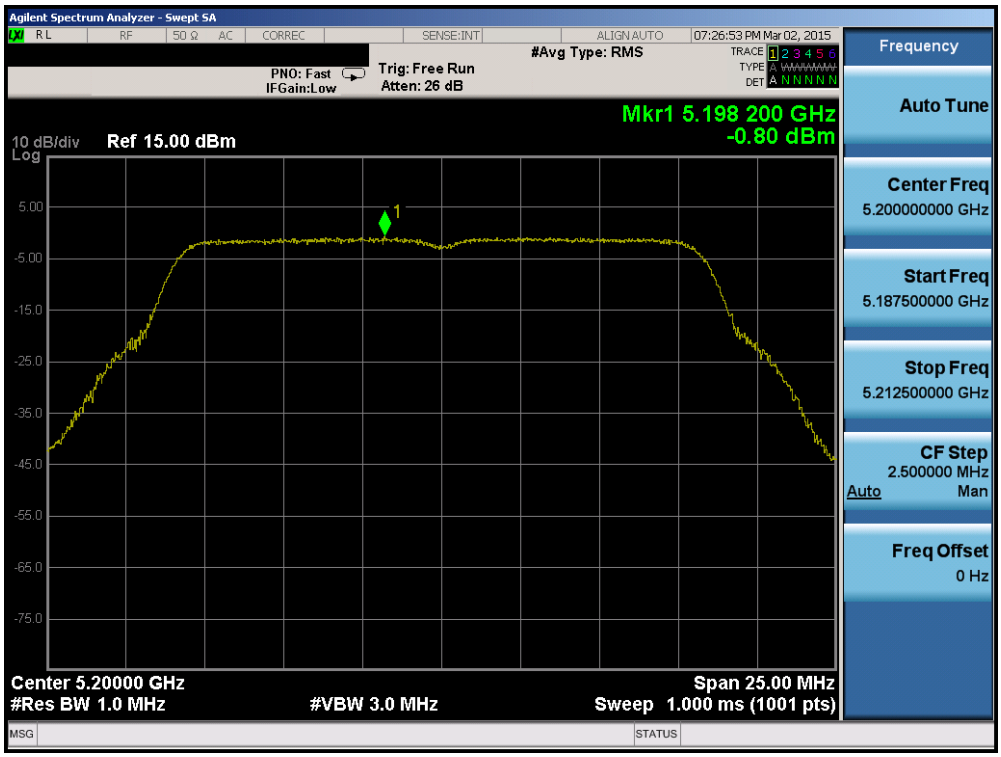
Plot 6-78. Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 40)



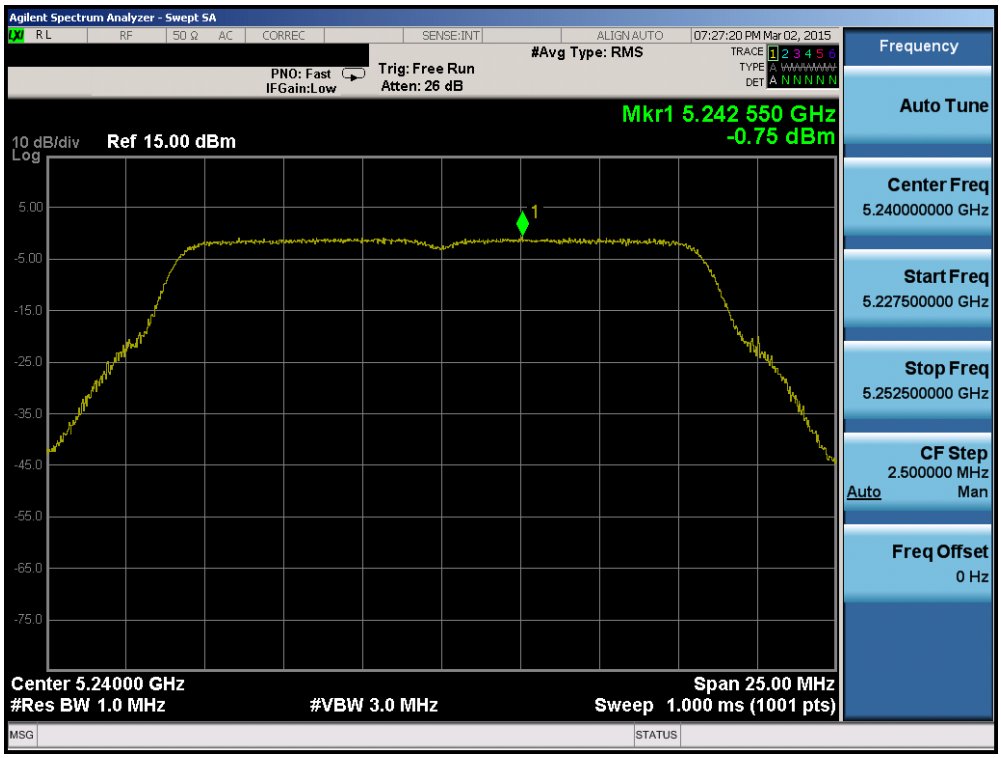
Plot 6-79. Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 48)



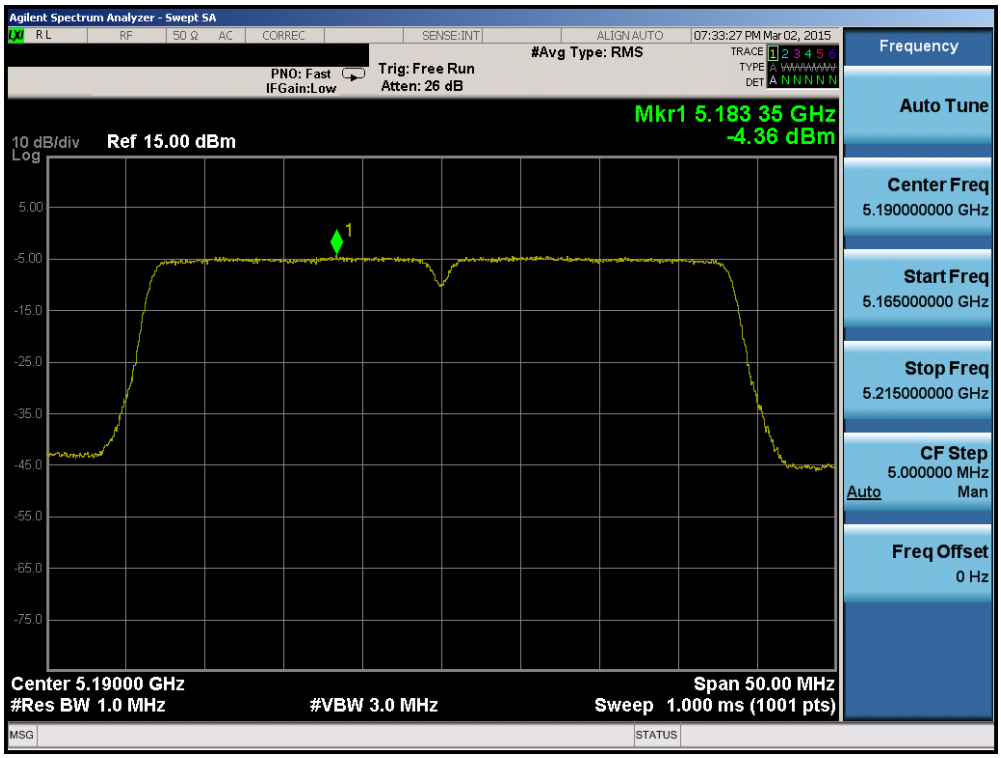
Plot 6-80. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 36)



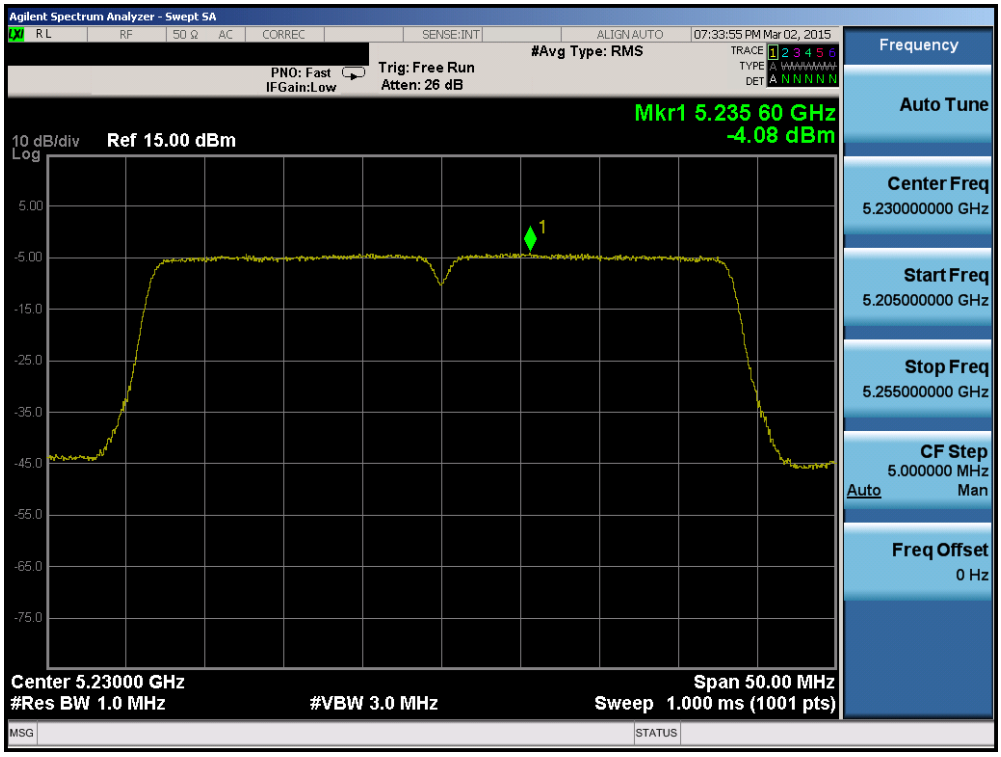
Plot 6-81. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 40)



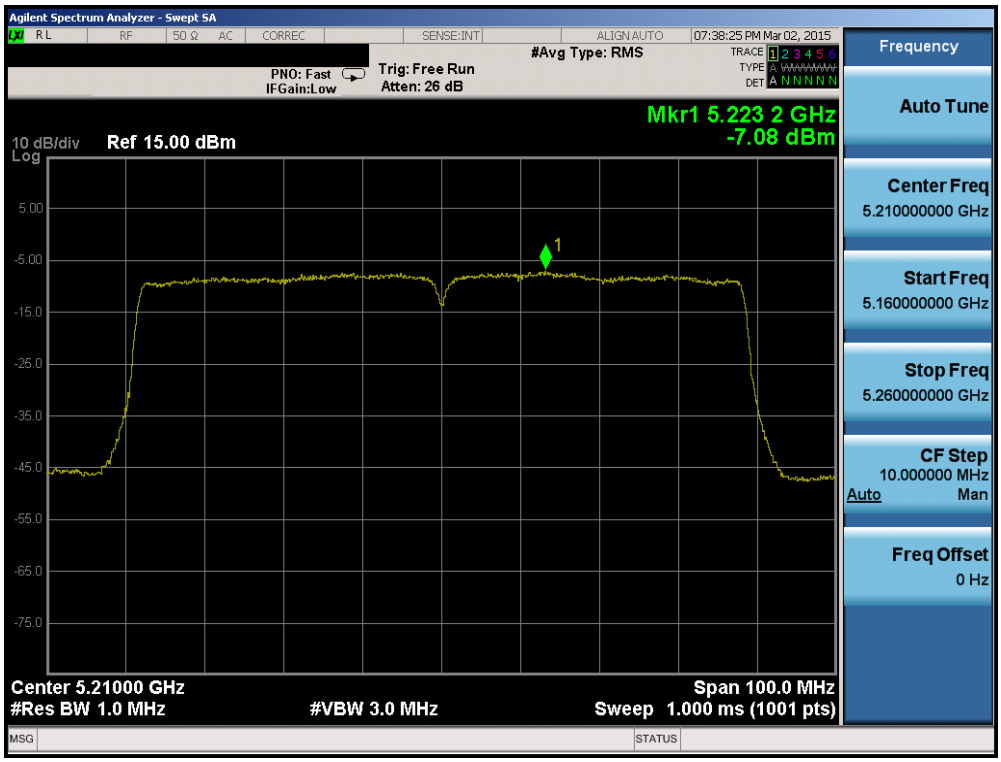
Plot 6-82. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 48)



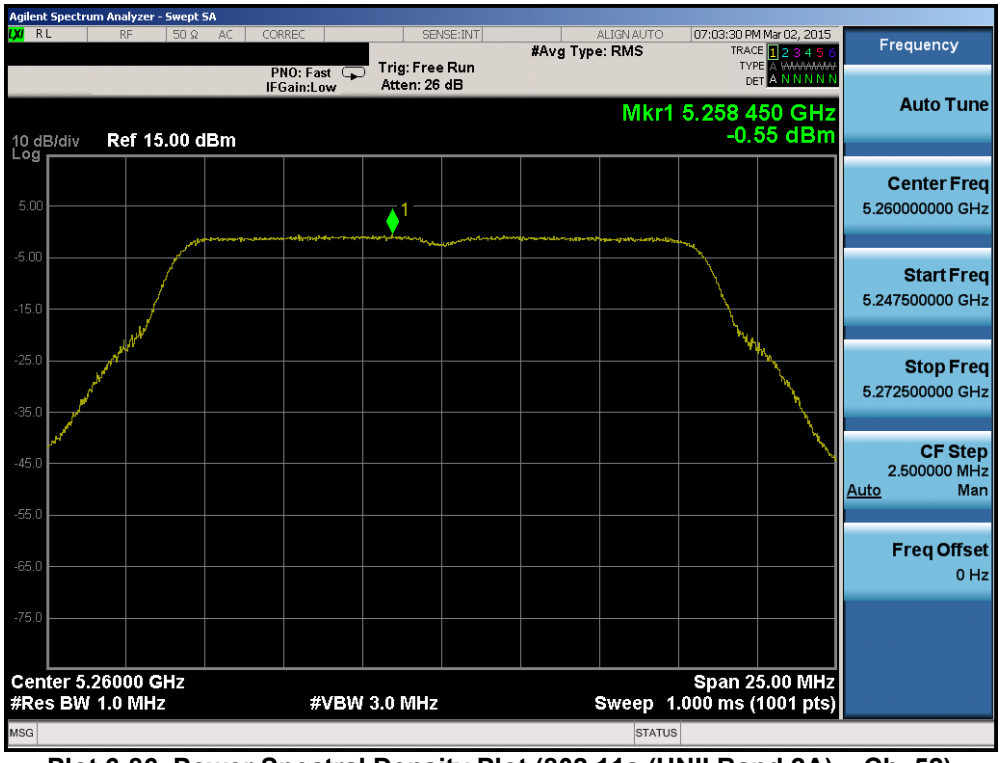
Plot 6-83. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 1) – Ch. 38)



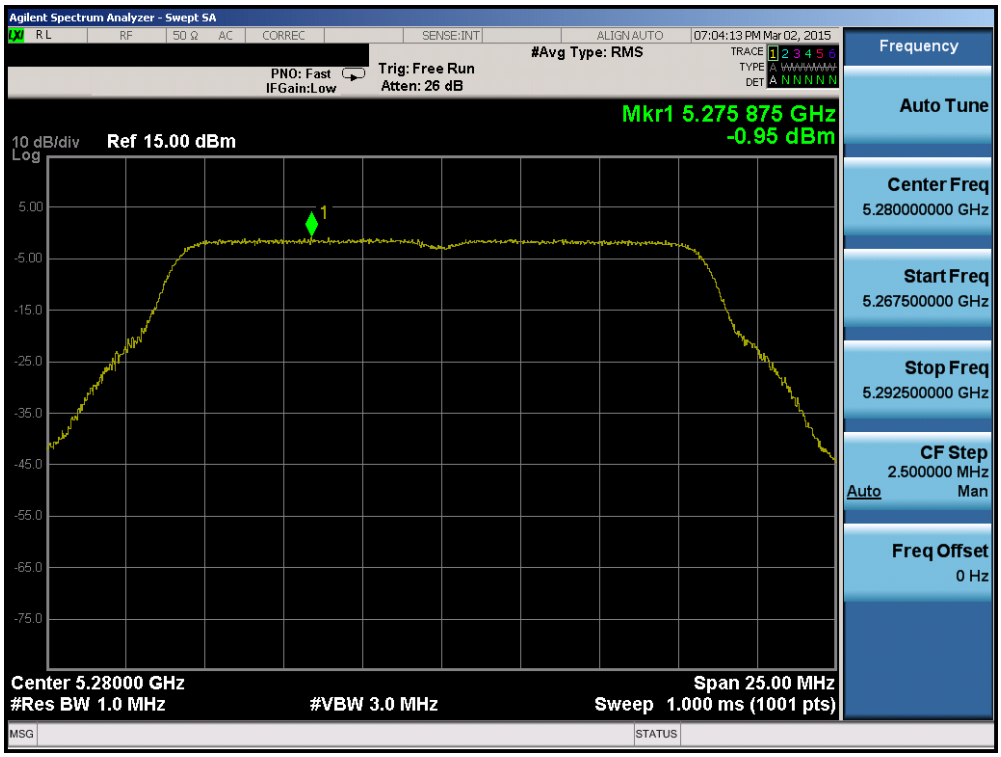
Plot 6-84. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 1) – Ch. 46)



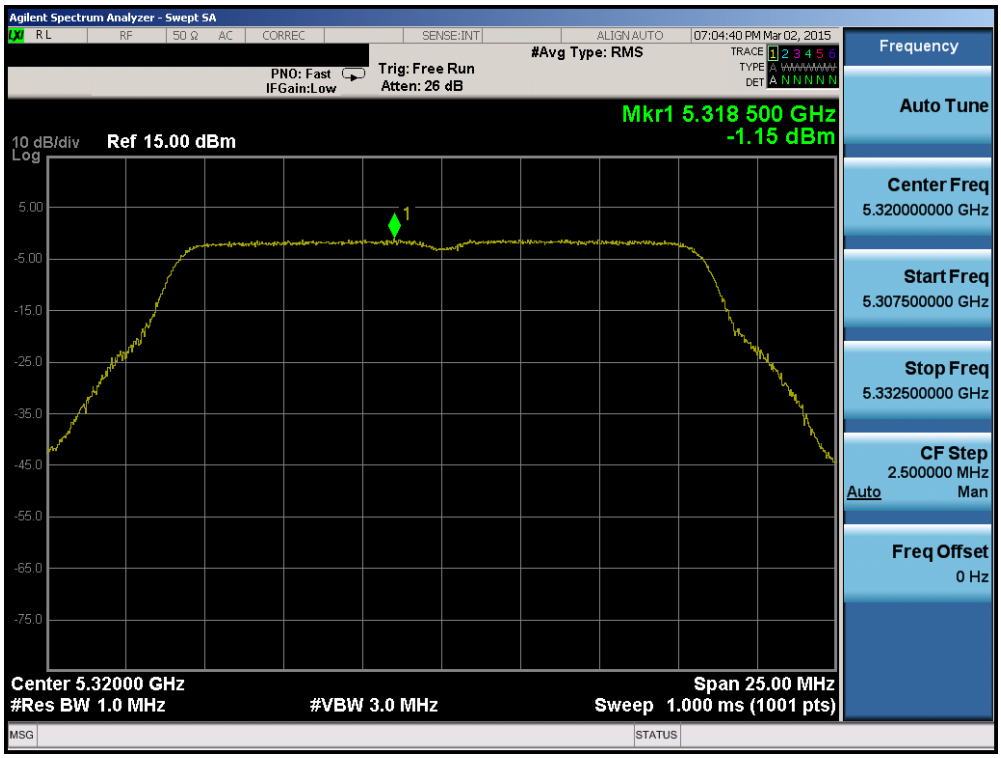
Plot 6-85. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 1) – Ch. 42)



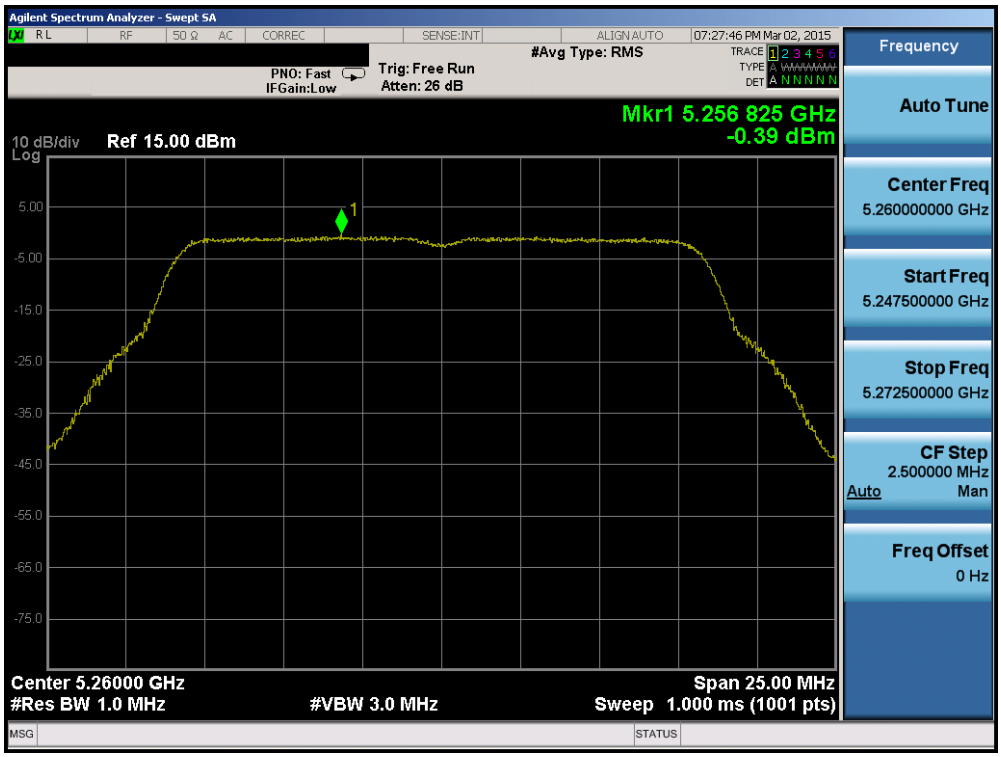
Plot 6-86. Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 52)



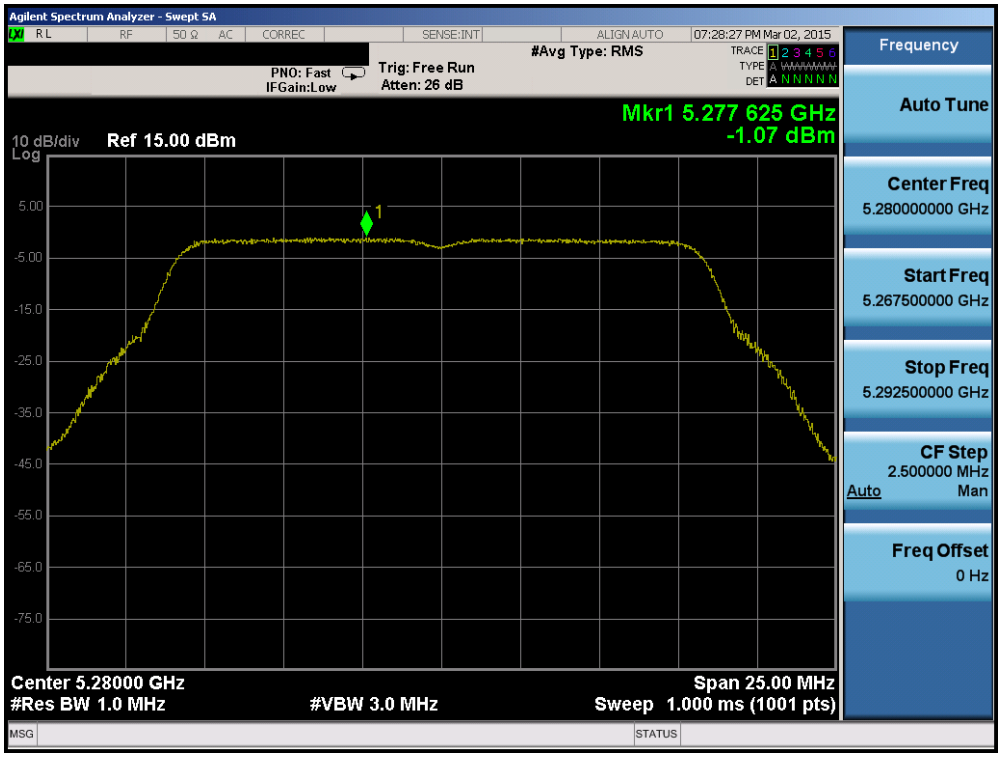
Plot 6-87. Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 56)



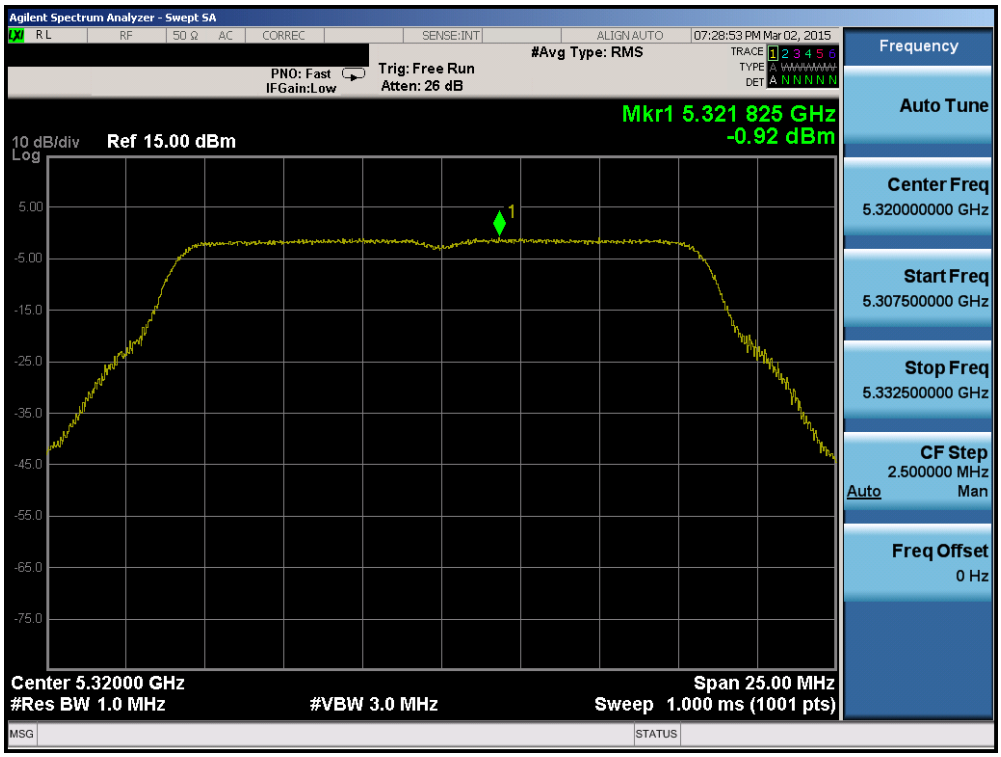
Plot 6-88. Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 64)



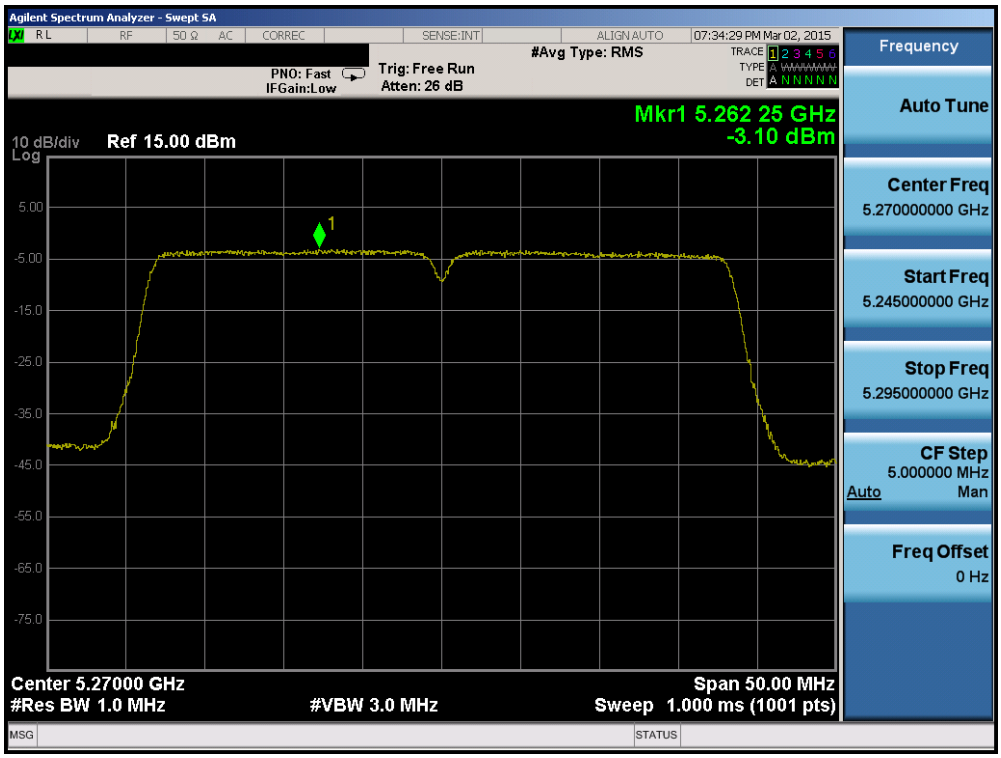
Plot 6-89. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 52)



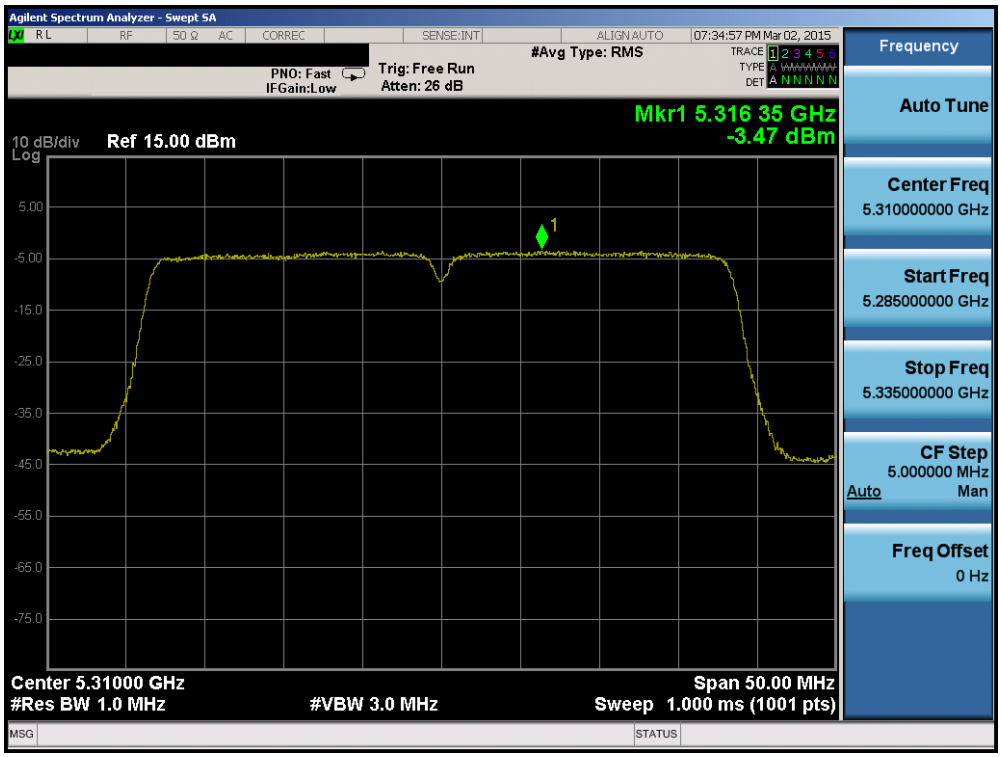
Plot 6-90. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 56)



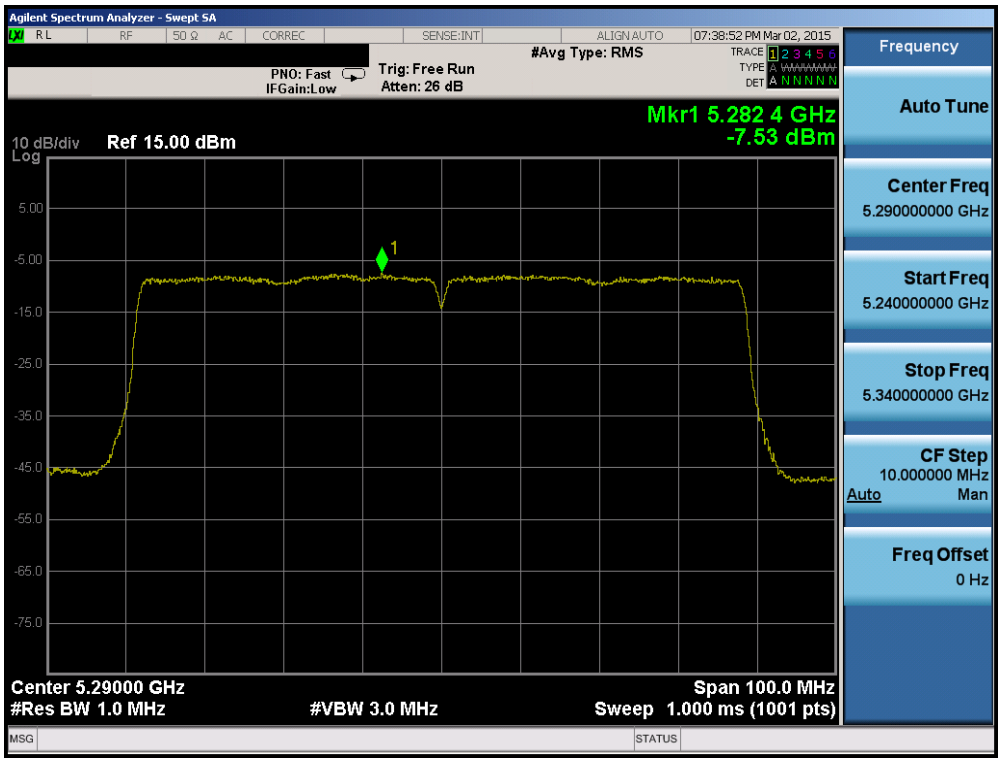
Plot 6-91. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 64)



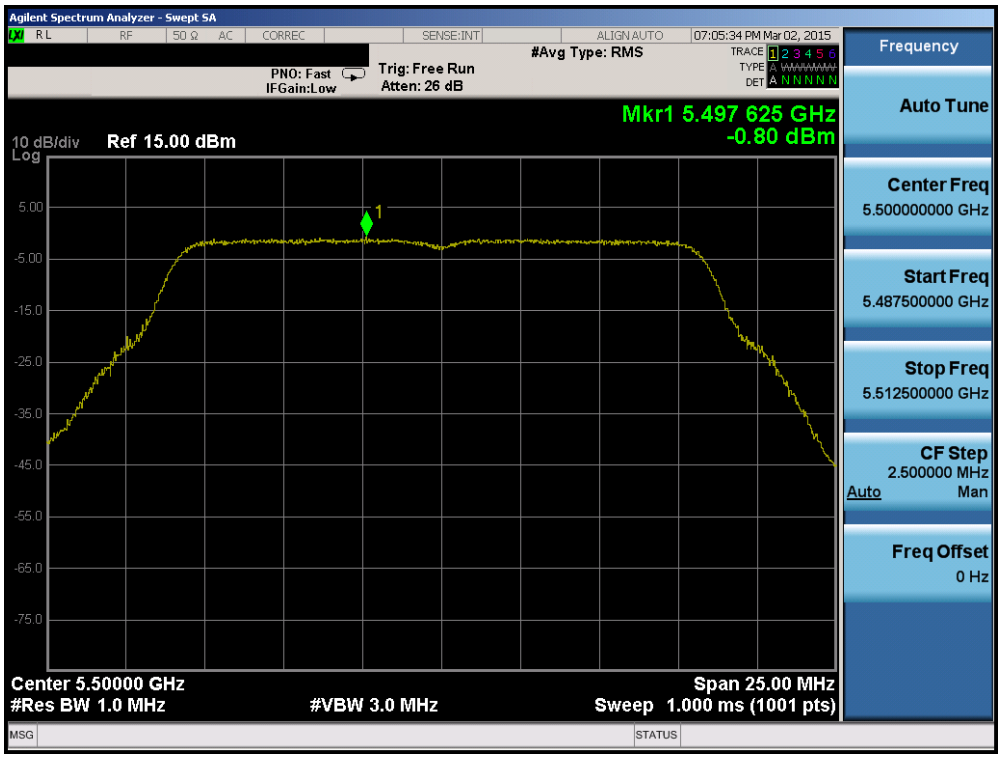
Plot 6-92. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2A) – Ch. 54)



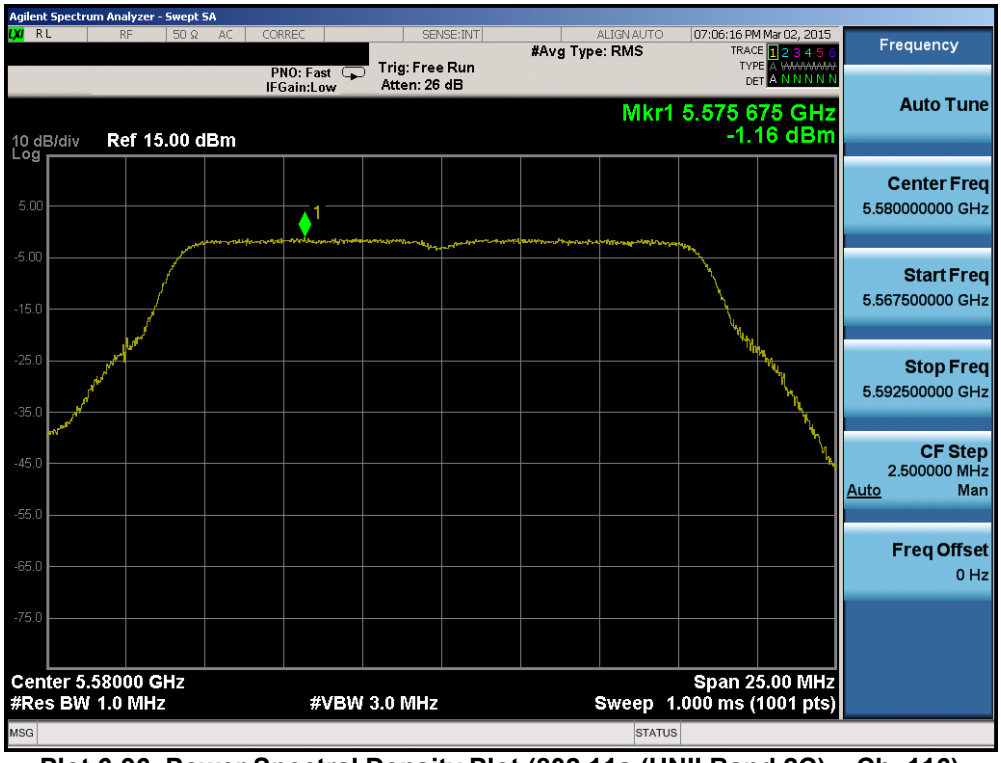
Plot 6-93. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2A) – Ch. 62)



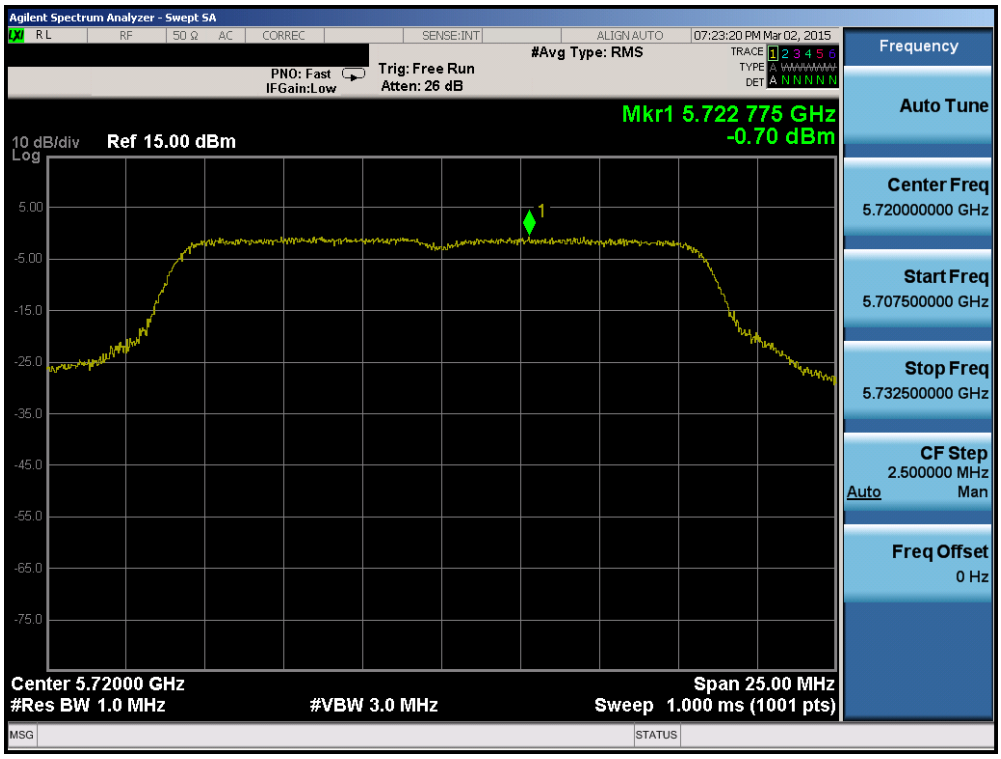
Plot 6-94. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2A) – Ch. 58)



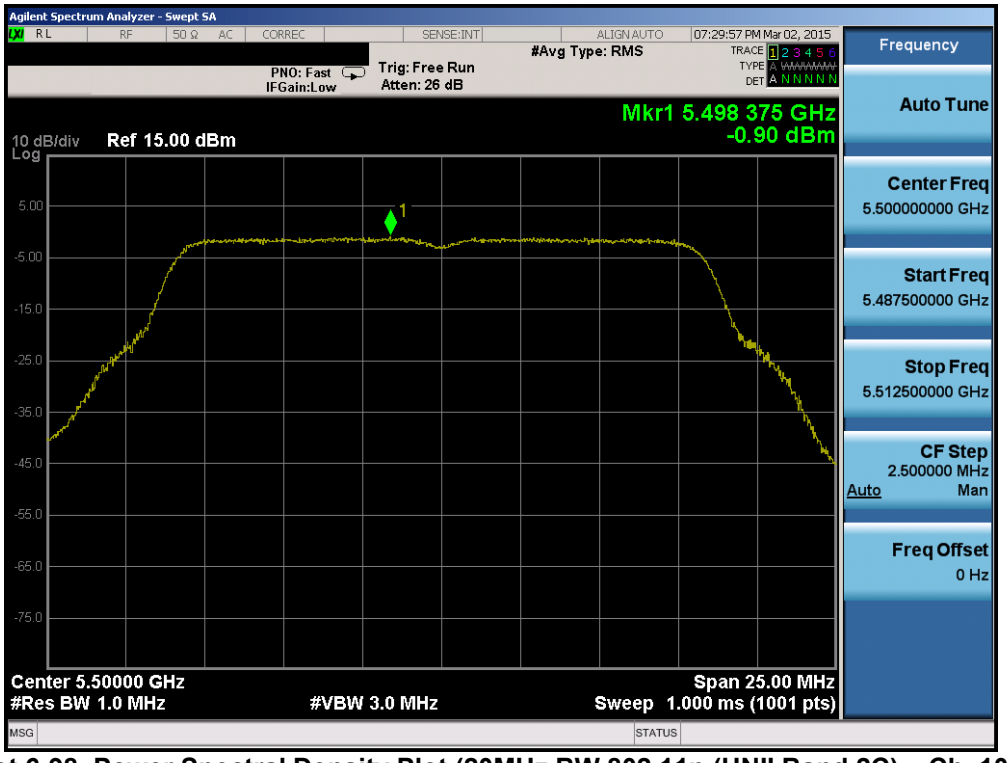
Plot 6-95. Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 100)



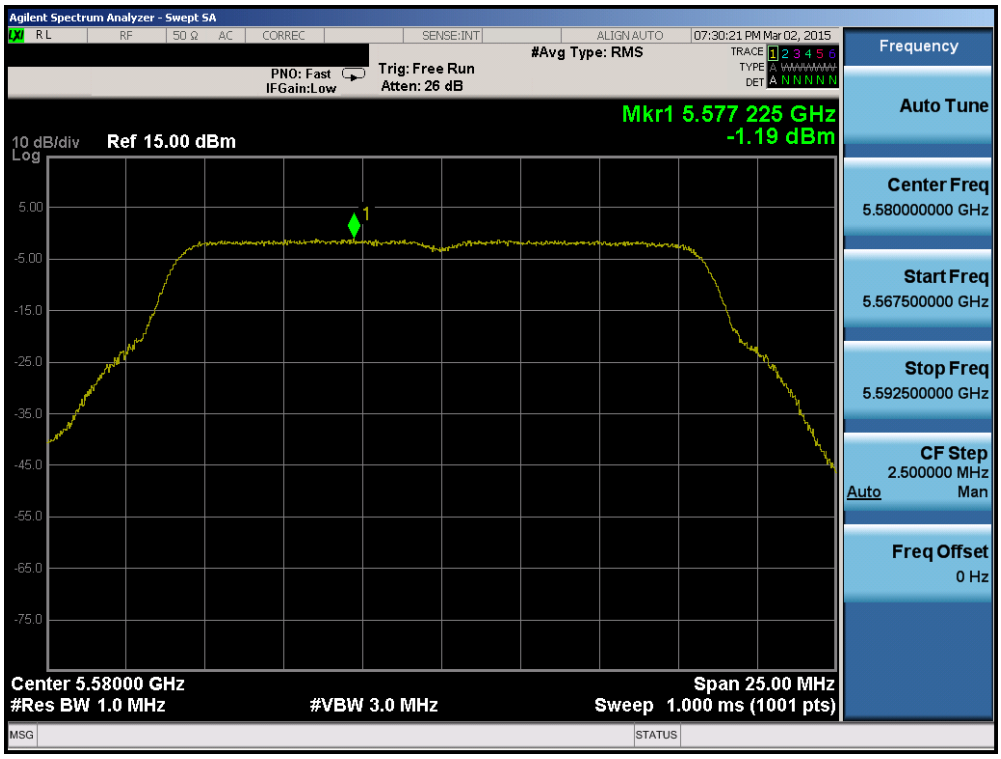
Plot 6-96. Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 116)



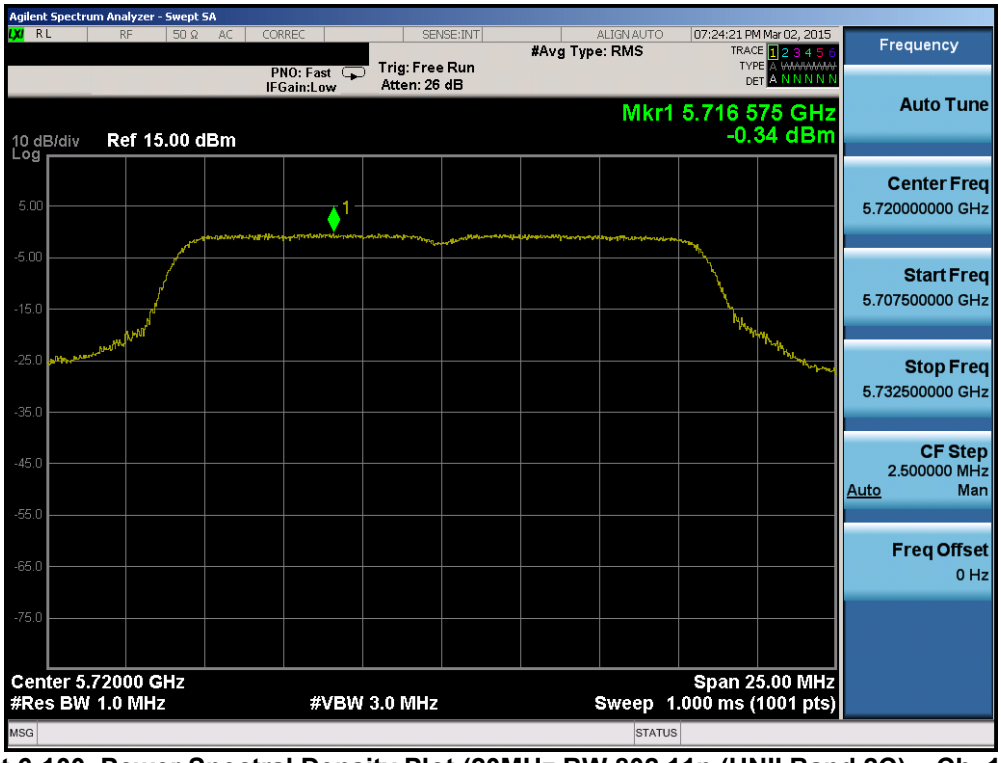
Plot 6-97. Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 144)



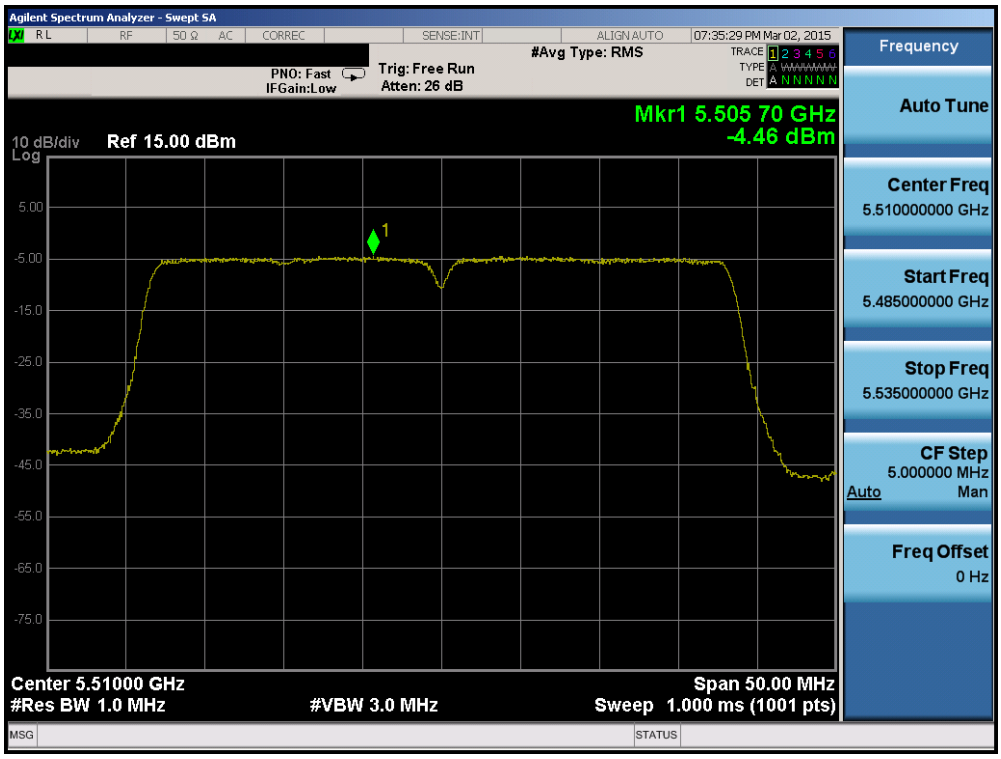
Plot 6-98. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 100)



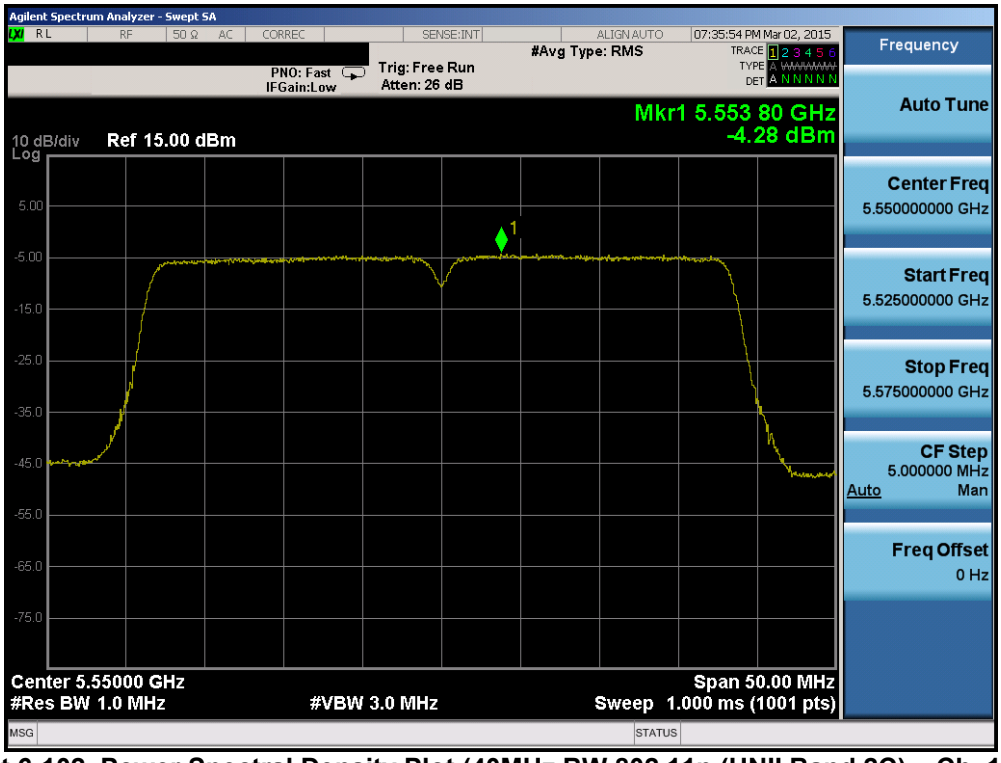
Plot 6-99. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 116)



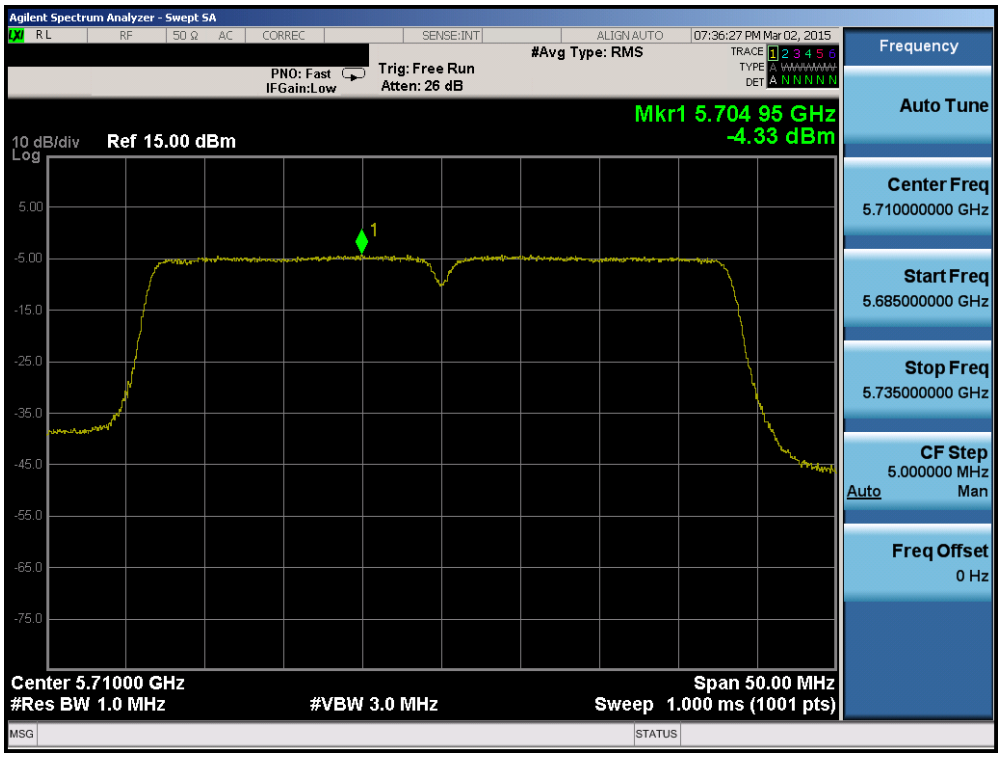
Plot 6-100. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 144)



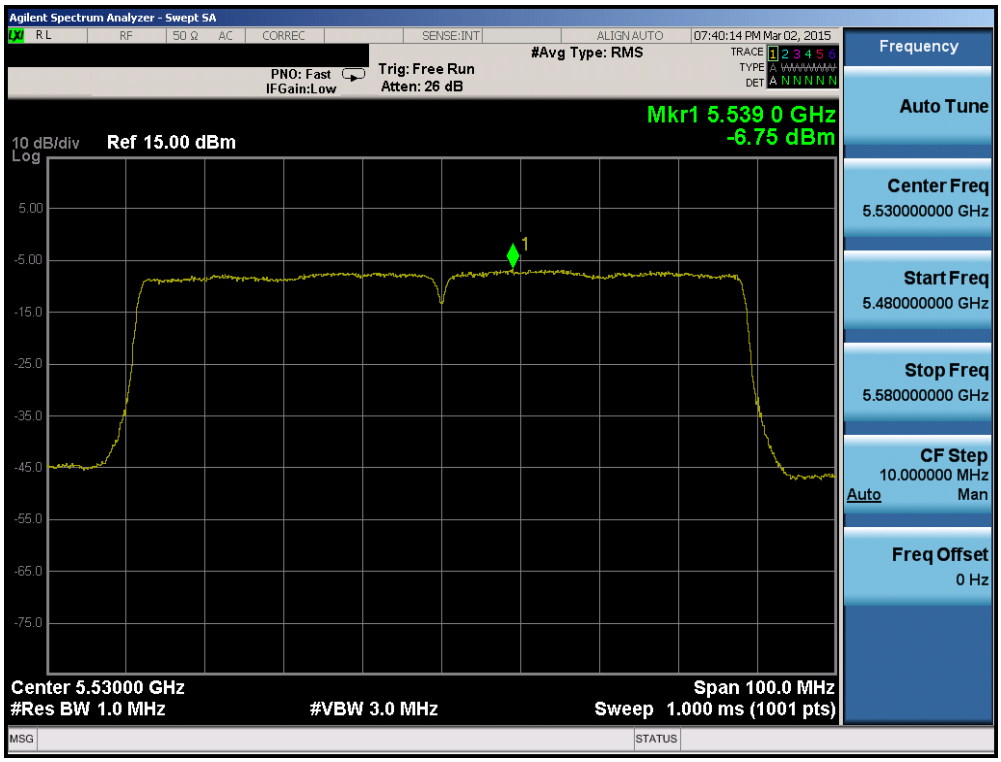
Plot 6-101. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 102)



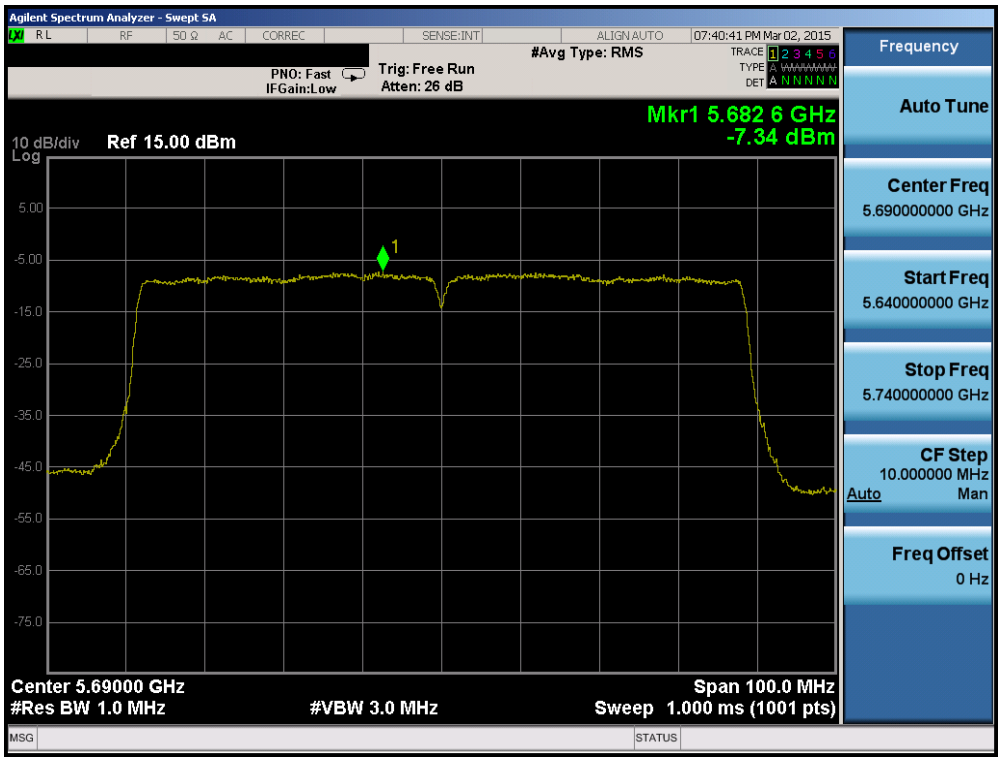
Plot 6-102. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 110)



Plot 6-103. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 142)



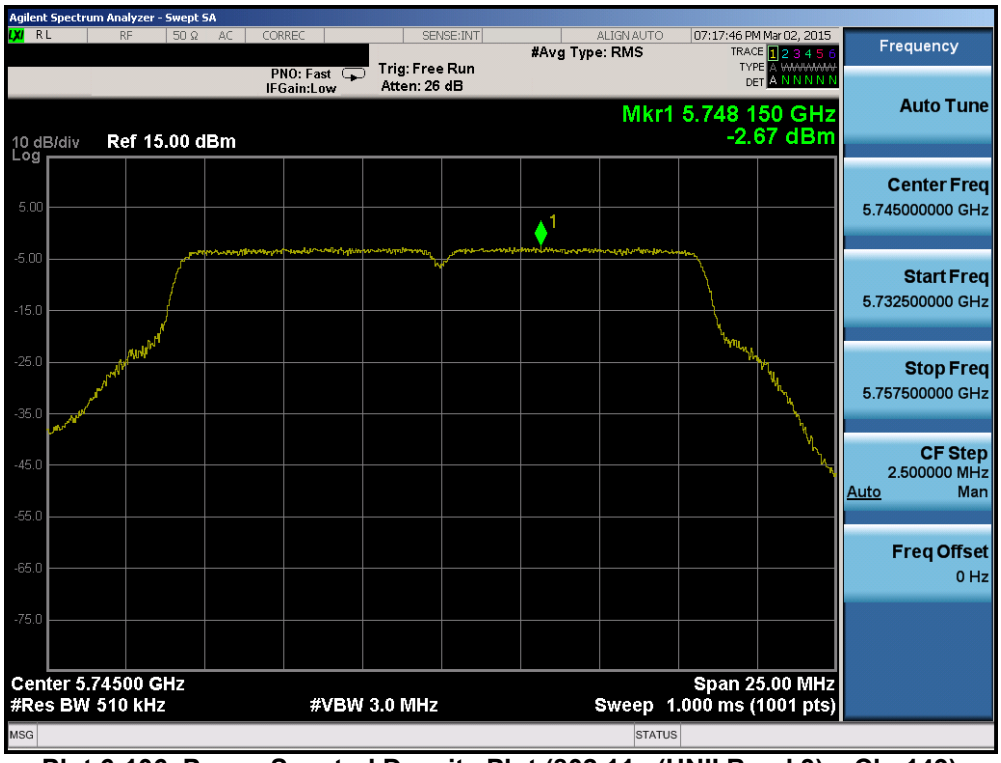
Plot 6-104. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2C) – Ch. 106)



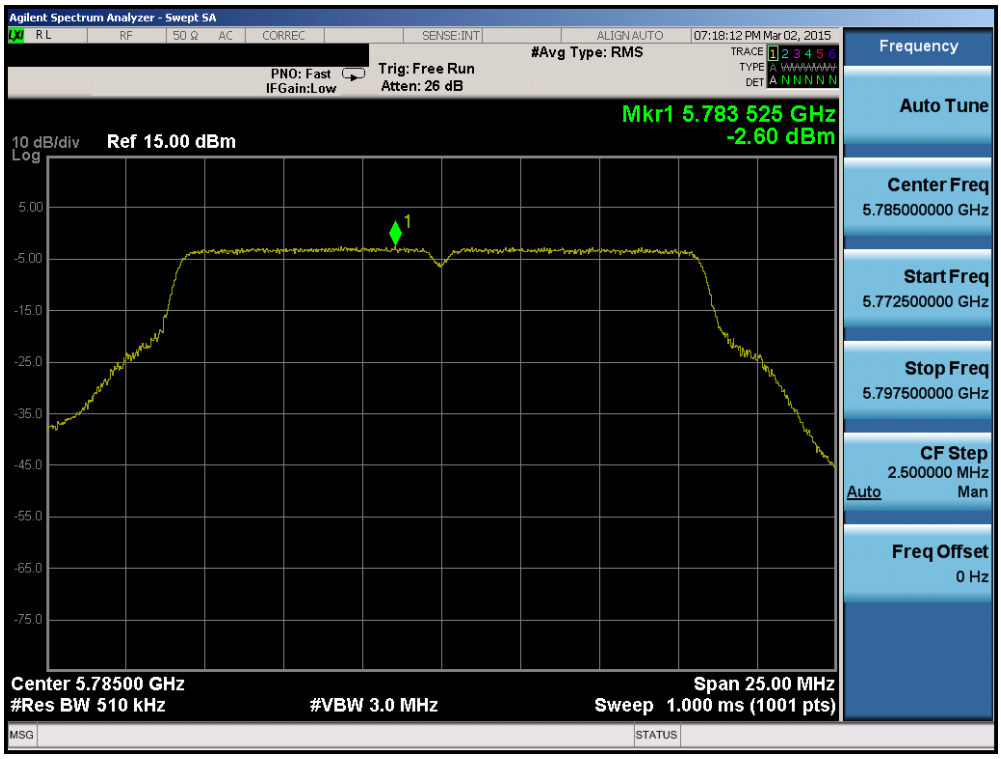
Plot 6-105. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2C) – Ch. 138)

	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured Power Density [dBm]	Max Permissible Power Density [dBm/500kHz]	Margin [dB]	Pass / Fail
Band 3	5745	149	a	6	-2.67	30.0	-32.67	Pass
	5785	157	a	6	-2.60	30.0	-32.60	Pass
	5825	165	a	6	-2.99	30.0	-32.99	Pass
	5745	149	n (20MHz)	6.5/7.2 (MCS0)	-2.99	30.0	-32.99	Pass
	5785	157	n (20MHz)	6.5/7.2 (MCS0)	-2.16	30.0	-32.16	Pass
	5825	165	n (20MHz)	6.5/7.2 (MCS0)	-3.19	30.0	-33.19	Pass
	5755	151	n (40MHz)	13.5/15 (MCS0)	-6.94	30.0	-36.94	Pass
	5795	159	n (40MHz)	13.5/15 (MCS0)	-6.89	30.0	-36.89	Pass
	5775	155	ac (80MHz)	29.3/32.5 (MCS0)	-9.57	30.0	-39.57	Pass

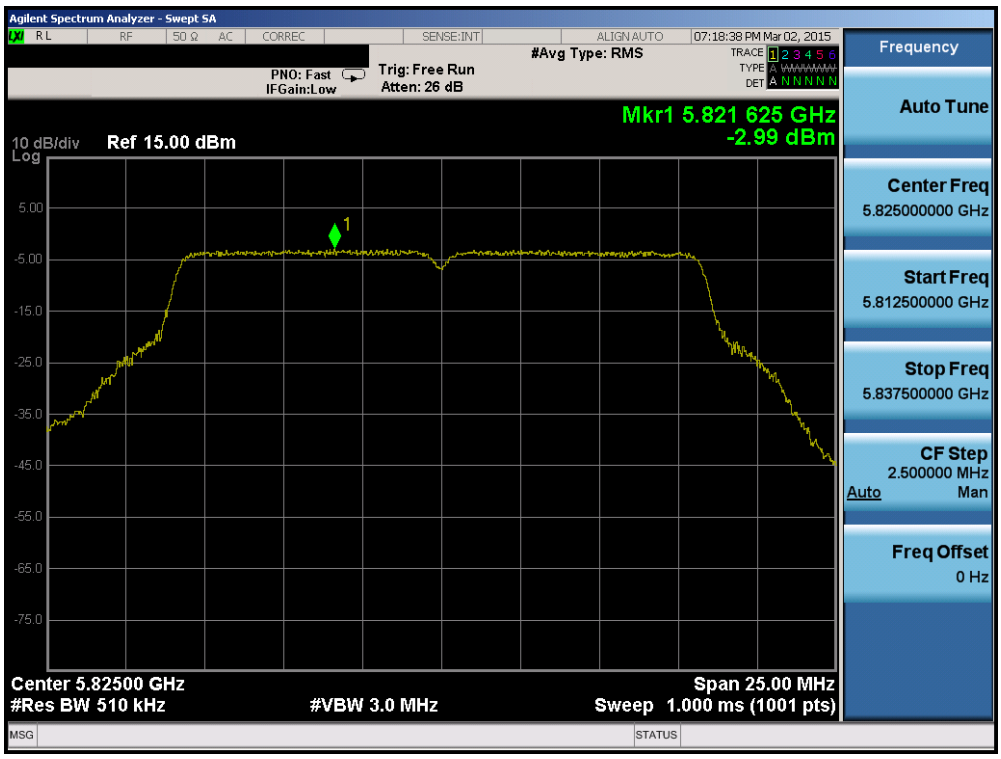
Table 6-18. Band 3 Conducted Power Spectral Density Measurements



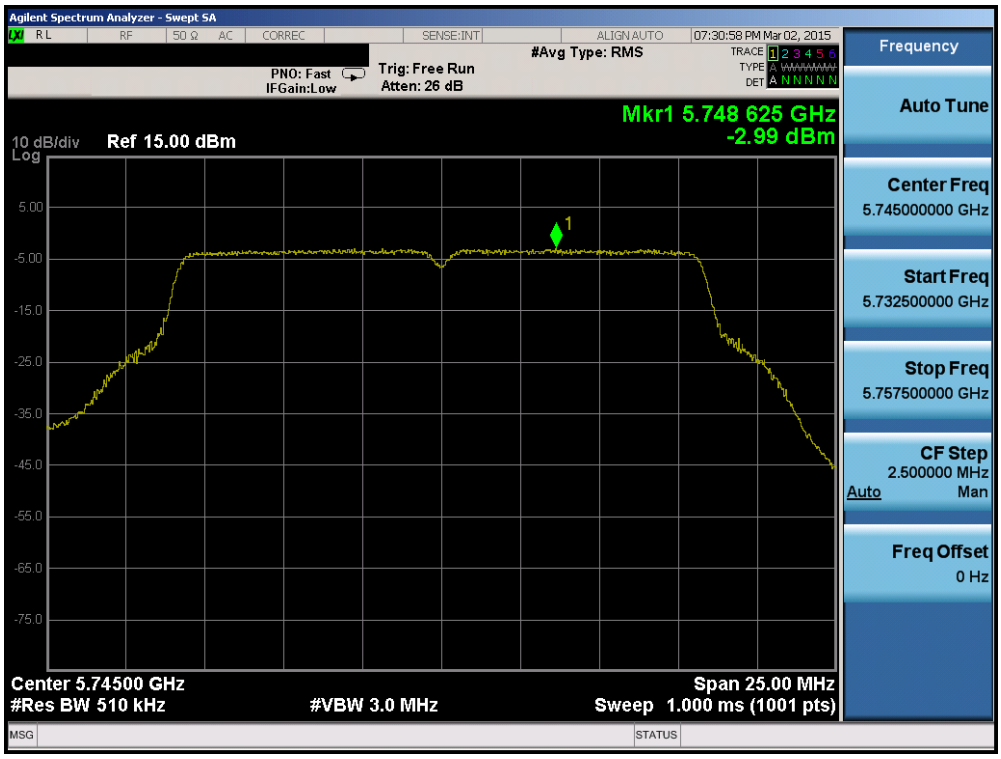
Plot 6-106. Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 149)



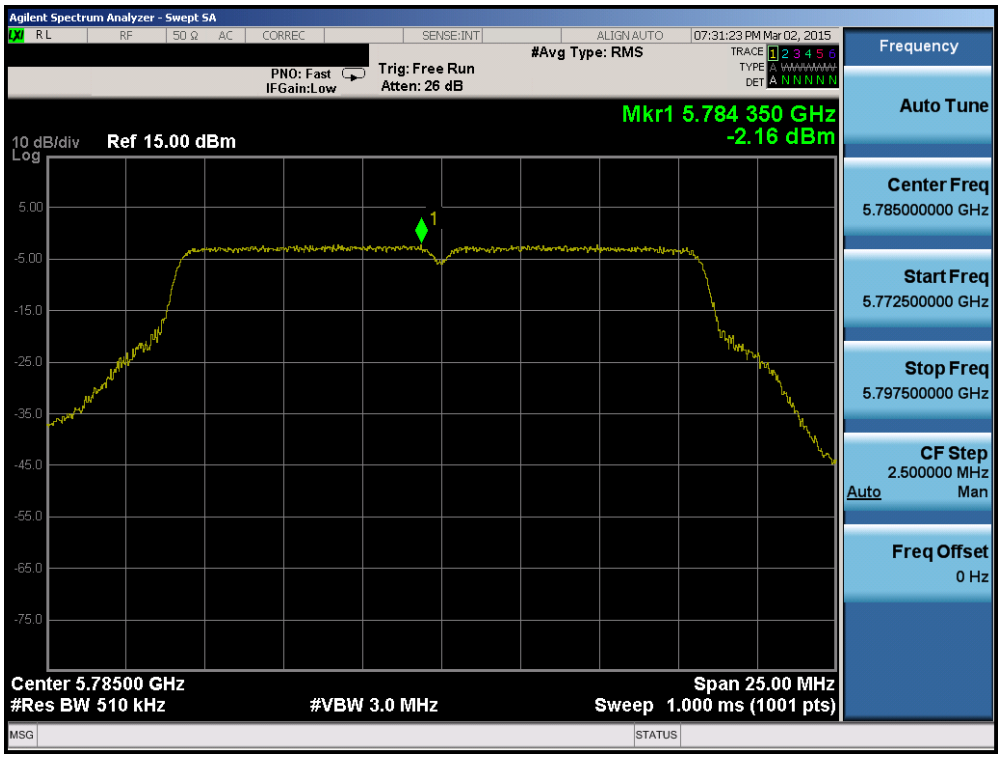
Plot 6-107. Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 157)



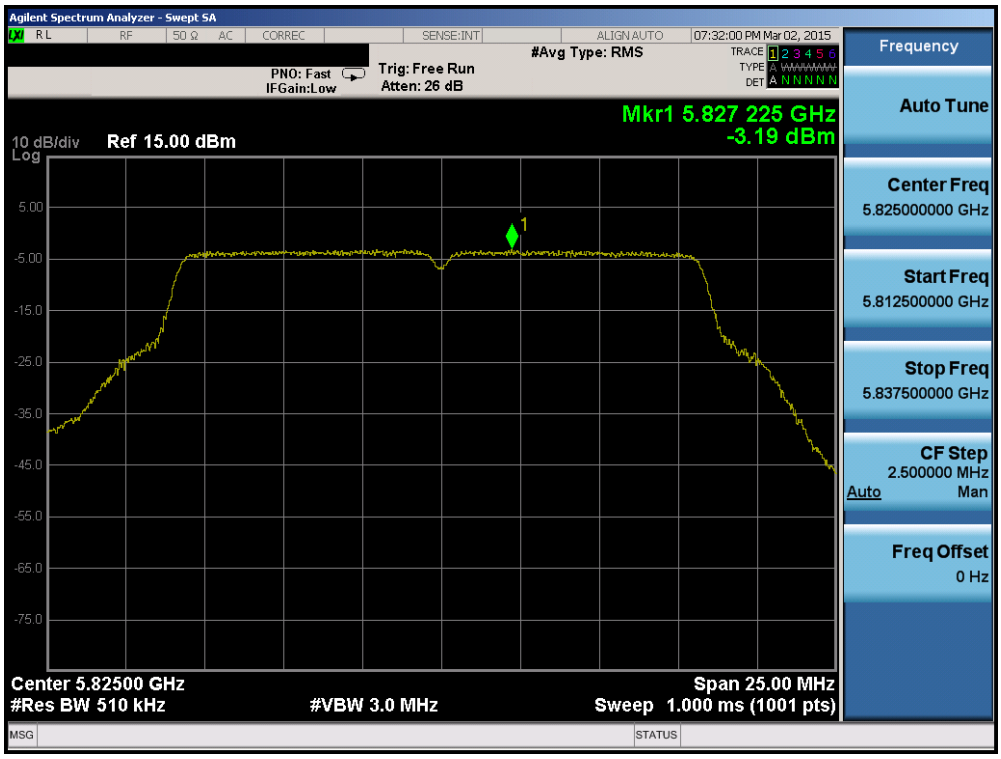
Plot 6-108. Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 165)



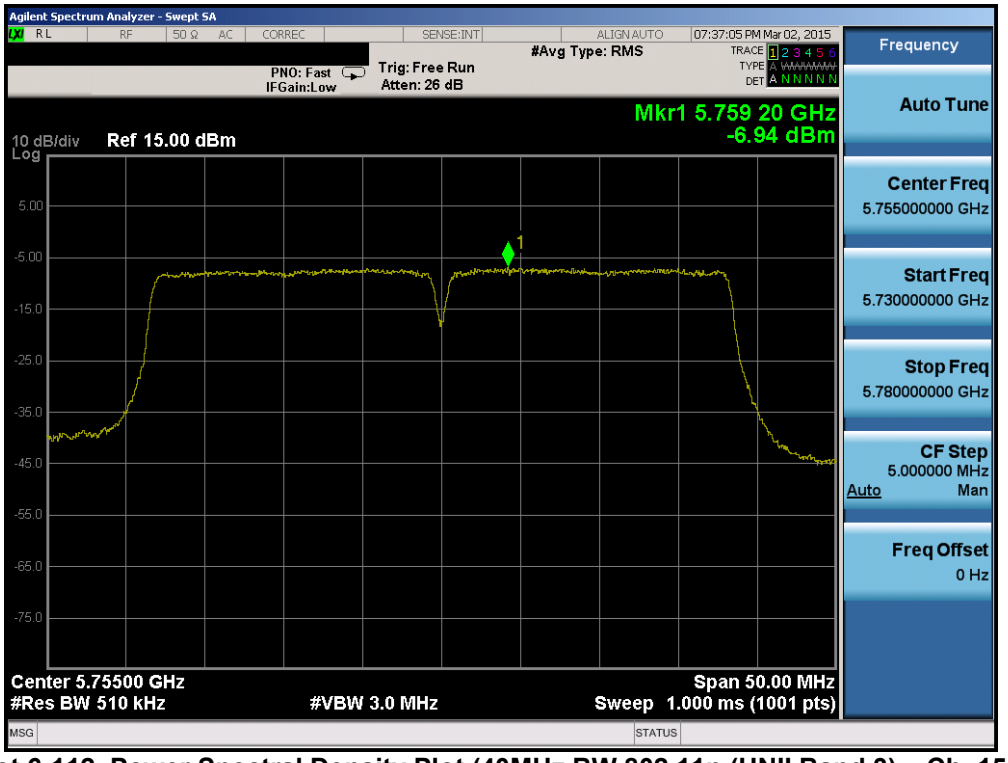
Plot 6-109. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 149)



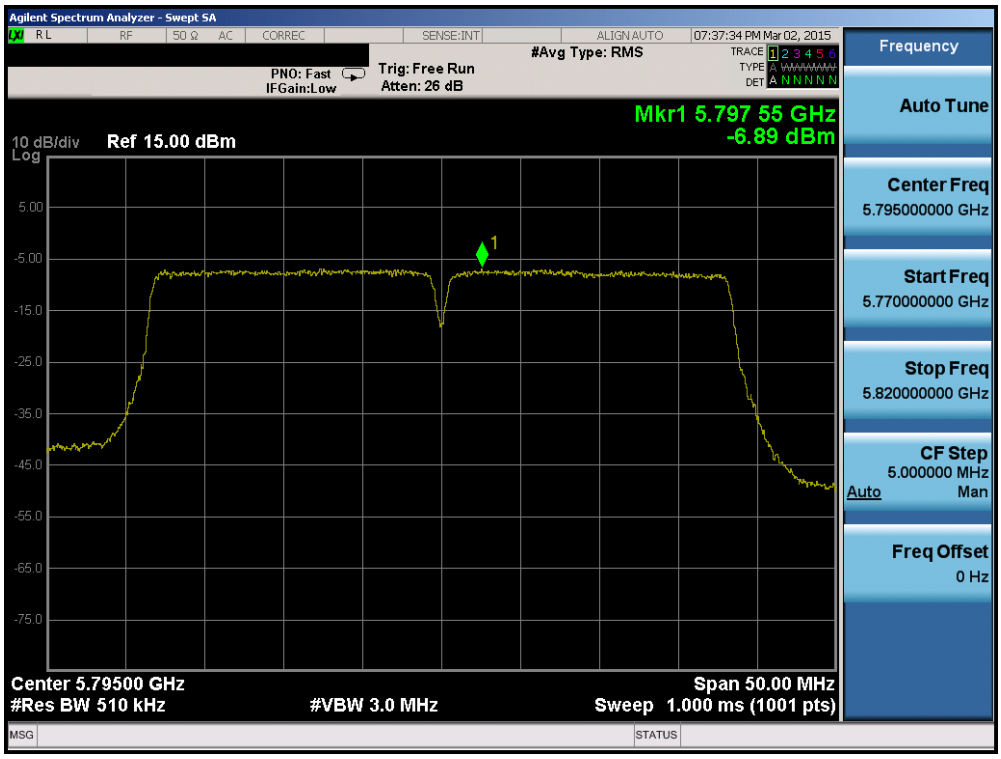
Plot 6-110. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 157)



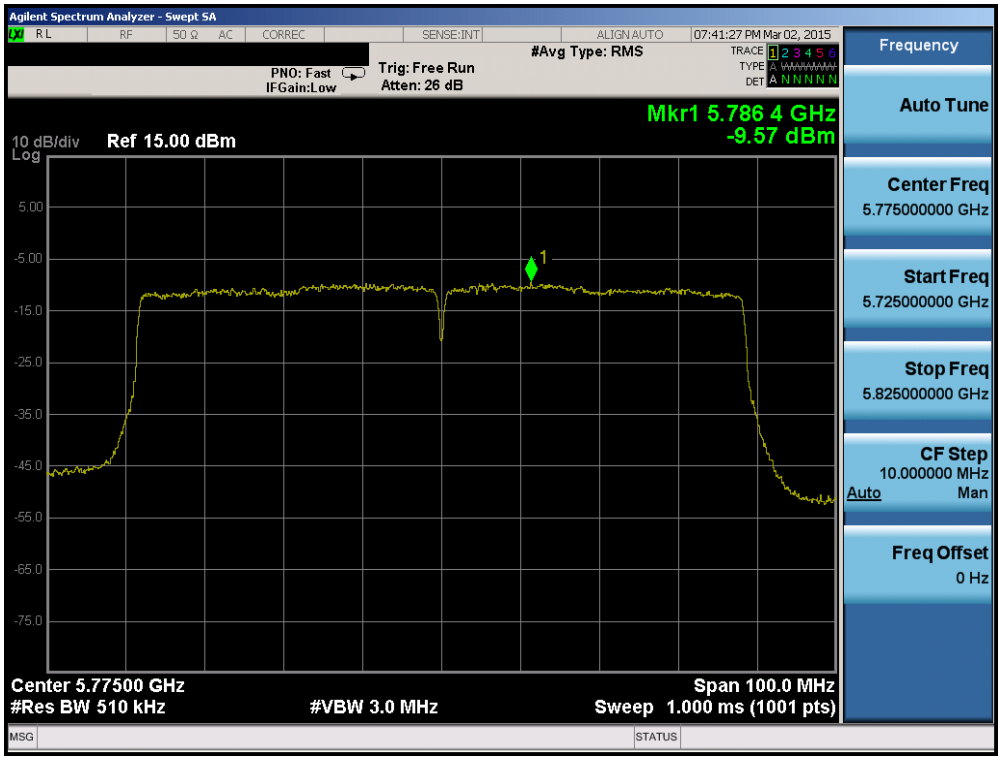
Plot 6-111. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 165)



Plot 6-112. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 3) – Ch. 151)



Plot 6-113. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 3) – Ch. 159)

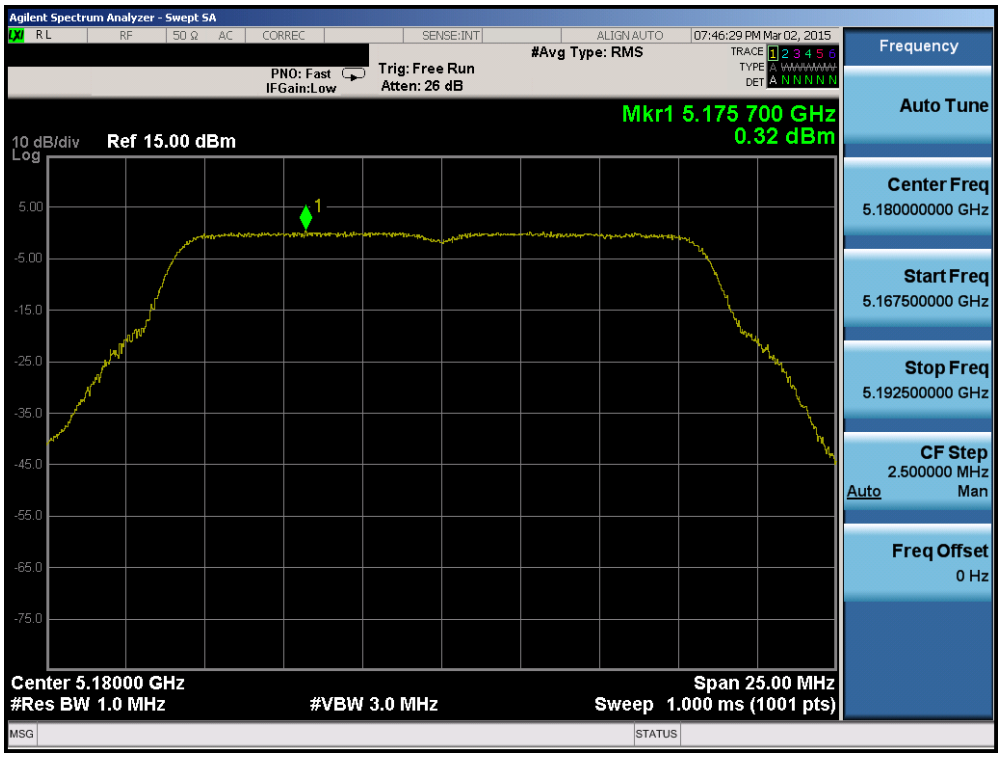


Plot 6-114. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 3) – Ch. 155)

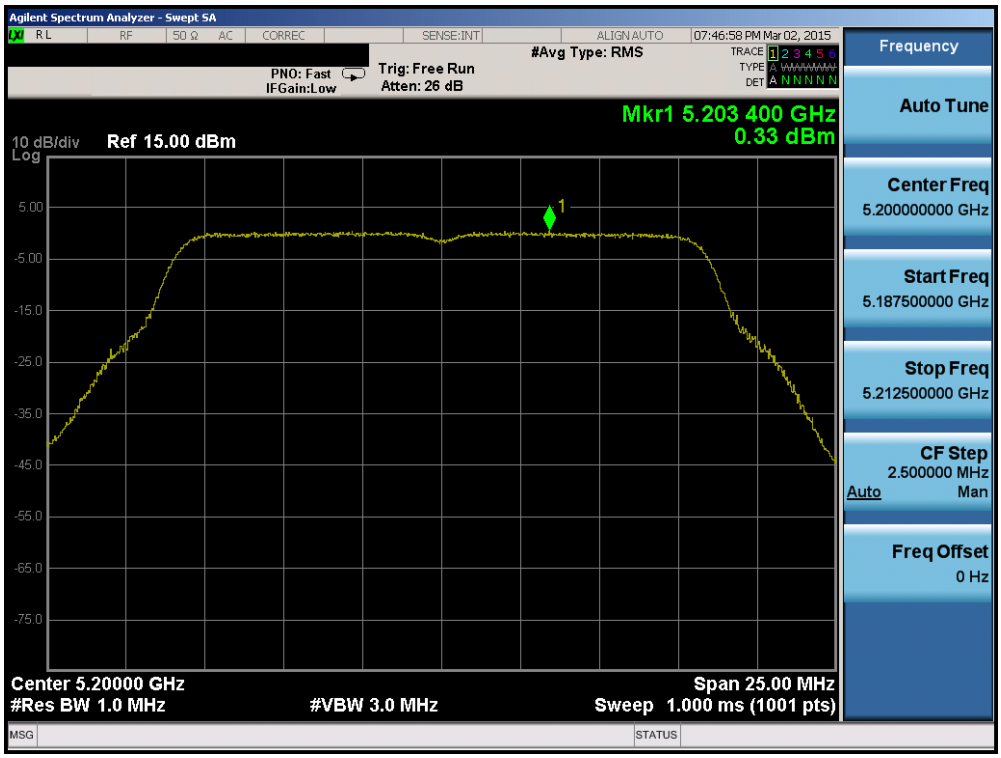
Antenna-2 Power Spectral Density Measurements

	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	11.0	-10.68	Pass
	5200	40	a	6	0.33	11.0	-10.67	Pass
	5240	48	a	6	0.33	11.0	-10.67	Pass
	5180	36	n (20MHz)	6.5/7.2 (MCS0)	-0.16	11.0	-11.16	Pass
	5200	40	n (20MHz)	6.5/7.2 (MCS0)	-0.18	11.0	-11.18	Pass
	5240	48	n (20MHz)	6.5/7.2 (MCS0)	0.02	11.0	-10.98	Pass
	5190	38	n (40MHz)	13.5/15 (MCS0)	-3.96	11.0	-14.96	Pass
	5230	46	n (40MHz)	13.5/15 (MCS0)	-3.71	11.0	-14.71	Pass
	5210	42	ac (80MHz)	29.3/32.5 (MCS0)	-6.92	11.0	-17.92	Pass
Band 2A	5260	52	a	6	0.38	11.0	-10.62	Pass
	5280	56	a	6	0.23	11.0	-10.77	Pass
	5320	64	a	6	-0.11	11.0	-11.11	Pass
	5260	52	n (20MHz)	6.5/7.2 (MCS0)	-0.07	11.0	-11.07	Pass
	5280	56	n (20MHz)	6.5/7.2 (MCS0)	-0.20	11.0	-11.20	Pass
	5320	64	n (20MHz)	6.5/7.2 (MCS0)	-0.57	11.0	-11.57	Pass
	5270	54	n (40MHz)	13.5/15 (MCS0)	-2.91	11.0	-13.91	Pass
	5310	62	n (40MHz)	13.5/15 (MCS0)	-3.19	11.0	-14.19	Pass
	5290	58	ac (80MHz)	29.3/32.5 (MCS0)	-6.95	11.0	-17.95	Pass
Band 2C	5500	100	a	6	0.39	11.0	-10.61	Pass
	5580	116	a	6	-0.01	11.0	-11.01	Pass
	5720	144	a	6	-0.12	11.0	-11.12	Pass
	5500	100	n (20MHz)	6.5/7.2 (MCS0)	-0.11	11.0	-11.11	Pass
	5580	116	n (20MHz)	6.5/7.2 (MCS0)	-0.39	11.0	-11.39	Pass
	5720	144	n (20MHz)	6.5/7.2 (MCS0)	-0.71	11.0	-11.71	Pass
	5510	102	n (40MHz)	13.5/15 (MCS0)	-3.11	11.0	-14.11	Pass
	5550	110	n (40MHz)	13.5/15 (MCS0)	-3.58	11.0	-14.58	Pass
	5710	142	n (40MHz)	13.5/15 (MCS0)	-2.71	11.0	-13.71	Pass
	5530	106	ac (80MHz)	29.3/32.5 (MCS0)	-7.97	11.0	-18.97	Pass
	5690	138	ac (80MHz)	29.3/32.5 (MCS0)	-7.05	11.0	-18.05	Pass

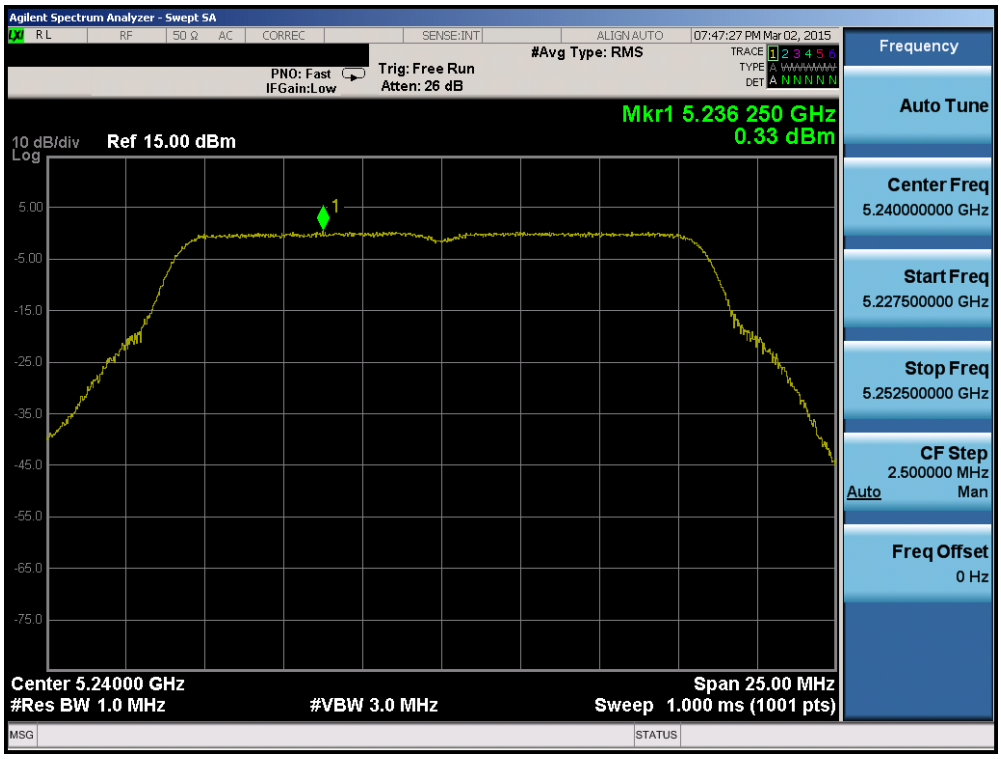
Table 6-19. Conducted Power Spectral Density Measurements



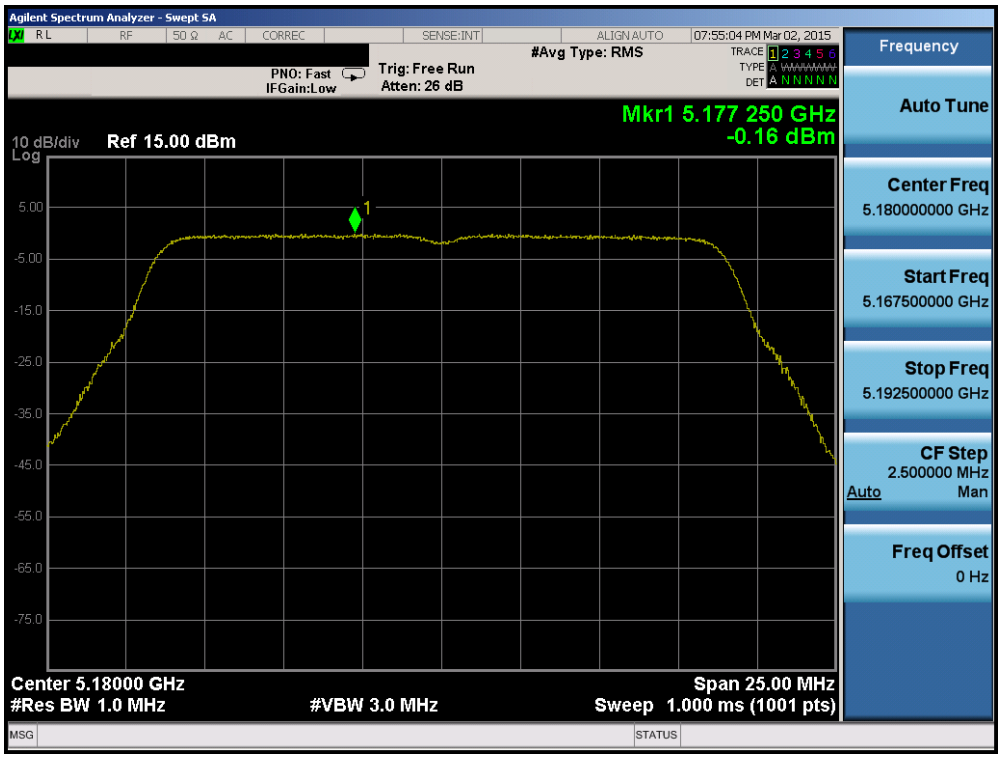
Plot 6-115. Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 36)



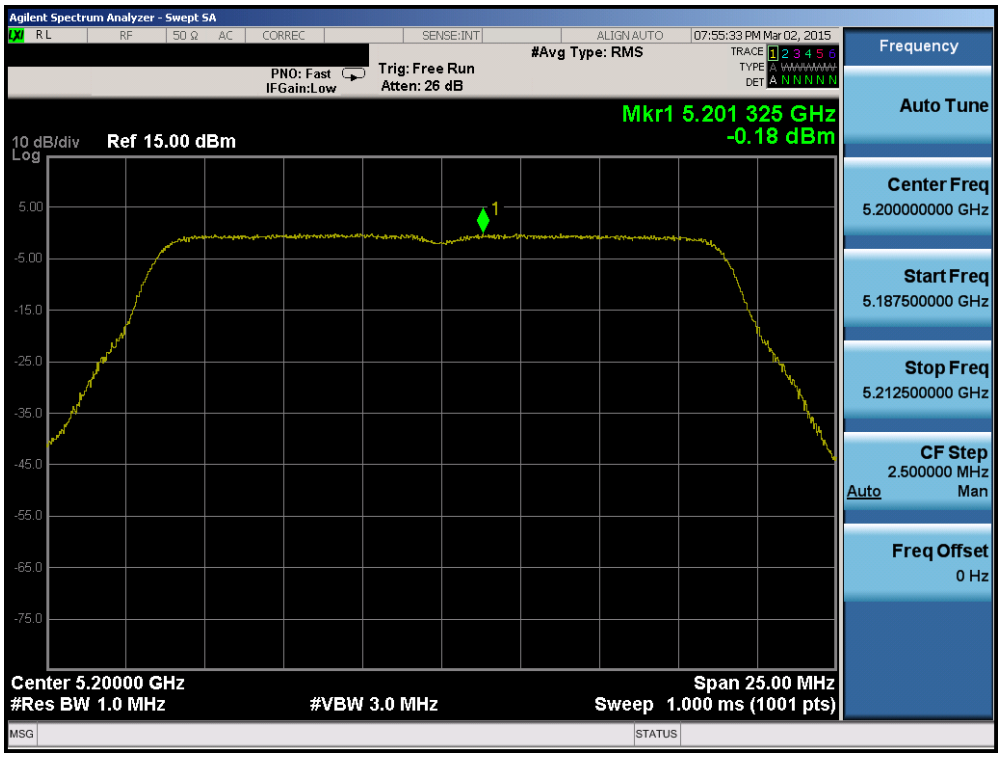
Plot 6-116. Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 40)



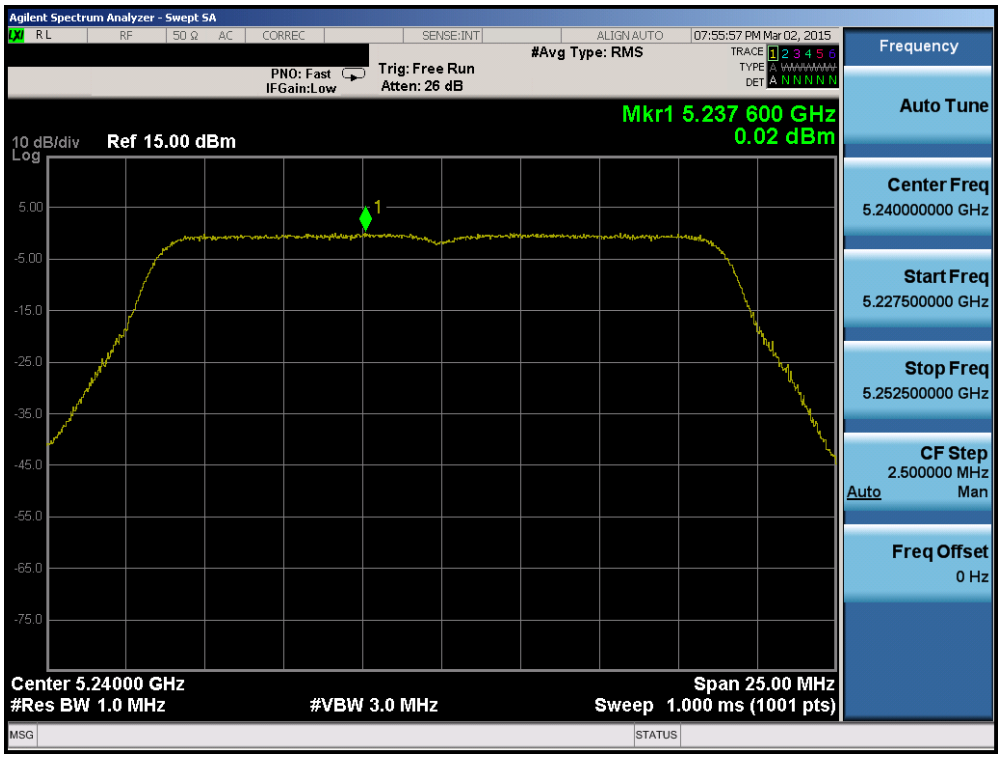
Plot 6-117. Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 48)



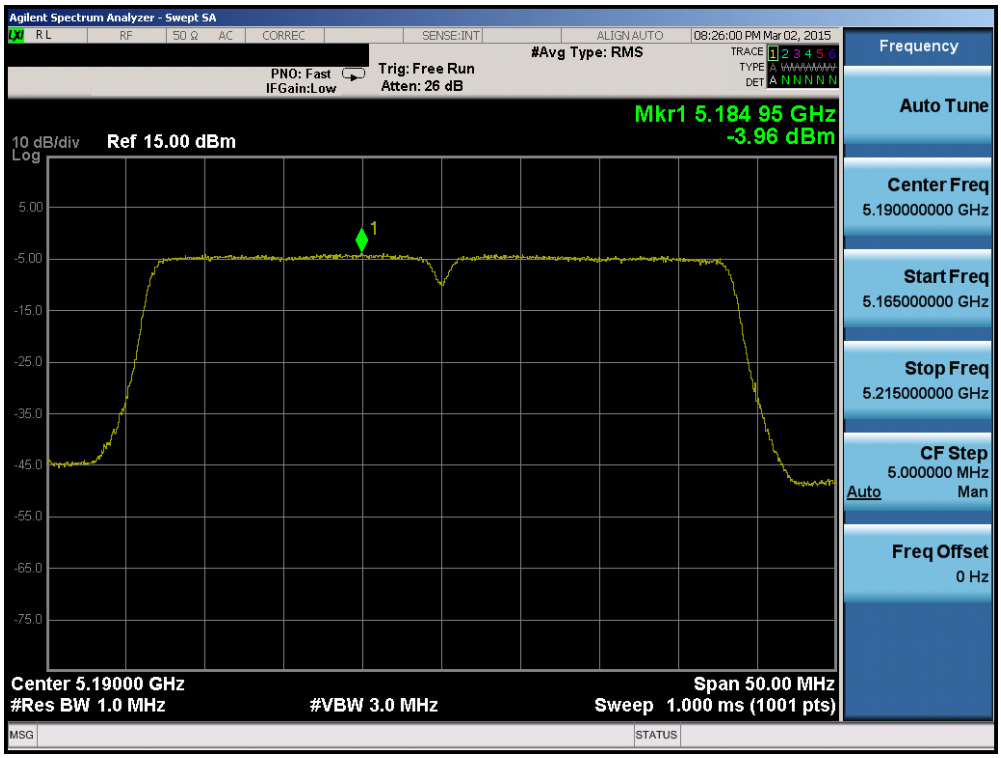
Plot 6-118. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 36)



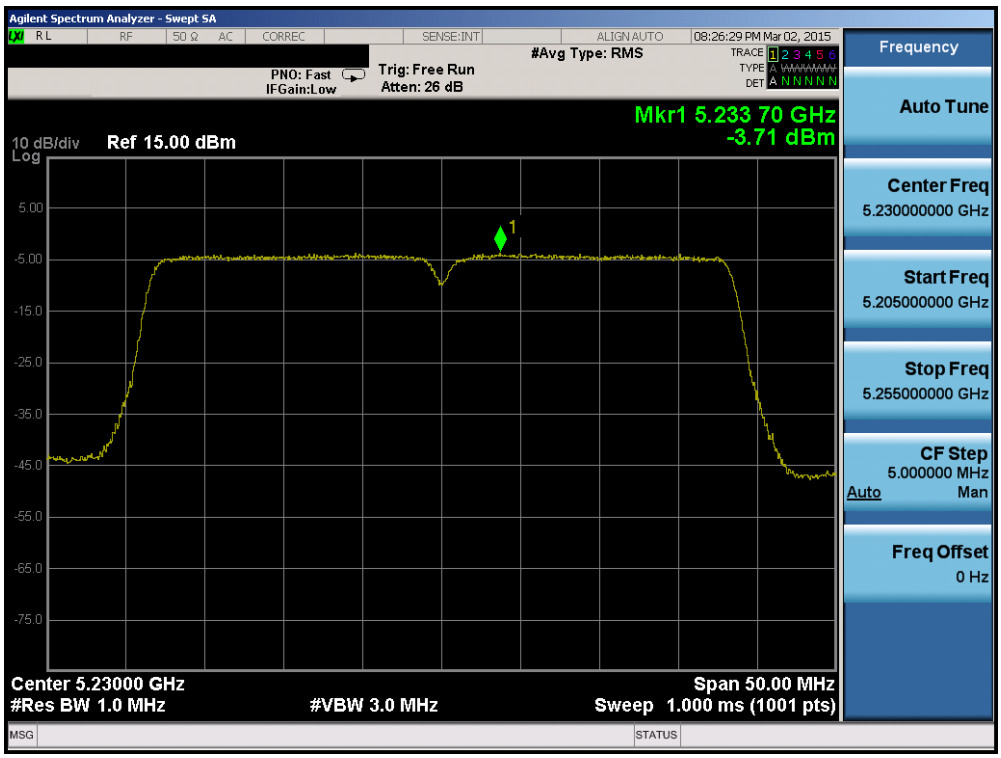
Plot 6-119. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 40)



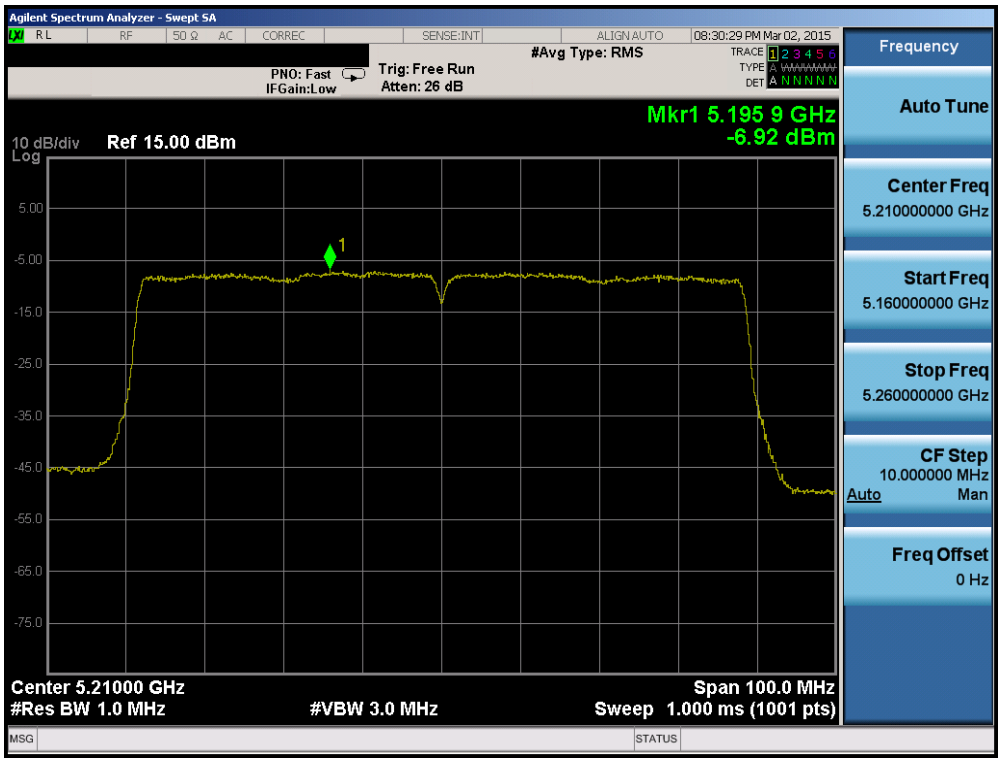
Plot 6-120. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 48)



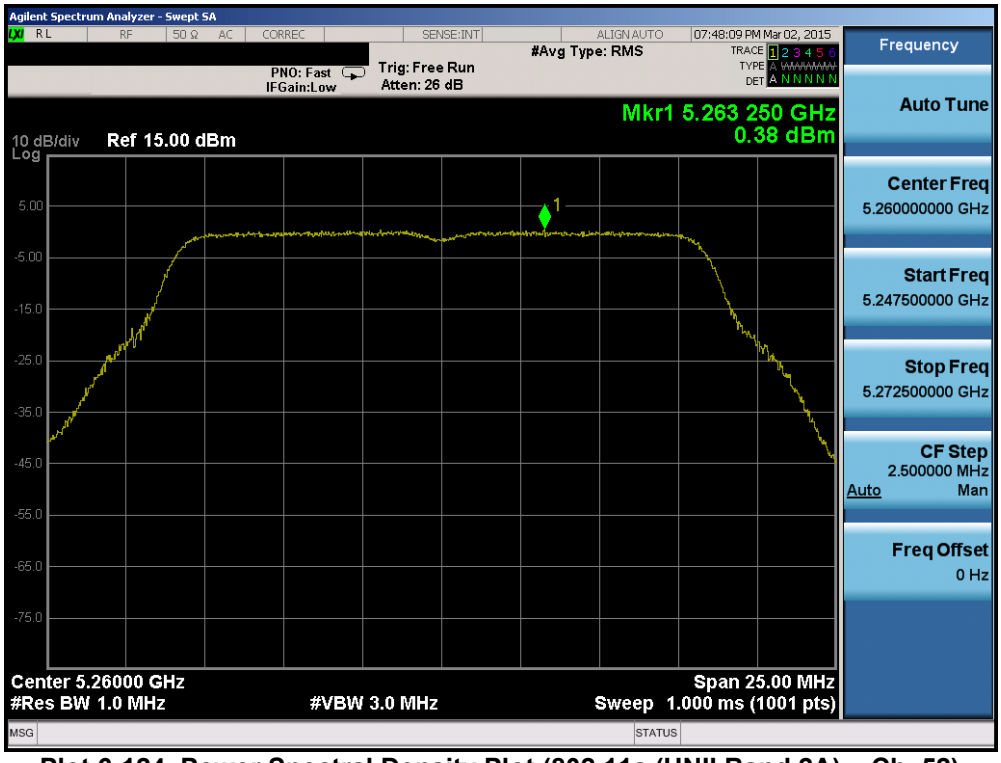
Plot 6-121. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 1) – Ch. 38)



Plot 6-122. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 1) – Ch. 46)

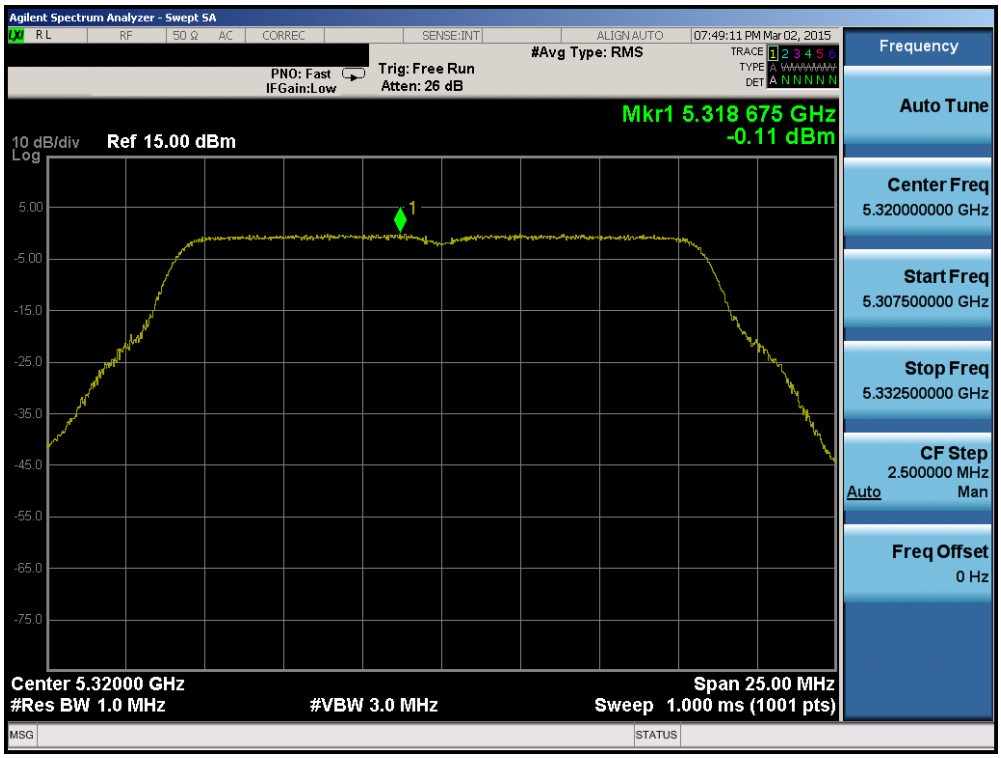


Plot 6-123. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 1) – Ch. 42)

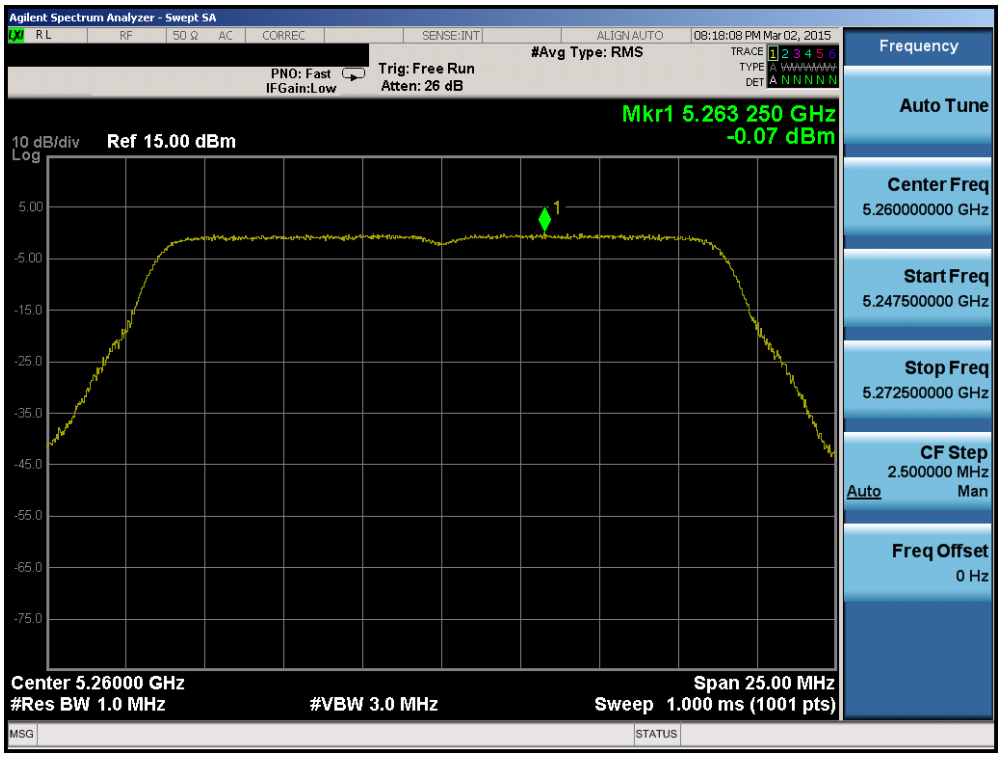


Plot 6-124. Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 52)

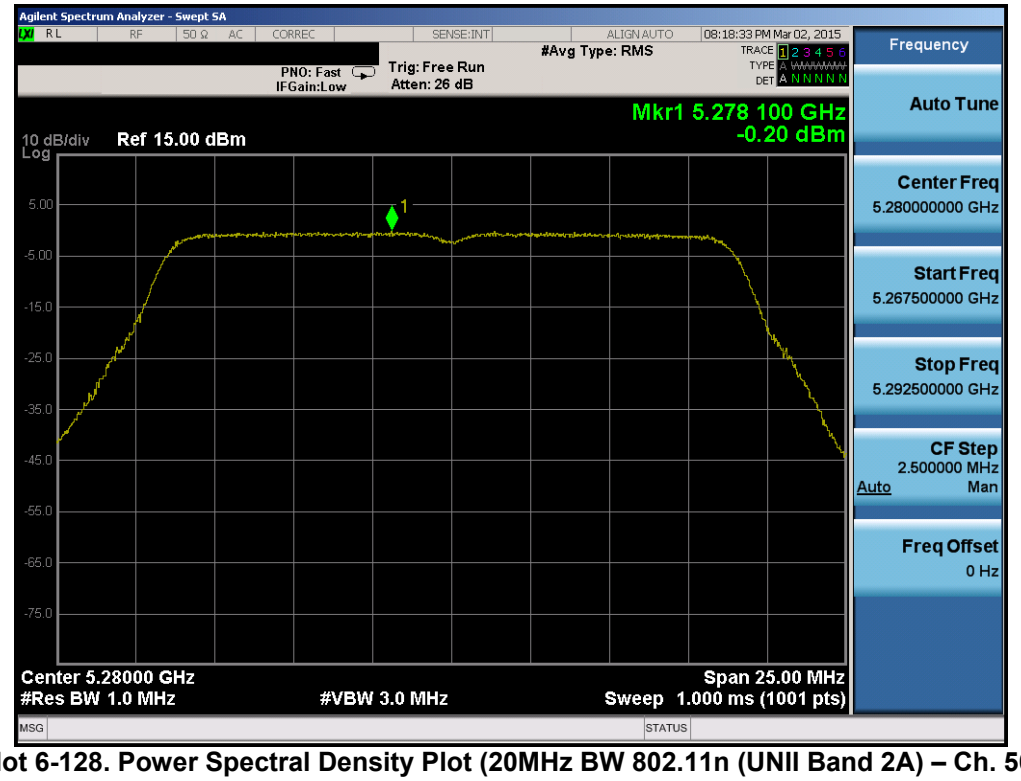
Plot 6-125. Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 56)



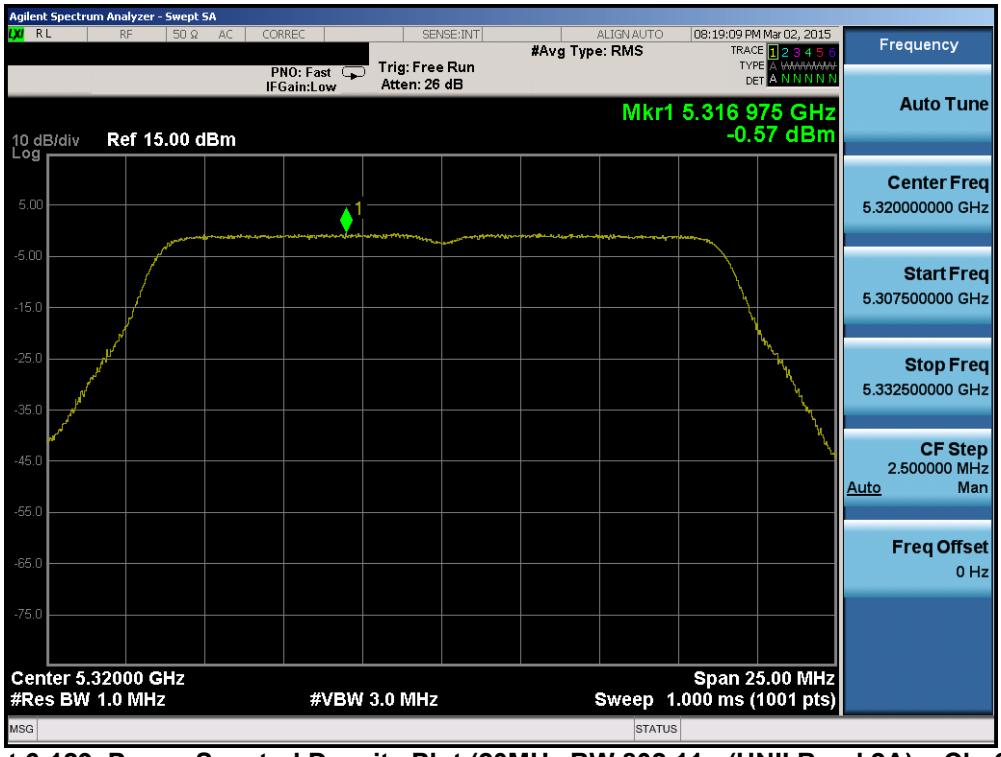
Plot 6-126. Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 64)



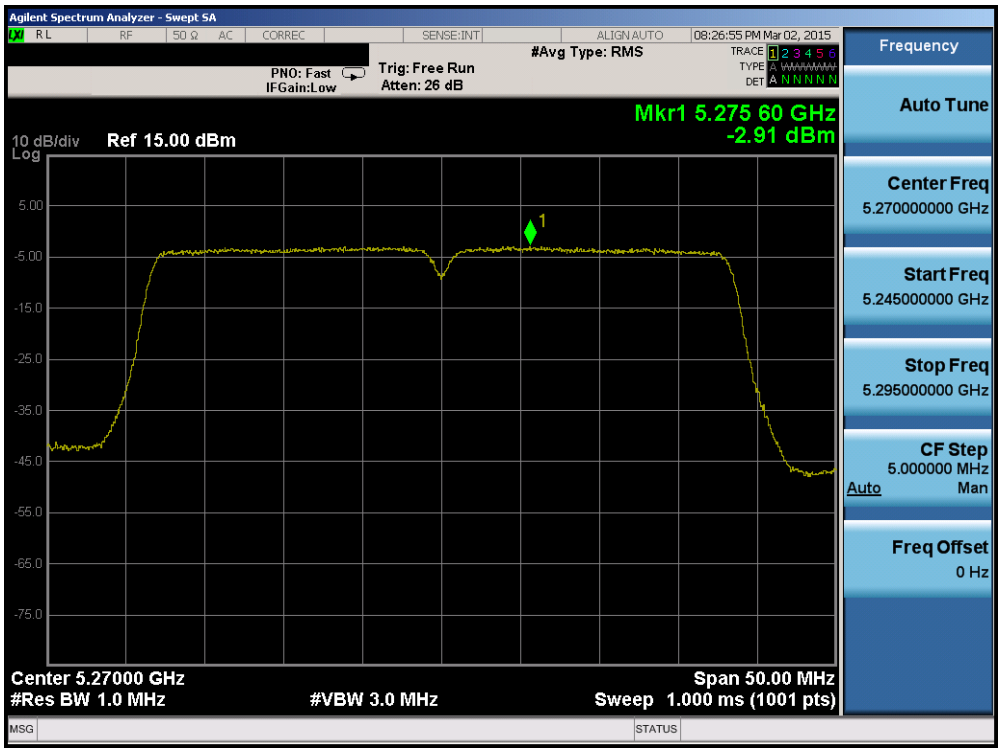
Plot 6-127. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 52)



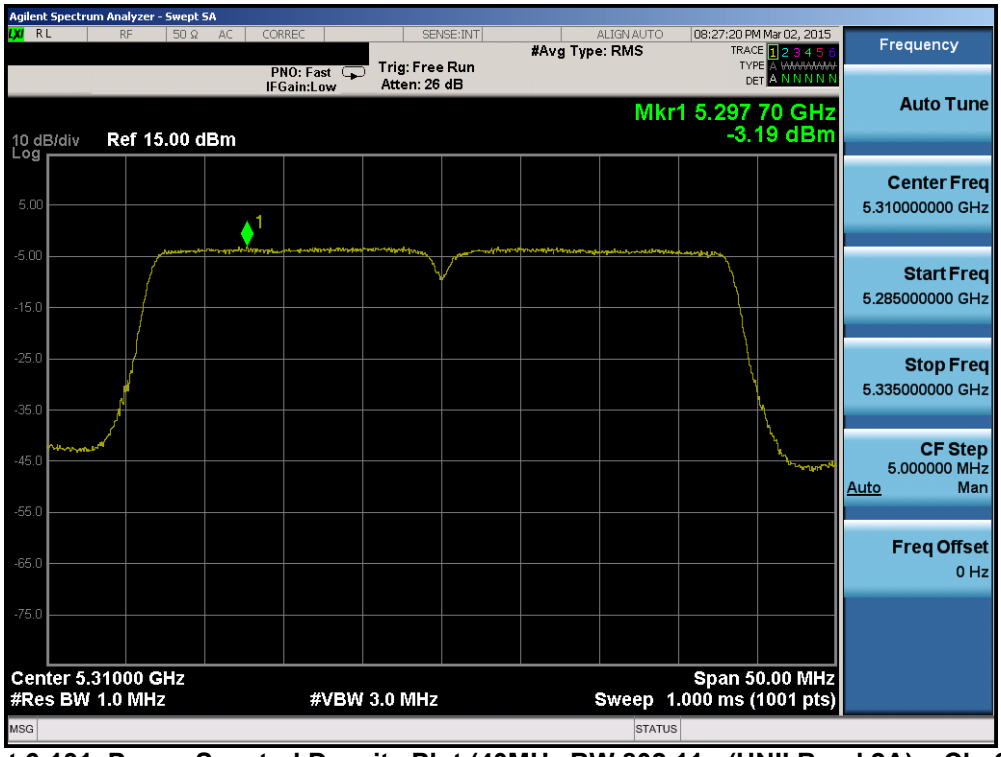
Plot 6-128. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 56)



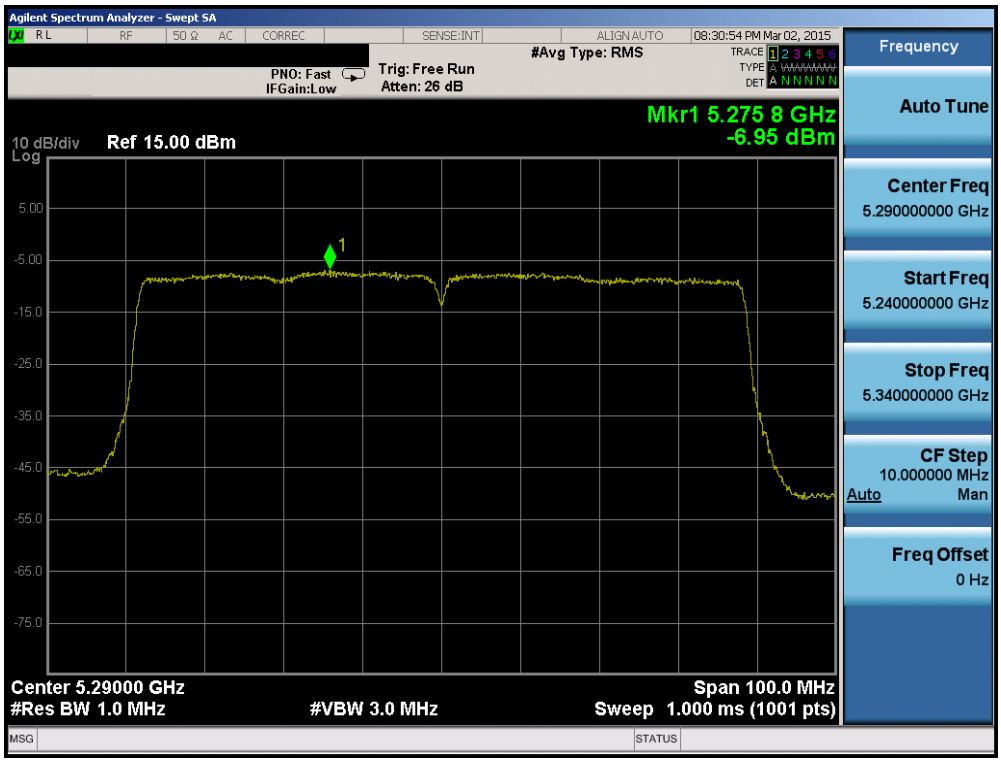
Plot 6-129. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 64)



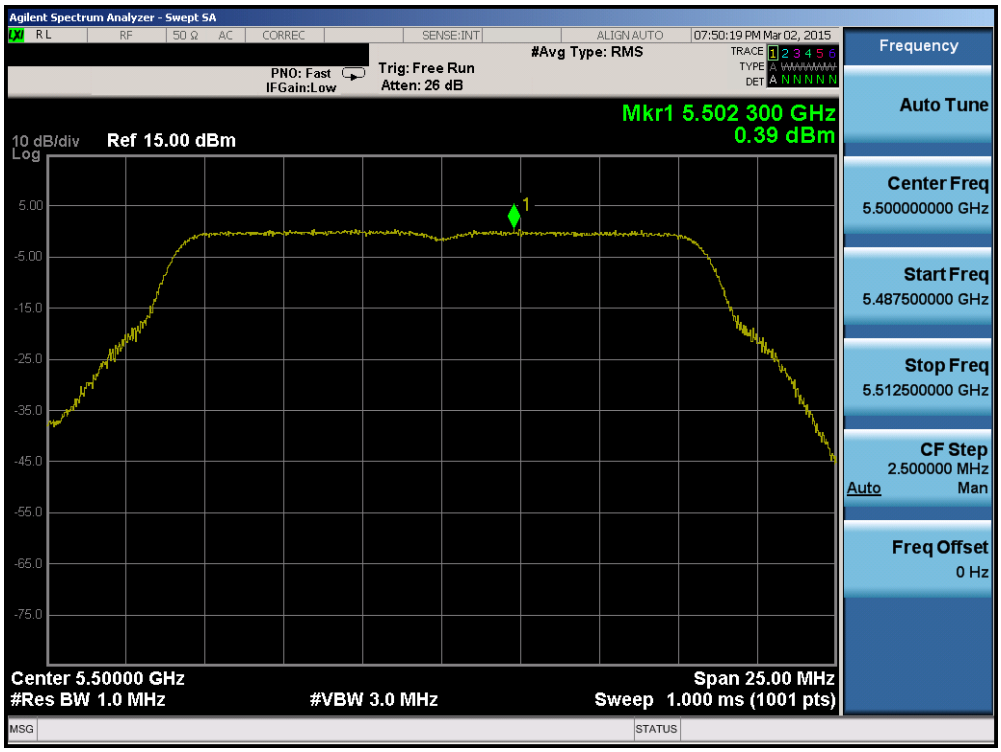
Plot 6-130. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2A) – Ch. 54)



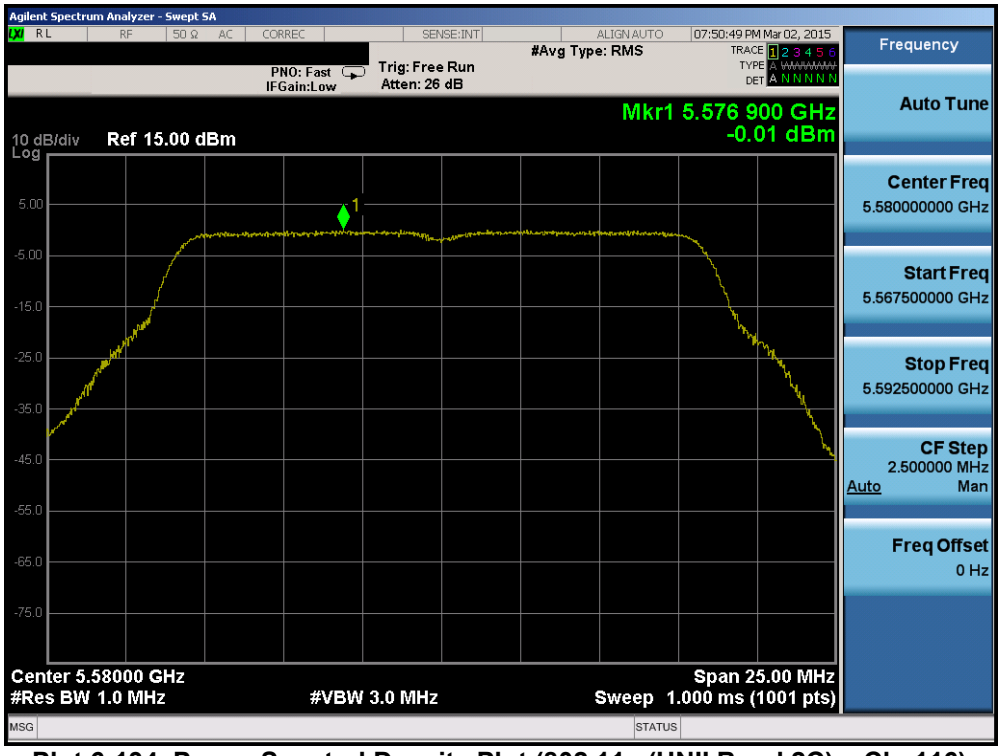
Plot 6-131. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2A) – Ch. 62)



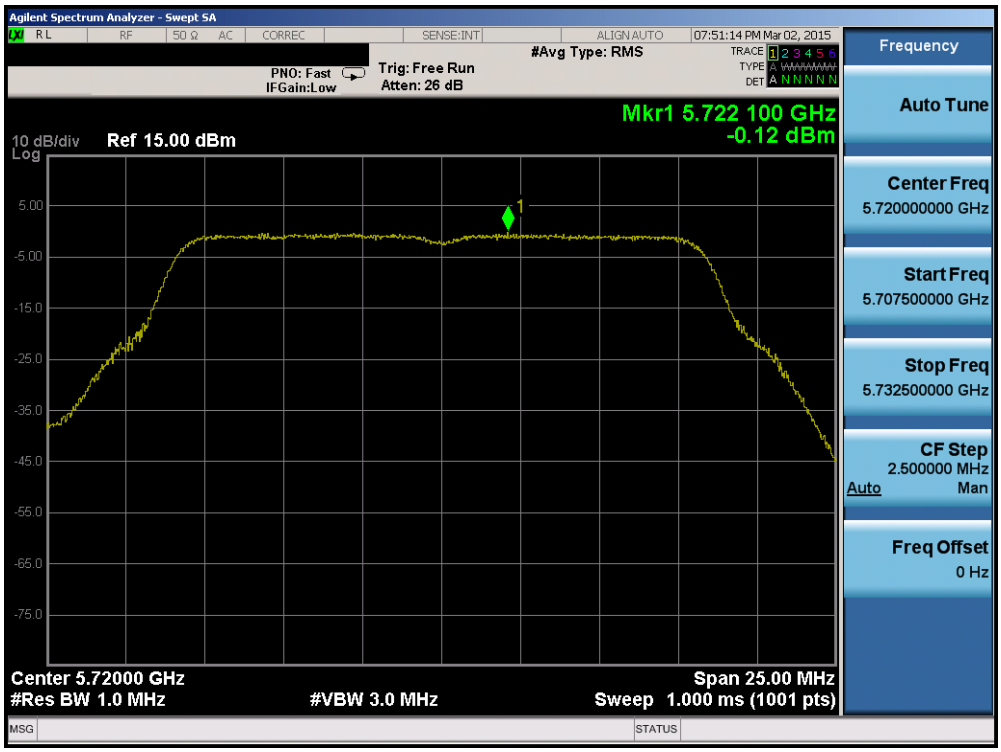
Plot 6-132. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2A) – Ch. 58)



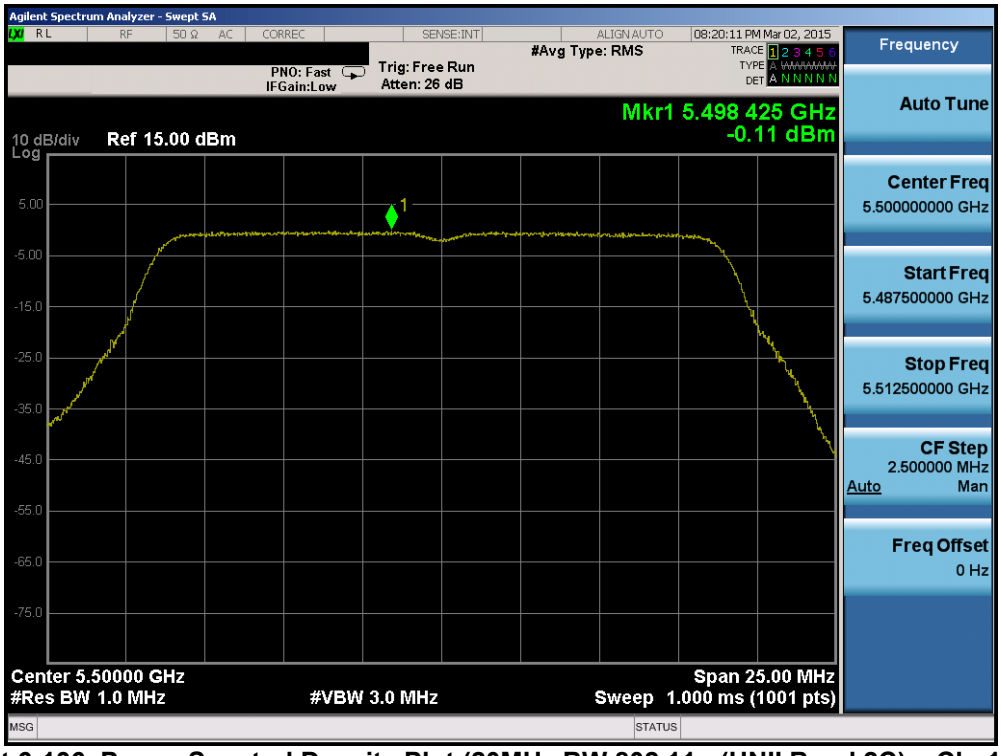
Plot 6-133. Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 100)



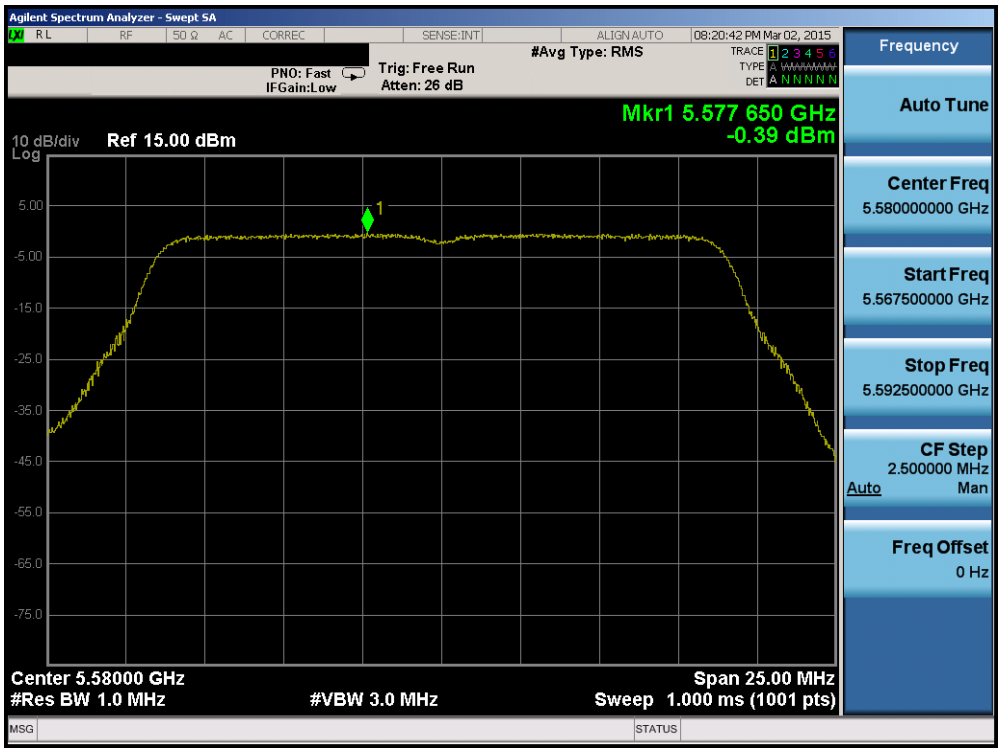
Plot 6-134. Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 116)



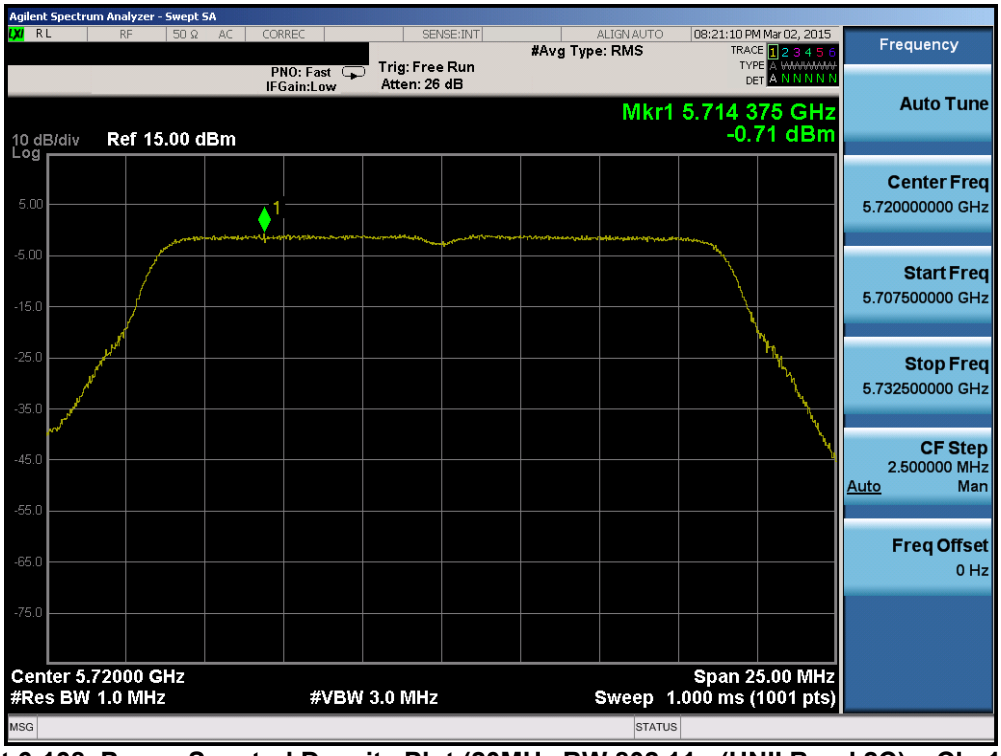
Plot 6-135. Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 144)



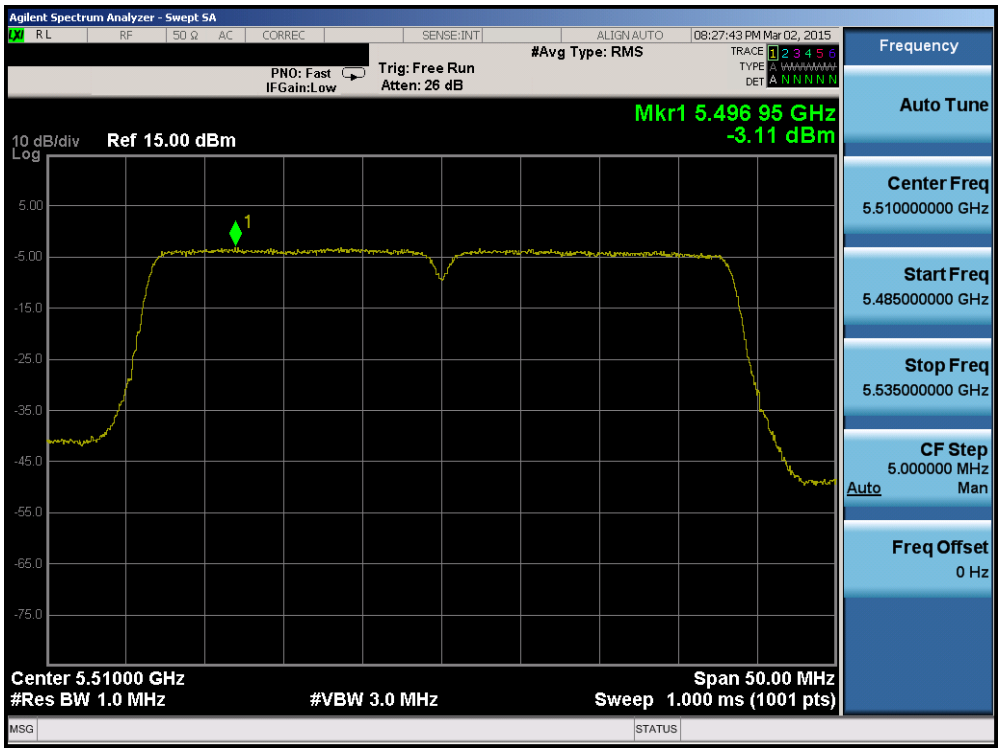
Plot 6-136. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 100)



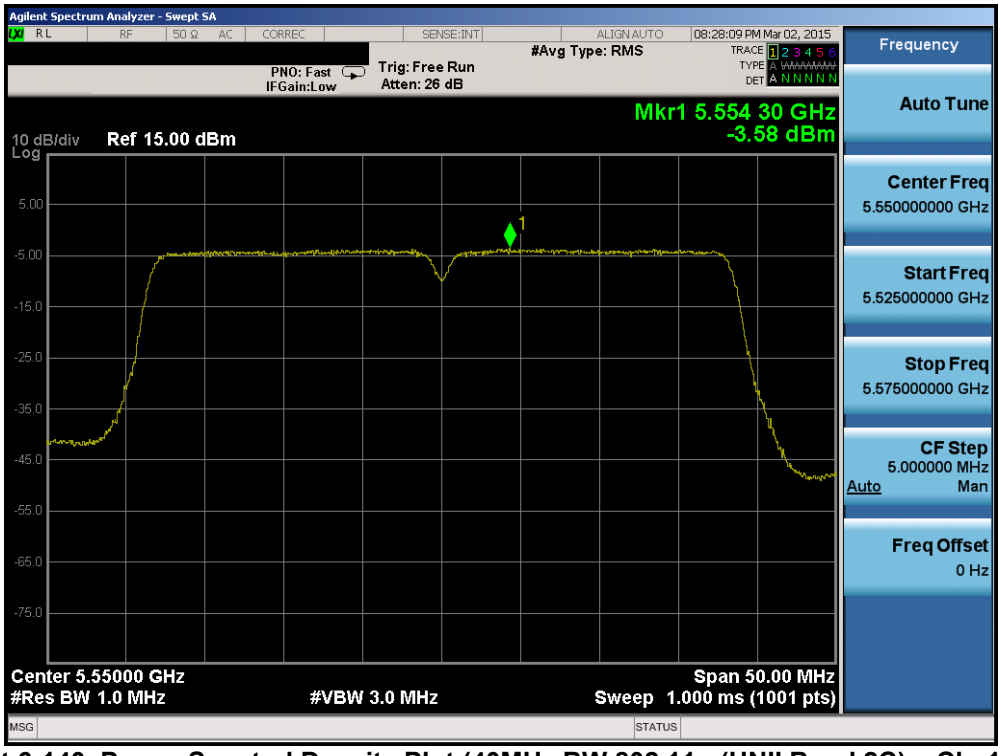
Plot 6-137. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 116)



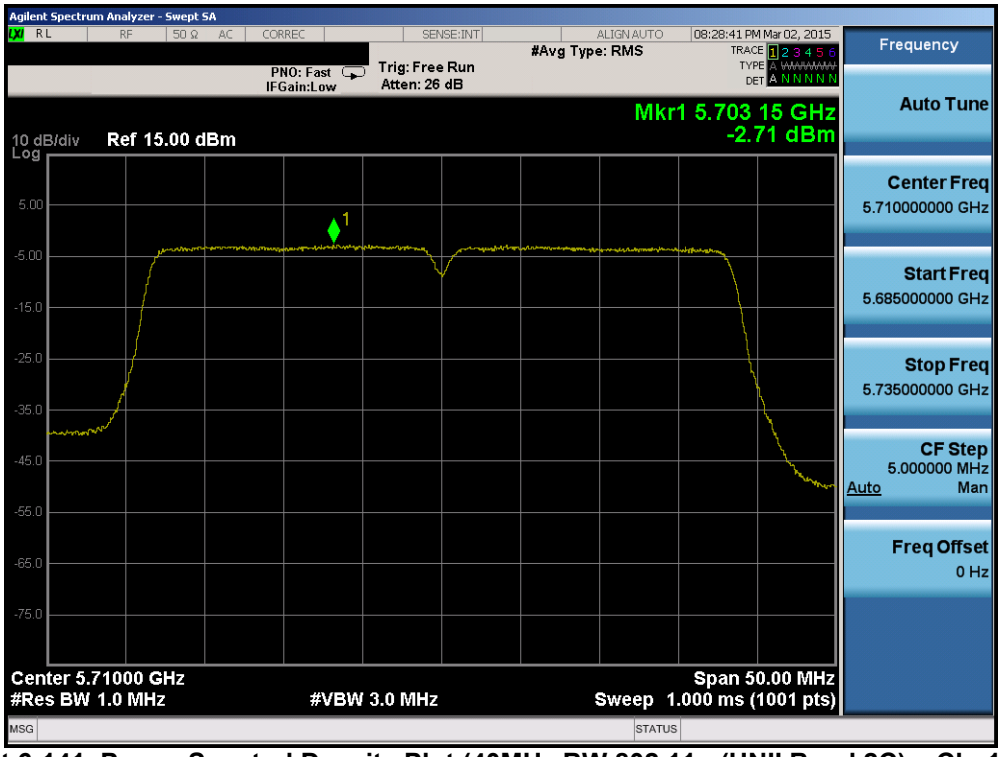
Plot 6-138. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 144)



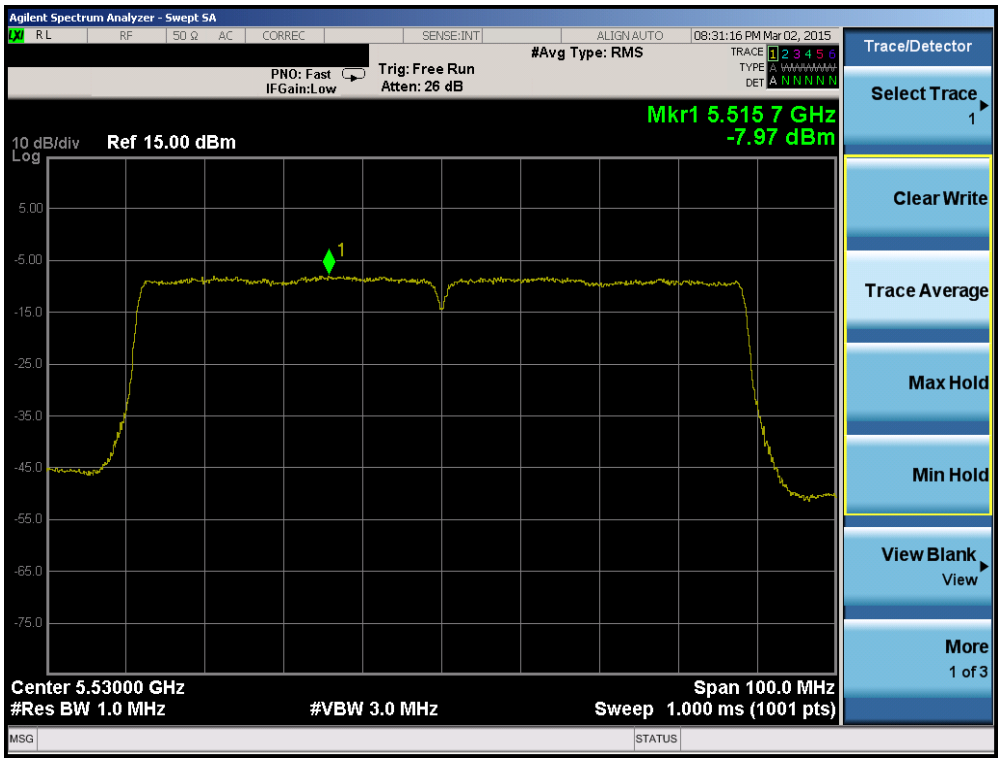
Plot 6-139. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 102)



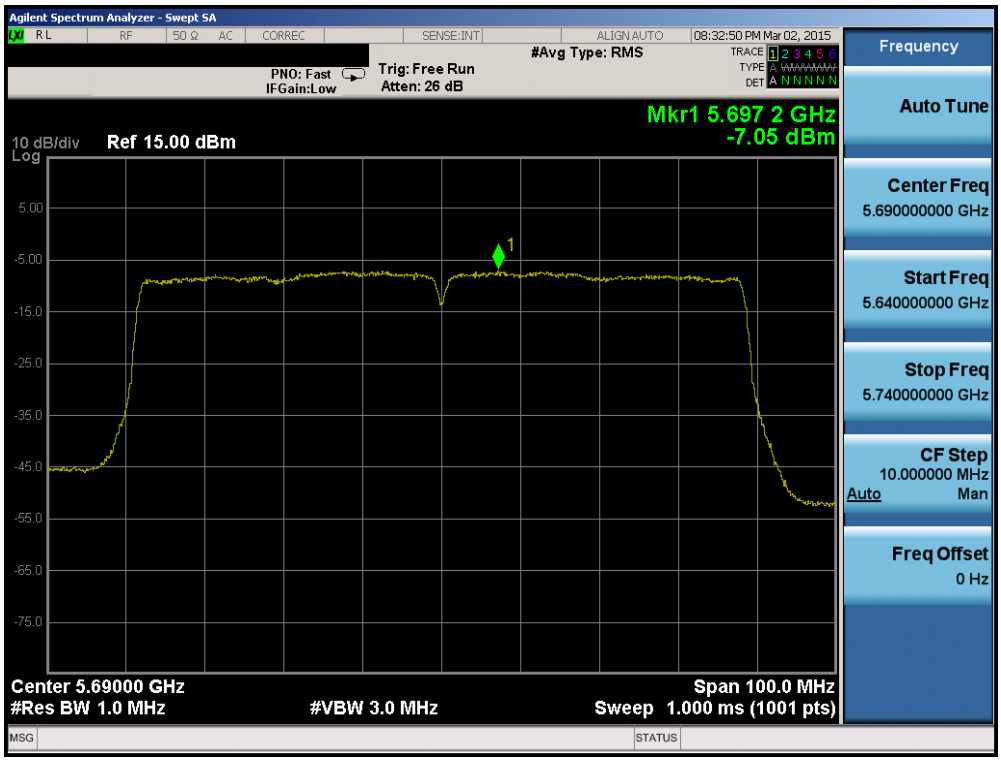
Plot 6-140. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 110)



Plot 6-141. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 142)



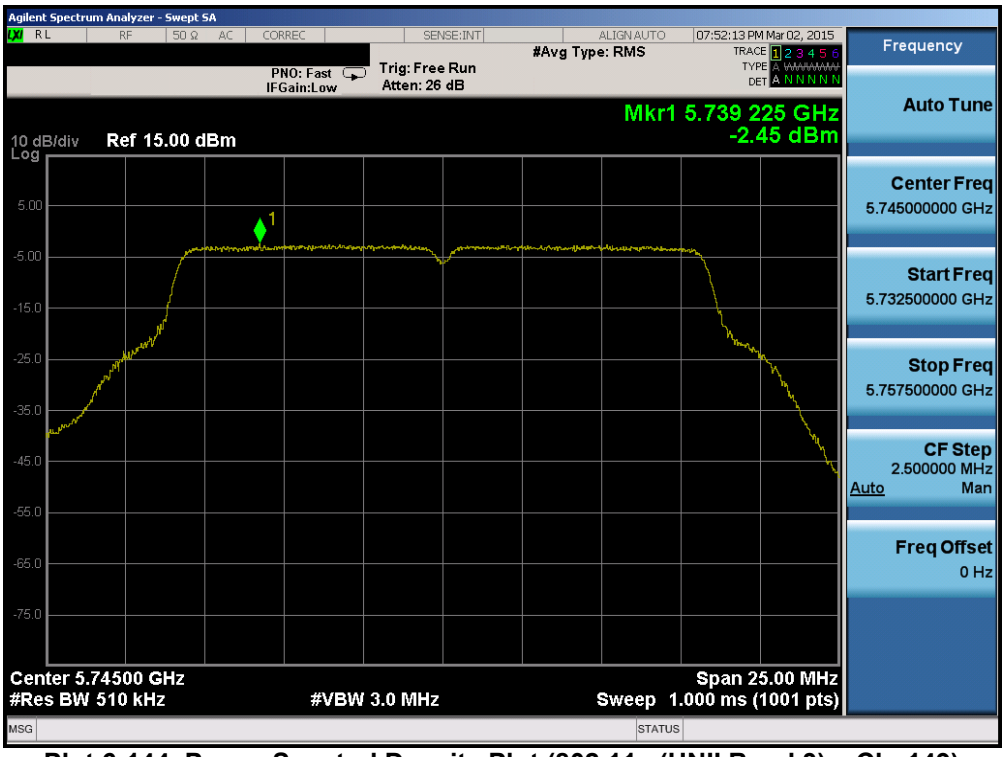
Plot 6-142. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2C) – Ch. 106)



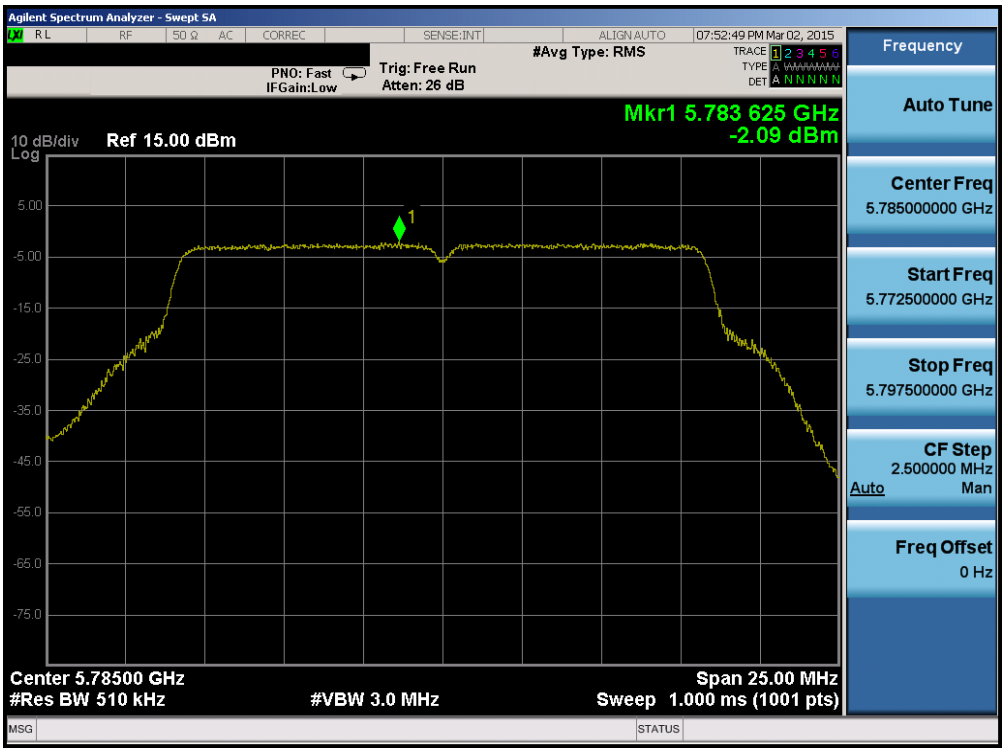
Plot 6-143. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2C) – Ch. 138)

	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured Power Density [dBm]	Max Permissible Power Density [dBm/500kHz]	Margin [dB]	Pass / Fail
Band 3	5745	149	a	6	-2.45	30.0	-32.45	Pass
	5785	157	a	6	-2.09	30.0	-32.09	Pass
	5825	165	a	6	-2.17	30.0	-32.17	Pass
	5745	149	n (20MHz)	6.5/7.2 (MCS0)	-2.67	30.0	-32.67	Pass
	5785	157	n (20MHz)	6.5/7.2 (MCS0)	-2.62	30.0	-32.62	Pass
	5825	165	n (20MHz)	6.5/7.2 (MCS0)	-2.75	30.0	-32.75	Pass
	5755	151	n (40MHz)	13.5/15 (MCS0)	-5.75	30.0	-35.75	Pass
	5795	159	n (40MHz)	13.5/15 (MCS0)	-5.49	30.0	-35.49	Pass
	5775	155	ac (80MHz)	29.3/32.5 (MCS0)	-9.61	30.0	-39.61	Pass

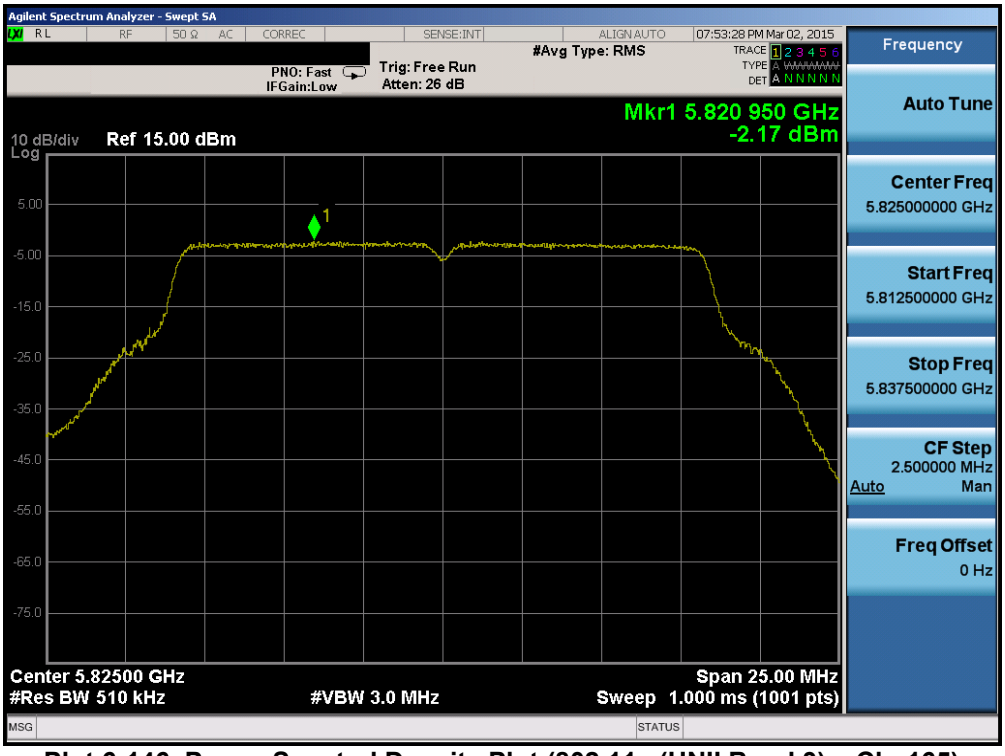
Table 6-20. Band 3 Conducted Power Spectral Density Measurements



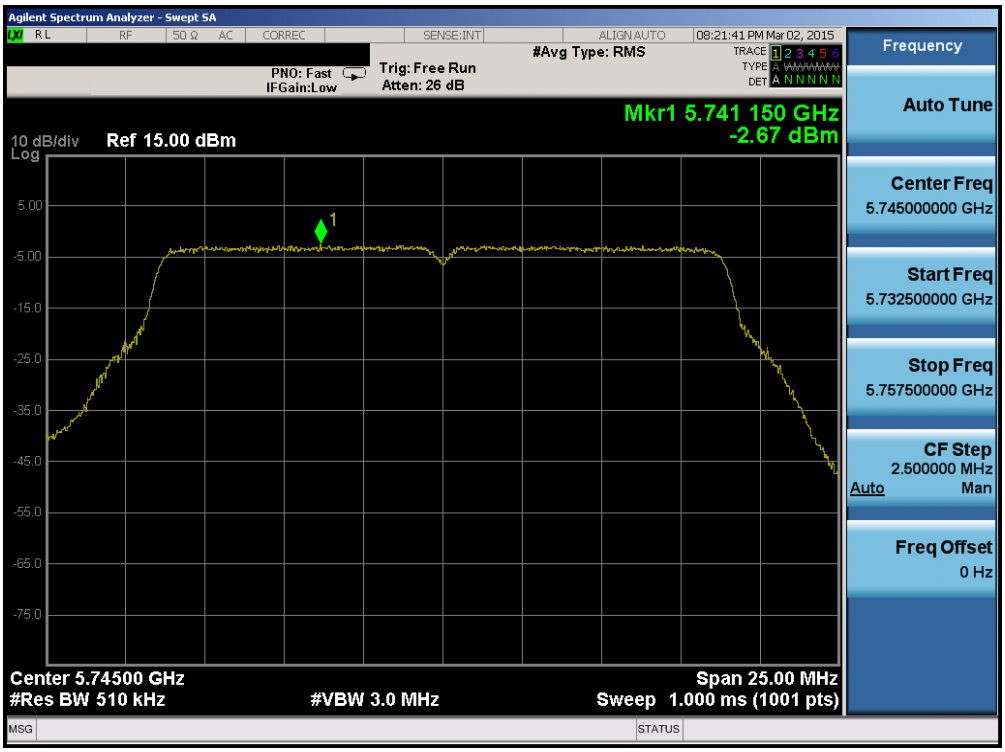
Plot 6-144. Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 149)



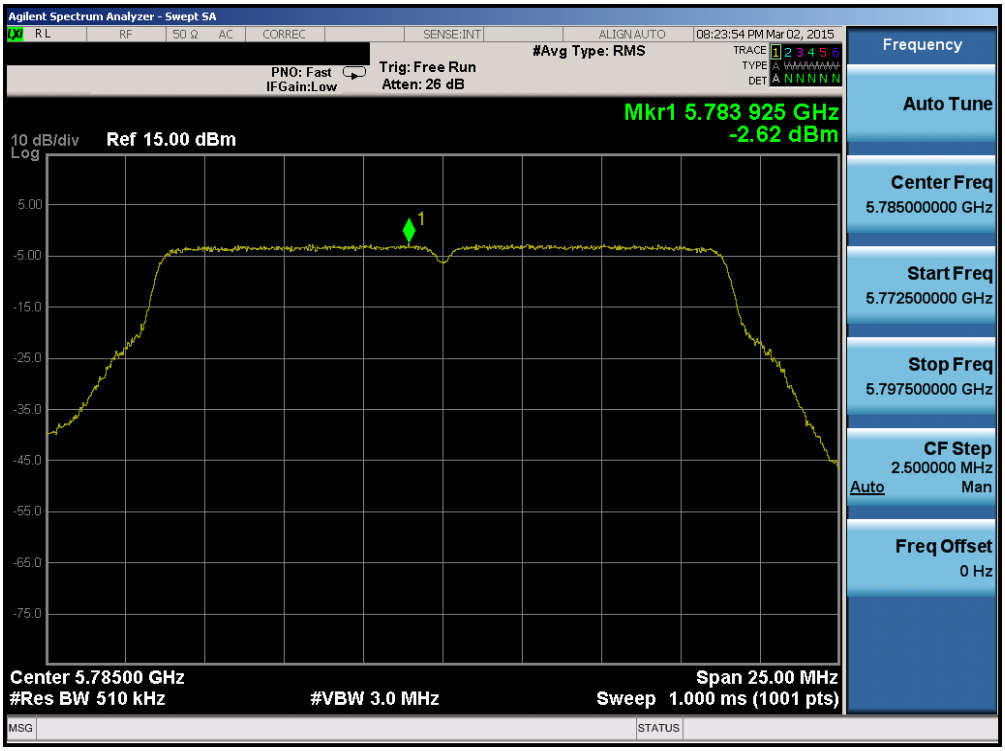
Plot 6-145. Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 157)



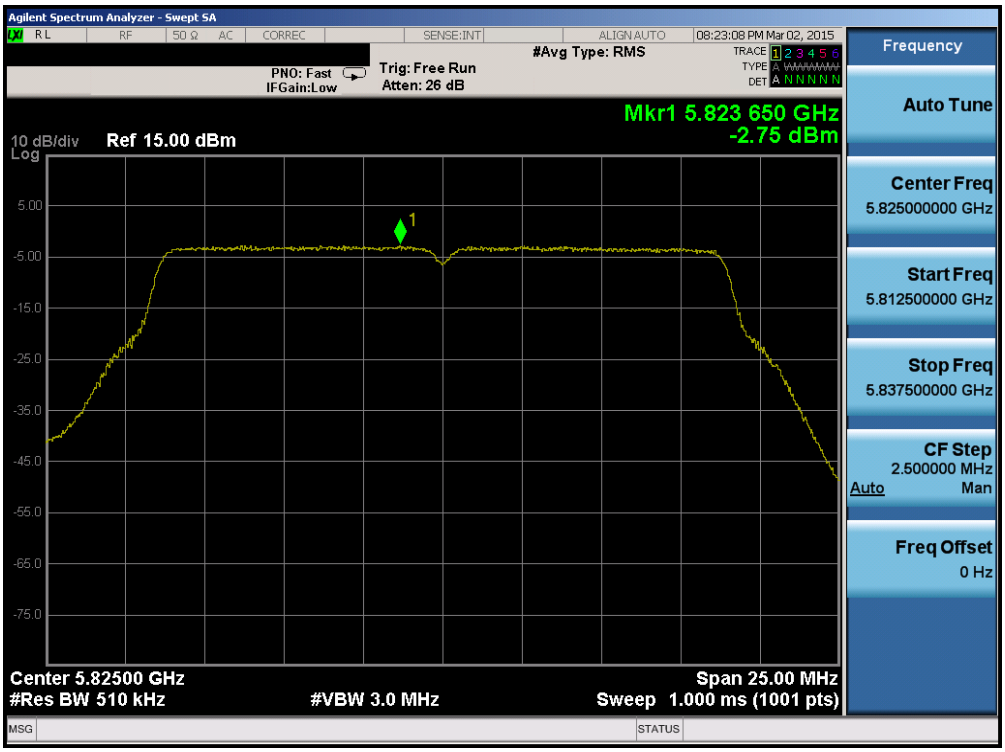
Plot 6-146. Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 165)



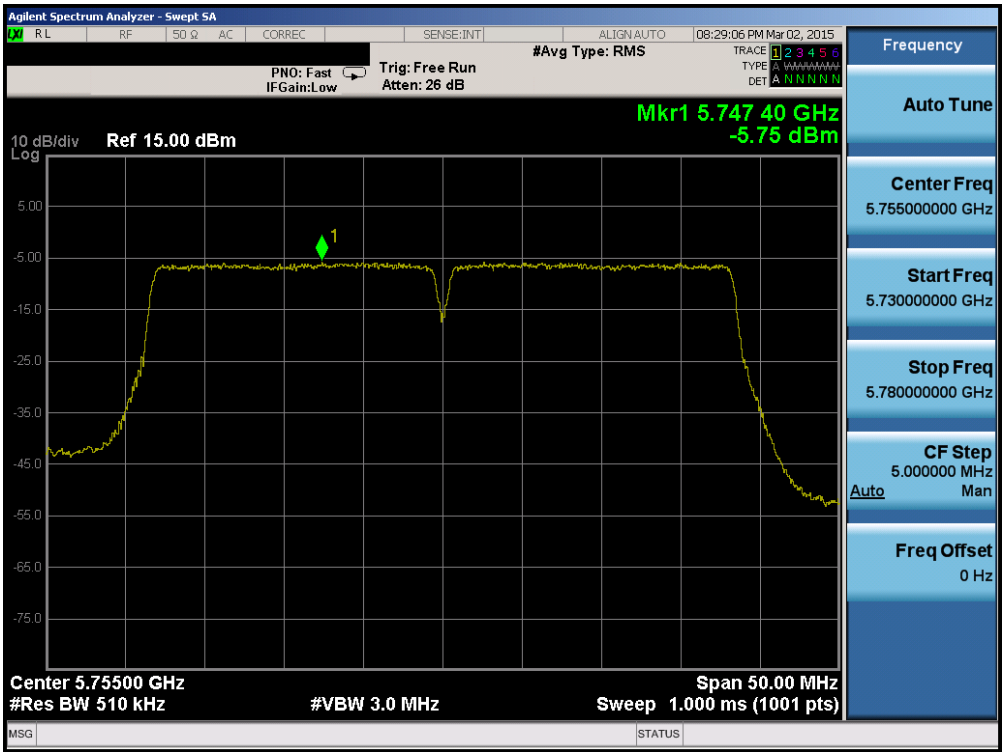
Plot 6-147. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 149)



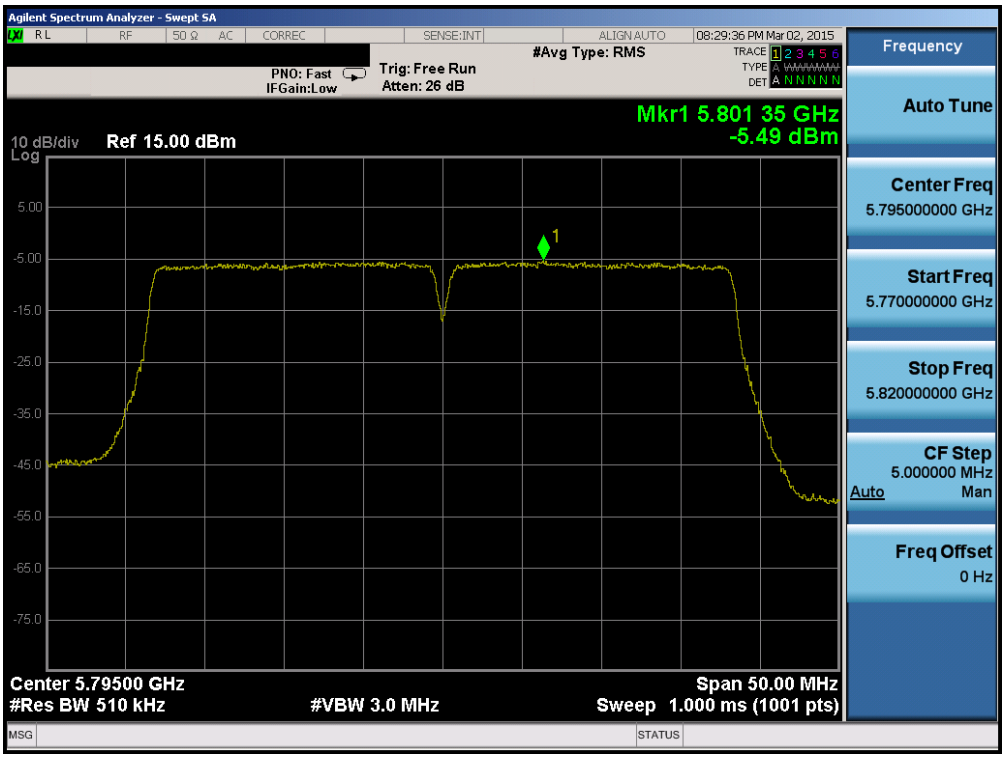
Plot 6-148. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 157)



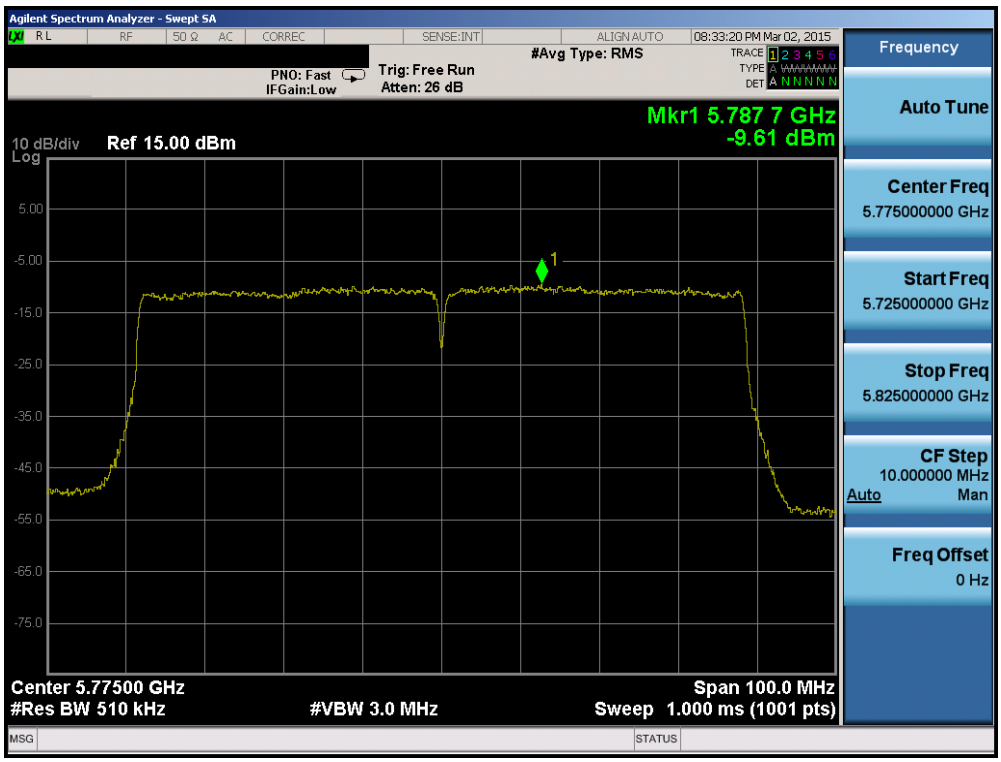
Plot 6-149. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 165)



Plot 6-150. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 3) – Ch. 151)



Plot 6-151. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 3) – Ch. 159)



Plot 6-152. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 3) – Ch. 155)

Summed MIMO Power Spectral Density Measurements

	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Antenn-1 Power Density [dBm]	Antenn-2 Power Density [dBm]	Summed MIMO Power Density [dBm]	Max Permissible Power Density [dBm/MHz]	Margin [dB]	Pass / Fail
Band 1	5180	36	n (20MHz)	6.5/7.2 (MCS0)	-0.85	-0.16	2.52	11.0	-8.48	Pass
	5200	40	n (20MHz)	6.5/7.2 (MCS0)	-0.80	-0.18	2.53	11.0	-8.47	Pass
	5240	48	n (20MHz)	6.5/7.2 (MCS0)	-0.75	0.02	2.66	11.0	-8.34	Pass
	5190	38	n (40MHz)	13.5/15 (MCS0)	-4.36	-3.96	-1.15	11.0	-12.15	Pass
	5230	46	n (40MHz)	13.5/15 (MCS0)	-4.08	-3.71	-0.88	11.0	-11.88	Pass
	5210	42	ac (80MHz)	29.3/32.5 (MCS0)	-7.08	-6.92	-3.99	11.0	-14.99	Pass
Band 2A	5260	52	n (20MHz)	6.5/7.2 (MCS0)	-0.39	-0.07	2.79	11.0	-8.21	Pass
	5280	56	n (20MHz)	6.5/7.2 (MCS0)	-1.07	-0.20	2.40	11.0	-8.60	Pass
	5320	64	n (20MHz)	6.5/7.2 (MCS0)	-0.92	-0.57	2.27	11.0	-8.73	Pass
	5270	54	n (40MHz)	13.5/15 (MCS0)	-3.10	-2.92	0.01	11.0	-10.99	Pass
	5310	62	n (40MHz)	13.5/15 (MCS0)	-3.47	-3.19	-0.32	11.0	-11.32	Pass
	5290	58	ac (80MHz)	29.3/32.5 (MCS0)	-7.53	-6.95	-4.22	11.0	-15.22	Pass
Band 2C	5500	100	n (20MHz)	6.5/7.2 (MCS0)	-0.90	-0.12	2.52	11.0	-8.48	Pass
	5580	116	n (20MHz)	6.5/7.2 (MCS0)	-1.19	-0.39	2.24	11.0	-8.76	Pass
	5720	144	n (20MHz)	6.5/7.2 (MCS0)	-0.34	-0.71	2.49	11.0	-8.51	Pass
	5510	102	n (40MHz)	13.5/15 (MCS0)	-4.46	-3.11	-0.72	11.0	-11.72	Pass
	5550	110	n (40MHz)	13.5/15 (MCS0)	-4.28	-3.58	-0.91	11.0	-11.91	Pass
	5710	142	n (40MHz)	13.5/15 (MCS0)	-4.33	-2.71	-0.44	11.0	-11.44	Pass
	5530	106	ac (80MHz)	29.3/32.5 (MCS0)	-6.75	-7.97	-4.31	11.0	-15.31	Pass
	5690	138	ac (80MHz)	29.3/32.5 (MCS0)	-7.34	-7.05	-4.18	11.0	-15.18	Pass

Table 6-21. Bands 1, 2A, 2C MIMO Conducted Power Spectral Density Measurements

	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Antenn-1 Power Density [dBm]	Antenn-2 Power Density [dBm]	Summed MIMO Power Density [dBm]	Max Permissible Power Density [dBm/500kHz]	Margin [dB]	Pass / Fail
Band 3	5745	149	n (20MHz)	6.5/7.2 (MCS0)	-2.99	-2.67	0.19	30.0	-29.81	Pass
	5785	157	n (20MHz)	6.5/7.2 (MCS0)	-2.16	-2.62	0.63	30.0	-29.37	Pass
	5825	165	n (20MHz)	6.5/7.2 (MCS0)	-3.20	-2.75	0.05	30.0	-29.95	Pass
	5755	151	n (40MHz)	13.5/15 (MCS0)	-6.94	-5.75	-3.29	30.0	-33.29	Pass
	5795	159	n (40MHz)	13.5/15 (MCS0)	-6.89	-5.49	-3.12	30.0	-33.12	Pass
	5775	155	ac (80MHz)	29.3/32.5 (MCS0)	-9.57	-9.61	-6.58	30.0	-36.58	Pass

Table 6-22. Band 3 MIMO Conducted Power Spectral Density Measurements

Note:

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

Sample MIMO Calculation:

At 5180MHz the average conducted power spectral density was measured to be -0.85 dBm for Antenna-1 and -0.16 dBm for Antenna-2.

Antenna 1 + Antenna 2 = MIMO

(-0.85 dBm + -0.16 dBm) = (0.82 mW + 0.96 mW) = 1.79 mW = 2.52 dBm

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)	5,180,000,140	140	0.00000270
100 %		- 30	5,180,000,208	208	0.00000402
100 %		- 20	5,180,000,041	41	0.00000079
100 %		- 10	5,179,999,923	-77	-0.00000149
100 %		0	5,179,999,763	-237	-0.00000458
100 %		+ 10	5,179,999,888	-112	-0.00000216
100 %		+ 20	5,179,999,784	-216	-0.00000417
100 %		+ 30	5,179,999,807	-193	-0.00000373
100 %		+ 40	5,179,999,933	-67	-0.00000129
100 %		+ 50	5,179,999,925	-75	-0.00000145
BATT. ENDPOINT	3.45	+ 20	5,180,000,151	151	0.00000292

Table 6-23. Frequency Stability Measurements for UNII Band 1 (Ch. 36)

Note:

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

Frequency Stability
§15.407(g)

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

OPERATING FREQUENCY:	5,260,000,000	Hz
CHANNEL:	52	
REFERENCE VOLTAGE:	3.85	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	5,259,999,922	-78	-0.00000148
100 %		- 30	5,259,999,989	-11	-0.00000021
100 %		- 20	5,259,999,809	-191	-0.00000363
100 %		- 10	5,259,999,923	-77	-0.00000146
100 %		0	5,259,999,864	-136	-0.00000259
100 %		+ 10	5,260,000,000	0	0.00000000
100 %		+ 20	5,259,999,957	-43	-0.00000082
100 %		+ 30	5,260,000,134	134	0.00000255
100 %		+ 40	5,259,999,970	-30	-0.00000057
100 %		+ 50	5,260,000,379	379	0.00000721
BATT. ENDPOINT	3.45	+ 20	5,260,000,213	213	0.00000405

Table 6-24. Frequency Stability Measurements for UNII Band 2A (Ch. 52)

Note:

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

Frequency Stability
§15.407(g)

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

OPERATING FREQUENCY:	5,500,000,000	Hz
CHANNEL:	100	
REFERENCE VOLTAGE:	3.85	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	5,499,999,945	-55	-0.00000100
100 %		- 30	5,500,000,165	165	0.00000300
100 %		- 20	5,500,000,057	57	0.00000104
100 %		- 10	5,500,000,251	251	0.00000456
100 %		0	5,500,000,114	114	0.00000207
100 %		+ 10	5,500,000,195	195	0.00000355
100 %		+ 20	5,499,999,834	-166	-0.00000302
100 %		+ 30	5,500,000,160	160	0.00000291
100 %		+ 40	5,499,999,979	-21	-0.00000038
100 %		+ 50	5,499,999,552	-448	-0.00000815
BATT. ENDPOINT	3.45	+ 20	5,500,000,308	308	0.00000560

Table 6-25. Frequency Stability Measurements for UNII Band 2C (Ch. 100)

Note:

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

Frequency Stability
§15.407(g)

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

OPERATING FREQUENCY:	5,745,000,000	Hz
CHANNEL:	149	
REFERENCE VOLTAGE:	3.85	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	5,745,000,217	217	0.00000378
100 %		- 30	5,744,999,749	-251	-0.00000437
100 %		- 20	5,745,000,066	66	0.00000115
100 %		- 10	5,745,000,172	172	0.00000299
100 %		0	5,745,000,231	231	0.00000402
100 %		+ 10	5,745,000,016	16	0.00000028
100 %		+ 20	5,745,000,005	5	0.00000009
100 %		+ 30	5,744,999,832	-168	-0.00000292
100 %		+ 40	5,745,000,296	296	0.00000515
100 %		+ 50	5,745,000,274	274	0.00000477
BATT. ENDPOINT	3.45	+ 20	5,744,999,879	-121	-0.00000211

Table 6-26. Frequency Stability Measurements for UNII Band 3 (Ch. 149)

Note:

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

6.7 Radiated Spurious Emission Measurements – Above 1GHz

§15.407(b.1)(b.6) §15.205 §15.209

Test Overview and Limit

All out of band radiated spurious emissions are measured with a spectrum analyzer connected to a receive antenna while the EUT is operating at its maximum duty cycle, at its maximum power control level, as defined in KDB 789033 D02 v01, and at the appropriate frequencies. All channels, modes (e.g. 802.11a, 802.11n (20MHz BW), 802.11n (40MHz BW), and 802.11ac (80MHz)), and modulations/data rates were investigated among all UNII bands. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Table 6-27 per Section 15.209.

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

Table 6-27. Radiated Limits

Test Procedures Used

KDB 789033 D02 v01 – Section G

Test Settings

Average Measurements above 1GHz (Method AD)

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

Peak Measurements above 1GHz

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

Peak Measurements below 1GHz

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

Test Setup

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

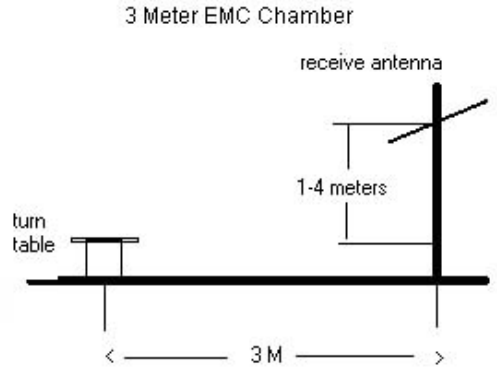


Figure 6-5. Test Instrument & Measurement Setup

Test Notes

1. All radiated spurious emissions levels were measured in a radiated test setup per the guidance of KDB 789033 D02 v01 Section H.
2. All emissions that lie in the restricted bands (denoted by a * next to the frequency) specified in §15.205 are below the limit shown in Table 6-27.
3. All spurious emissions lying in restricted bands specified in §15.205 are below the limit shown in Table 6-11. All spurious emissions that do not lie in a restricted band are subject to a peak limit of -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a "conversion" factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions of 68.2dBμV/m.
4. The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
5. This unit was tested with its standard battery.

6. The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter using CISPR quasi peak detector below 1GHz. Above 1 GHz, average and peak measurements were taken using linearly polarized horn antennas. The worst-case emissions are reported however emissions whose levels were not within 20dB of the respective limits were not reported.
7. Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.
8. Radiated spurious emissions were investigated while operating in MIMO mode, however, it was determined that single antenna operation produced the worst case emissions. Since the emissions produced from MIMO operation were found to be more than 20dB below the limit, the MIMO emissions are not reported.
9. The wide spectrum spurious emissions plots shown on the following pages are used only for the purpose of emission identification. Any emissions found to be within 20dB of the limit are fully investigated and the results are shown in this section. Rohde & Schwarz EMC32, Version 9.15.00 automated test software was used to perform the Radiated Spurious Emissions Pre-Scan testing.

Sample Calculations

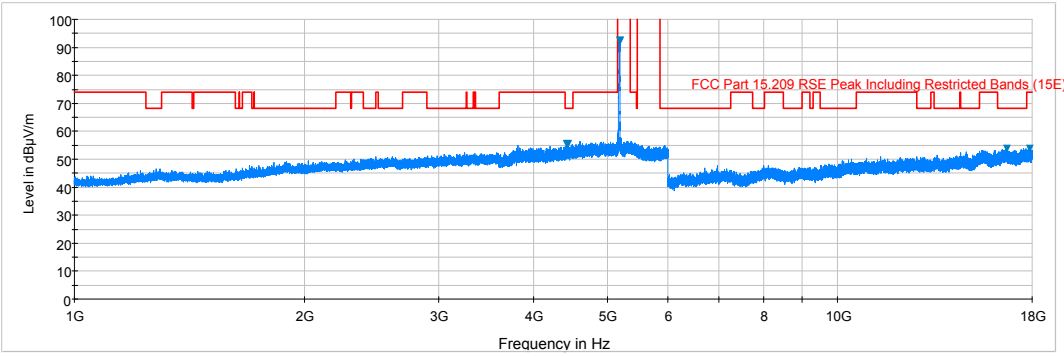
Determining Spurious Emissions Levels

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

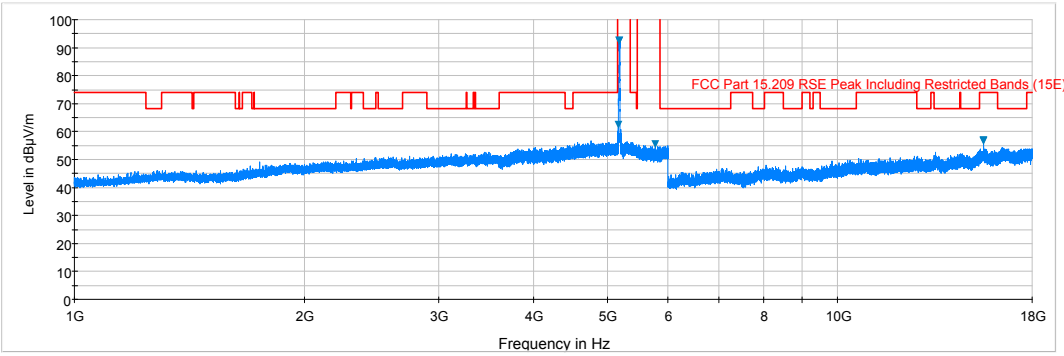
Radiated Band Edge Measurement Offset

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

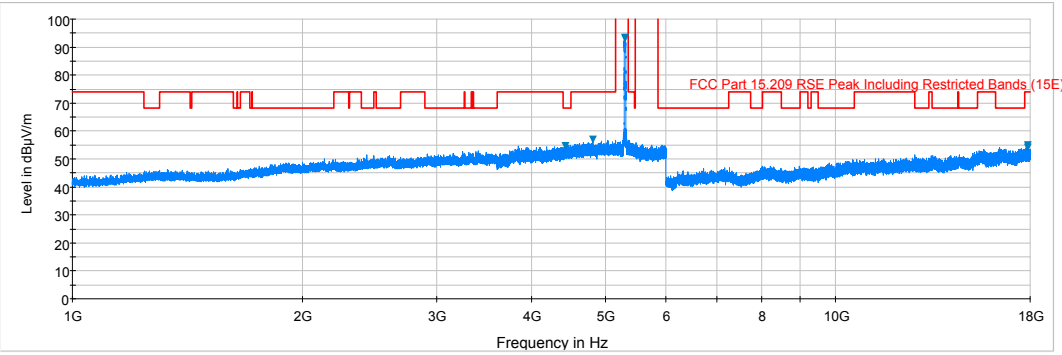
6.7.1 Antenna-1 Radiated Spurious Emission Measurements



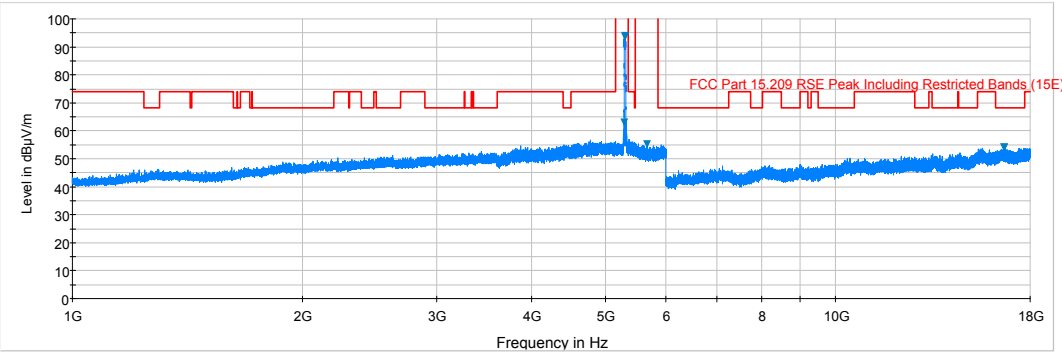
Plot 6-153. Radiated Spurious Plot above 1GHz (802.11a – U1 Ch. 40, Ant. Pol. H)



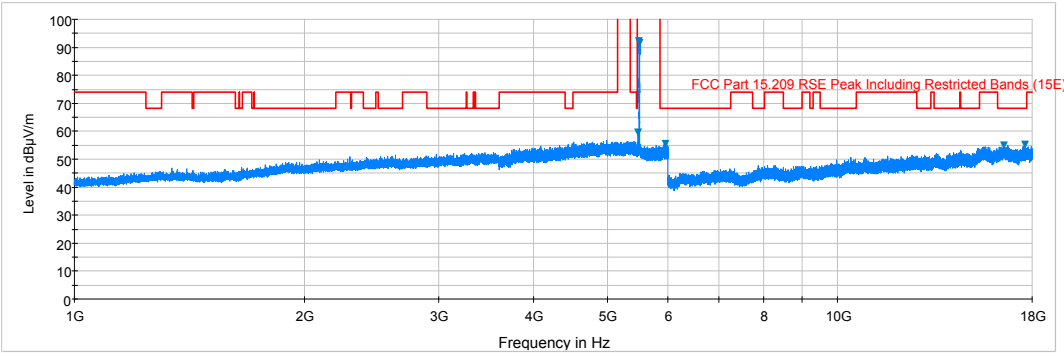
Plot 6-154. Radiated Spurious Plot above 1GHz (802.11a – U1 Ch. 40, Ant. Pol. V)



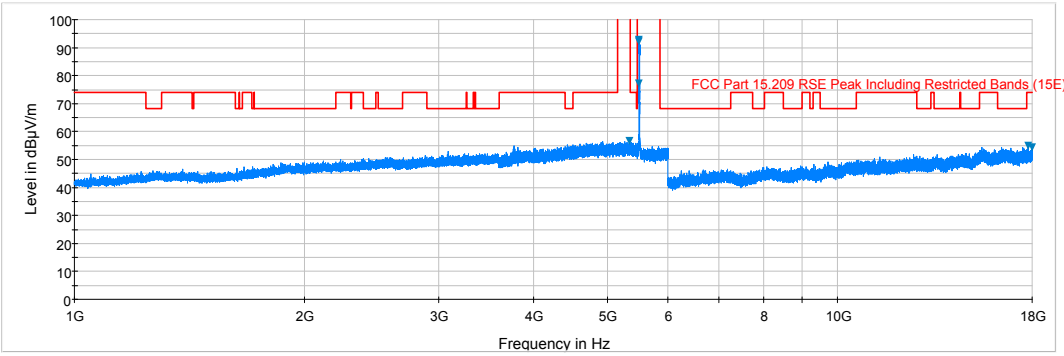
Plot 6-155. Radiated Spurious Plot above 1GHz (802.11a – U2A Ch. 56, Ant. Pol. H)



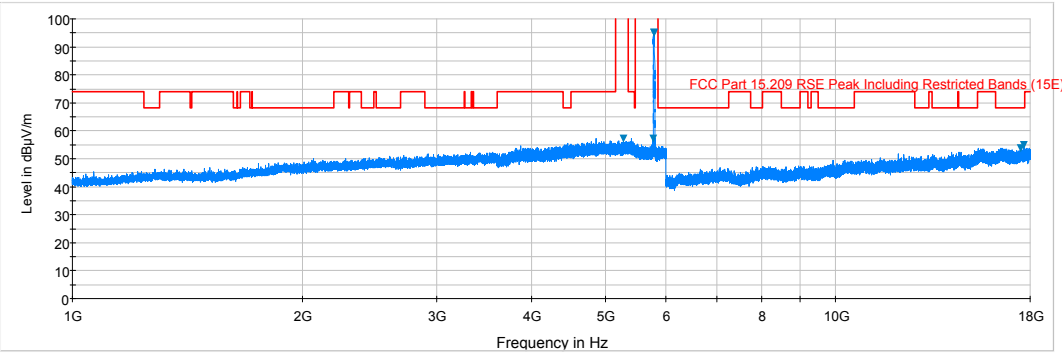
Plot 6-156. Radiated Spurious Plot above 1GHz (802.11a – U2A Ch. 56, Ant. Pol. V)



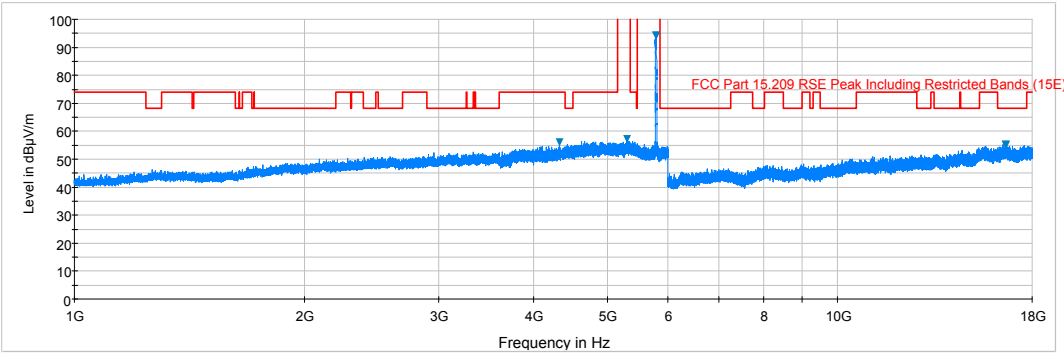
Plot 6-157. Radiated Spurious Plot above 1GHz (802.11a – U2C Ch. 116, Ant. Pol. H)



Plot 6-158. Radiated Spurious Plot above 1GHz (802.11a – U2C Ch. 116, Ant. Pol. V)



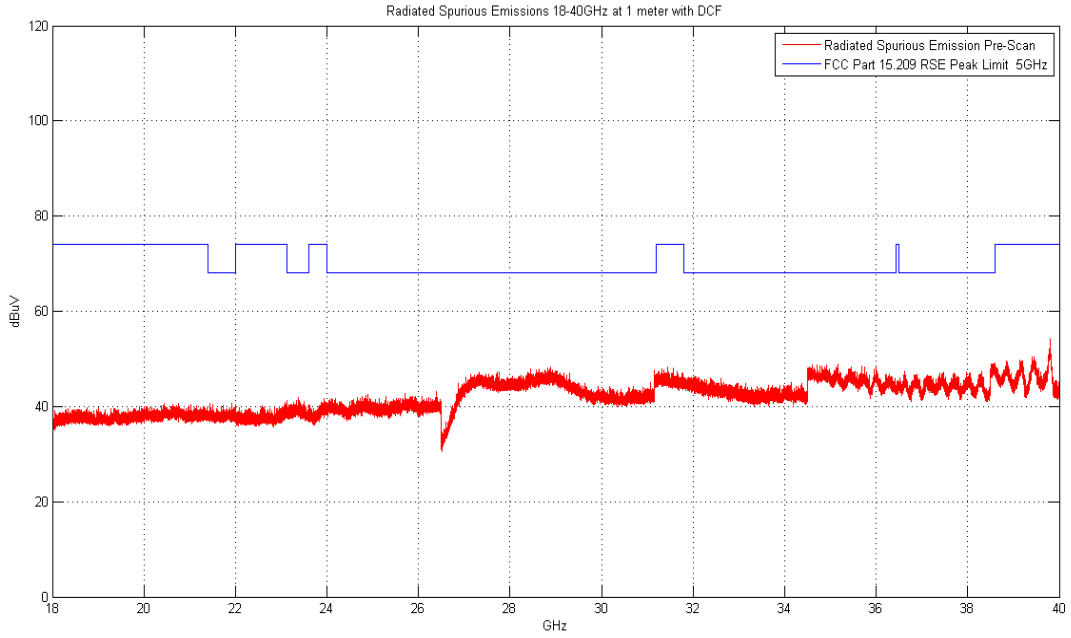
Plot 6-159. Radiated Spurious Plot above 1GHz (802.11a – U3 Ch. 157, Ant. Pol. H)



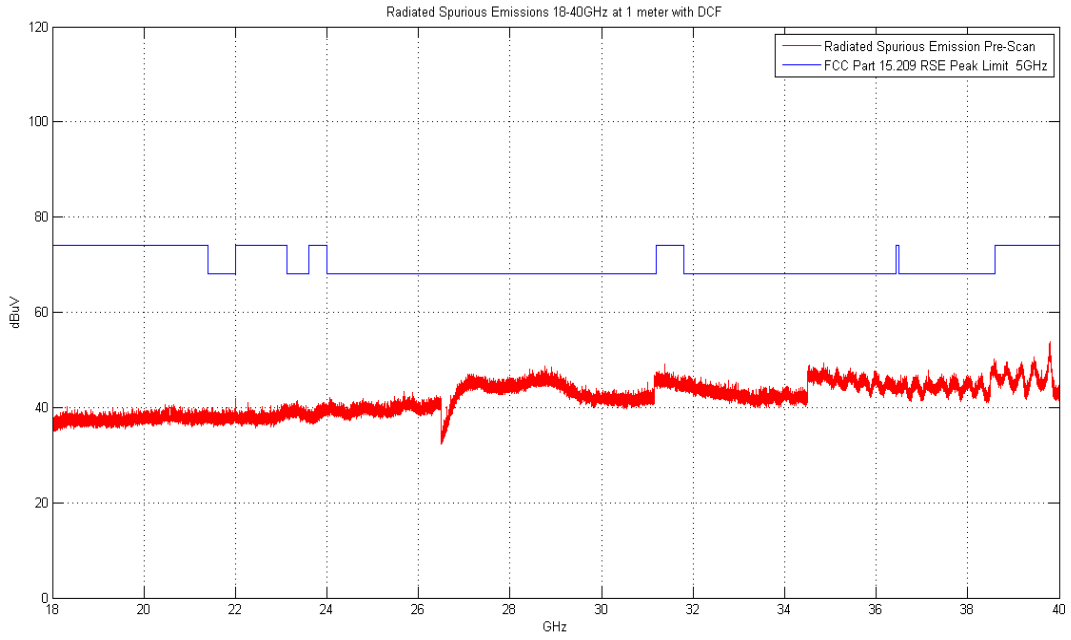
Plot 6-160. Radiated Spurious Plot above 1GHz (802.11a – U3 Ch. 157, Ant. Pol. V)

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

§15.209



Plot 6-161. Radiated Spurious Plot above 18GHz (802.11a – Ant. Pol. H)



Plot 6-162. Radiated Spurious Plot above 18GHz (802.11a – Ant. Pol. V)

Antenna-1 Radiated Spurious Emission Measurements

§15.247(d) §15.205 & §15.209

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

	Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10360.00	-99.13	Peak	H	44.79	0.00	52.65	68.20	-15.55
*	15540.00	-113.46	Average	H	49.29	0.00	42.83	53.98	-11.15
*	15540.00	-99.88	Peak	H	49.29	0.00	56.41	73.98	-17.57
*	20720.00	-107.44	Average	H	48.73	-9.54	38.75	53.98	-15.23
*	20720.00	-97.43	Peak	H	48.73	-9.54	48.76	73.98	-25.22
	25900.00	-97.83	Peak	H	51.07	-9.54	50.70	68.20	-17.50

Table 6-28. Radiated Measurements

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

	Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10400.00	-98.19	Peak	H	44.87	0.00	53.69	68.20	-14.51
*	15600.00	-112.59	Average	H	49.31	0.00	43.72	53.98	-10.26
*	15600.00	-100.55	Peak	H	49.31	0.00	55.76	73.98	-18.22
*	20800.00	-107.27	Average	H	48.83	-9.54	39.01	53.98	-14.97
*	20800.00	-98.58	Peak	H	48.83	-9.54	47.70	73.98	-26.28
	26000.00	-98.16	Peak	H	51.15	-9.54	50.45	68.20	-17.75

Table 6-29. Radiated Measurements

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

	Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10480.00	-97.69	Peak	H	45.08	0.00	54.39	68.20	-13.81
*	15720.00	-114.63	Average	H	49.40	0.00	41.77	53.98	-12.21
*	15720.00	-99.68	Peak	H	49.40	0.00	56.72	73.98	-17.26
*	20960.00	-107.81	Average	H	48.98	-9.54	38.63	53.98	-15.35
*	20960.00	-97.69	Peak	H	48.98	-9.54	48.75	73.98	-25.23
	26200.00	-97.03	Peak	H	51.17	-9.54	51.59	68.20	-16.61

Table 6-30. Radiated Measurements

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

	Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10360.00	-98.13	Peak	H	44.79	0.00	53.65	68.20	-14.55
*	15540.00	-114.23	Average	H	49.29	0.00	42.06	53.98	-11.92
*	15540.00	-98.76	Peak	H	49.29	0.00	57.53	73.98	-16.45
*	20720.00	-108.50	Average	H	48.73	-9.54	37.69	53.98	-16.29
*	20720.00	-98.86	Peak	H	48.73	-9.54	47.33	73.98	-26.65
	25900.00	-97.20	Peak	H	51.07	-9.54	51.33	68.20	-16.87

Table 6-31. Radiated Measurements with WCP

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]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10520.00	-99.31	Peak	H	45.13	0.00	52.82	68.20	-15.38
*	15780.00	-112.98	Average	H	49.46	0.00	43.47	53.98	-10.51
*	15780.00	-99.55	Peak	H	49.46	0.00	56.90	73.98	-17.08
*	21040.00	-105.96	Average	H	49.04	-9.54	40.53	53.98	-13.45
*	21040.00	-96.89	Peak	H	49.04	-9.54	49.60	73.98	-24.38
	26300.00	-97.62	Peak	H	51.24	-9.54	51.08	68.20	-17.12

Table 6-32. Radiated Measurements

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

	Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10560.00	-100.75	Peak	H	45.13	0.00	51.38	68.20	-16.82
*	15840.00	-112.61	Average	H	49.54	0.00	43.94	53.98	-10.04
*	15840.00	-100.11	Peak	H	49.54	0.00	56.44	73.98	-17.54
*	21120.00	-105.27	Average	H	49.07	-9.54	41.26	53.98	-12.72
*	21120.00	-96.08	Peak	H	49.07	-9.54	50.45	73.98	-23.53
	26400.00	-95.65	Peak	H	51.37	-9.54	53.17	68.20	-15.03

Table 6-33. 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]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	10640.00	-113.22	Average	H	45.16	0.00	38.94	53.98	-15.04
*	10640.00	-100.51	Peak	H	45.16	0.00	51.65	73.98	-22.33
*	15960.00	-112.88	Average	H	49.75	0.00	43.87	53.98	-10.11
*	15960.00	-99.48	Peak	H	49.75	0.00	57.27	73.98	-16.71
*	21280.00	-104.64	Average	H	49.15	-9.54	41.97	53.98	-12.01
*	21280.00	-95.69	Peak	H	49.15	-9.54	50.92	73.98	-23.06
	26600.00	-119.11	Peak	H	47.61	-9.54	25.96	68.20	-42.24

Table 6-34. 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]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10560.00	-99.44	Peak	H	45.13	0.00	52.69	68.20	-15.51
*	15840.00	-112.62	Average	H	49.54	0.00	43.93	53.98	-10.05
*	15840.00	-98.45	Peak	H	49.54	0.00	58.10	73.98	-15.88
*	21120.00	-105.30	Average	H	49.07	0.00	50.78	53.98	-3.20
*	21120.00	-96.88	Peak	H	49.07	-9.54	49.65	73.98	-24.33
	26400.00	-98.05	Peak	H	51.37	-9.54	50.77	68.20	-17.43

Table 6-35. Radiated Measurements with WCP

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]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11000.00	-116.44	Average	H	45.24	0.00	35.80	53.98	-18.18
*	11000.00	-102.70	Peak	H	45.24	0.00	49.54	73.98	-24.44
	16500.00	-99.32	Peak	H	50.35	0.00	58.03	68.20	-10.17
	22000.00	-97.29	Peak	H	49.46	-9.54	49.63	68.20	-18.57
	27500.00	-106.11	Peak	H	47.92	-9.54	39.27	68.20	-28.93

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]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11160.00	-114.84	Average	H	45.23	0.00	37.39	53.98	-16.59
*	11160.00	-101.13	Peak	H	45.23	0.00	51.10	73.98	-22.88
	16740.00	-99.97	Peak	H	50.51	0.00	57.54	68.20	-10.66
*	22320.00	-106.86	Average	H	49.87	-9.54	40.47	53.98	-13.51
*	22320.00	-98.64	Peak	H	49.87	-9.54	48.69	73.98	-25.29
	27900.00	-104.89	Peak	H	48.09	-9.54	40.66	68.20	-27.54

Table 6-37. Radiated Measurements

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

	Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11440.00	-115.19	Average	H	45.38	0.00	37.19	53.98	-16.79
*	11440.00	-100.83	Peak	H	45.38	0.00	51.55	73.98	-22.43
	17160.00	-99.49	Peak	H	50.43	0.00	57.94	68.20	-10.26
*	22880.00	-107.72	Average	H	49.98	-9.54	39.72	53.98	-14.26
*	22880.00	-97.33	Peak	H	49.98	-9.54	50.11	73.98	-23.87
	28600.00	-105.68	Peak	H	48.35	-9.54	40.13	68.20	-28.07

Table 6-38. 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]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11000.00	-114.71	Average	H	45.24	0.00	37.53	53.98	-16.45
*	11000.00	-99.82	Peak	H	45.24	0.00	52.42	73.98	-21.56
	16500.00	-100.32	Peak	H	50.35	0.00	57.03	68.20	-11.17
	22000.00	-96.53	Peak	H	49.46	-9.54	50.39	68.20	-17.81
	27500.00	-105.73	Peak	H	47.92	-9.54	39.65	68.20	-28.55

Table 6-39. Radiated Measurements with WCP

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

	Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11490.00	-113.70	Average	H	45.43	0.00	38.73	53.98	-15.25
*	11490.00	-100.26	Peak	H	45.43	0.00	52.17	73.98	-21.81
	17235.00	-98.93	Peak	H	50.61	0.00	58.68	68.20	-9.52
*	22980.00	-109.04	Average	H	49.94	-9.54	38.35	53.98	-15.62
*	22980.00	-98.79	Peak	H	49.94	-9.54	48.60	73.98	-25.37
	28725.00	-104.82	Peak	H	48.26	-9.54	40.90	68.20	-27.30

Table 6-40. Radiated Measurements

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

	Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11570.00	-114.14	Average	H	45.55	0.00	38.41	53.98	-15.57
*	11570.00	-100.57	Peak	H	45.55	0.00	51.98	73.98	-22.00
	17355.00	-99.28	Peak	H	51.00	0.00	58.72	68.20	-9.48
	23140.00	-98.72	Peak	H	50.05	-9.54	48.79	68.20	-19.41
	28925.00	-105.01	Peak	H	48.28	-9.54	40.72	68.20	-27.48

Table 6-41. Radiated Measurements

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

	Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11650.00	-112.64	Average	H	45.67	0.00	40.03	53.98	-13.95
*	11650.00	-98.96	Peak	H	45.67	0.00	53.71	73.98	-20.27
	17475.00	-98.62	Peak	H	51.30	0.00	59.69	68.20	-8.51
	23300.00	-98.35	Peak	H	50.10	-9.54	49.20	68.20	-19.00
	29125.00	-105.07	Peak	H	48.24	-9.54	40.63	68.20	-27.57

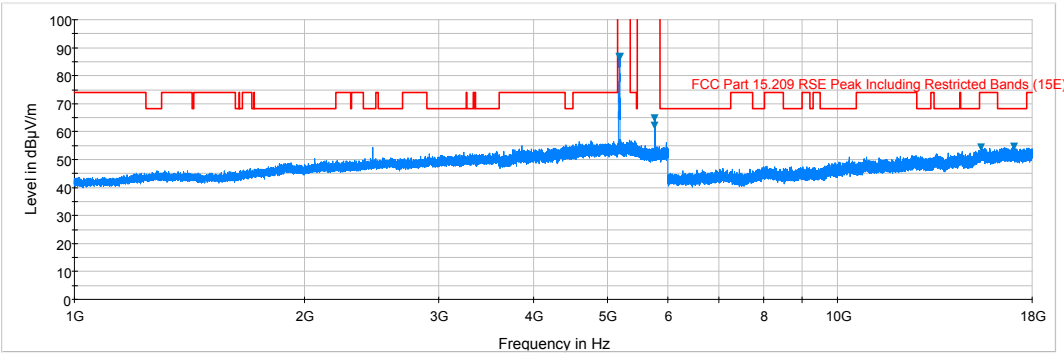
Table 6-42. Radiated Measurements

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

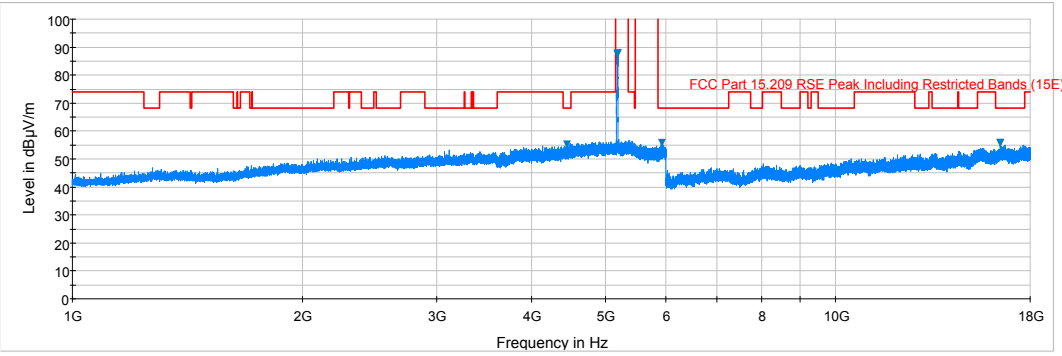
	Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11650.00	-113.32	Average	H	45.67	0.00	39.35	53.98	-14.63
*	11650.00	-98.23	Peak	H	45.67	0.00	54.44	73.98	-19.54
	17475.00	-97.15	Peak	H	51.30	0.00	61.16	68.20	-7.04
	23300.00	-97.54	Peak	H	50.10	-9.54	50.01	68.20	-18.19
	29125.00	-104.42	Peak	H	48.24	-9.54	41.28	68.20	-26.92

Table 6-43. Radiated Measurements with WCP

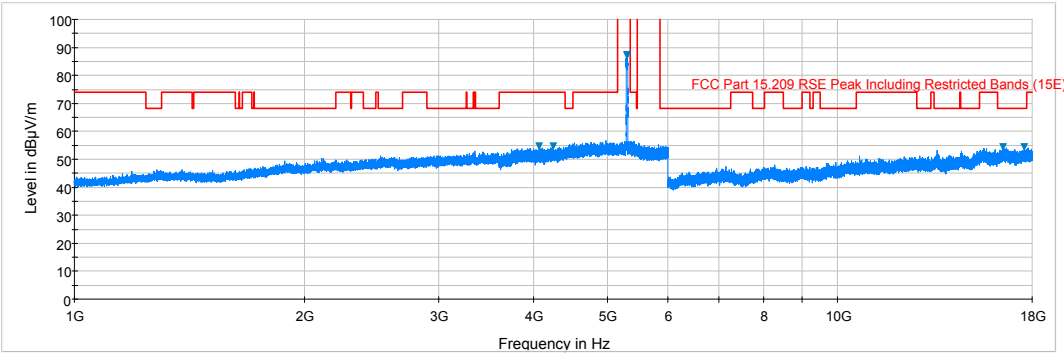
6.7.2 Antenna-2 Radiated Spurious Emission Measurements



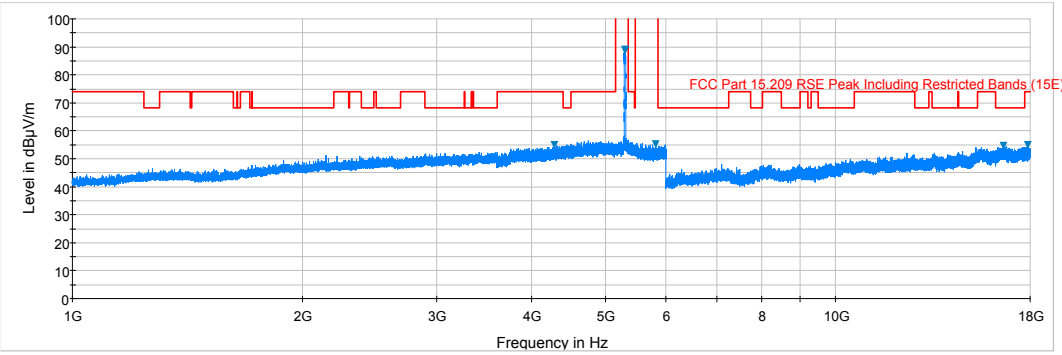
Plot 6-163. Radiated Spurious Plot above 1GHz (802.11a – U1 Ch. 40, Ant. Pol. H)



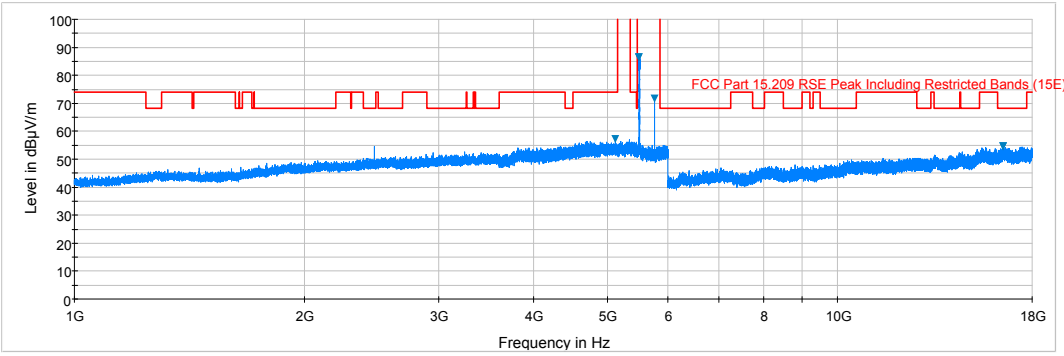
Plot 6-164. Radiated Spurious Plot above 1GHz (802.11a – U1 Ch. 40, Ant. Pol. V)



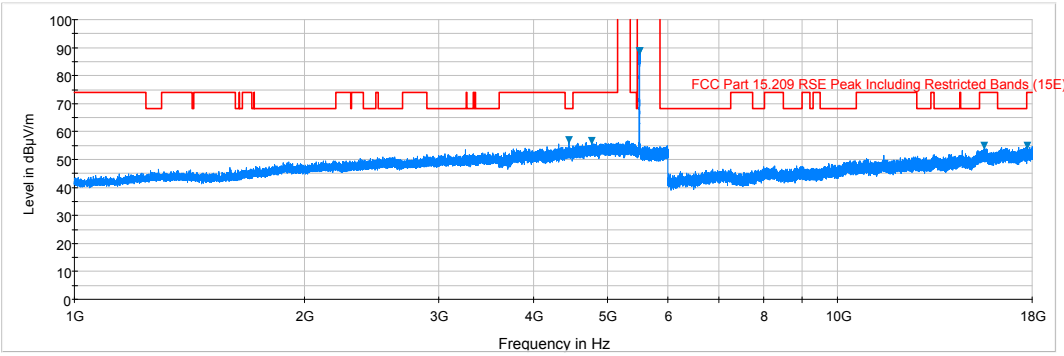
Plot 6-165. Radiated Spurious Plot above 1GHz (802.11a – U2A Ch. 56, Ant. Pol. H)



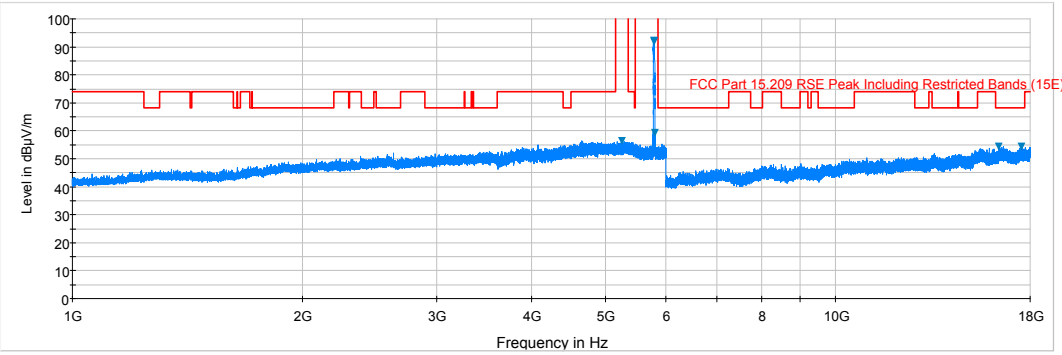
Plot 6-166. Radiated Spurious Plot above 1GHz (802.11a – U2A Ch. 56, Ant. Pol. V)



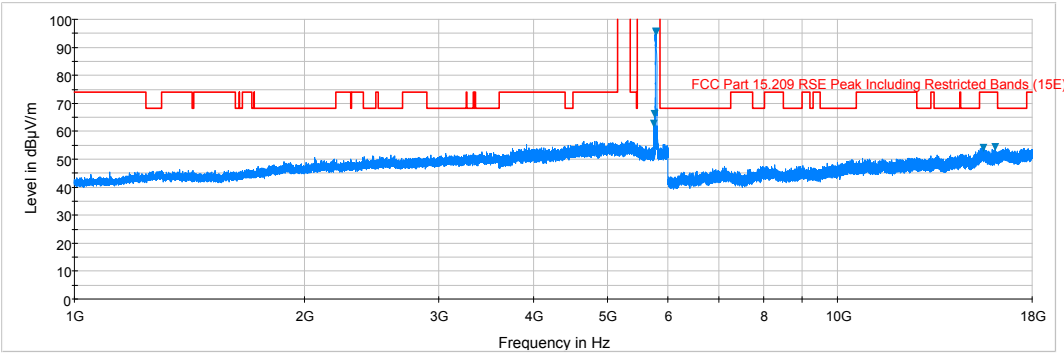
Plot 6-167. Radiated Spurious Plot above 1GHz (802.11a – U2C Ch. 116, Ant. Pol. H)



Plot 6-168. Radiated Spurious Plot above 1GHz (802.11a – U2C Ch. 116, Ant. Pol. V)

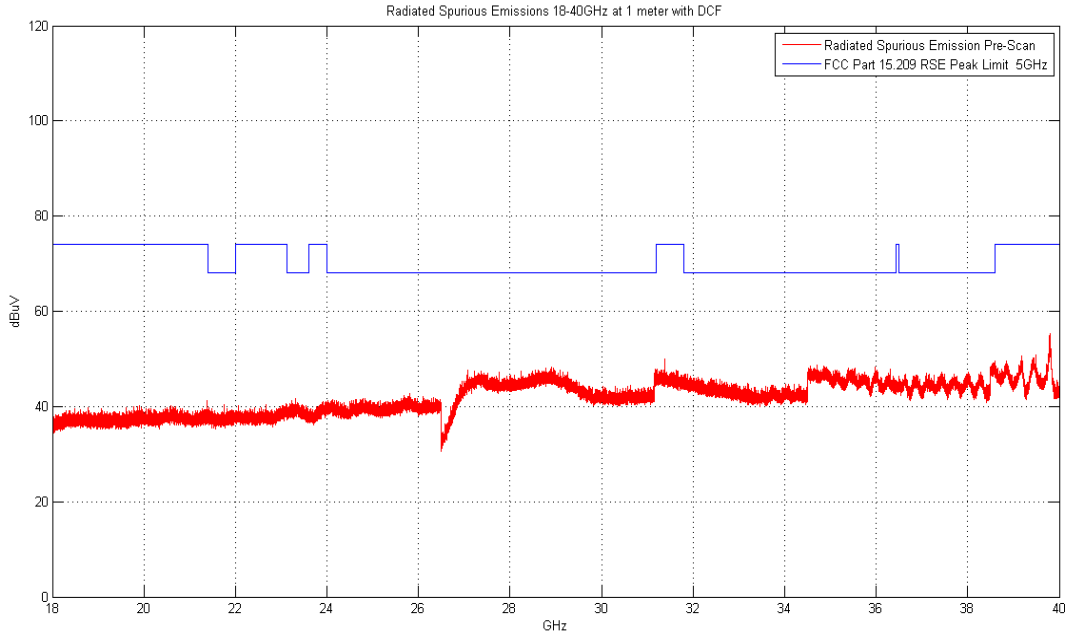


Plot 6-169. Radiated Spurious Plot above 1GHz (802.11a – U3 Ch. 157, Ant. Pol. H)

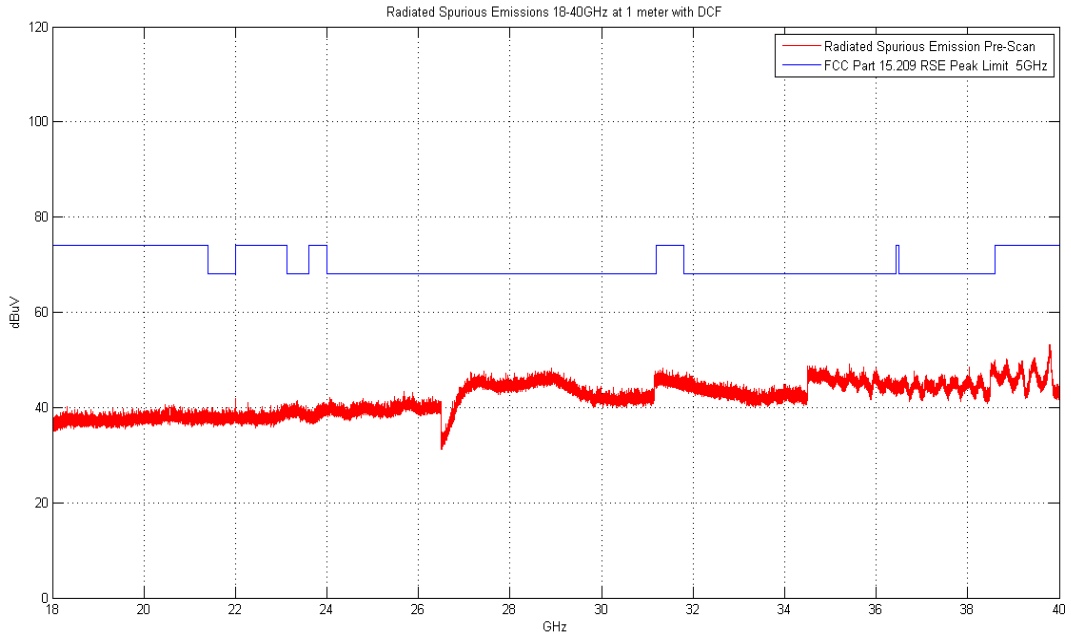


Plot 6-170. Radiated Spurious Plot above 1GHz (802.11a – U3 Ch. 157, Ant. Pol. V)

Antenna-2 Radiated Spurious Emissions Measurements (Above 18GHz)
§15.209



Plot 6-171. Radiated Spurious Plot above 18GHz (802.11a – Ant. Pol. H)



Plot 6-172. Radiated Spurious Plot above 18GHz (802.11a – Ant. Pol. V)

Antenna-2 Radiated Spurious Emission Measurements

§15.247(d) §15.205 & §15.209

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

	Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10360.00	-97.74	Peak	H	44.79	0.00	54.04	68.20	-14.16
*	15540.00	-113.29	Average	H	49.29	0.00	43.00	53.98	-10.98
*	15540.00	-99.56	Peak	H	49.29	0.00	56.73	73.98	-17.25
*	20720.00	-108.35	Average	H	48.73	-9.54	37.84	53.98	-16.14
*	20720.00	-98.77	Peak	H	48.73	-9.54	47.42	73.98	-26.56
	25900.00	-99.16	Peak	H	51.07	-9.54	49.37	68.20	-18.83

Table 6-44. Radiated Measurements

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

	Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10400.00	-100.35	Peak	H	44.87	0.00	51.53	68.20	-16.67
*	15600.00	-114.92	Average	H	49.31	0.00	41.39	53.98	-12.59
*	15600.00	-100.44	Peak	H	49.31	0.00	55.87	73.98	-18.11
*	20800.00	-108.28	Average	H	48.83	-9.54	38.00	53.98	-15.98
*	20800.00	-97.11	Peak	H	48.83	-9.54	49.17	73.98	-24.81
	26000.00	-96.43	Peak	H	51.15	-9.54	52.18	68.20	-16.02

Table 6-45. 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]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10480.00	-100.46	Peak	H	45.08	0.00	51.62	68.20	-16.58
*	15720.00	-113.97	Average	H	49.40	0.00	42.43	53.98	-11.55
*	15720.00	-99.68	Peak	H	49.40	0.00	56.72	73.98	-17.26
*	20960.00	-106.66	Average	H	48.98	-9.54	39.78	53.98	-14.20
*	20960.00	-97.22	Peak	H	48.98	-9.54	49.22	73.98	-24.76
	26200.00	-96.70	Peak	H	51.17	-9.54	51.92	68.20	-16.28

Table 6-46. Radiated Measurements

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

	Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10360.00	-98.94	Peak	H	44.79	0.00	52.84	68.20	-15.36
*	15540.00	-113.34	Average	H	49.29	0.00	42.95	53.98	-11.03
*	15540.00	-100.00	Peak	H	49.29	0.00	56.29	73.98	-17.69
*	20720.00	-107.43	Average	H	48.73	-9.54	38.76	53.98	-15.22
*	20720.00	-97.50	Peak	H	48.73	-9.54	48.69	73.98	-25.29
	25900.00	-97.77	Peak	H	51.07	-9.54	50.76	68.20	-17.44

Table 6-47. Radiated Measurements with WCP

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]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10520.00	-97.91	Peak	H	45.13	0.00	54.22	68.20	-13.98
*	15780.00	-113.85	Average	H	49.46	0.00	42.60	53.98	-11.38
*	15780.00	-100.12	Peak	H	49.46	0.00	56.33	73.98	-17.65
*	21040.00	-107.18	Average	H	49.04	-9.54	39.31	53.98	-14.67
*	21040.00	-97.10	Peak	H	49.04	-9.54	49.39	73.98	-24.59
	26300.00	-97.23	Peak	H	51.24	-9.54	51.47	68.20	-16.73

Table 6-48. Radiated Measurements

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

	Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10560.00	-97.91	Peak	H	45.13	0.00	54.22	68.20	-13.98
*	15840.00	-112.76	Average	H	49.54	0.00	43.79	53.98	-10.19
*	15840.00	-98.95	Peak	H	49.54	0.00	57.60	73.98	-16.38
*	21120.00	-106.00	Average	H	49.07	-9.54	40.53	53.98	-13.45
*	21120.00	-97.70	Peak	H	49.07	-9.54	48.83	73.98	-25.15
	26400.00	-97.65	Peak	H	51.37	-9.54	51.17	68.20	-17.03

Table 6-49. 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]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	10640.00	-113.36	Average	H	45.16	0.00	38.80	53.98	-15.18
*	10640.00	-100.43	Peak	H	45.16	0.00	51.73	73.98	-22.25
*	15960.00	-113.54	Average	H	49.75	0.00	43.21	53.98	-10.77
*	15960.00	-99.15	Peak	H	49.75	0.00	57.60	73.98	-16.38
*	21280.00	-104.55	Average	H	49.15	-9.54	42.06	53.98	-11.92
*	21280.00	-95.49	Peak	H	49.15	-9.54	51.12	73.98	-22.86
	26600.00	-118.82	Peak	H	47.61	-9.54	26.25	68.20	-41.95

Table 6-50. 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]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10560.00	-99.37	Average	H	45.13	0.00	52.76	68.20	-15.44
*	15840.00	-112.35	Peak	H	49.54	0.00	44.20	53.98	-9.78
*	15840.00	-98.46	Average	H	49.54	0.00	58.09	73.98	-15.89
*	21120.00	-106.96	Peak	H	49.07	0.00	49.12	53.98	-4.86
*	21120.00	-96.60	Average	H	49.07	-9.54	49.93	73.98	-24.05
	26400.00	-96.22	Peak	H	51.37	-9.54	52.60	68.20	-15.60

Table 6-51. Radiated Measurements with WCP

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]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11000.00	-114.47	Average	H	45.24	0.00	37.77	53.98	-16.21
*	11000.00	-101.03	Peak	H	45.24	0.00	51.21	73.98	-22.77
	16500.00	-99.58	Peak	H	50.35	0.00	57.77	68.20	-10.43
	22000.00	-97.78	Peak	H	49.46	-9.54	49.14	68.20	-19.06
	27500.00	-103.33	Peak	H	47.92	-9.54	42.05	68.20	-26.15

Table 6-52. 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]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11160.00	-115.13	Average	H	45.23	0.00	37.10	53.98	-16.88
*	11160.00	-101.30	Peak	H	45.23	0.00	50.93	73.98	-23.05
	16740.00	-99.29	Peak	H	50.51	0.00	58.22	68.20	-9.98
*	22320.00	-107.12	Average	H	49.87	-9.54	40.21	53.98	-13.77
*	22320.00	-99.35	Peak	H	49.87	-9.54	47.98	73.98	-26.00
	27900.00	-105.28	Peak	H	48.09	-9.54	40.27	68.20	-27.93

Table 6-53. Radiated Measurements

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

	Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11440.00	-113.74	Average	H	45.38	0.00	38.64	53.98	-15.34
*	11440.00	-99.56	Peak	H	45.38	0.00	52.82	73.98	-21.16
	17160.00	-100.38	Peak	H	50.43	0.00	57.05	68.20	-11.15
*	22880.00	-105.41	Average	H	49.98	-9.54	42.03	53.98	-11.95
*	22880.00	-97.85	Peak	H	49.98	-9.54	49.59	73.98	-24.39
	28600.00	-105.32	Peak	H	48.35	-9.54	40.49	68.20	-27.71

Table 6-54. 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]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11160.00	-115.86	Average	H	45.23	0.00	36.37	53.98	-17.61
*	11160.00	-100.40	Peak	H	45.23	0.00	51.83	73.98	-22.15
	16740.00	-100.62	Peak	H	50.51	0.00	56.89	68.20	-11.31
	22320.00	-107.58	Average	H	49.87	-9.54	39.75	53.98	-14.23
	22320.00	-99.15	Peak	H	49.87	-9.54	48.18	73.98	-25.80
	27900.00	-105.09	Peak	H	48.09	-9.54	40.46	68.20	-27.74

Table 6-55. Radiated Measurements with WCP

Worst Case Mode:	802.11a

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

	Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11490.00	-113.33	Average	H	45.43	0.00	39.10	53.98	-14.88
*	11490.00	-100.62	Peak	H	45.43	0.00	51.81	73.98	-22.17
	17235.00	-98.50	Peak	H	50.61	0.00	59.11	68.20	-9.09
*	22980.00	-108.95	Average	H	49.94	-9.54	38.44	53.98	-15.53
*	22980.00	-98.76	Peak	H	49.94	-9.54	48.63	73.98	-25.34
	28725.00	-104.86	Peak	H	48.26	-9.54	40.86	68.20	-27.34

Table 6-56. Radiated Measurements

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

	Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11570.00	-115.38	Average	H	45.55	0.00	37.17	53.98	-16.81
*	11570.00	-99.62	Peak	H	45.55	0.00	52.93	73.98	-21.05
	17355.00	-99.04	Peak	H	51.00	0.00	58.96	68.20	-9.24
	23140.00	-99.35	Peak	H	50.05	-9.54	48.16	68.20	-20.04
	28925.00	-106.34	Peak	H	48.28	-9.54	39.39	68.20	-28.81

Table 6-57. Radiated Measurements

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

	Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11650.00	-111.86	Average	H	45.67	0.00	40.81	53.98	-13.17
*	11650.00	-99.43	Peak	H	45.67	0.00	53.24	73.98	-20.74
	17475.00	-98.66	Peak	H	51.30	0.00	59.65	68.20	-8.55
	23300.00	-96.95	Peak	H	50.10	-9.54	50.60	68.20	-17.60
	29125.00	-105.15	Peak	H	48.24	-9.54	40.55	68.20	-27.65

Table 6-58. Radiated Measurements

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

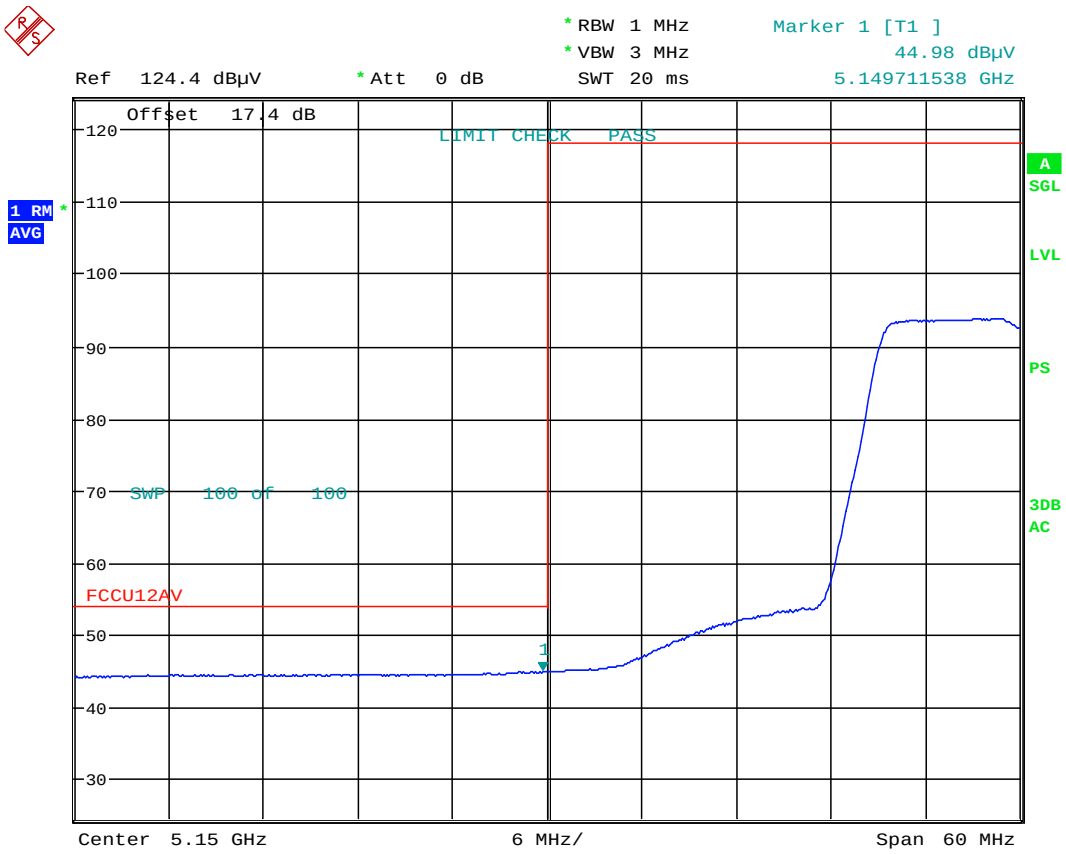
	Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11650.00	-111.51	Average	H	45.67	0.00	41.16	53.98	-12.82
*	11650.00	-99.36	Peak	H	45.67	0.00	53.31	73.98	-20.67
	17475.00	-99.12	Peak	H	51.30	0.00	59.19	68.20	-9.01
	23300.00	-97.27	Peak	H	50.10	-9.54	50.28	68.20	-17.92
	29125.00	-106.33	Peak	H	48.24	-9.54	39.37	68.20	-28.83

Table 6-59. Radiated Measurements with WCP

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

§15.407(b.1)(b.2) §15.205 §15.209

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

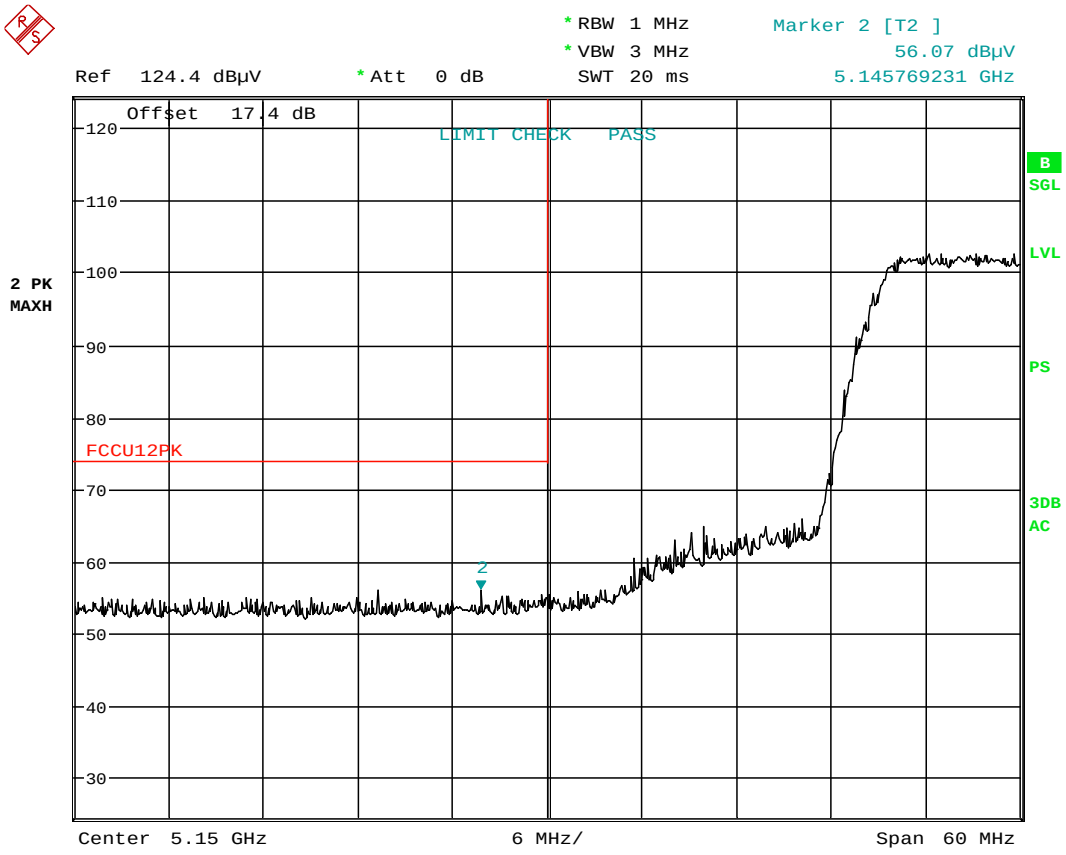


Date: 19.FEB.2015 17:14:38

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

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

§15.407(b.1)(b.2) §15.205 §15.209



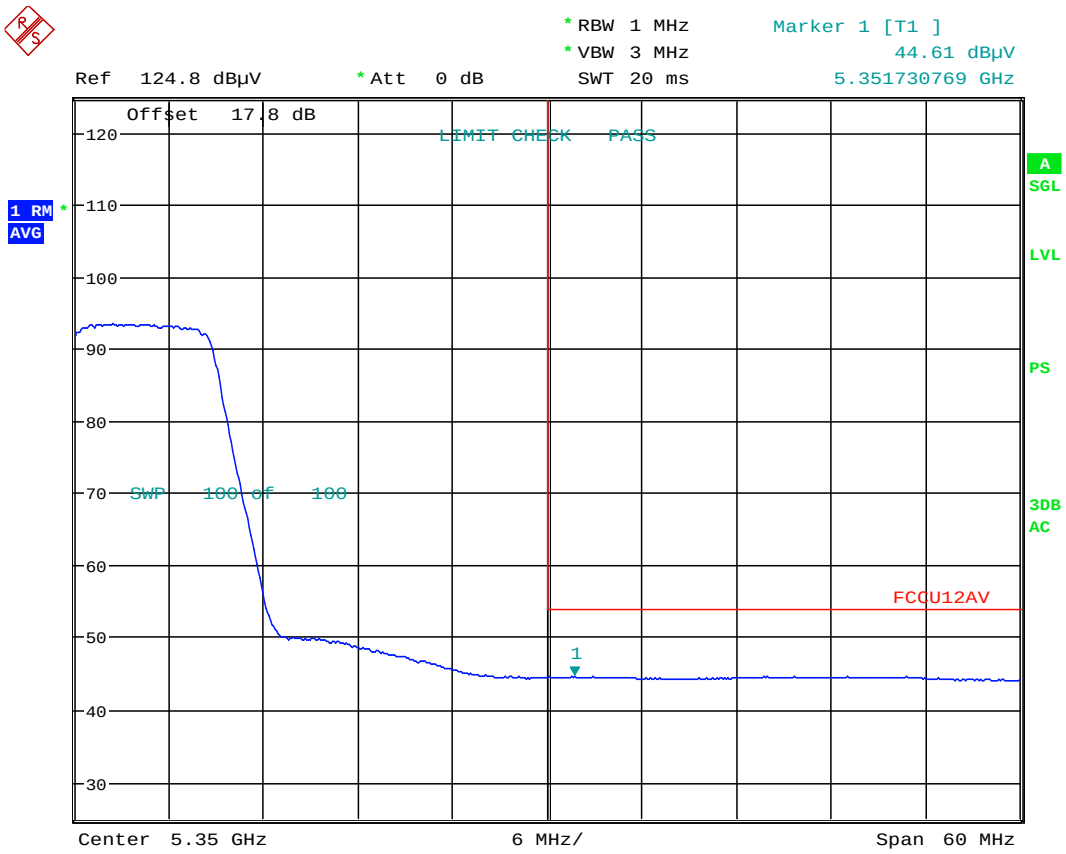
Date: 19.FEB.2015 17:14:48

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

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

§15.407(b.1)(b.2) §15.205 §15.209

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

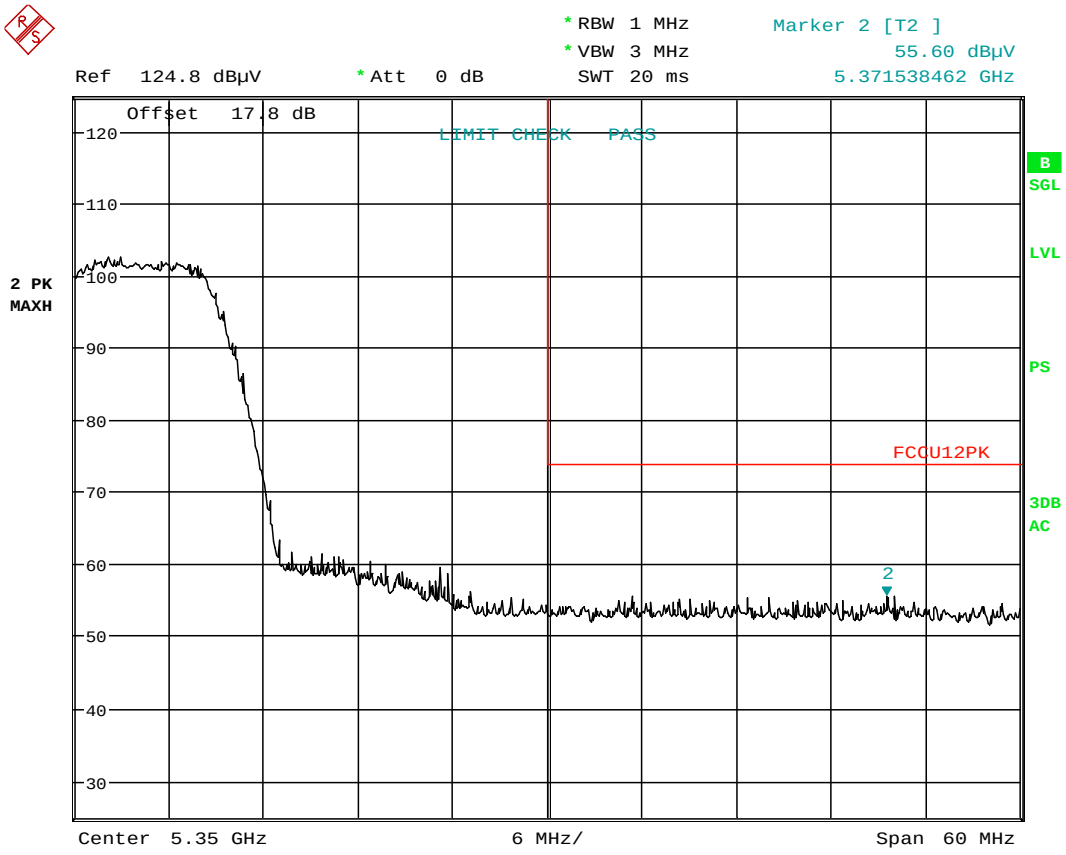


Date: 19.FEB.2015 17:41:43

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

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

§15.407(b.1)(b.2) §15.205 §15.209



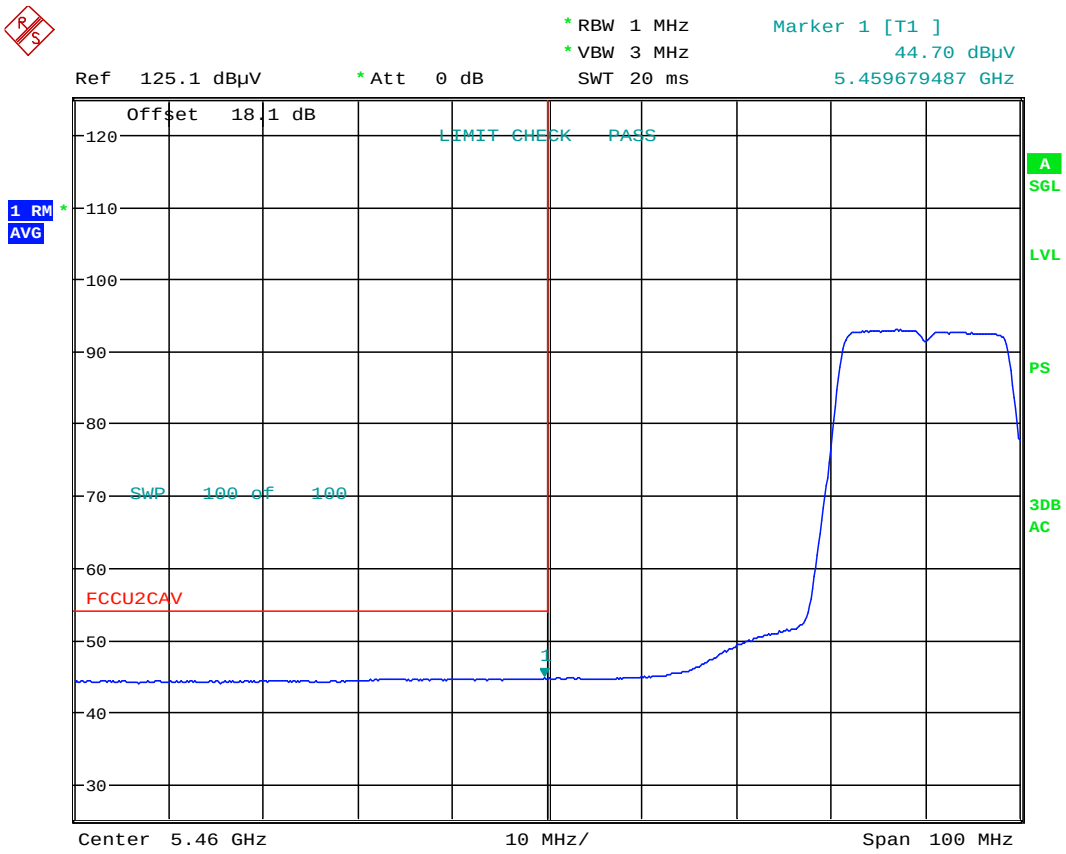
Date: 19.FEB.2015 17:41:52

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

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

§15.407(b.1)(b.2) §15.205 §15.209

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

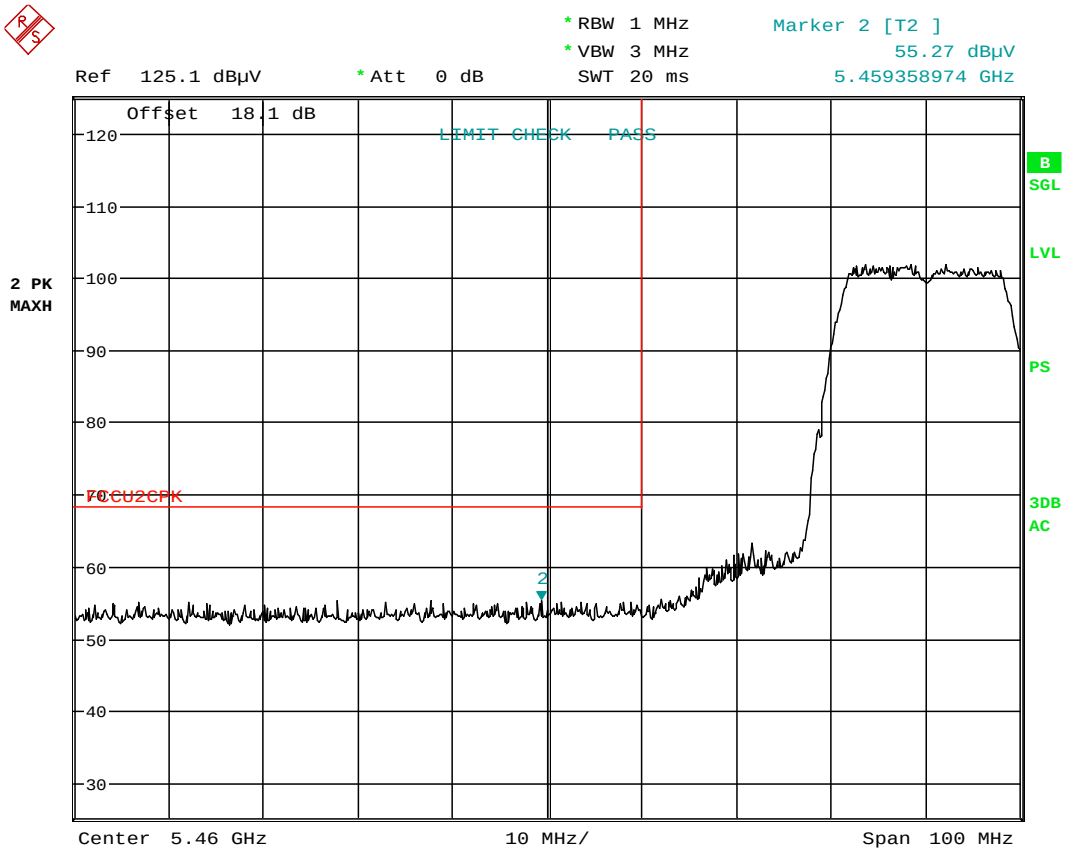


Date: 19.FEB.2015 17:59:27

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

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

§15.407(b.1)(b.2) §15.205 §15.209



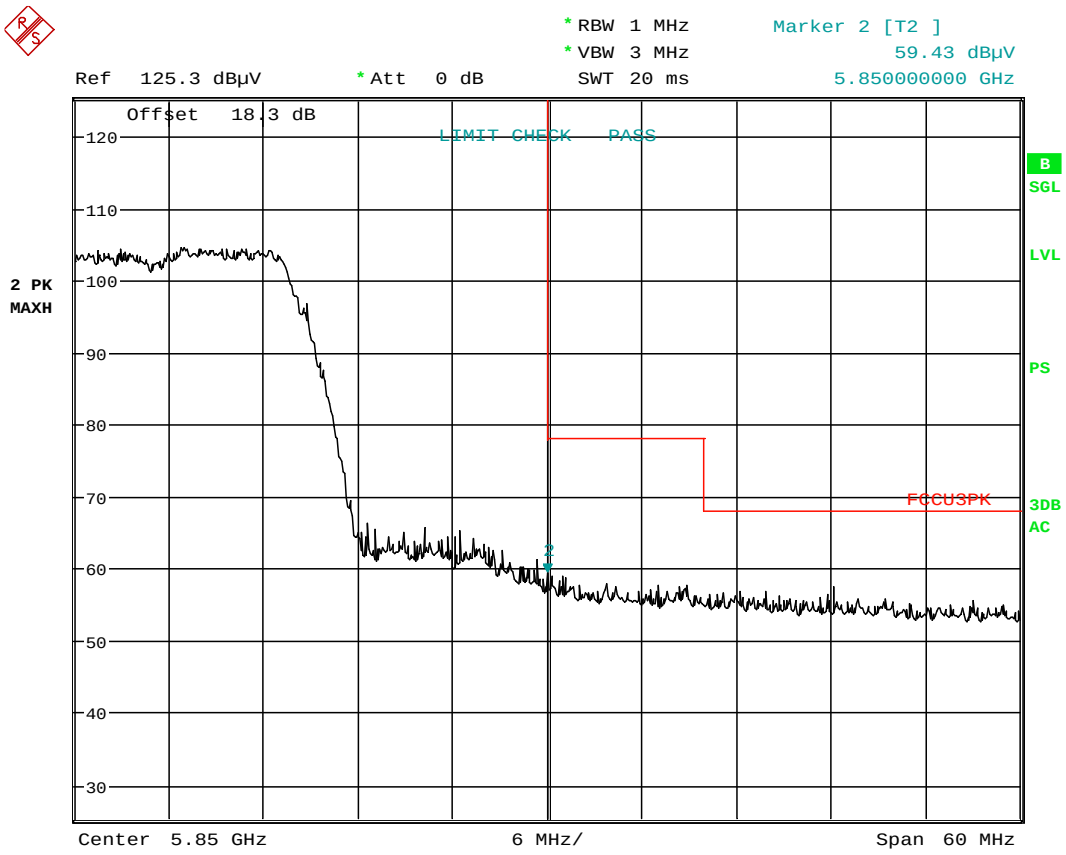
Date: 19.FEB.2015 17:59:38

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

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

§15.407(b.1)(b.2) §15.205 §15.209

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



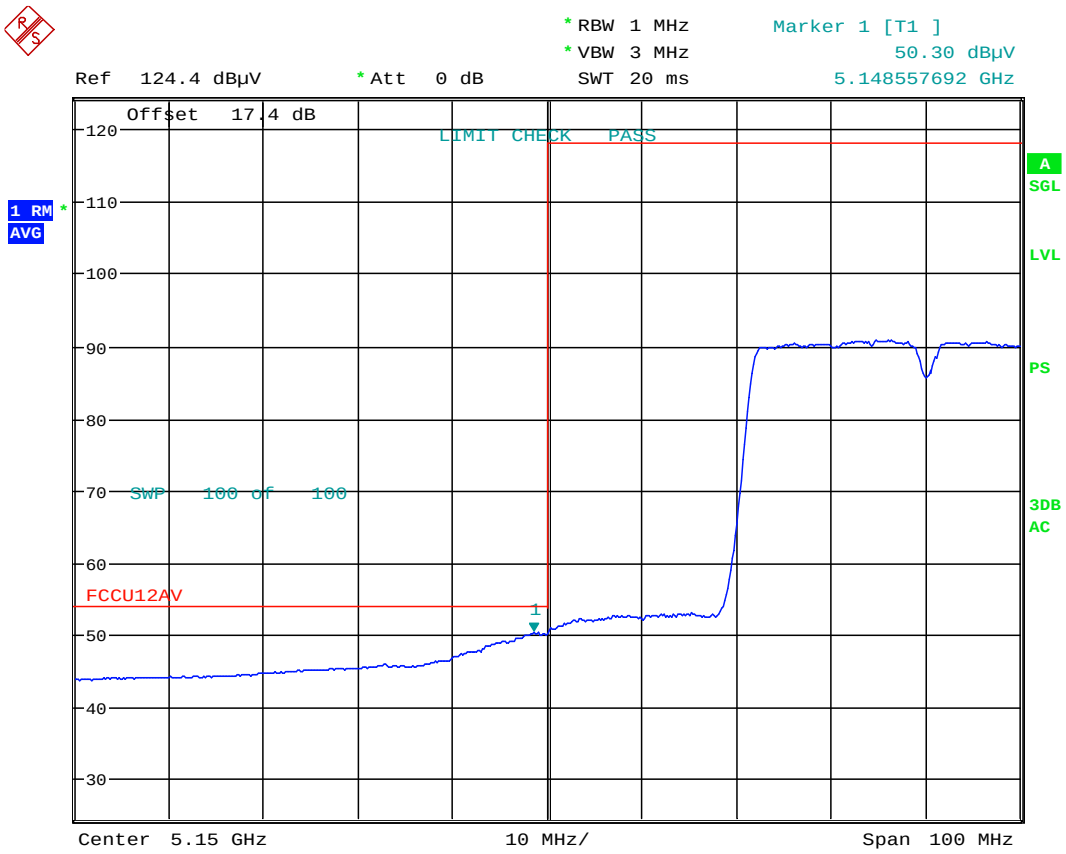
Date: 19.FEB.2015 18:11:27

Plot 6-179. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

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

§15.407(b.1)(b.2) §15.205 §15.209

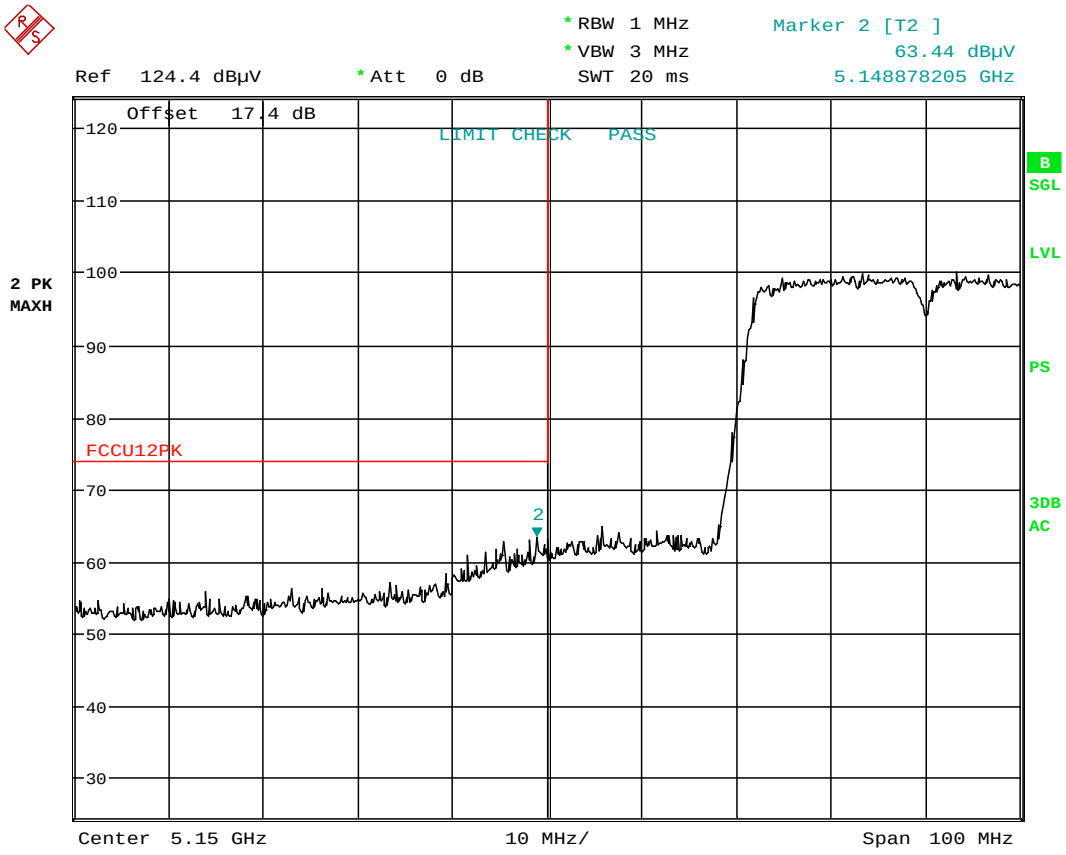
Worst Case Mode:	802.11n (40MHz)
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5190MHz
Channel:	38



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

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

§15.407(b.1)(b.2) §15.205 §15.209



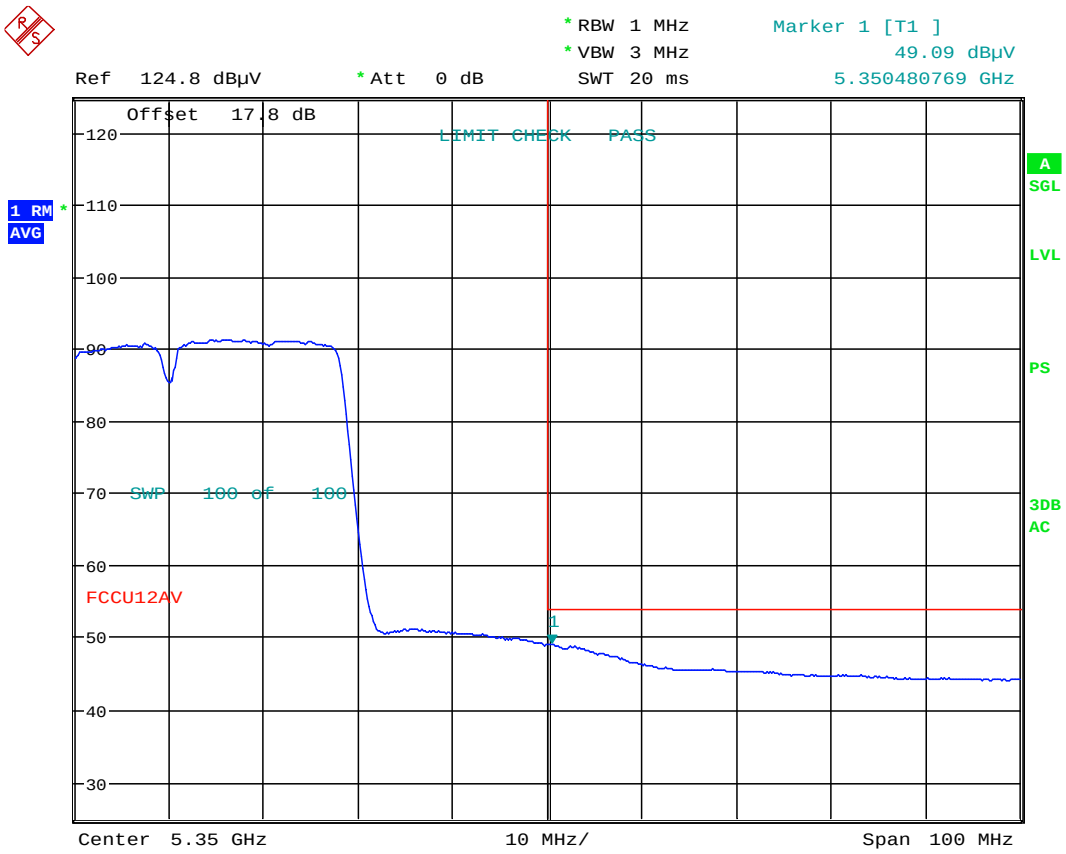
Date: 19.FEB.2015 17:17:50

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

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

§15.407(b.1)(b.2) §15.205 §15.209

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

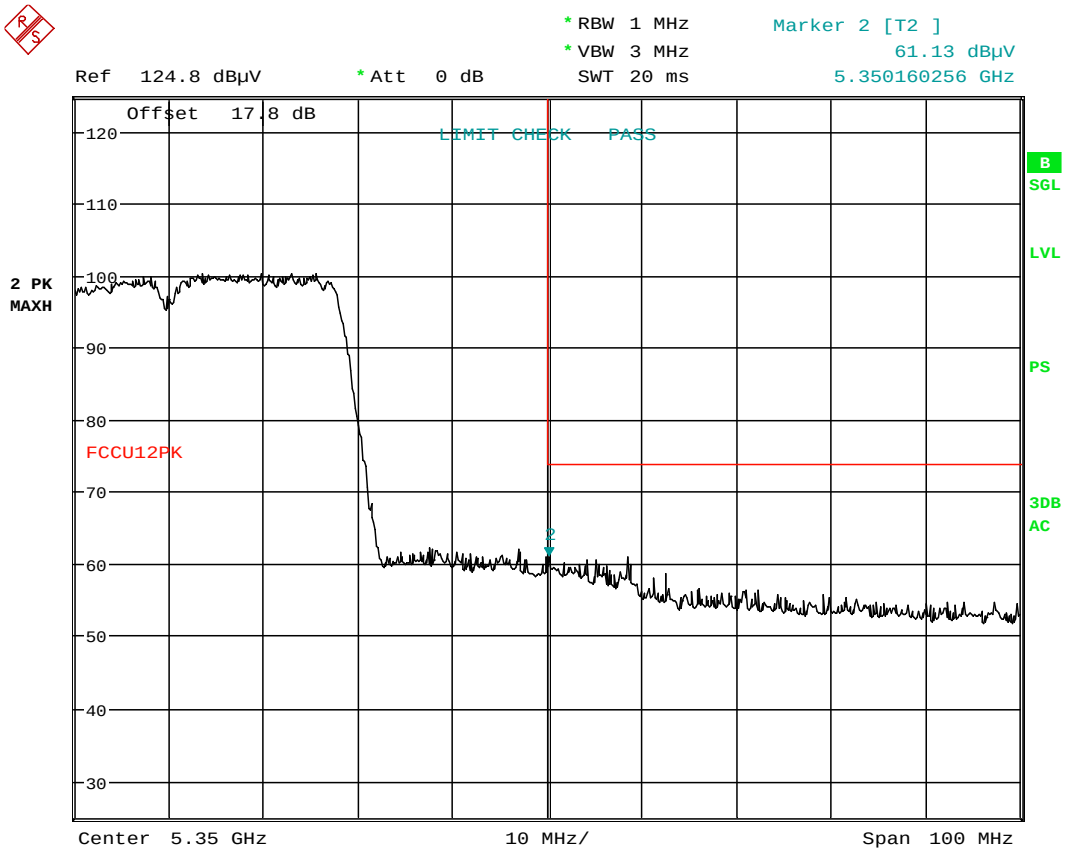


Date: 19.FEB.2015 17:43:35

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

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

§15.407(b.1)(b.2) §15.205 §15.209



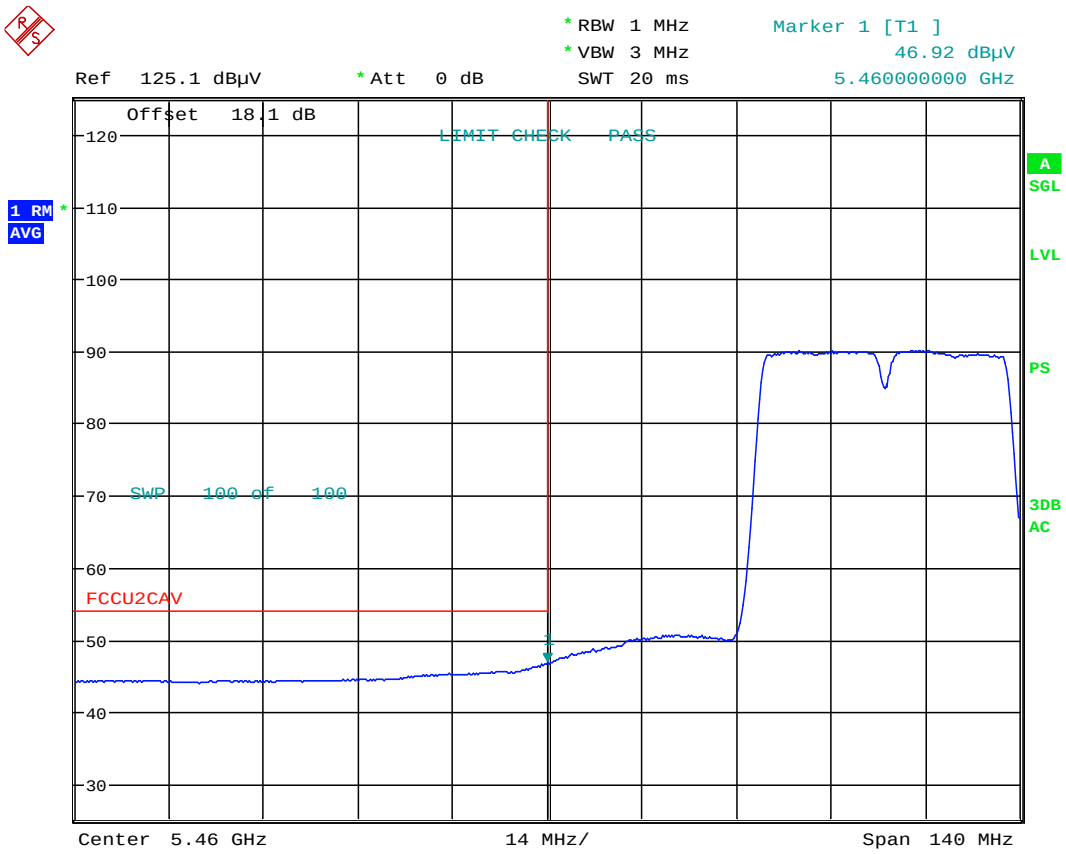
Date: 19.FEB.2015 17:42:57

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

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

§15.407(b.1)(b.2) §15.205 §15.209

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

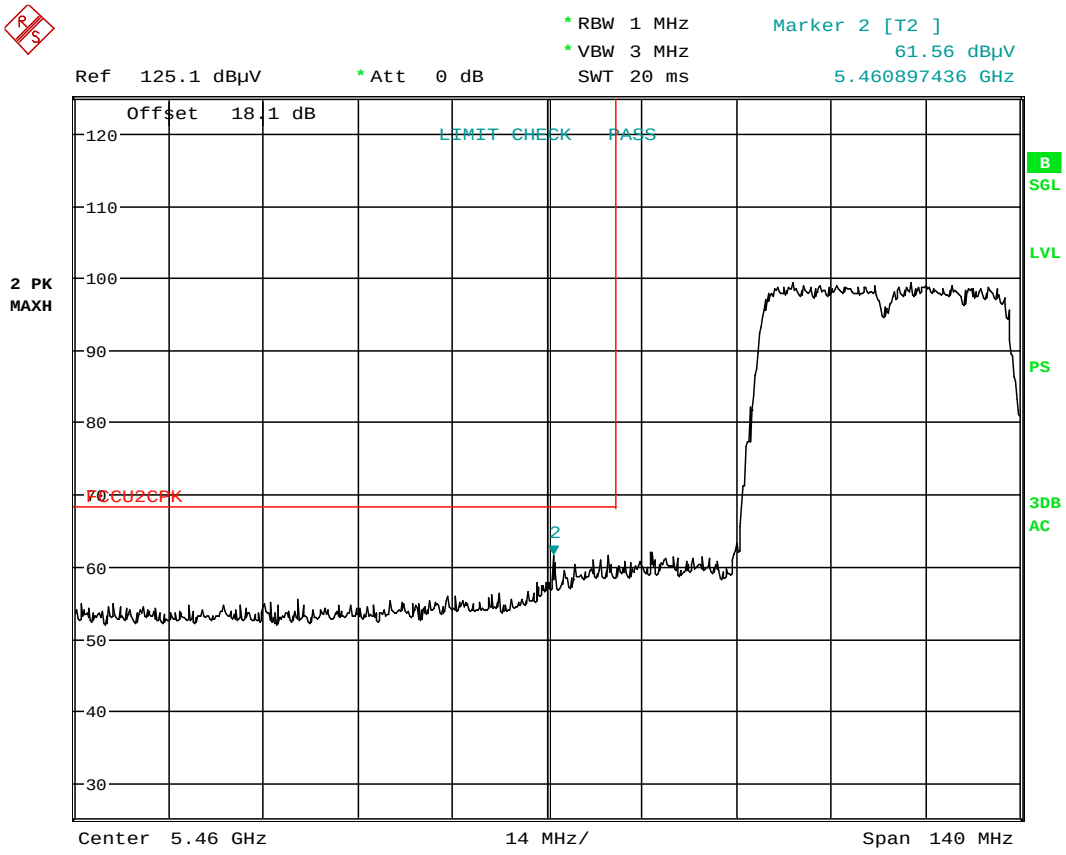


Date: 19.FEB.2015 18:00:43

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

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

§15.407(b.1)(b.2) §15.205 §15.209



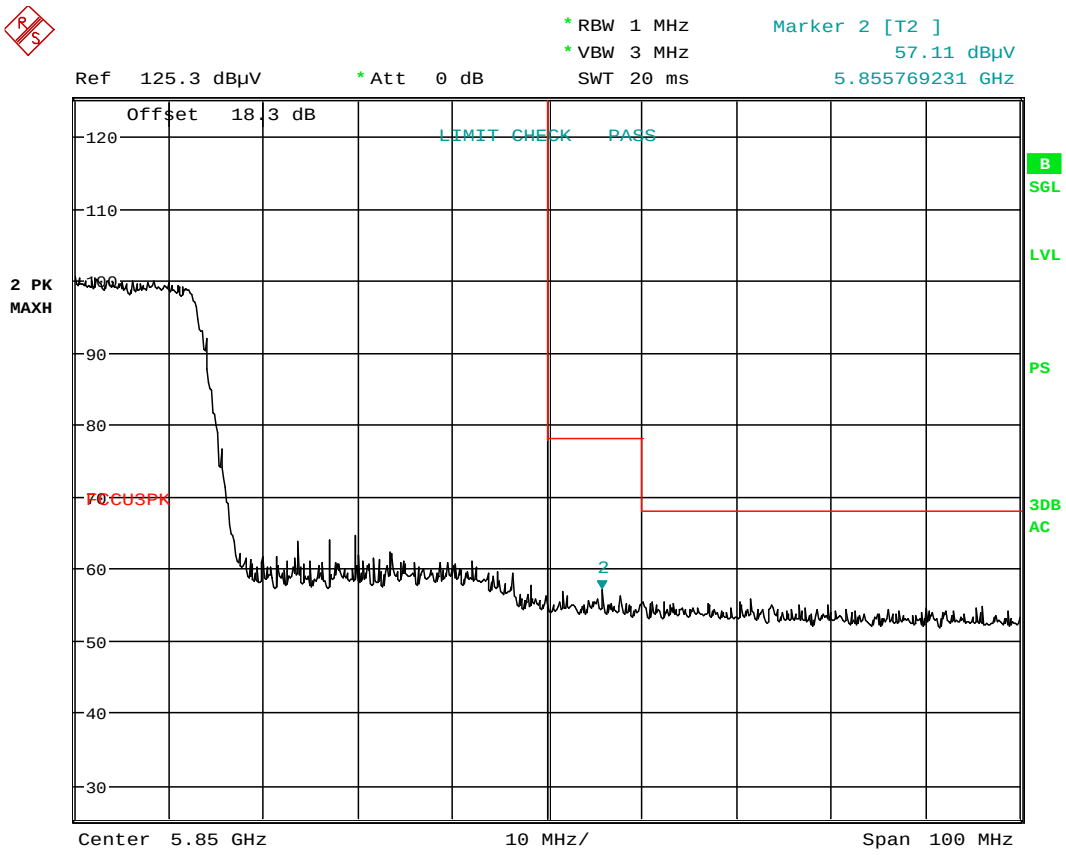
Date: 19.FEB.2015 18:01:01

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

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

§15.407(b.1)(b.2) §15.205 §15.209

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



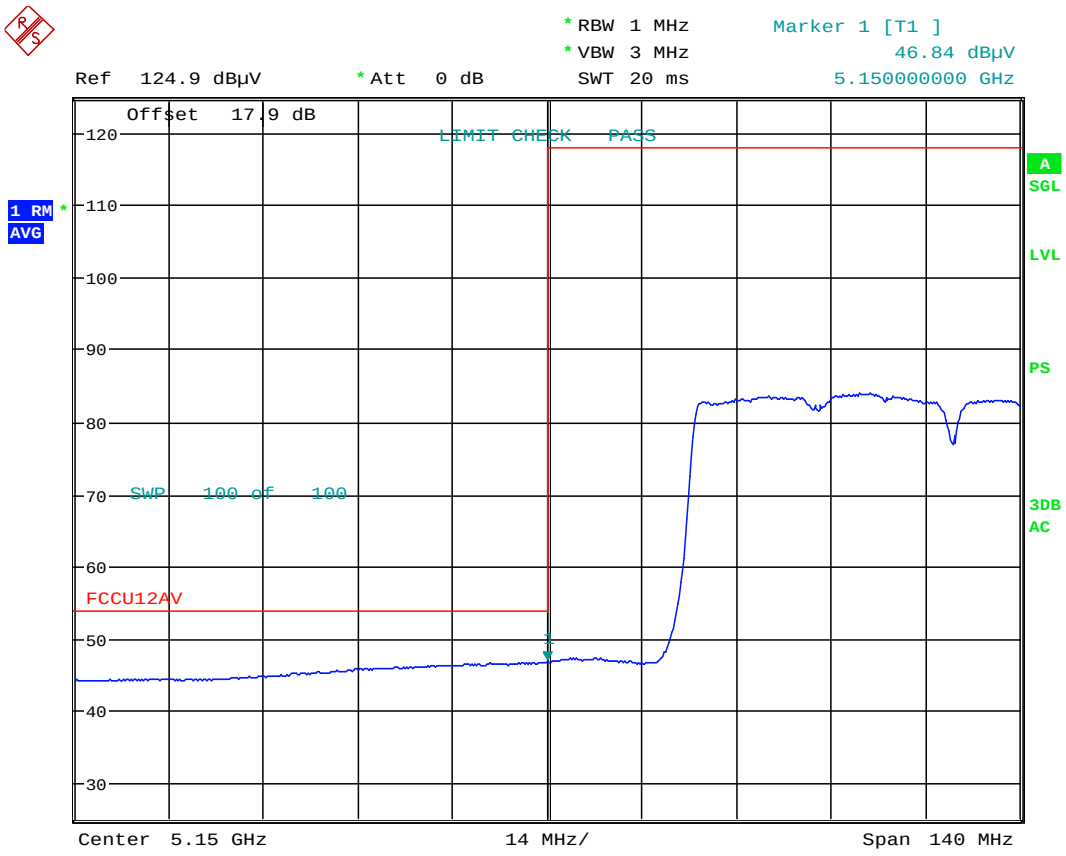
Date: 19.FEB.2015 18:12:30

Plot 6-186. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

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

§15.407(b.1)(b.2) §15.205 §15.209

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

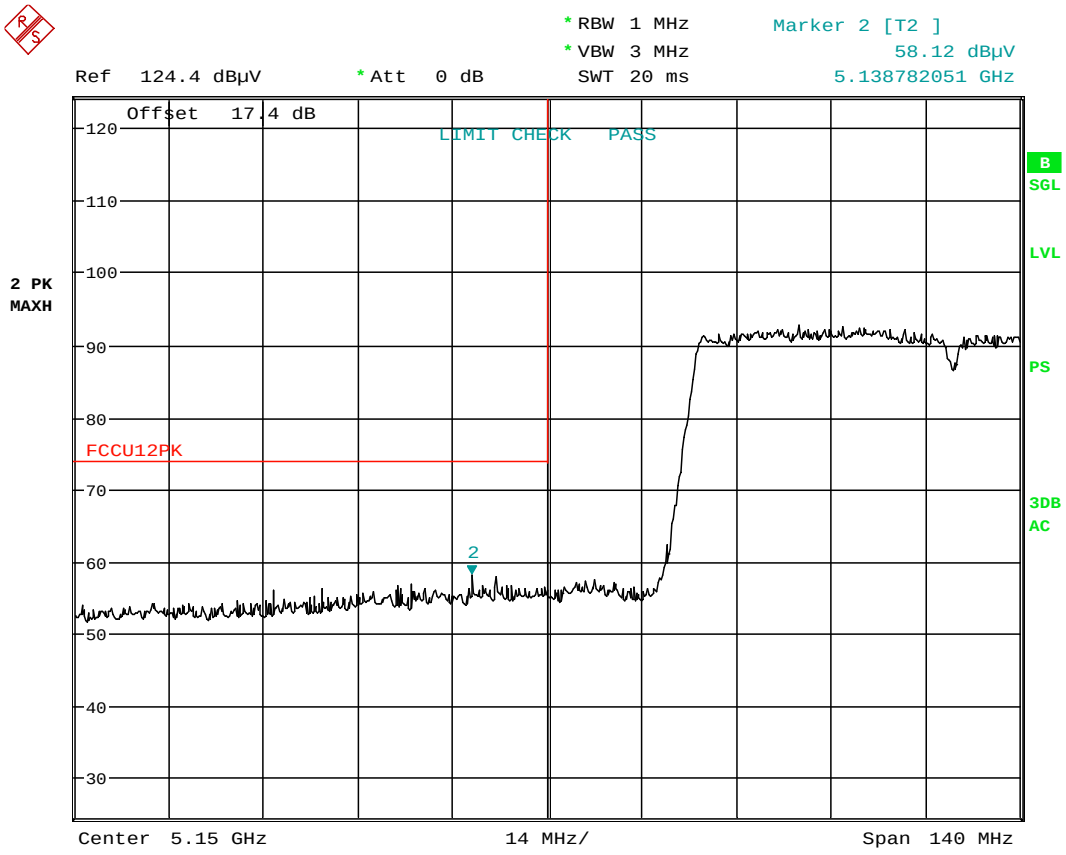


Date: 19.FEB.2015 17:22:18

Plot 6-187. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

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

§15.407(b.1)(b.2) §15.205 §15.209



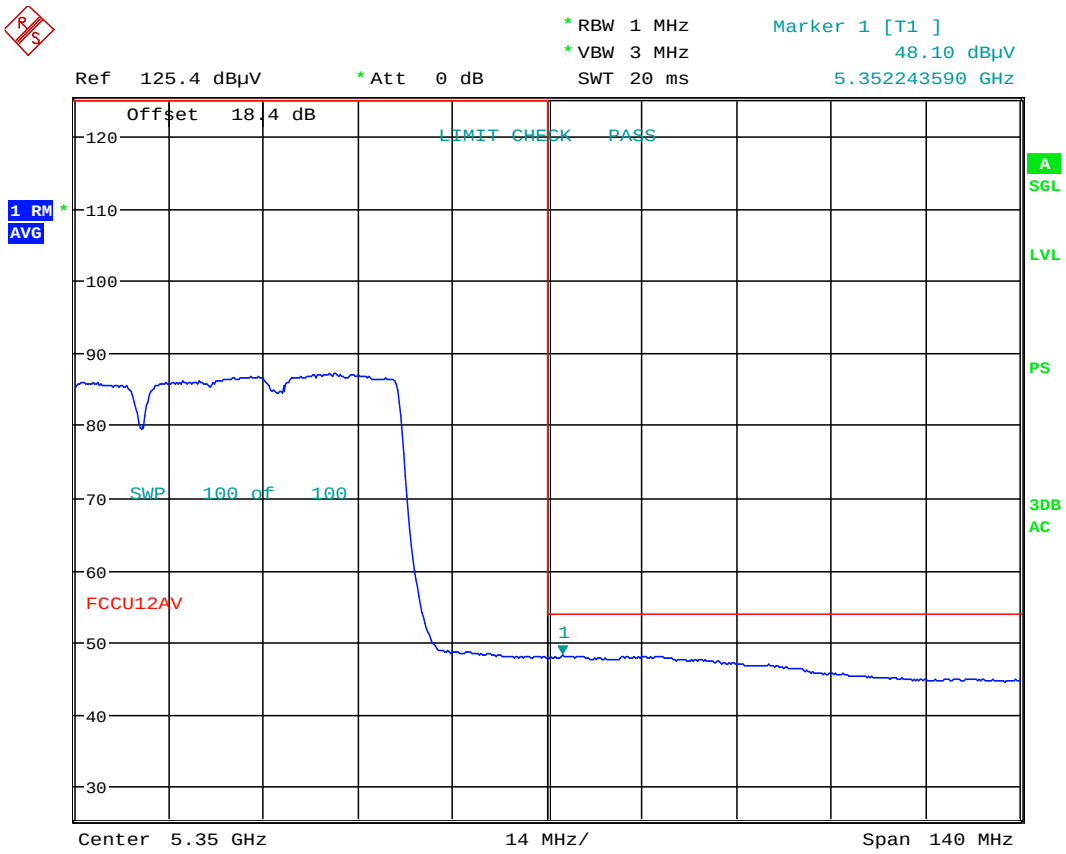
Date: 19.FEB.2015 17:22:03

Plot 6-188. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)

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

§15.407(b.1)(b.2) §15.205 §15.209

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

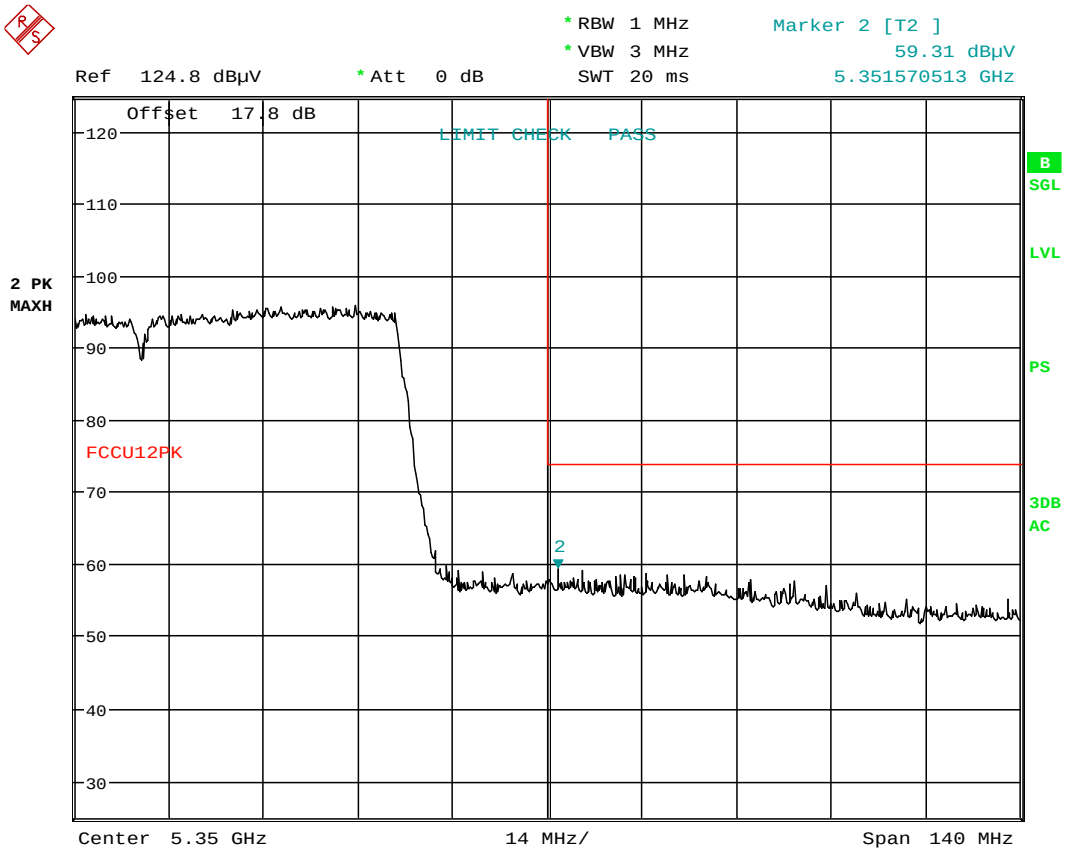


Date: 19.FEB.2015 17:44:56

Plot 6-189. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

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

§15.407(b.1)(b.2) §15.205 §15.209



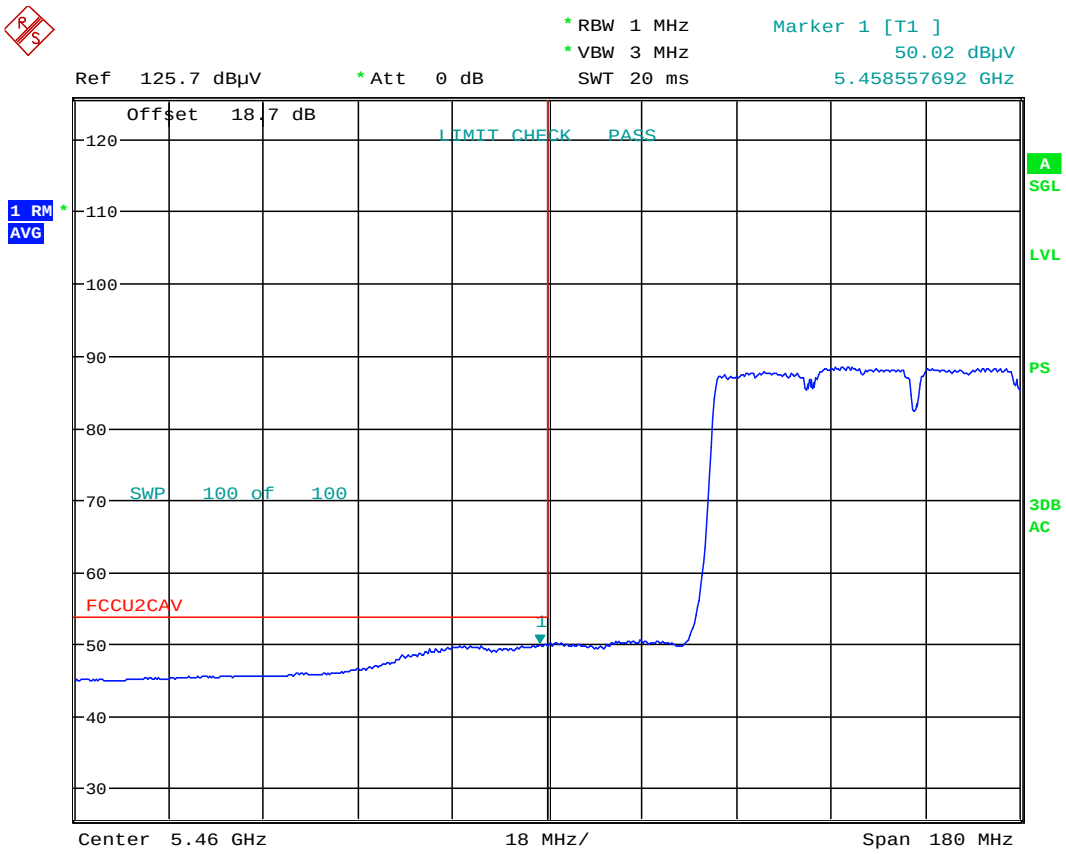
Date: 19.FEB.2015 17:45:08

Plot 6-190. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

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

§15.407(b.1)(b.2) §15.205 §15.209

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

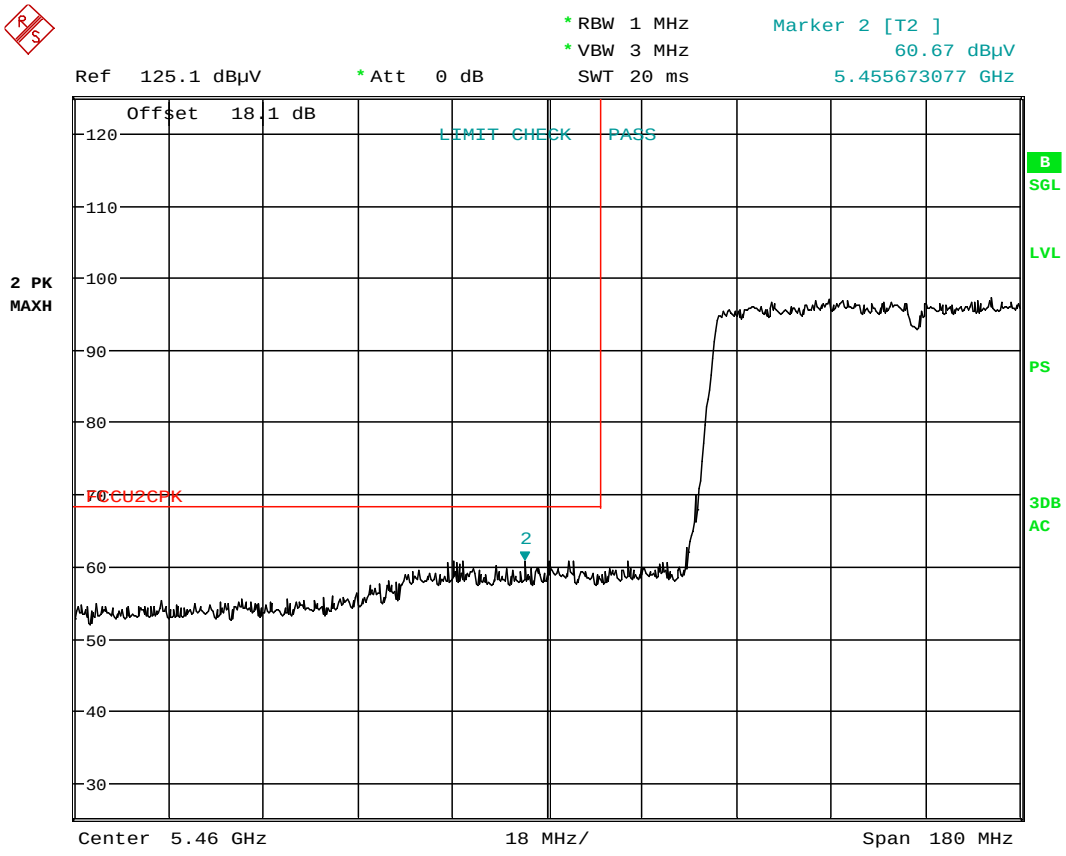


Date: 19.FEB.2015 18:02:08

Plot 6-191. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

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

§15.407(b.1)(b.2) §15.205 §15.209

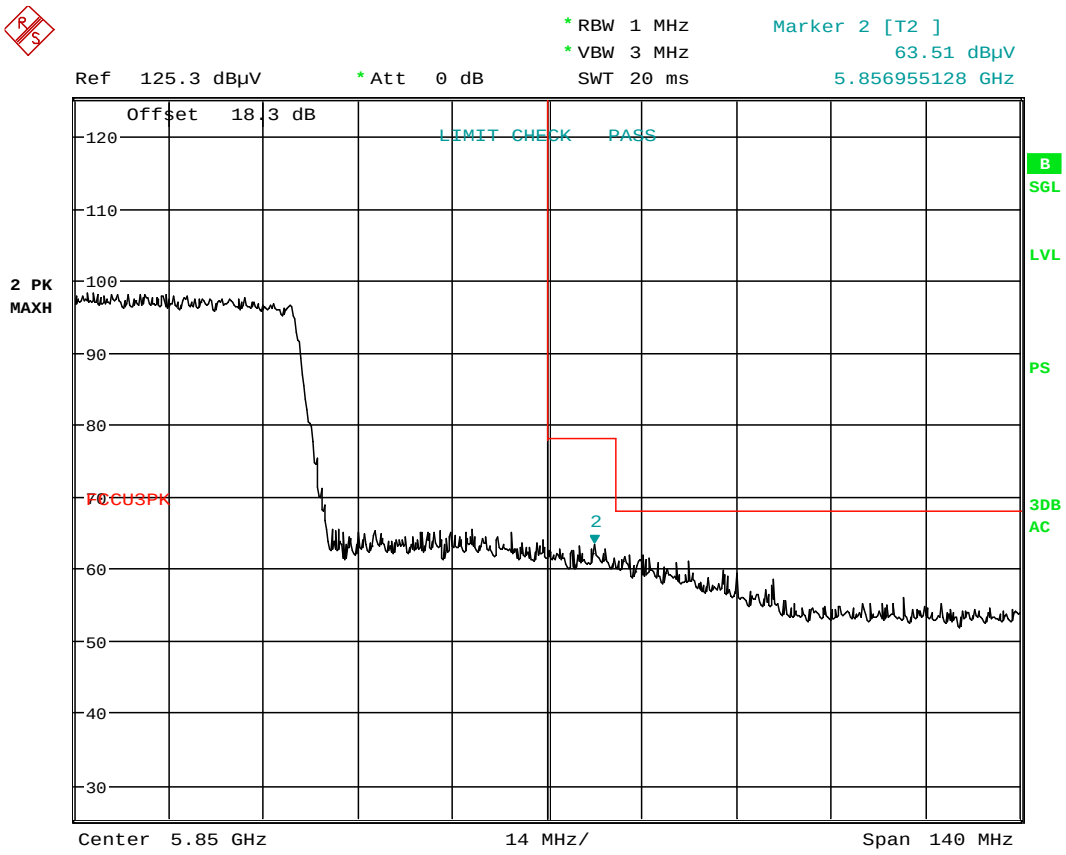


Plot 6-192. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

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

§15.407(b.1)(b.2) §15.205 §15.209

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

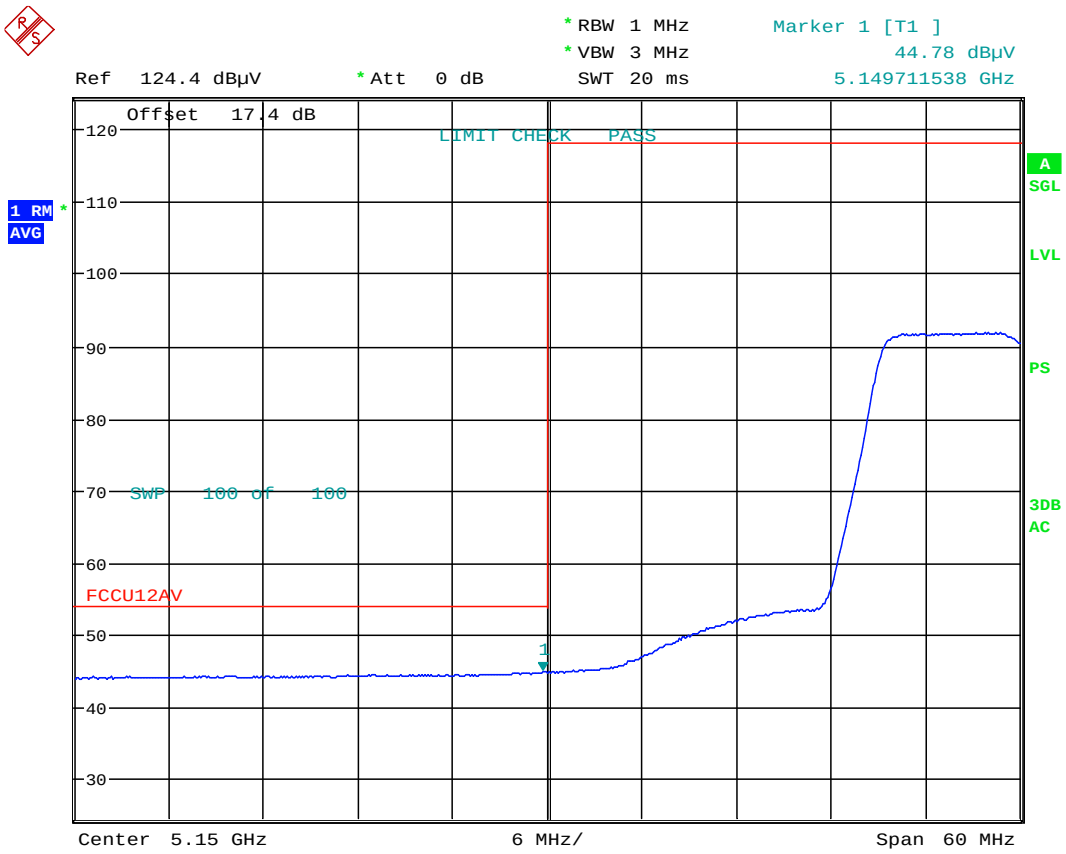


Plot 6-193. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

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

§15.407(b.1)(b.2) §15.205 §15.209

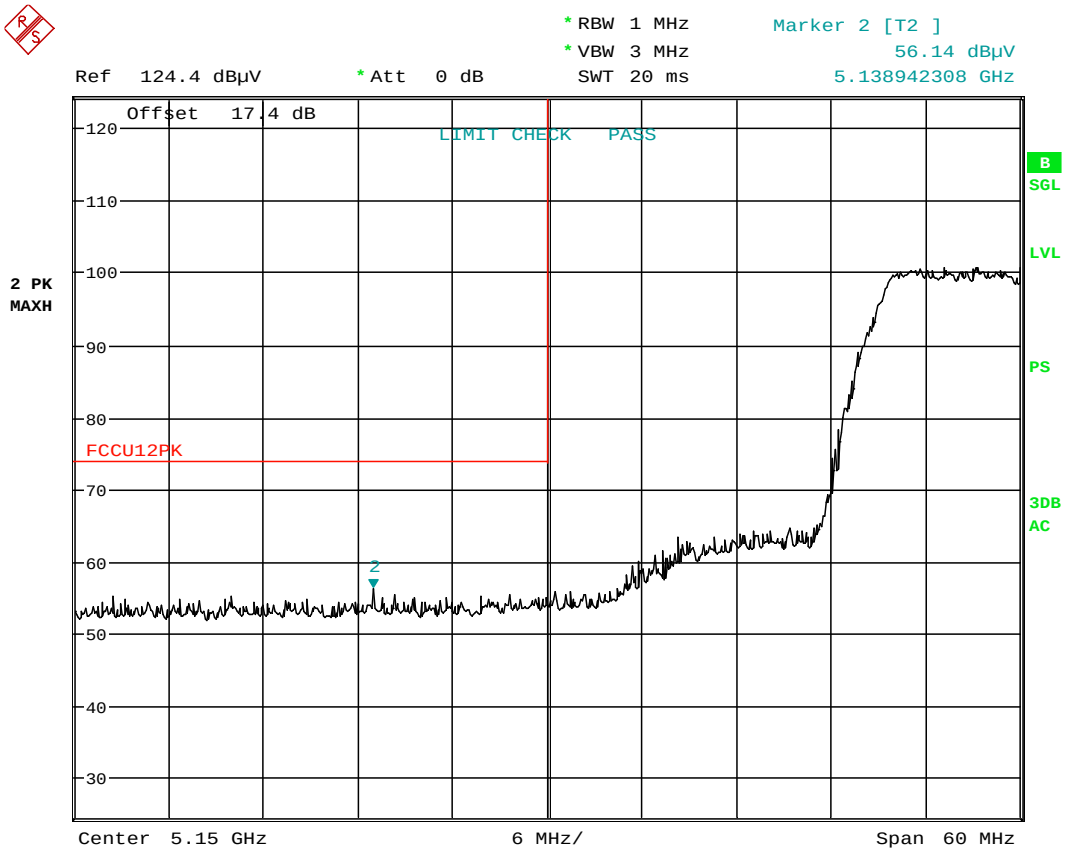
Worst Case Mode:	802.11a
Worst Case Transfer Rate:	6 Mbps
Distance of Measurements:	3 Meters
Operating Frequency:	5180MHz
Channel:	36



Plot 6-194. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

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

§15.407(b.1)(b.2) §15.205 §15.209



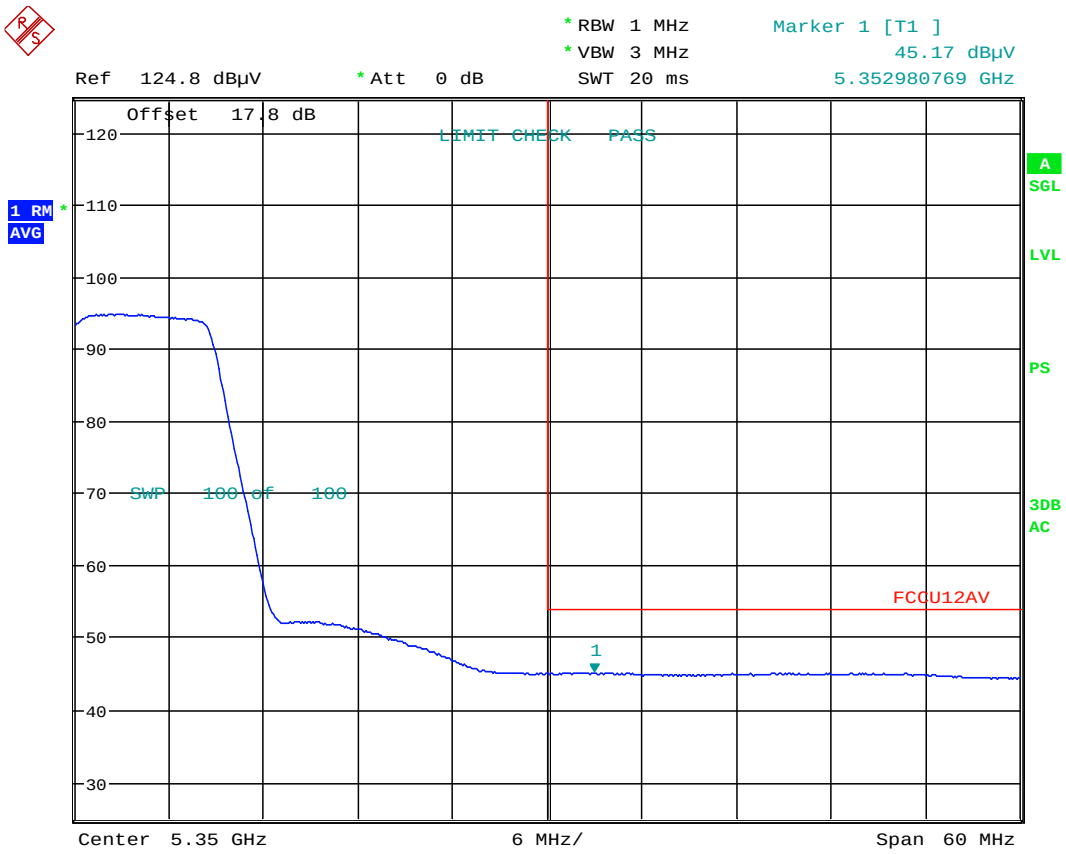
Date: 19.FEB.2015 19:59:17

Plot 6-195. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)

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

§15.407(b.1)(b.2) §15.205 §15.209

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

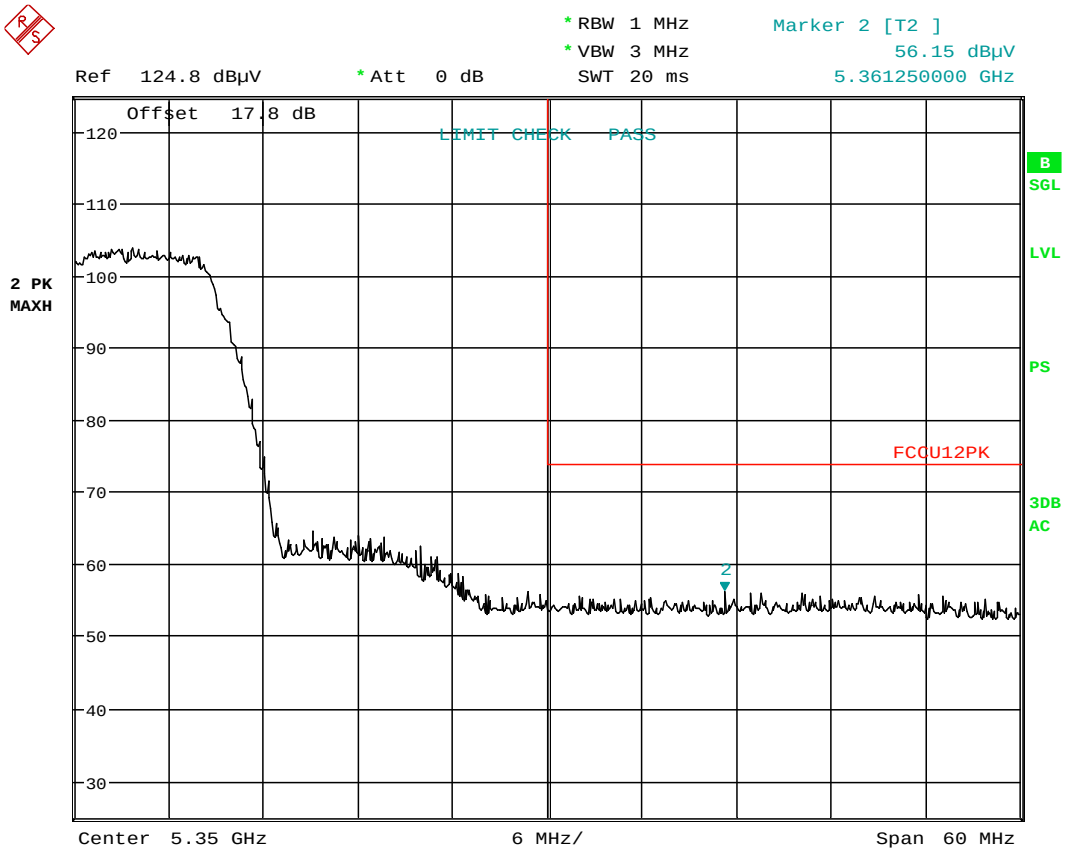


Date: 19.FEB.2015 20:26:15

Plot 6-196. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

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

§15.407(b.1)(b.2) §15.205 §15.209



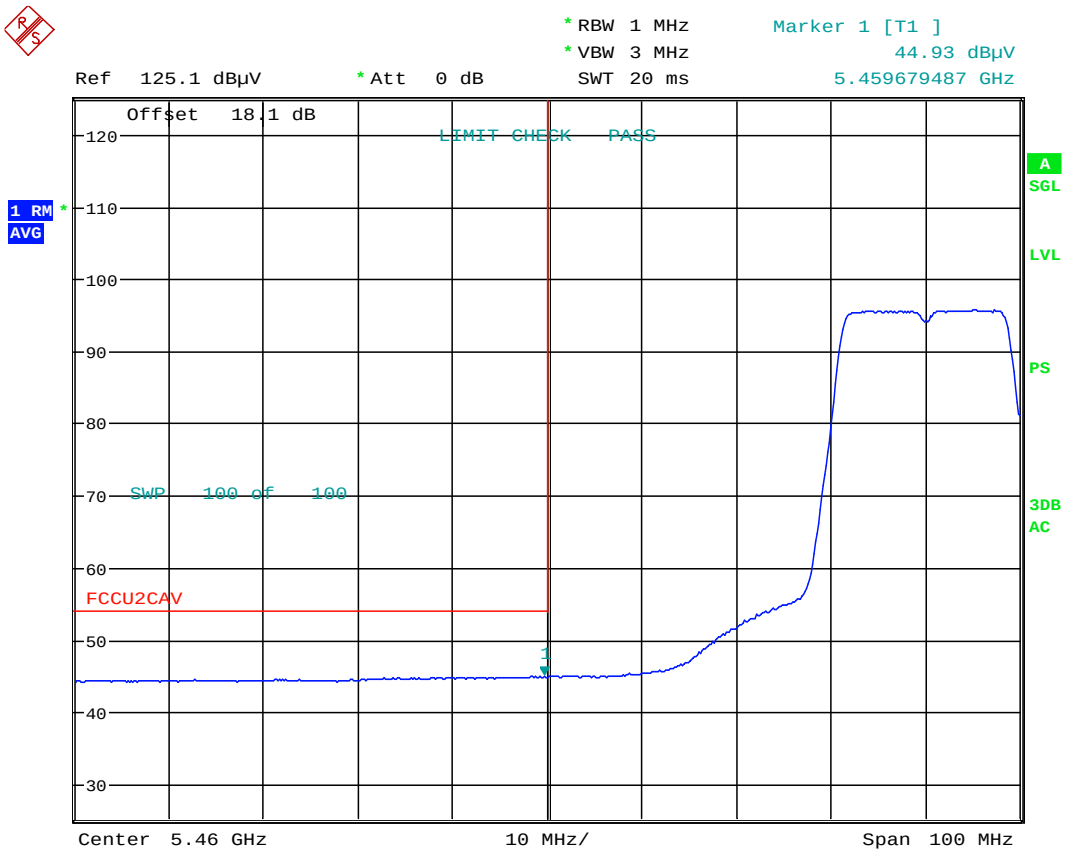
Date: 19.FEB.2015 20:26:25

Plot 6-197. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

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

§15.407(b.1)(b.2) §15.205 §15.209

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

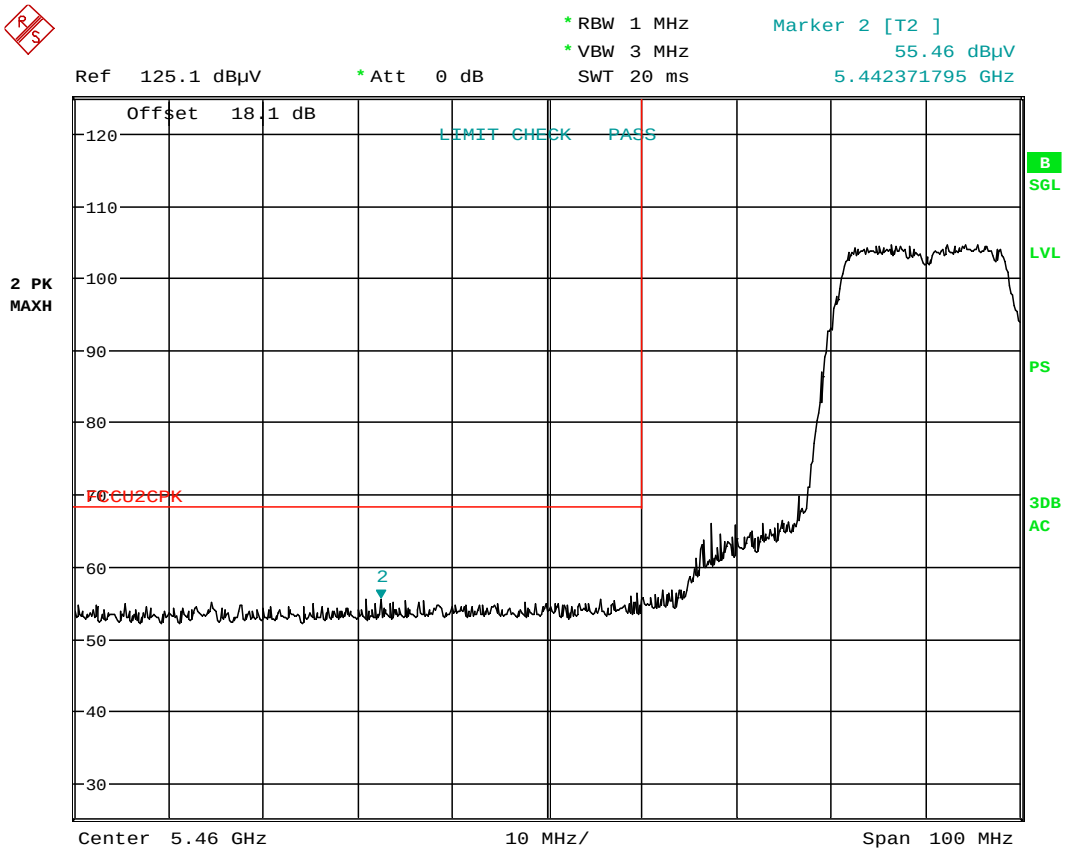


Date: 19.FEB.2015 20:33:08

Plot 6-198. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

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

§15.407(b.1)(b.2) §15.205 §15.209



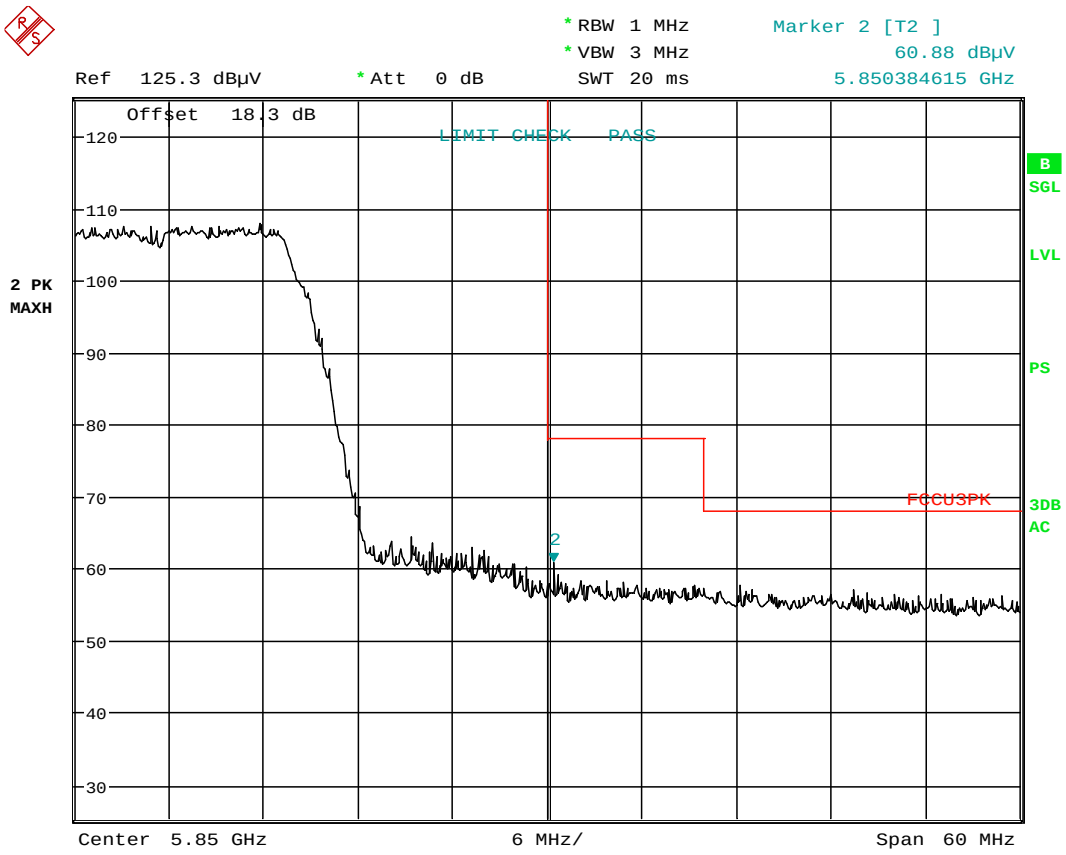
Date: 19.FEB.2015 20:33:18

Plot 6-199. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

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

§15.407(b.1)(b.2) §15.205 §15.209

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



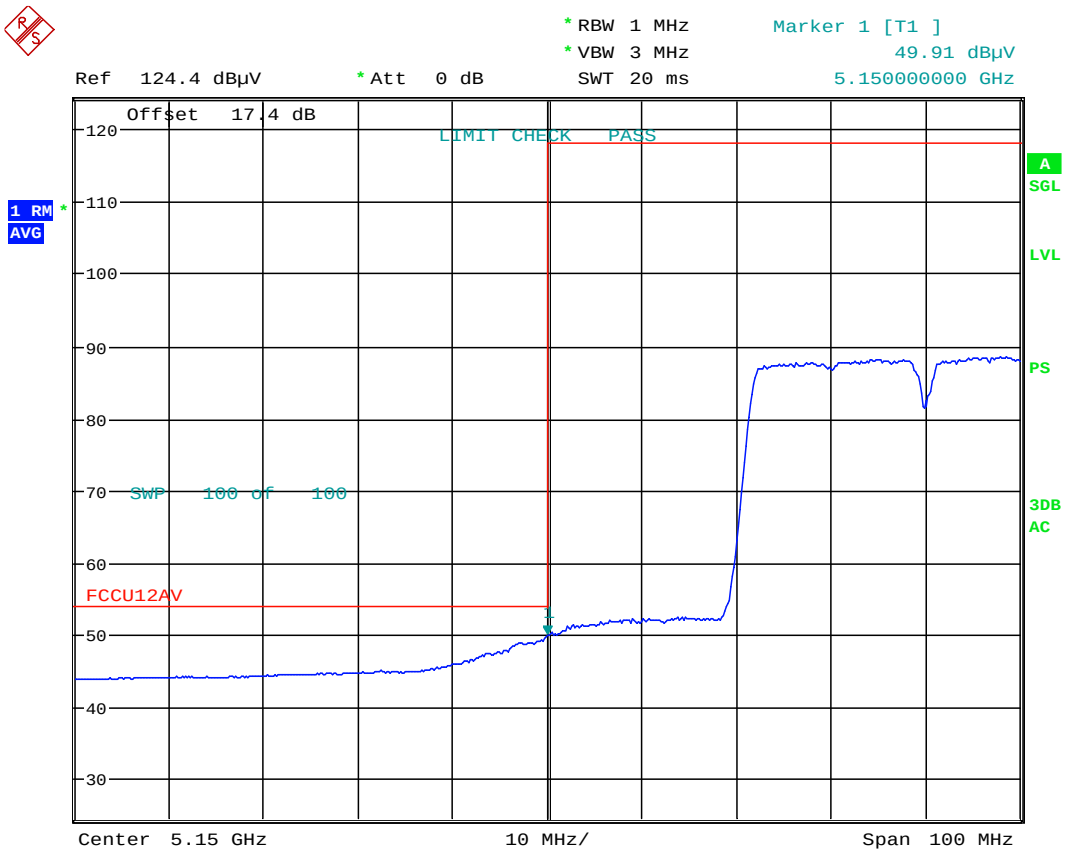
Date: 19.FEB.2015 20:40:28

Plot 6-200. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

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

§15.407(b.1)(b.2) §15.205 §15.209

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

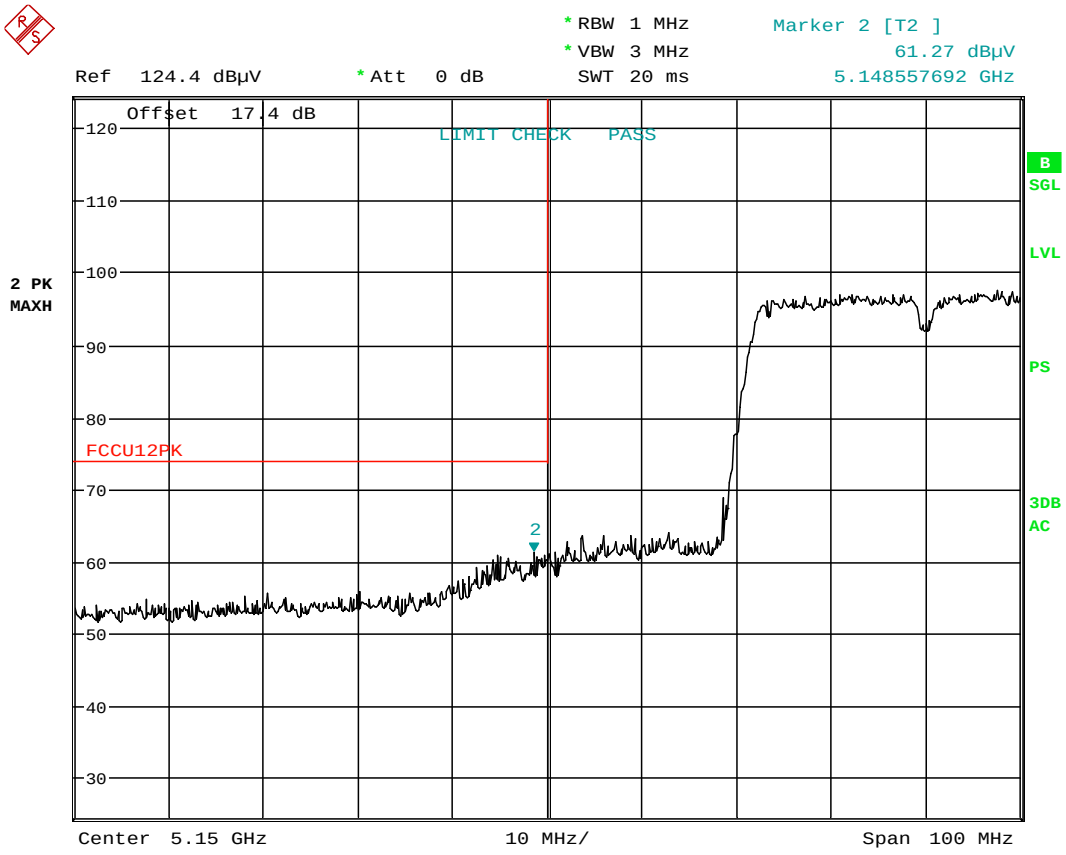


Date: 19.FEB.2015 20:02:03

Plot 6-201. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

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

§15.407(b.1)(b.2) §15.205 §15.209



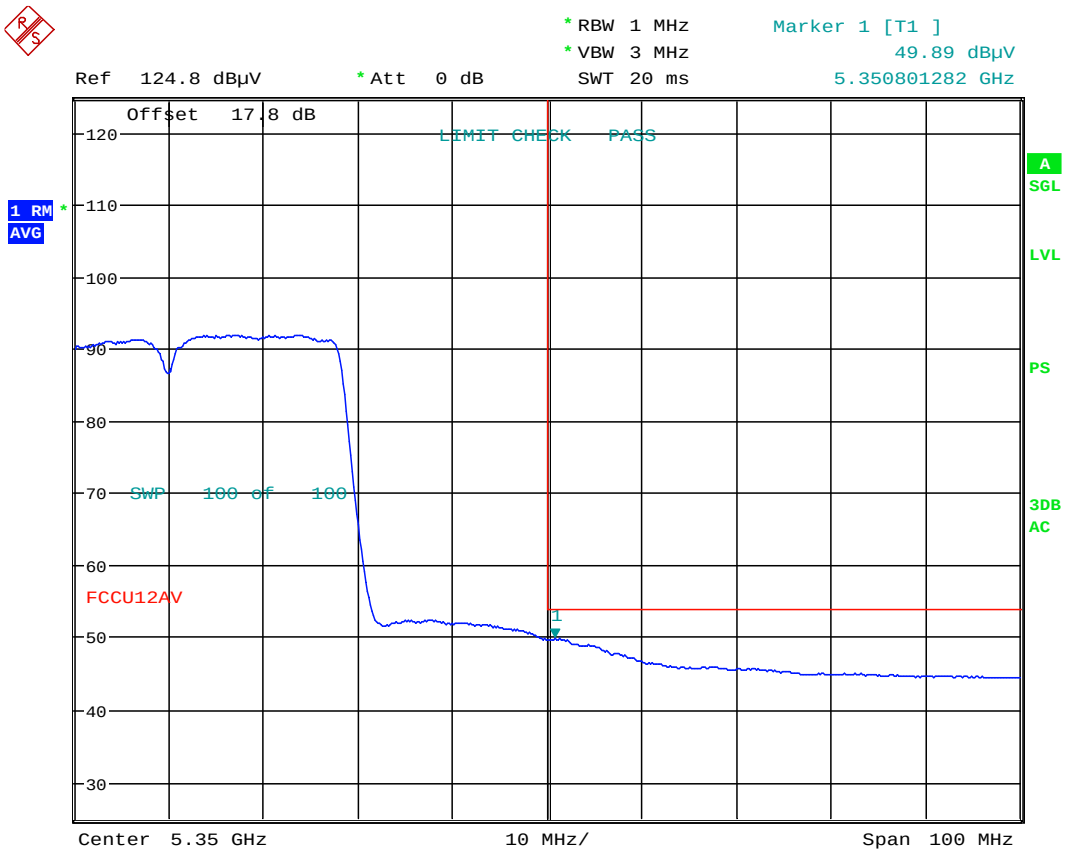
Date: 19.FEB.2015 20:02:13

Plot 6-202. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)

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

§15.407(b.1)(b.2) §15.205 §15.209

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

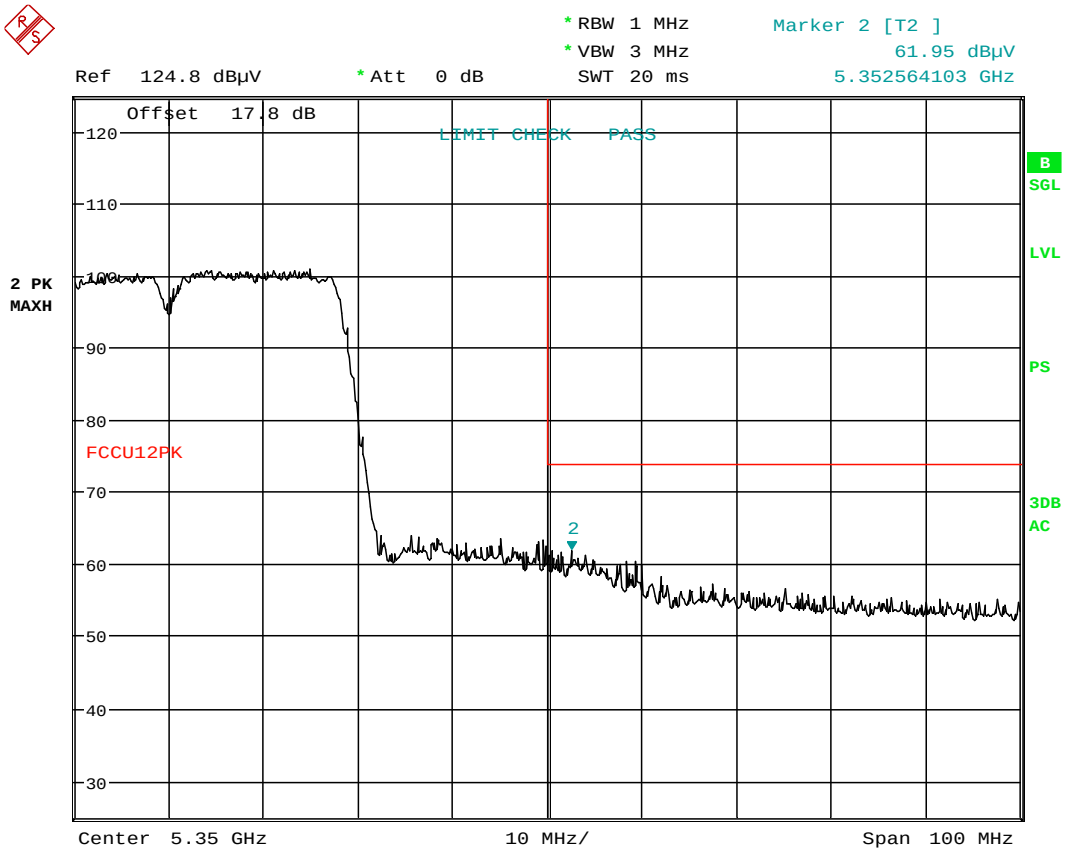


Date: 19.FEB.2015 20:27:31

Plot 6-203. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

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

§15.407(b.1)(b.2) §15.205 §15.209



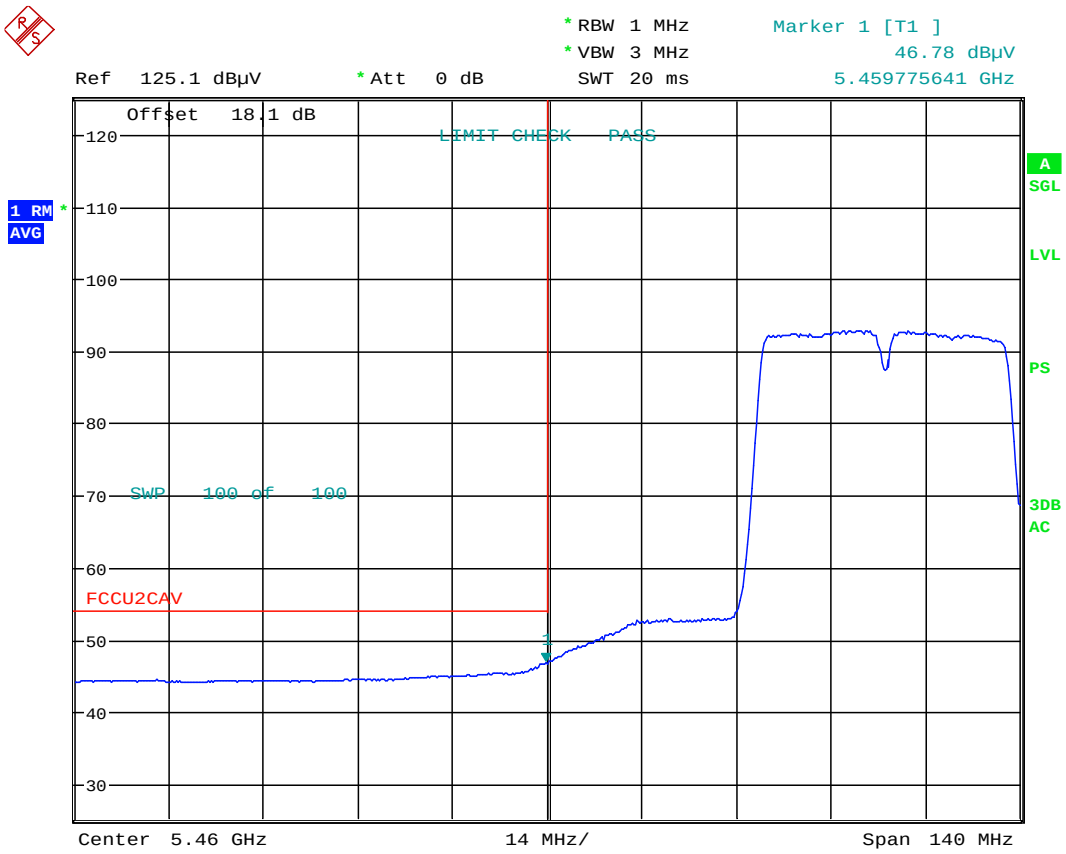
Date: 19.FEB.2015 20:27:17

Plot 6-204. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

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

§15.407(b.1)(b.2) §15.205 §15.209

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

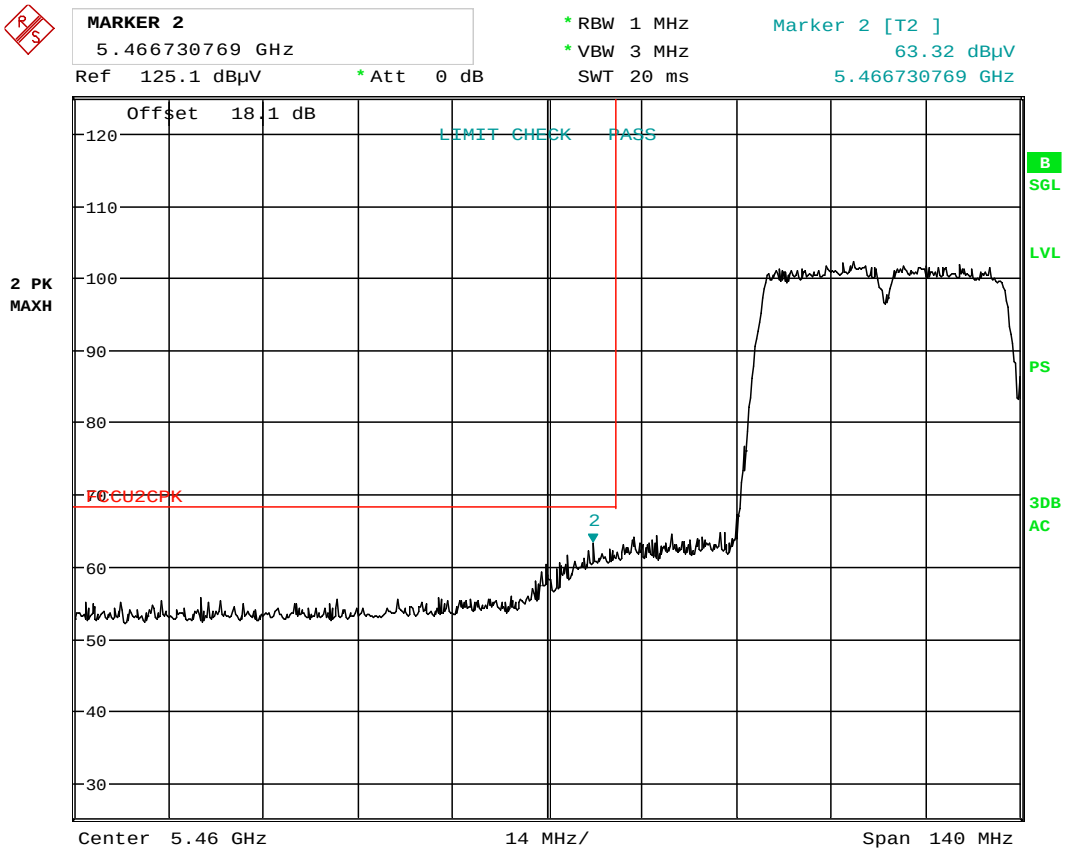


Date: 19.FEB.2015 20:34:40

Plot 6-205. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

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

§15.407(b.1)(b.2) §15.205 §15.209

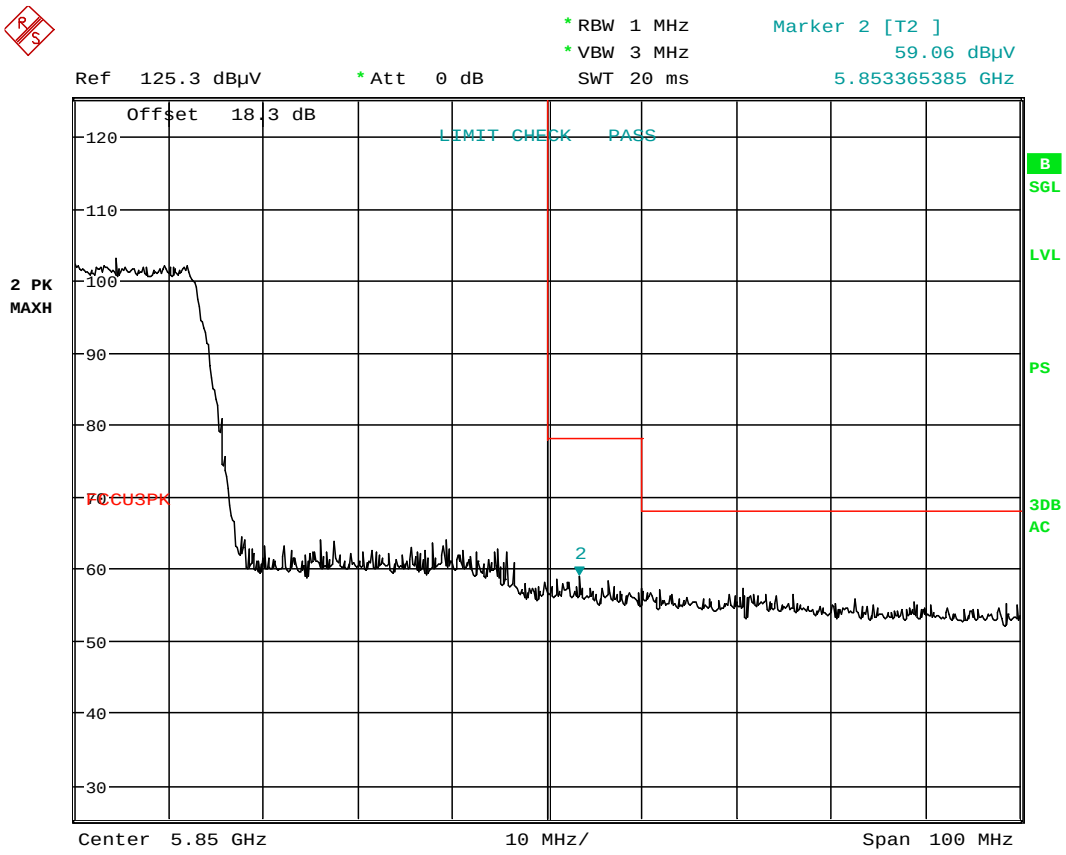


Plot 6-206. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

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

§15.407(b.1)(b.2) §15.205 §15.209

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



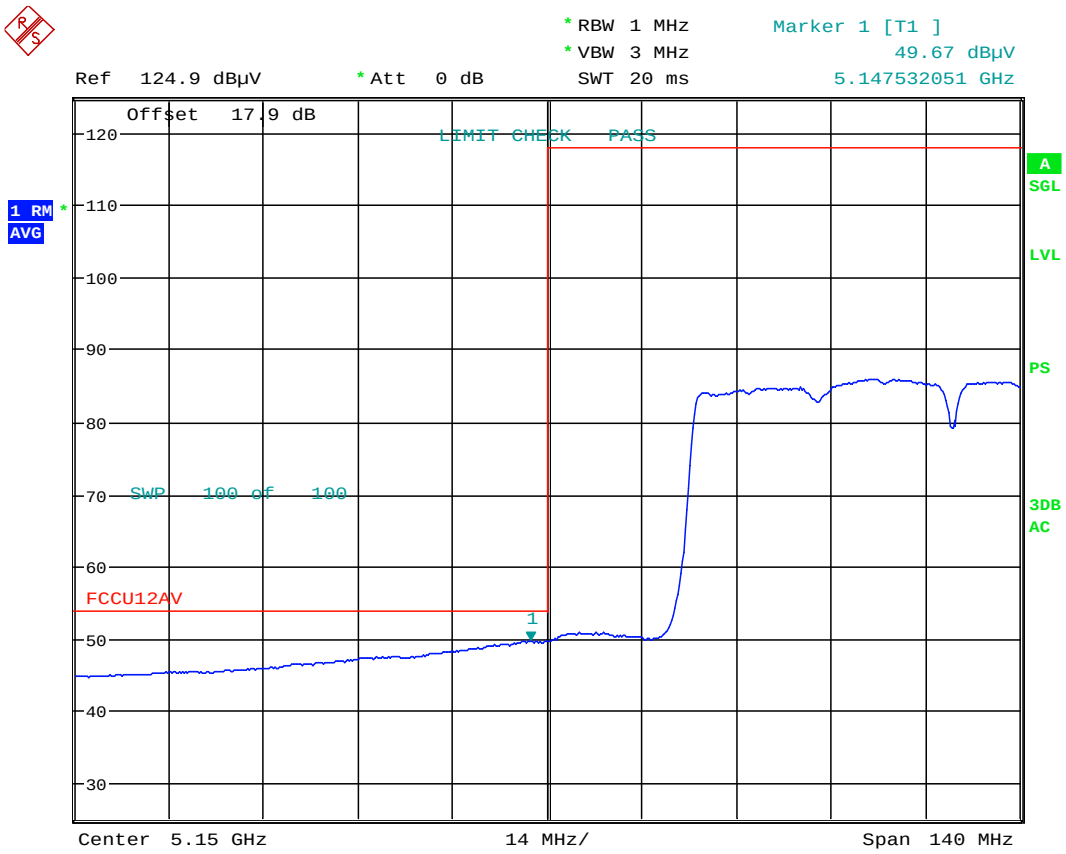
Date: 19.FEB.2015 20:41:13

Plot 6-207. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

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

§15.407(b.1)(b.2) §15.205 §15.209

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

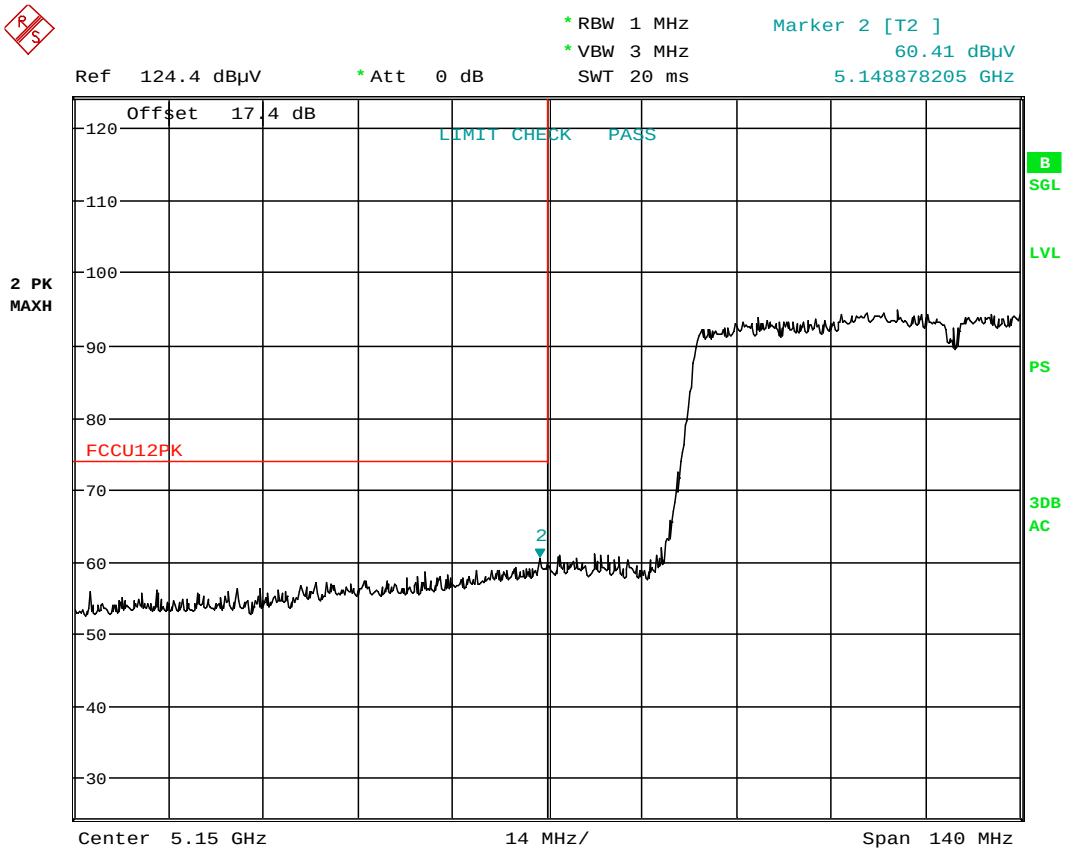


Date: 19.FEB.2015 20:04:39

Plot 6-208. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

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

§15.407(b.1)(b.2) §15.205 §15.209



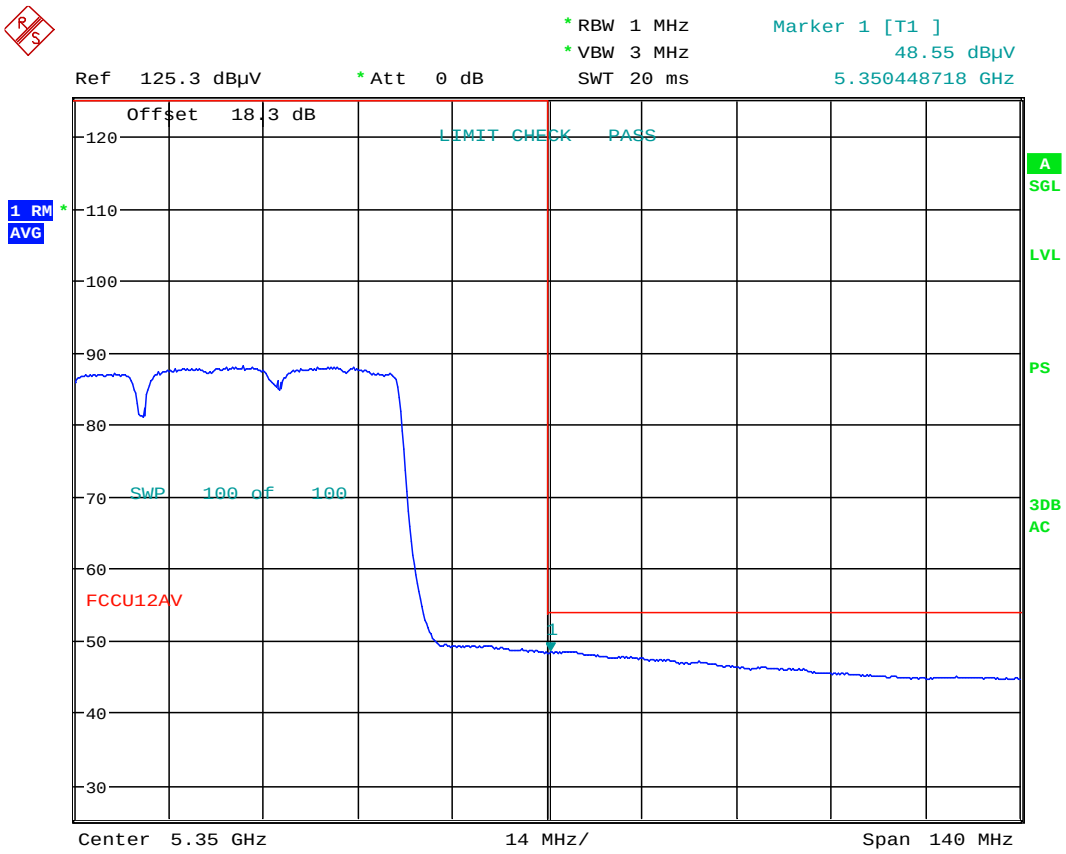
Date: 19.FEB.2015 20:03:05

Plot 6-209. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)

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

§15.407(b.1)(b.2) §15.205 §15.209

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

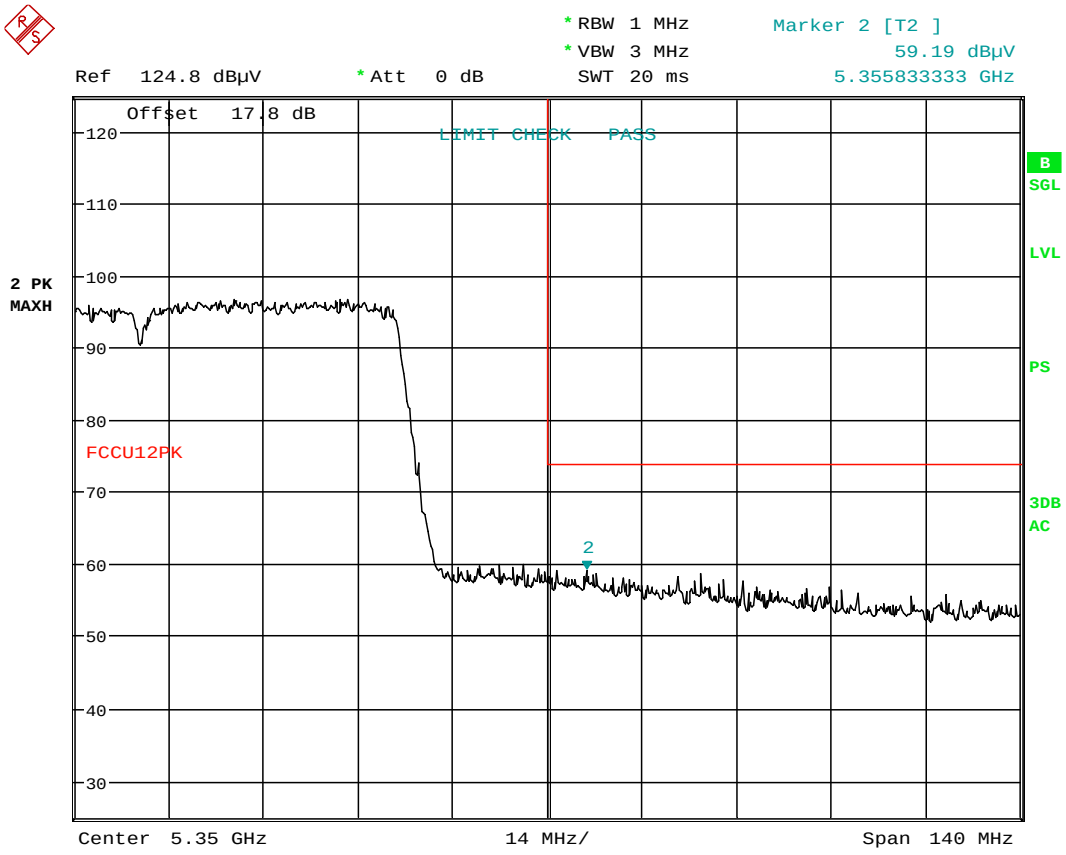


Date: 19.FEB.2015 20:29:11

Plot 6-210. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

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

§15.407(b.1)(b.2) §15.205 §15.209



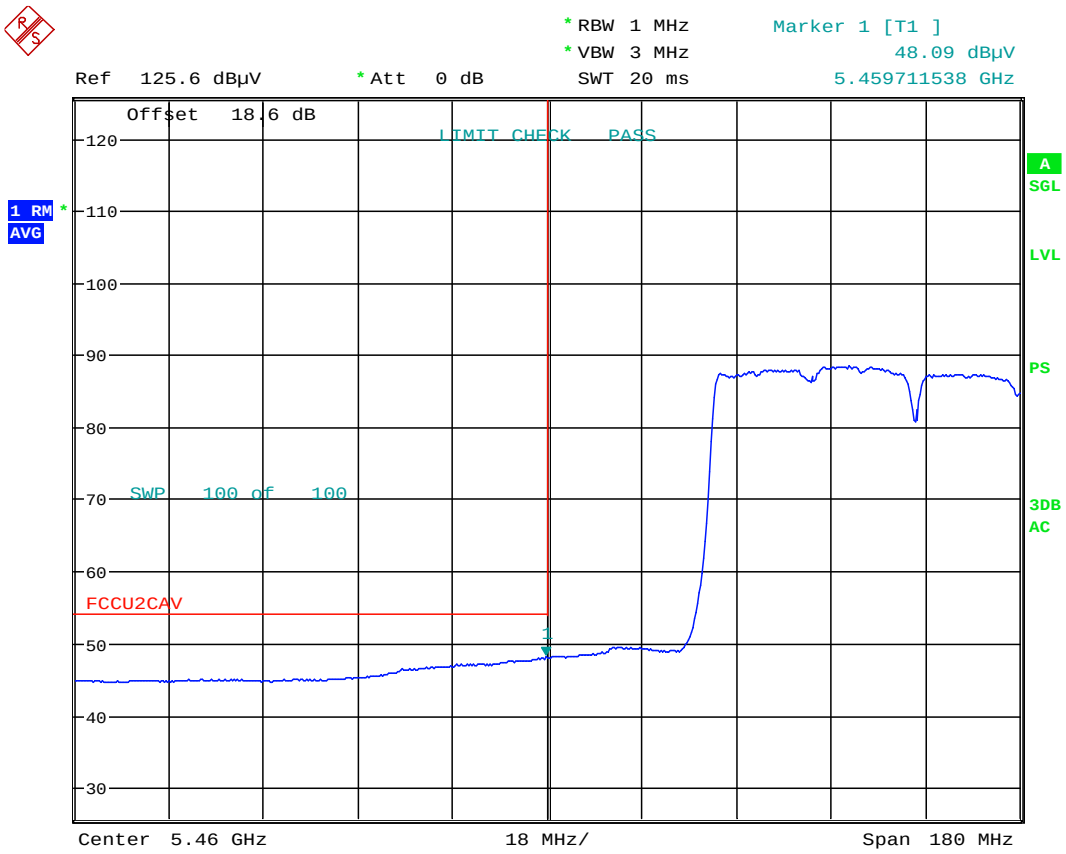
Date: 19.FEB.2015 20:29:23

Plot 6-211. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

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

§15.407(b.1)(b.2) §15.205 §15.209

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

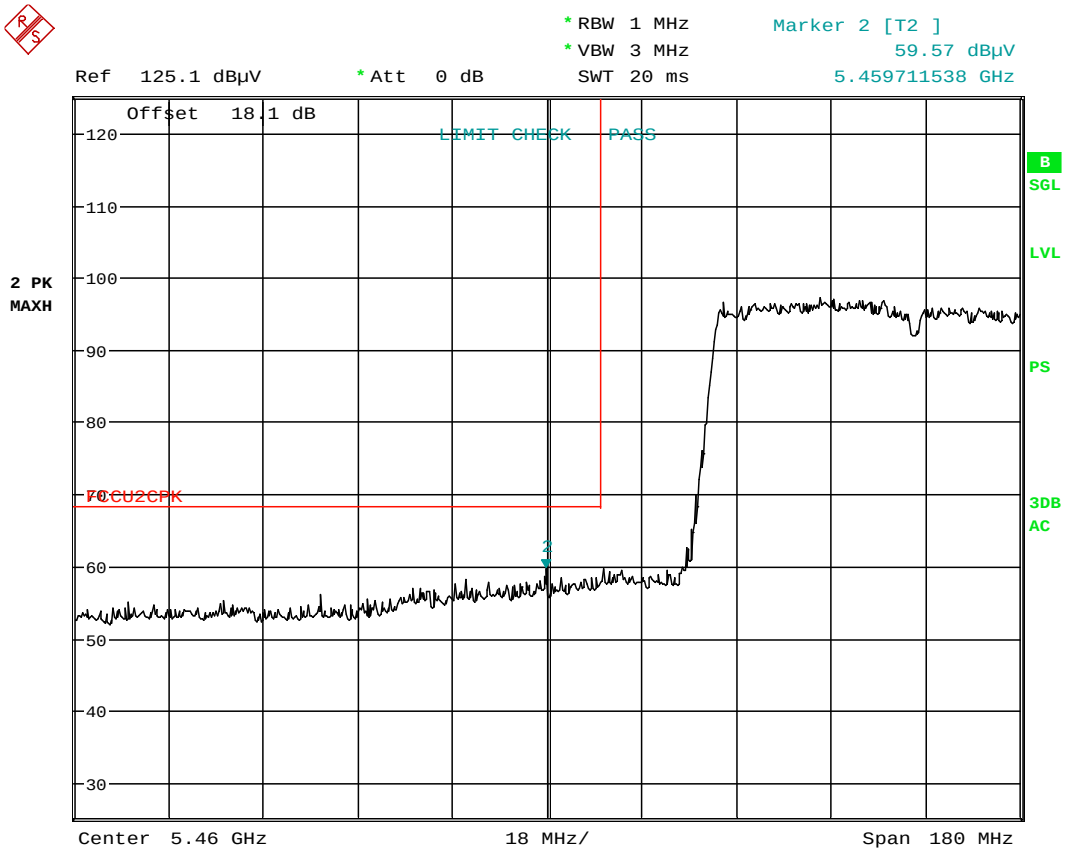


Date: 19.FEB.2015 20:35:45

Plot 6-212. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

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

§15.407(b.1)(b.2) §15.205 §15.209



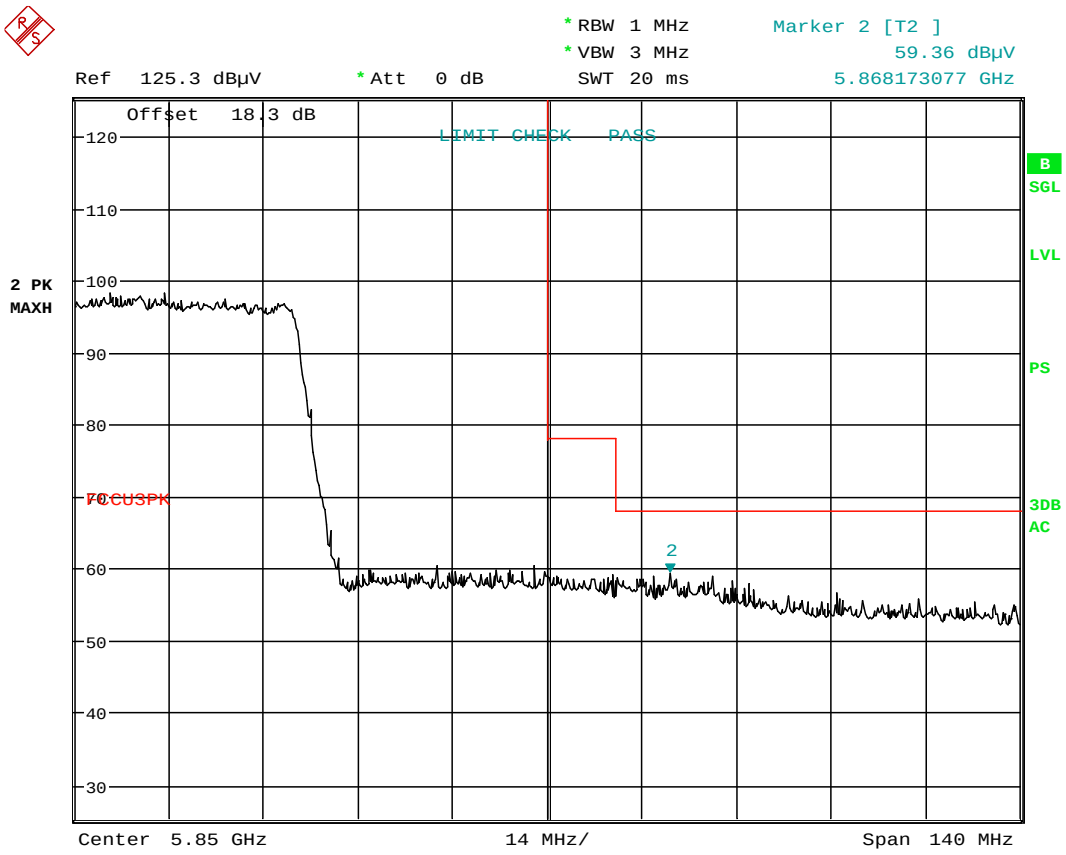
Date: 19.FEB.2015 20:35:57

Plot 6-213. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

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

§15.407(b.1)(b.2) §15.205 §15.209

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



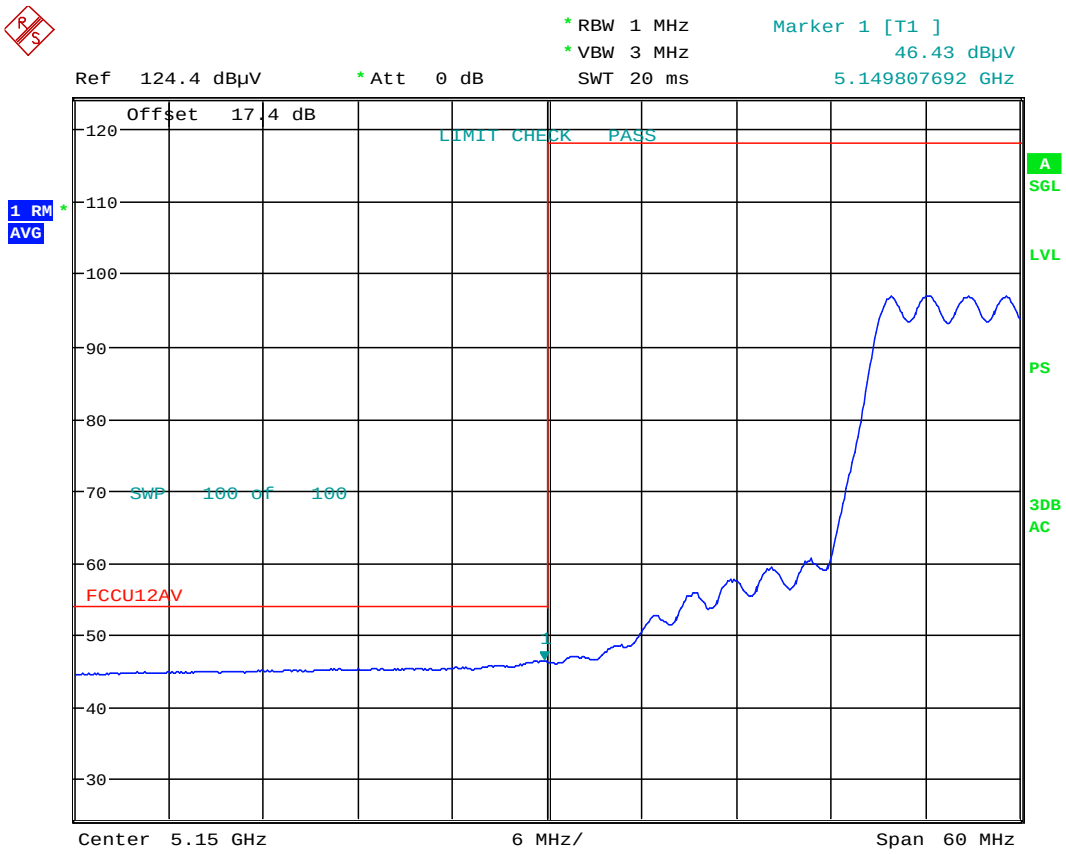
Date: 19.FEB.2015 20:42:00

Plot 6-214. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

6.7.9 MIMO Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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

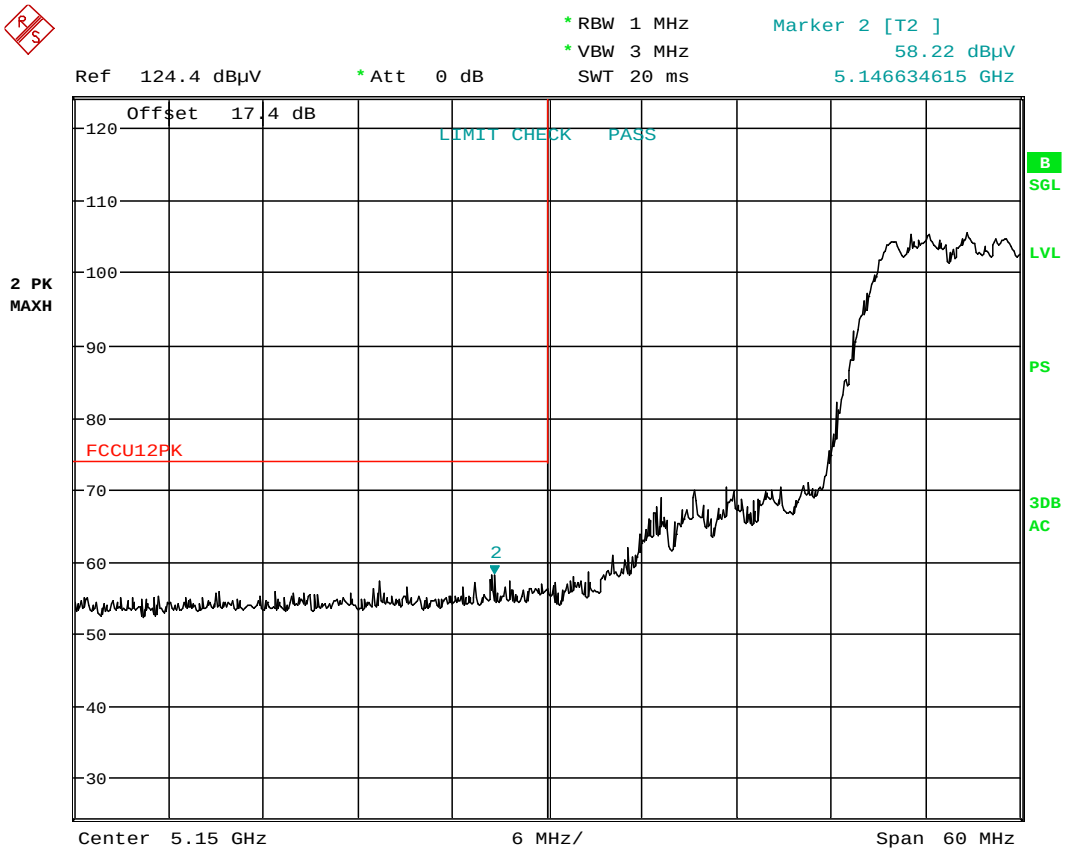


Date: 19.FEB.2015 20:47:56

Plot 6-215. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

MIMO Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



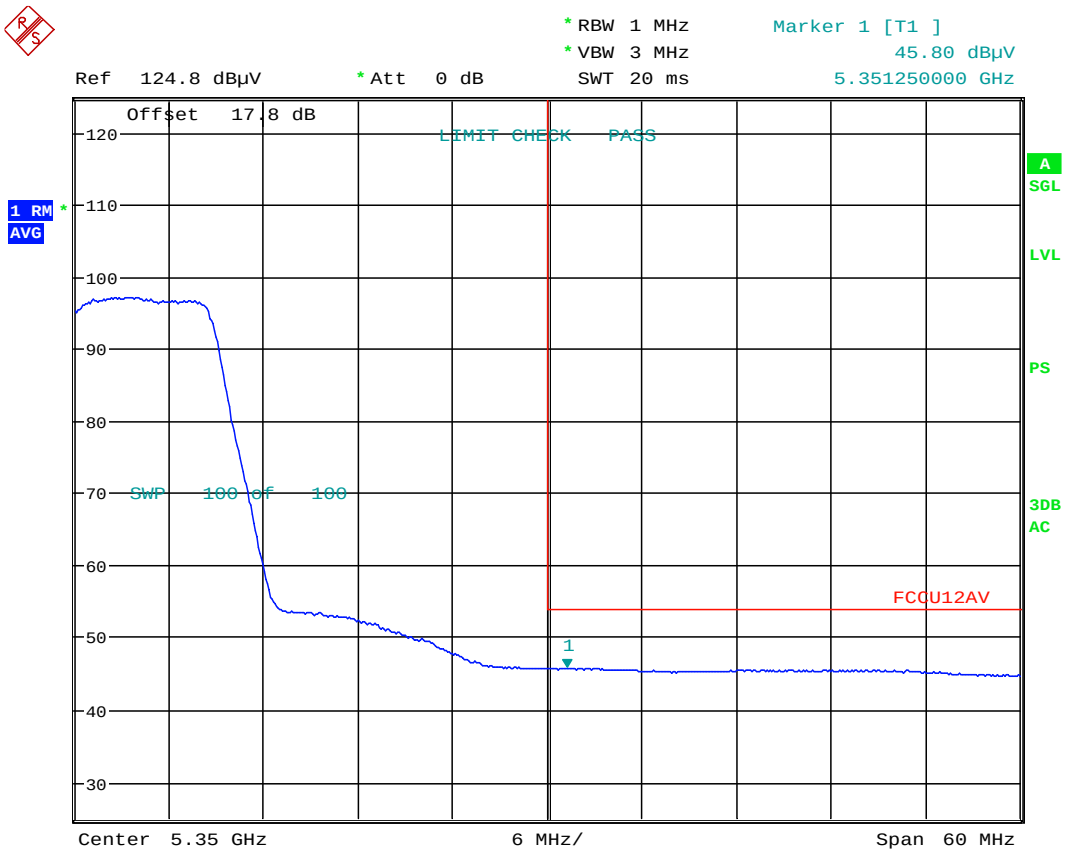
Date: 19.FEB.2015 20:48:06

Plot 6-216. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)

MIMO Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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

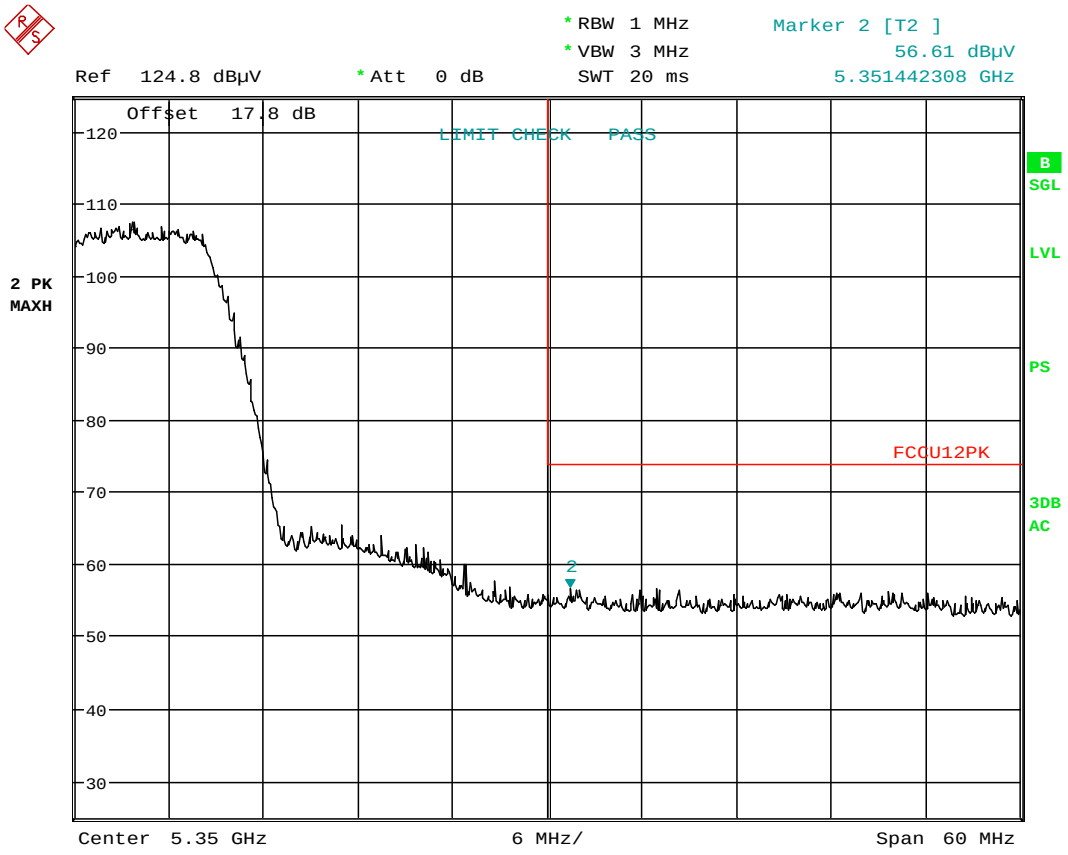


Date: 19.FEB.2015 21:02:14

Plot 6-217. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

MIMO Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

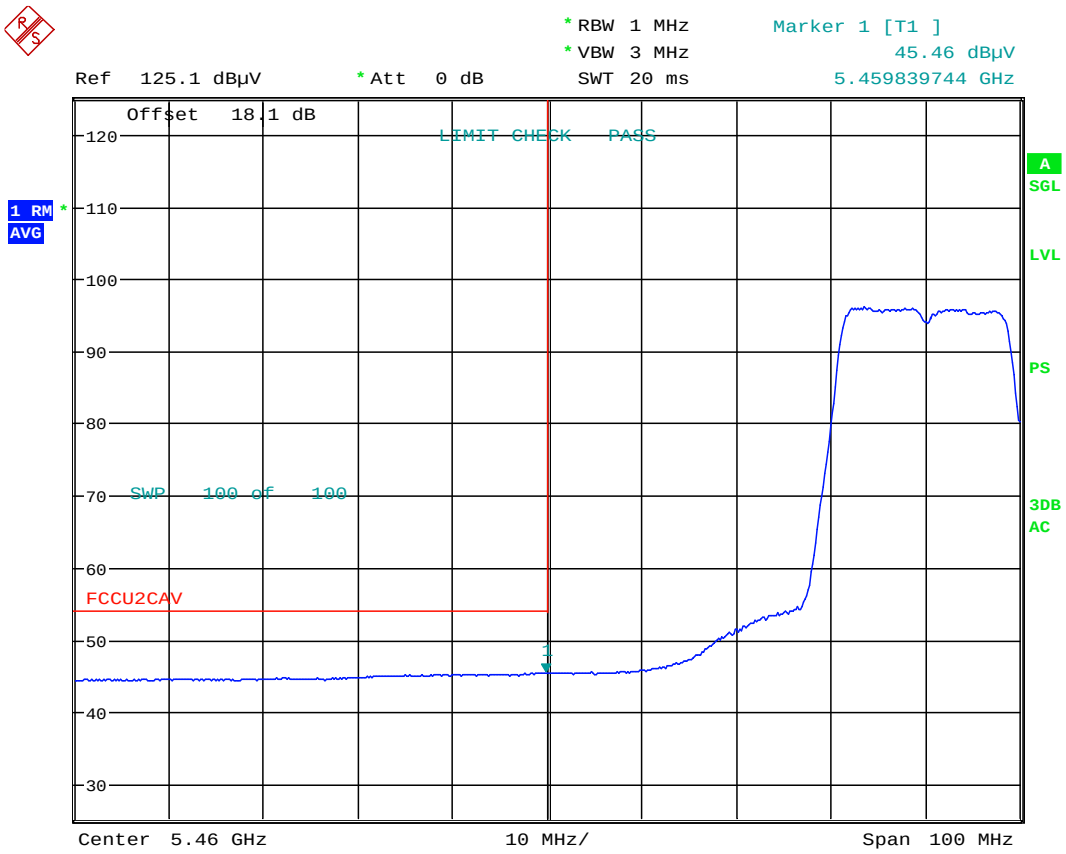


Plot 6-218. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

MIMO Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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

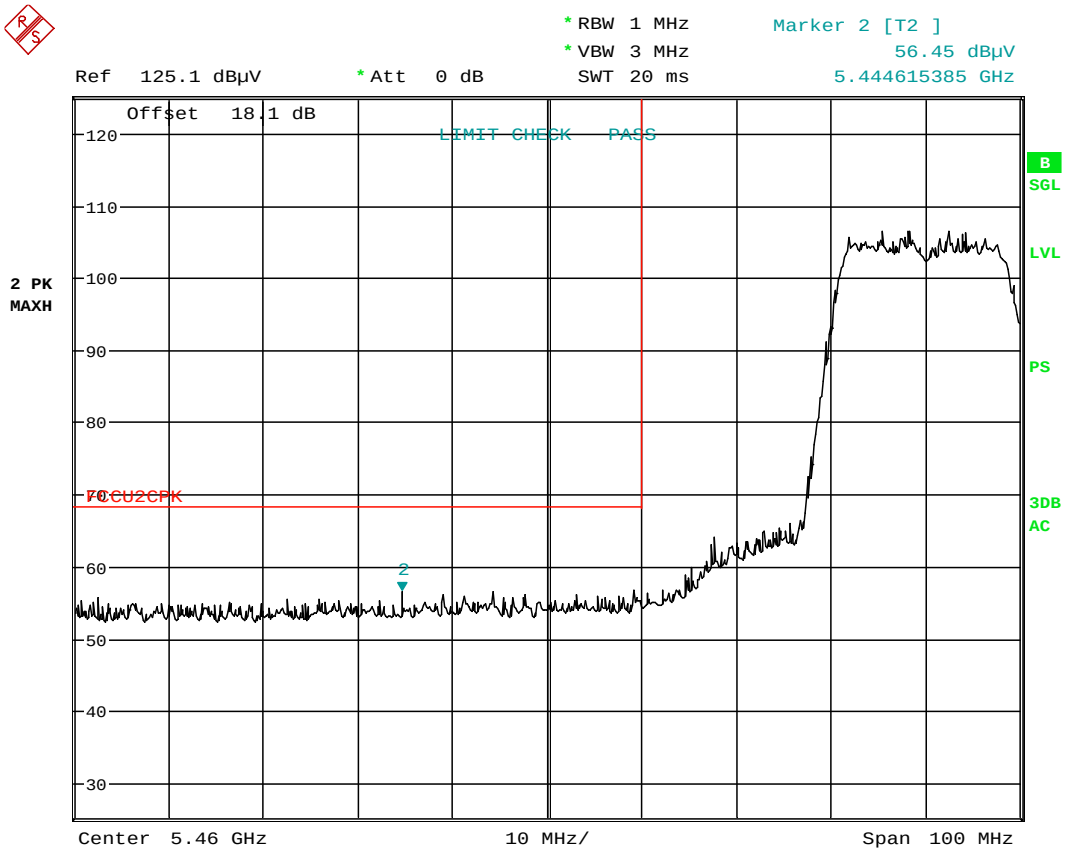


Date: 19.FEB.2015 21:08:28

Plot 6-219. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

MIMO Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



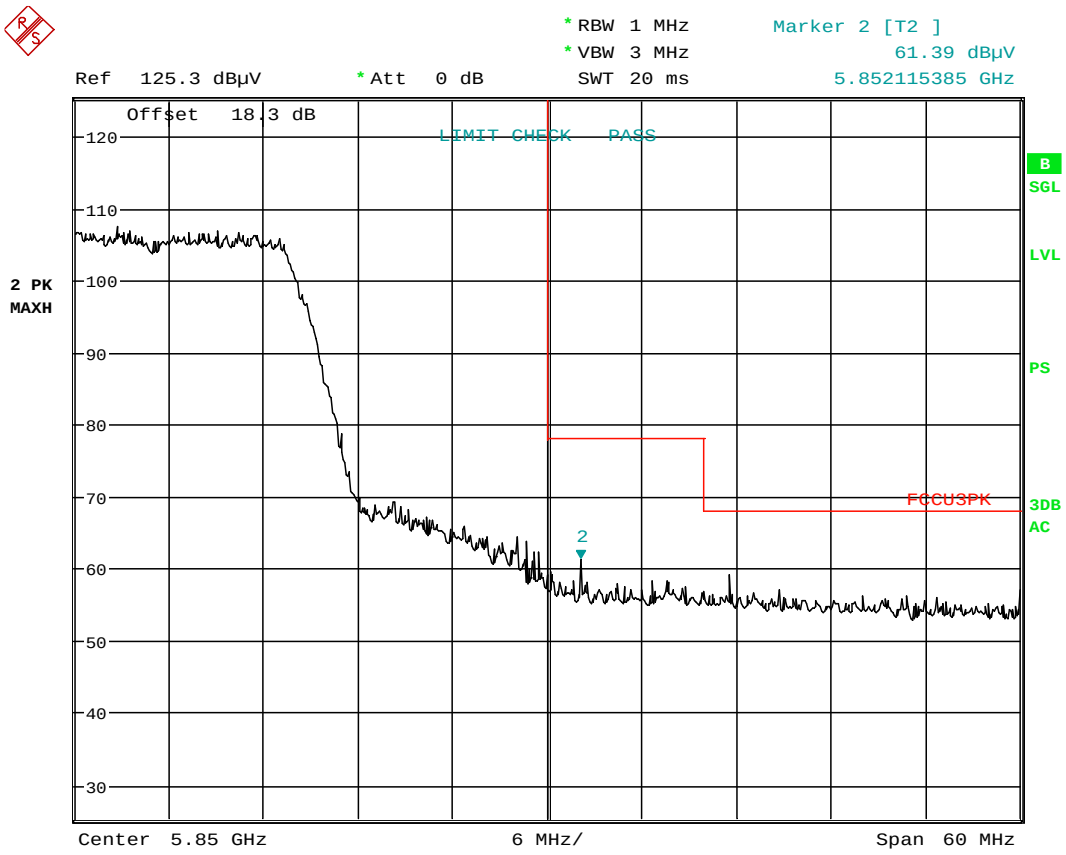
Date: 19.FEB.2015 21:08:37

Plot 6-220. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

MIMO Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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



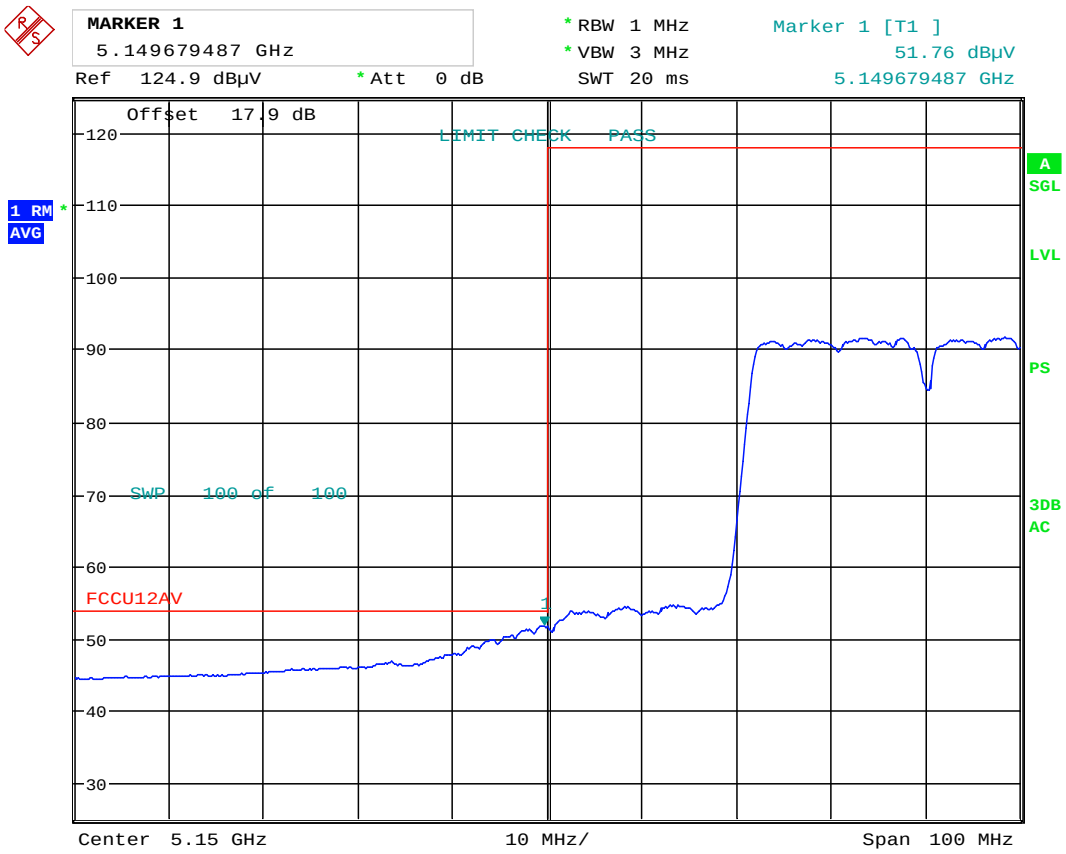
Date: 19.FEB.2015 21:20:40

Plot 6-221. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

6.7.10 MIMO Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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

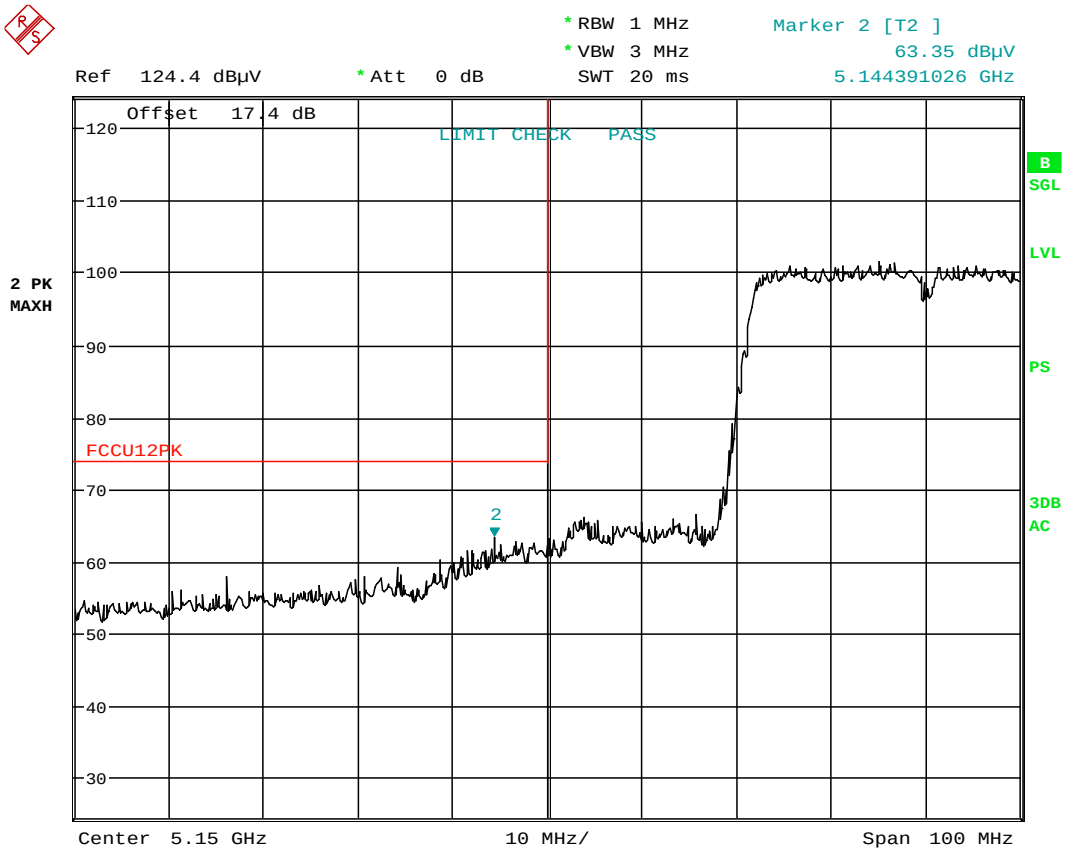


Date: 19.FEB.2015 20:58:17

Plot 6-222. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

MIMO Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



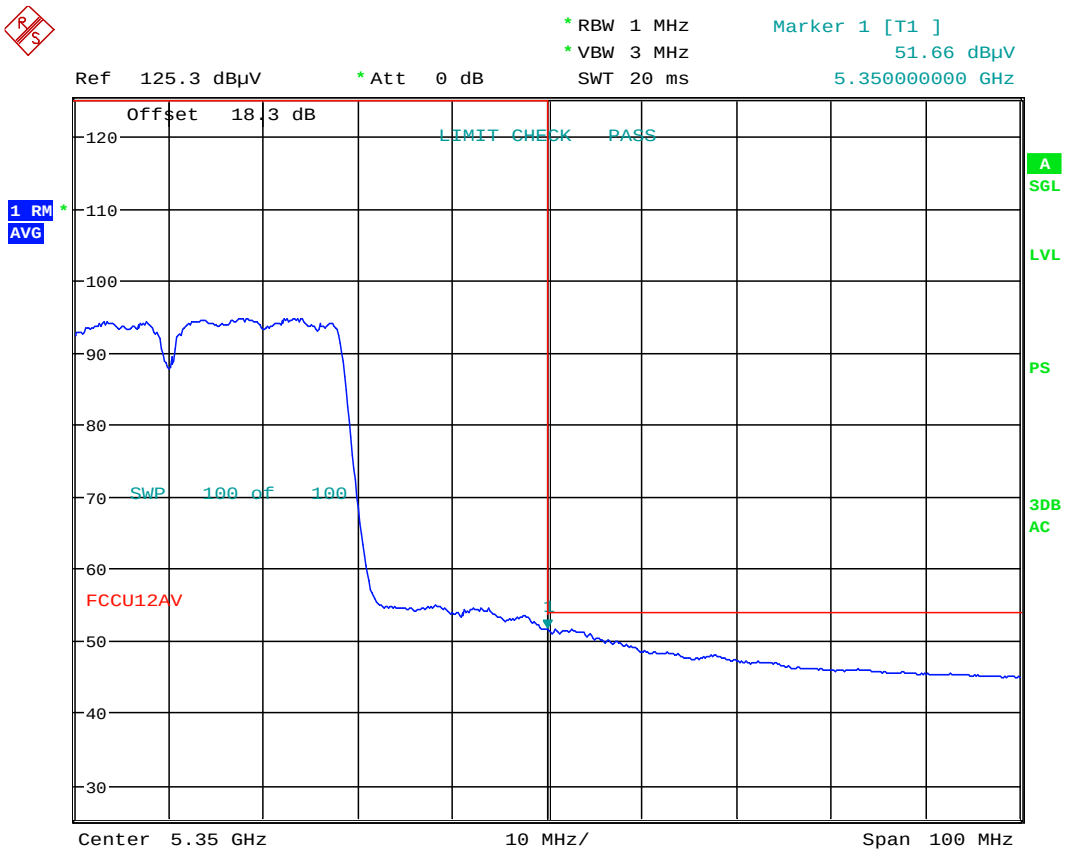
Date: 19.FEB.2015 20:50:10

Plot 6-223. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)

MIMO Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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

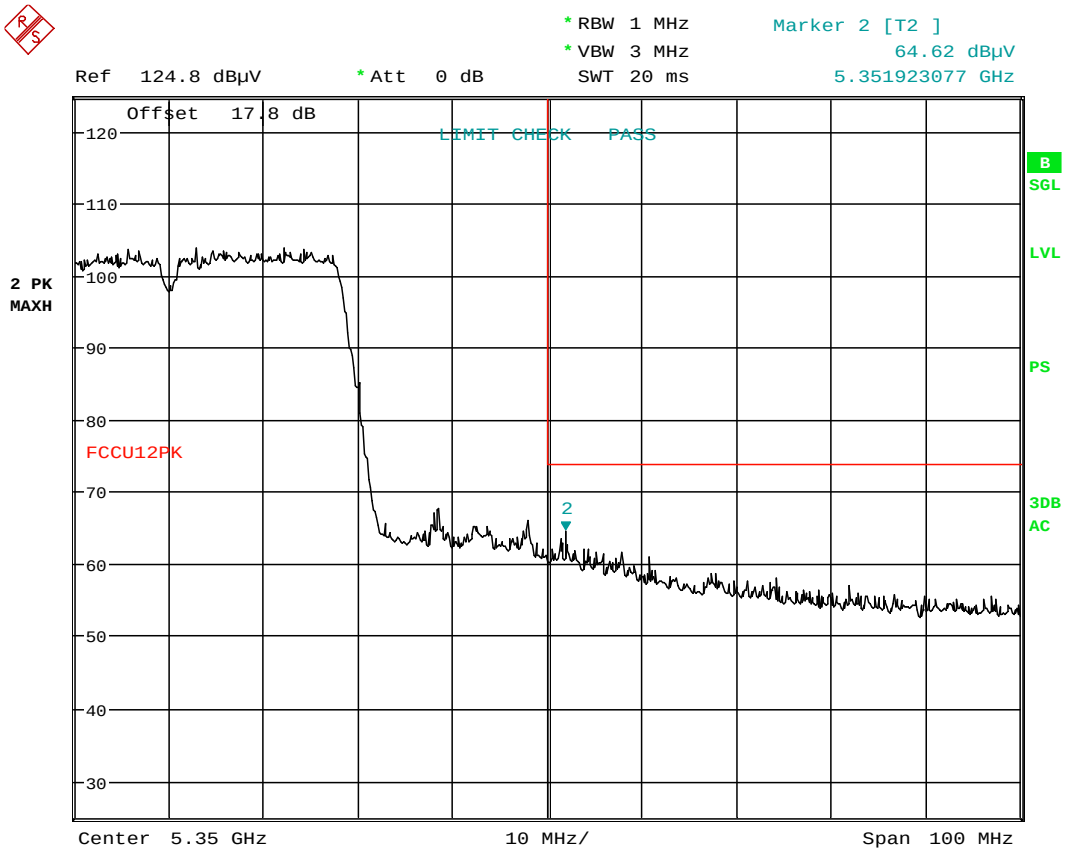


Date: 19.FEB.2015 21:04:03

Plot 6-224. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

MIMO Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



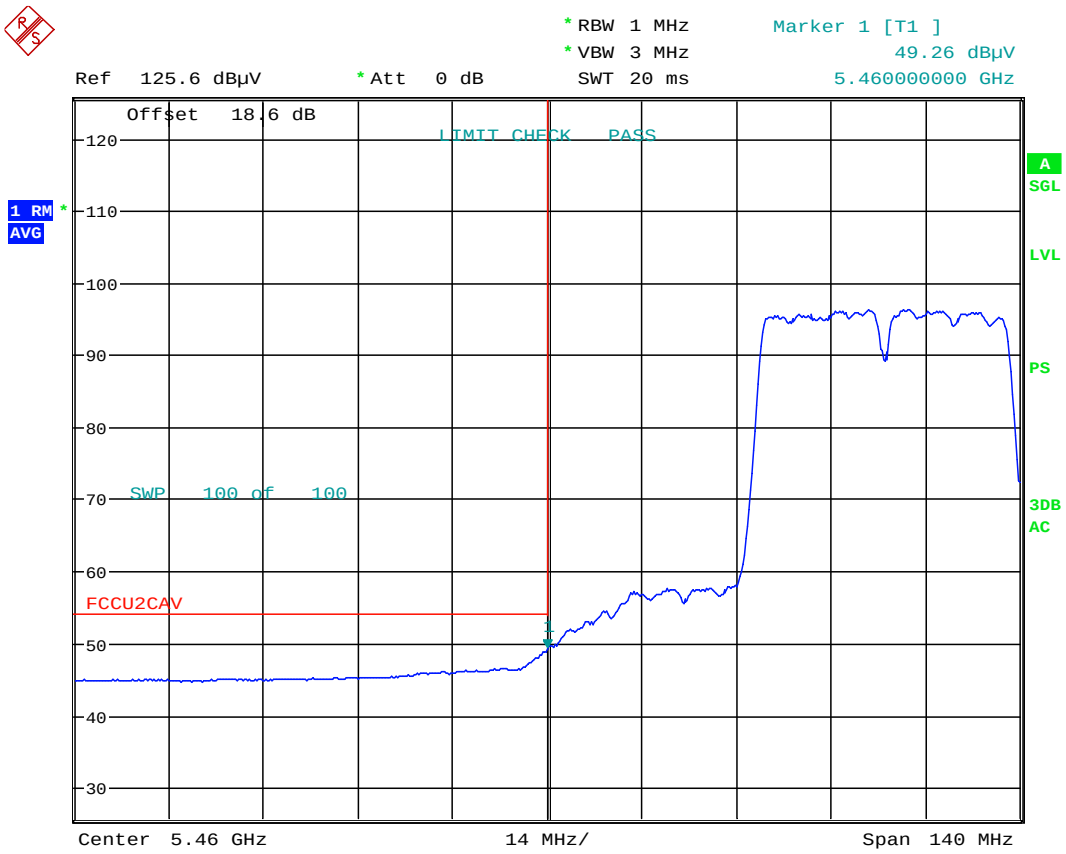
Date: 19.FEB.2015 21:04:14

Plot 6-225. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

MIMO Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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

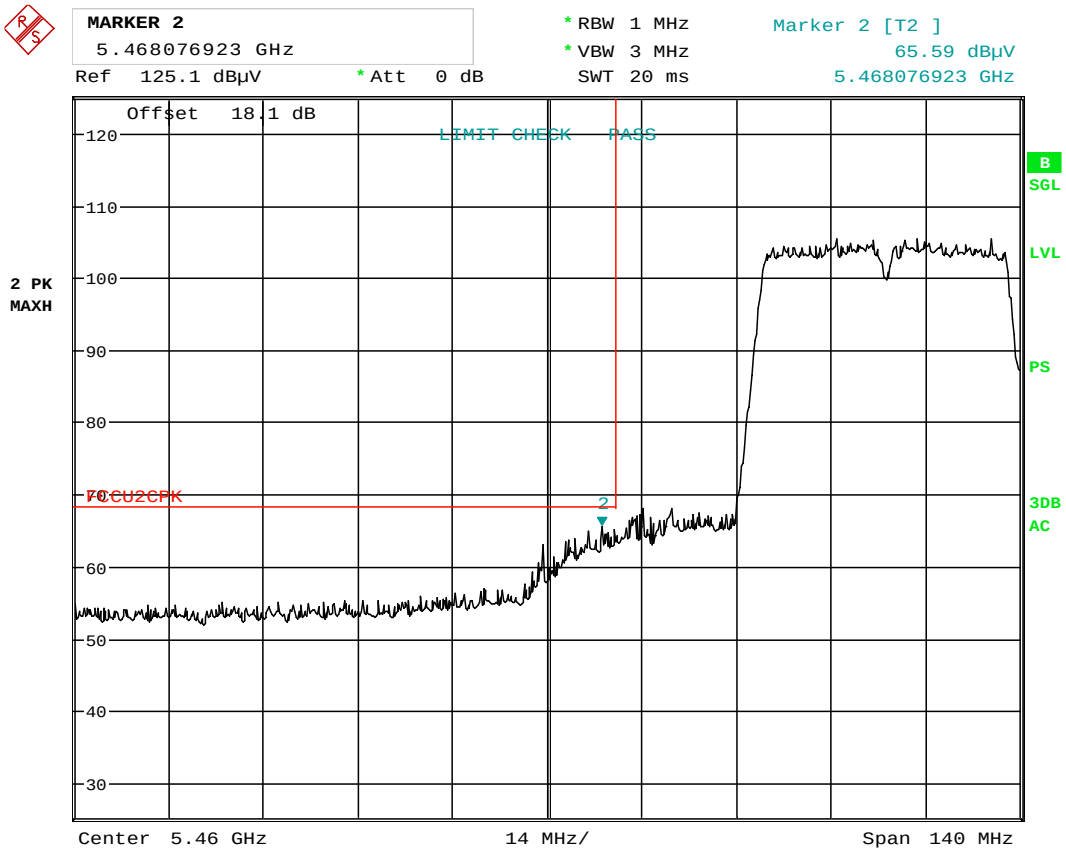


Date: 19.FEB.2015 21:14:13

Plot 6-226. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

MIMO Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



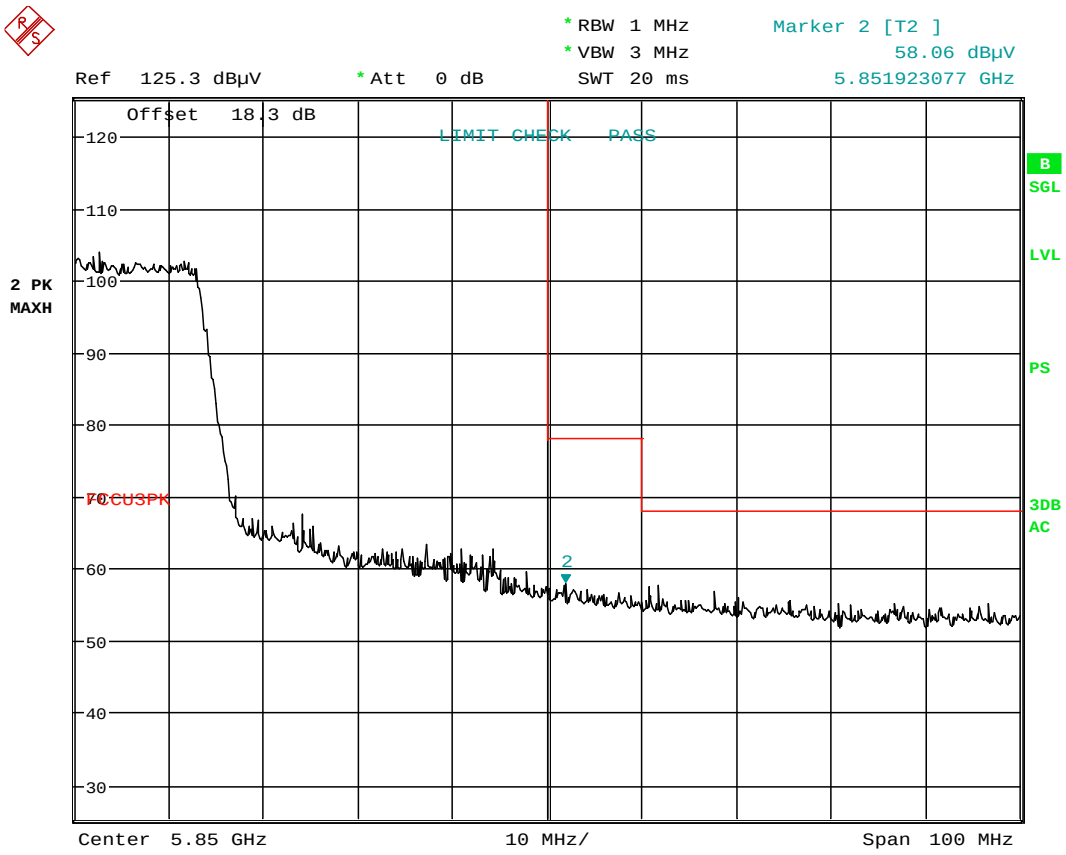
Date: 19.FEB.2015 21:13:59

Plot 6-227. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

MIMO Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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

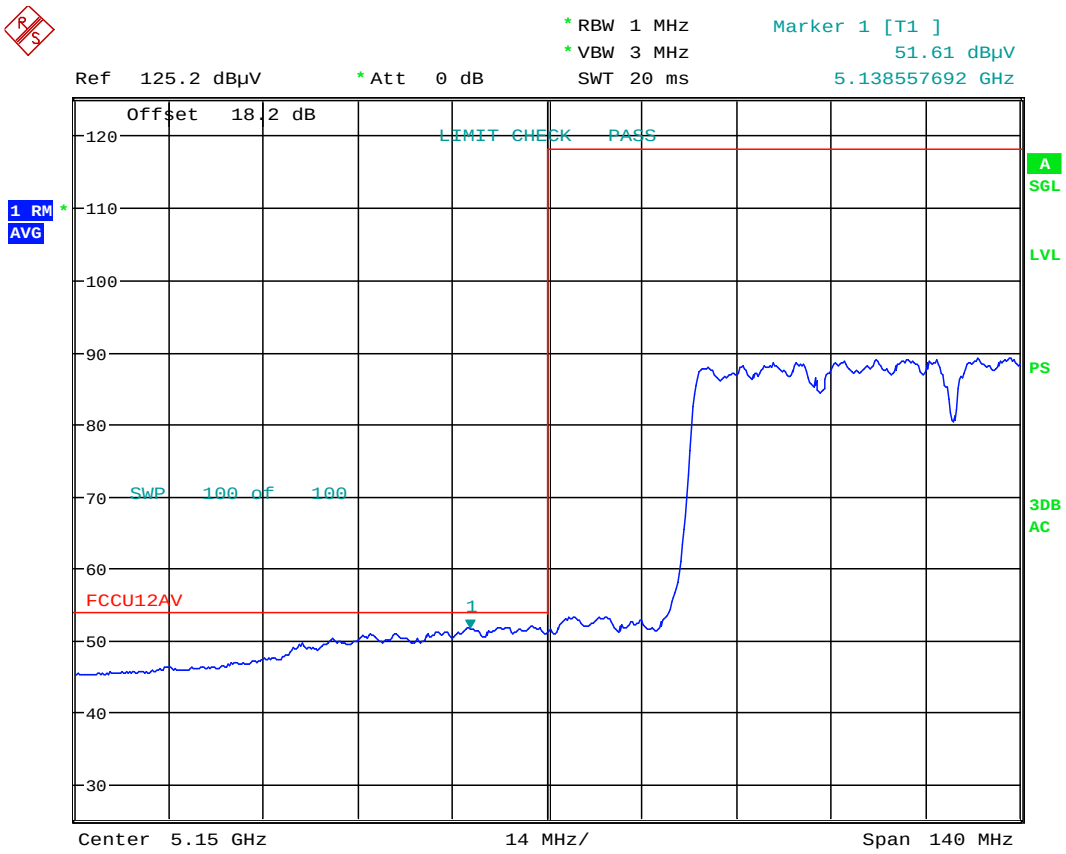


Plot 6-228. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

6.7.11 MIMO Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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

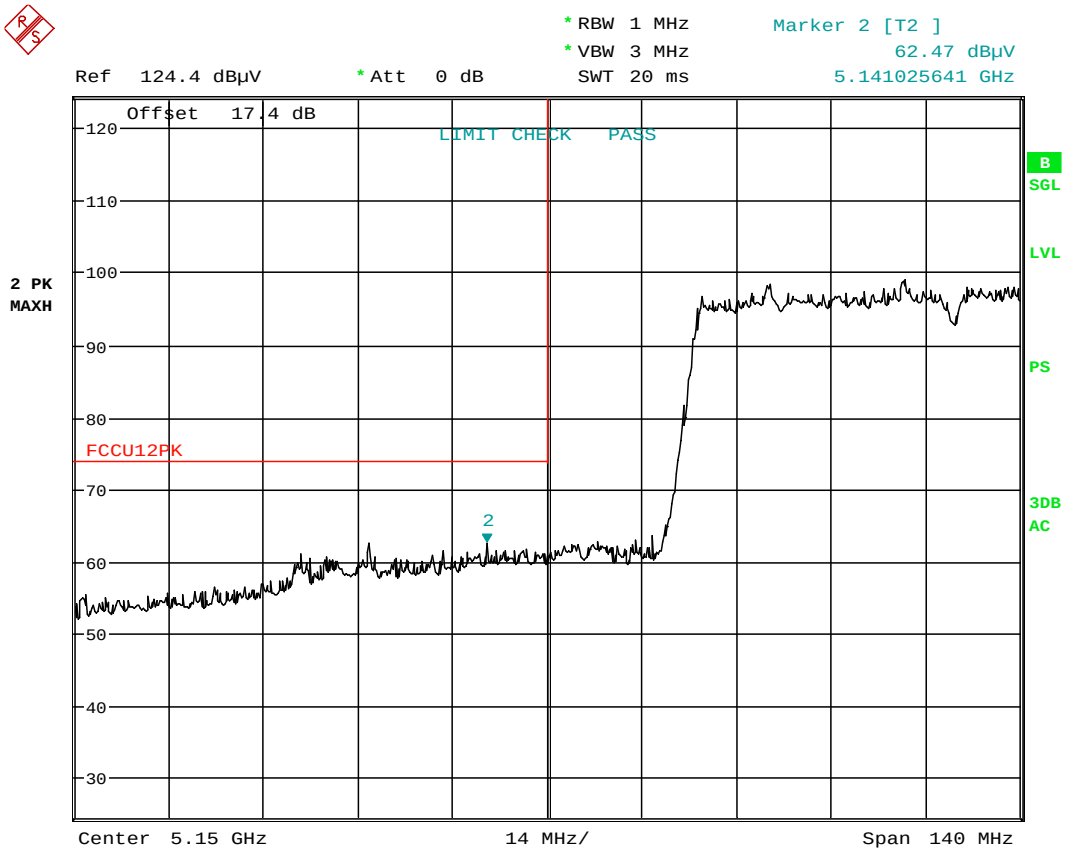


Date: 19.FEB.2015 20:53:45

Plot 6-229. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

MIMO Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



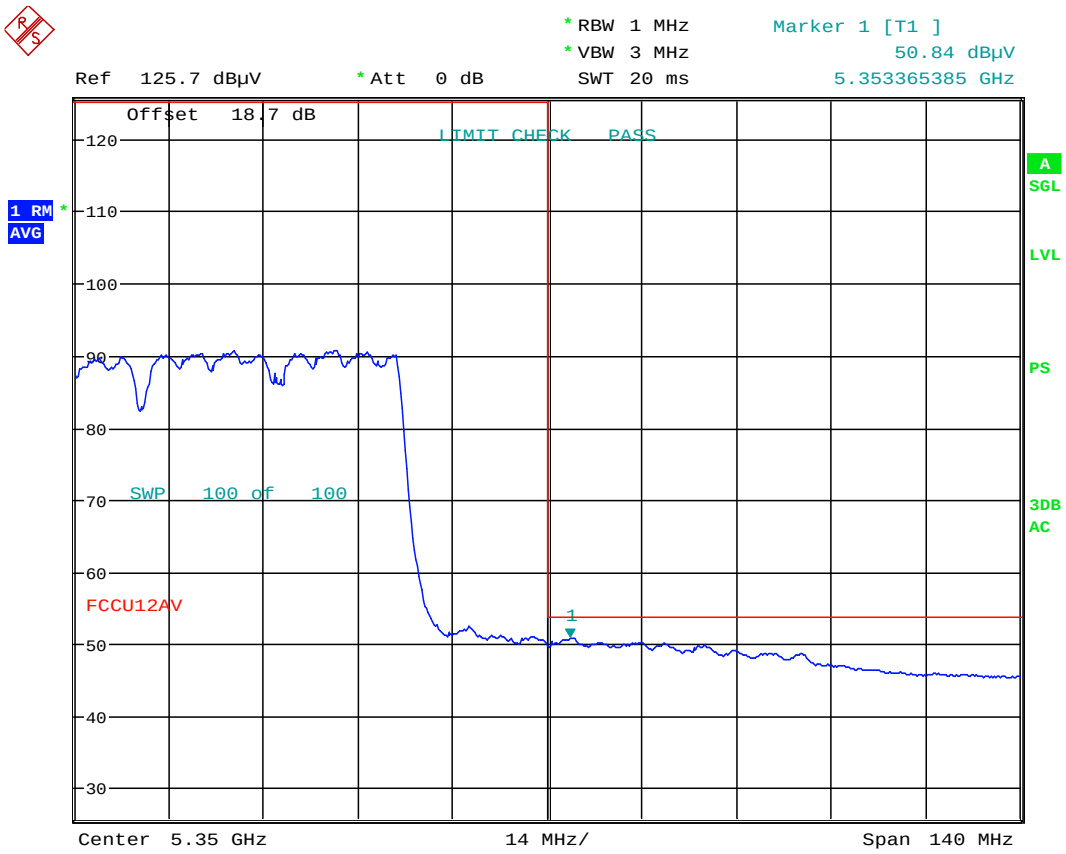
Date: 19.FEB.2015 20:53:57

Plot 6-230. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)

MIMO Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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

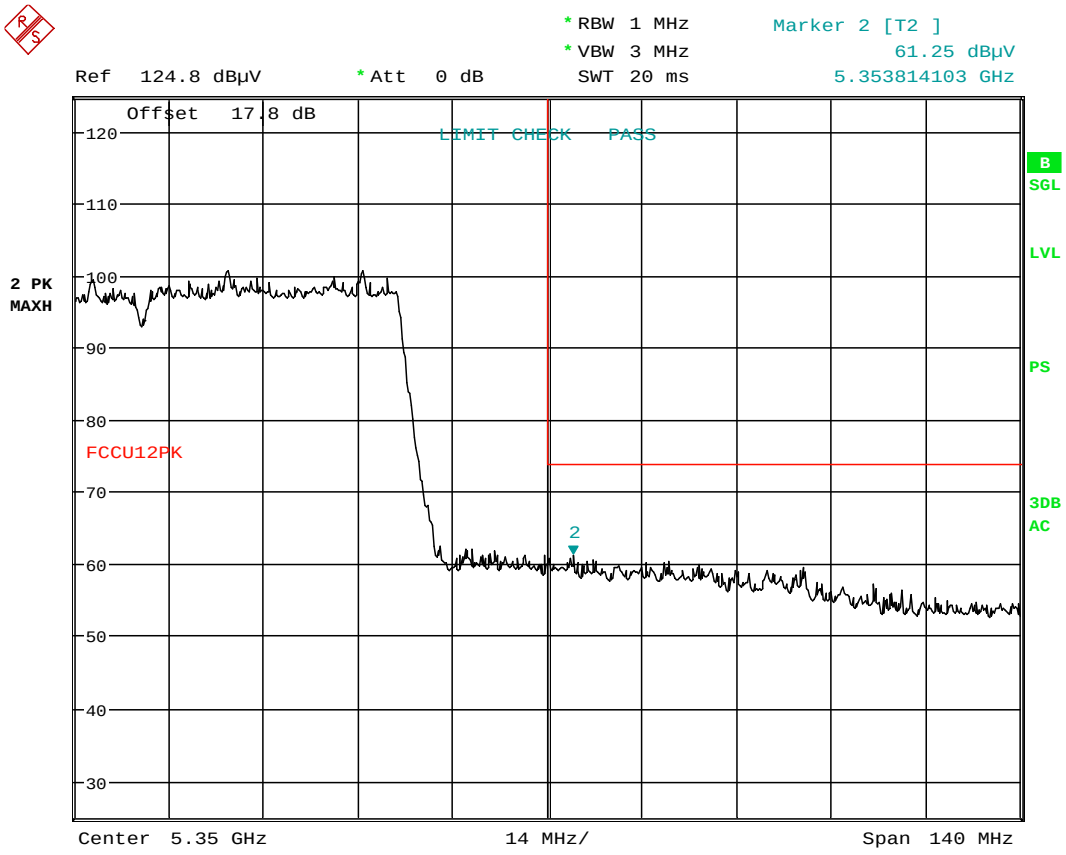


Date: 19.FEB.2015 21:05:19

Plot 6-231. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

MIMO Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



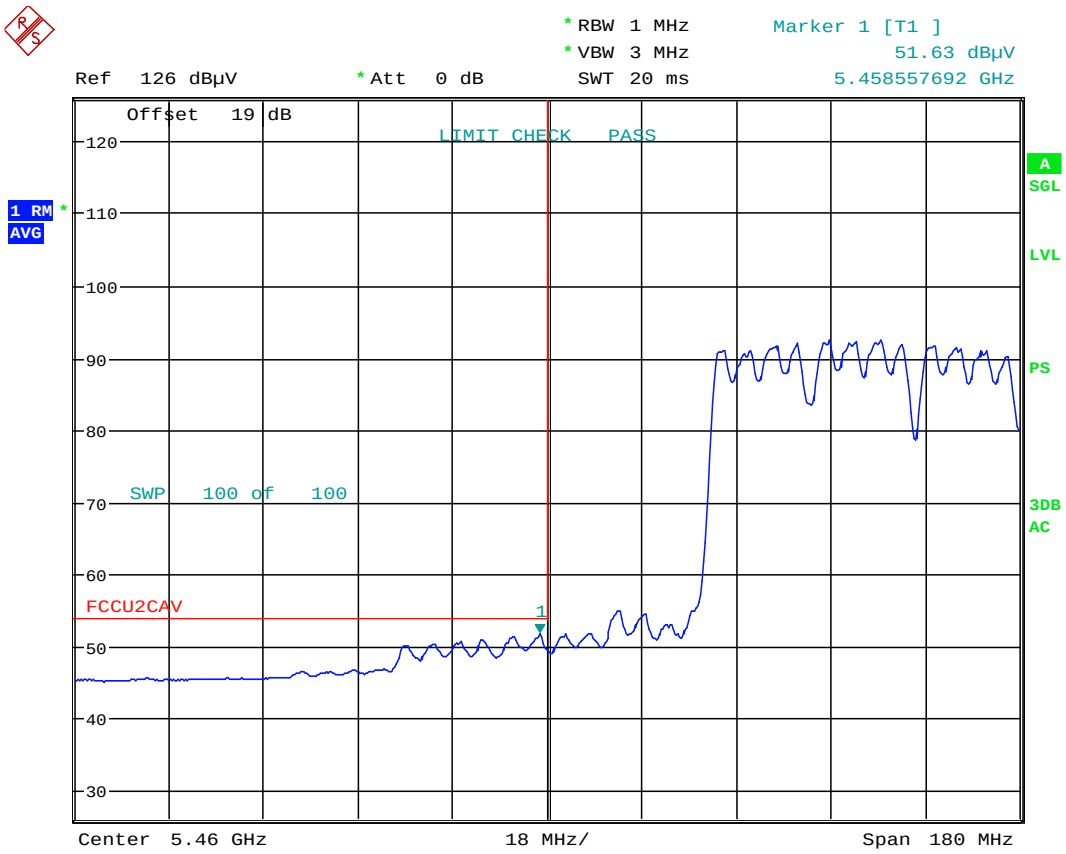
Date: 19.FEB.2015 21:05:03

Plot 6-232. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

MIMO Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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

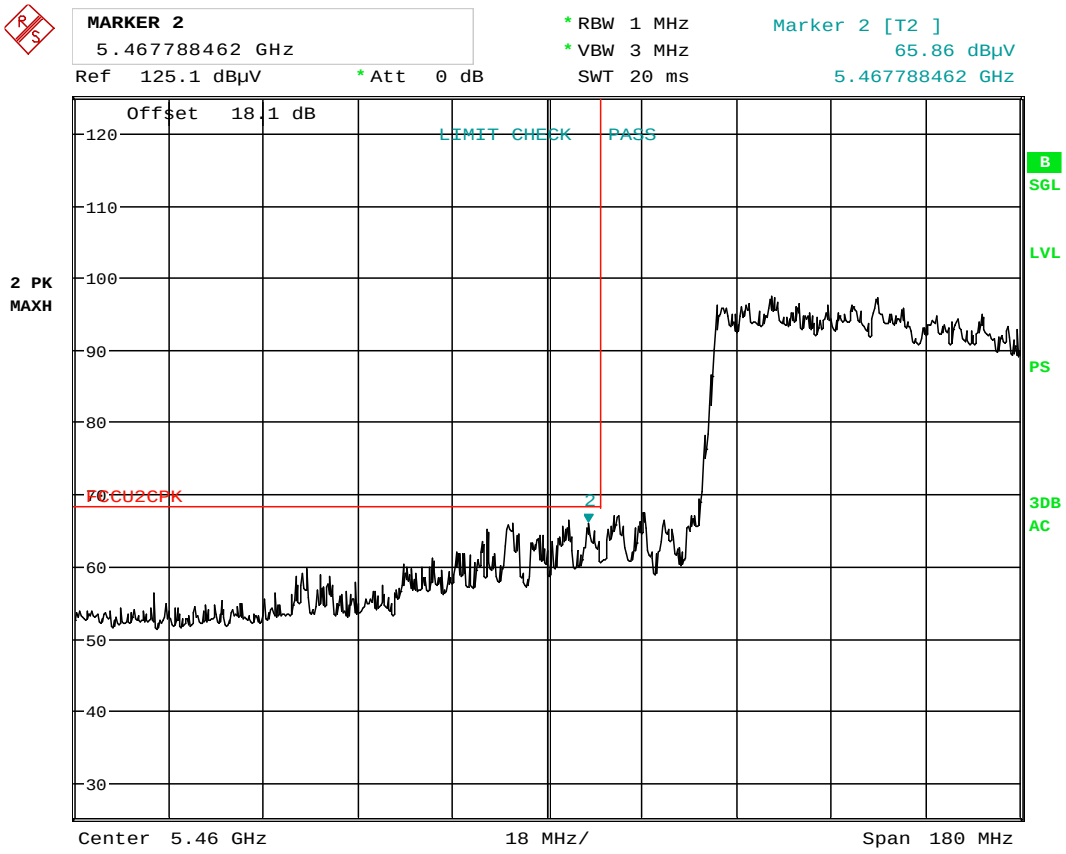


Date: 19.FEB.2015 21:15:06

Plot 6-233. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

MIMO Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



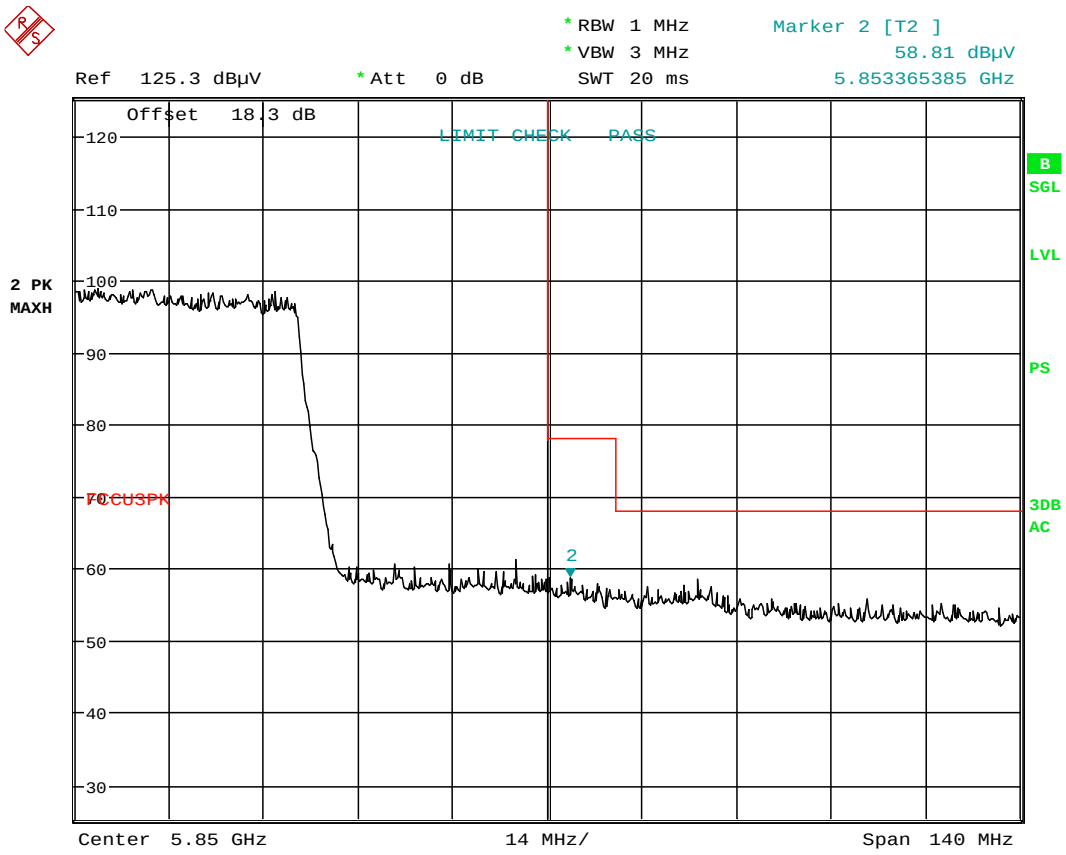
Date: 19.FEB.2015 21:17:17

Plot 6-234. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

MIMO Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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



Plot 6-235. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

6.8 Radiated Spurious Emissions Measurements – Below 1GHz

§15.209

Test Overview and Limit

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

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Table 6-60 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 6-60. Radiated Limits

Test Procedures Used

ANSI C63.4-2009

Test Settings

Quasi-Peak Field Strength Measurements

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

Test Setup

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

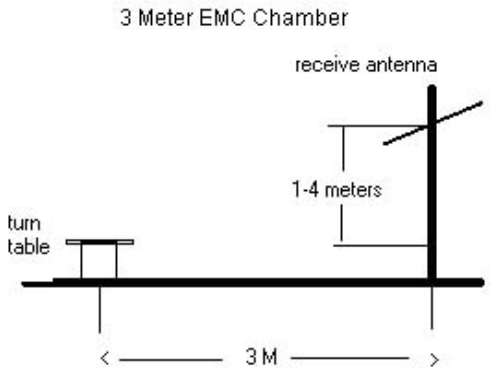


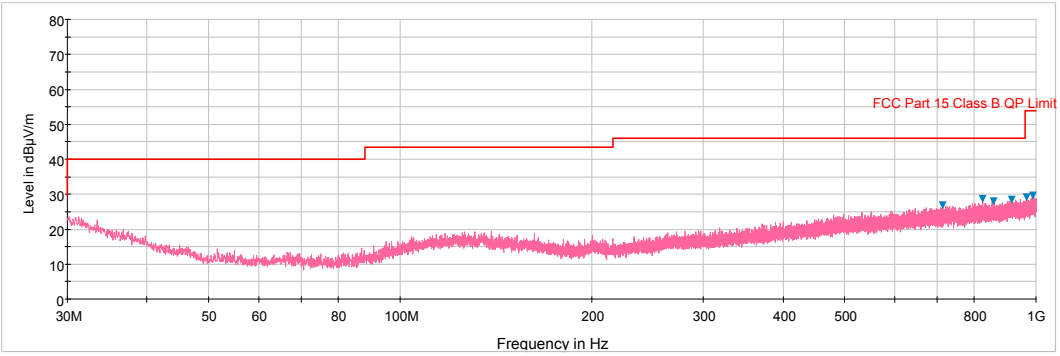
Figure 6-6. Test Instrument & Measurement Setup

Test Notes

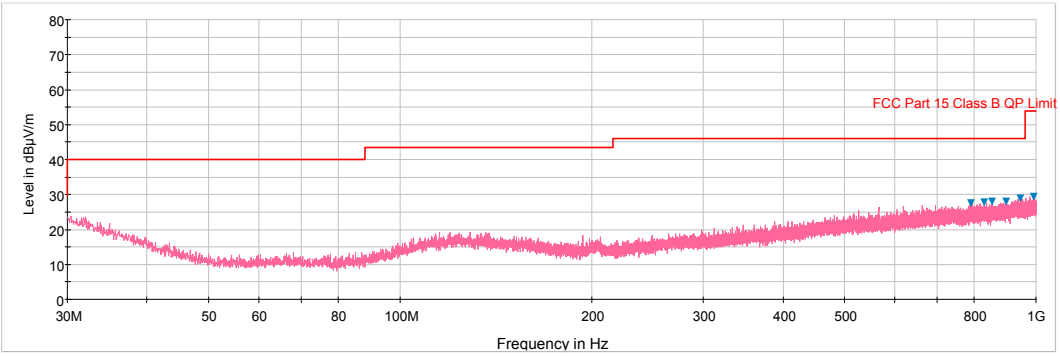
1. All emissions lying in restricted bands specified in §15.205 are below the limit shown in Table 6-60.
2. The broadband receive antenna is manipulated through vertical and horizontal polarizations during the tests. The EUT is manipulated through three orthogonal planes.
3. This unit was tested with its standard battery.
4. The spectrum is investigated using a peak detector and final measurements are recorded using CISPR quasi peak detector. The worst-case emissions are reported however emissions whose levels were not within 20dB of the respective limits were not reported.
5. Emissions were measured at a 3 meter test distance.
6. Emissions are investigated while operating on the center channel of the mode, band, and modulation that produced the worst case results during the transmitter spurious emissions testing.
7. No spurious emissions were detected within 20dB of the limit below 30MHz.
8. The results recorded using the broadband antenna is known to correlate with the results obtained by using a tuned dipole with an acceptable degree of accuracy. The VSWR for the measurement antenna was found to be less than 2:1.
9. The wide spectrum spurious emissions plots shown on the following pages are used only for the purpose of emission identification. There were no emissions detected in the 30MHz – 1GHz frequency range, as shown in the subsequent plots.

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

§15.209



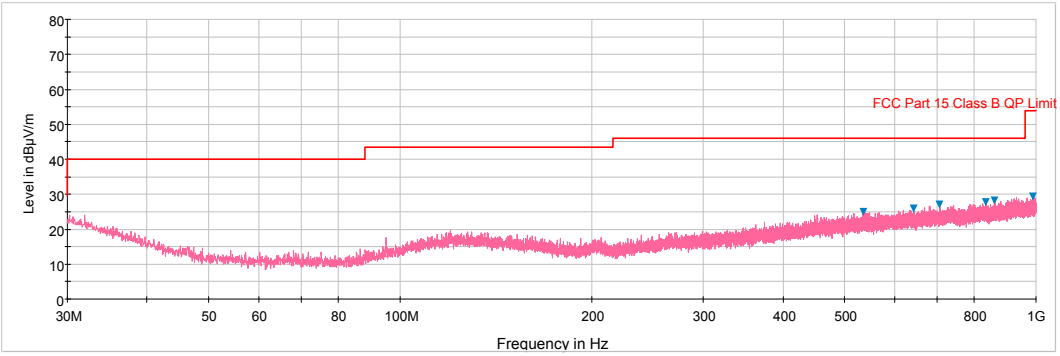
Plot 6-236. Radiated Spurious Plot below 1GHz (802.11a – U3 Ch. 157, Ant. Pol. H)



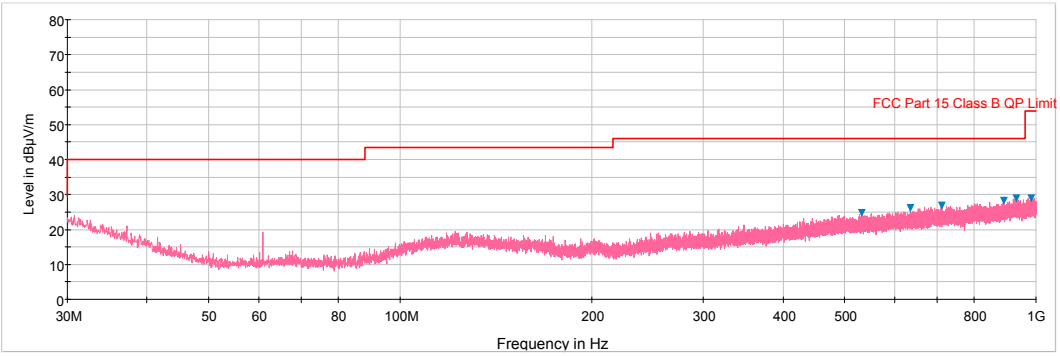
Plot 6-237. Radiated Spurious Plot below 1GHz (802.11a – U3 Ch. 157, Ant. Pol. V)

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

§15.209



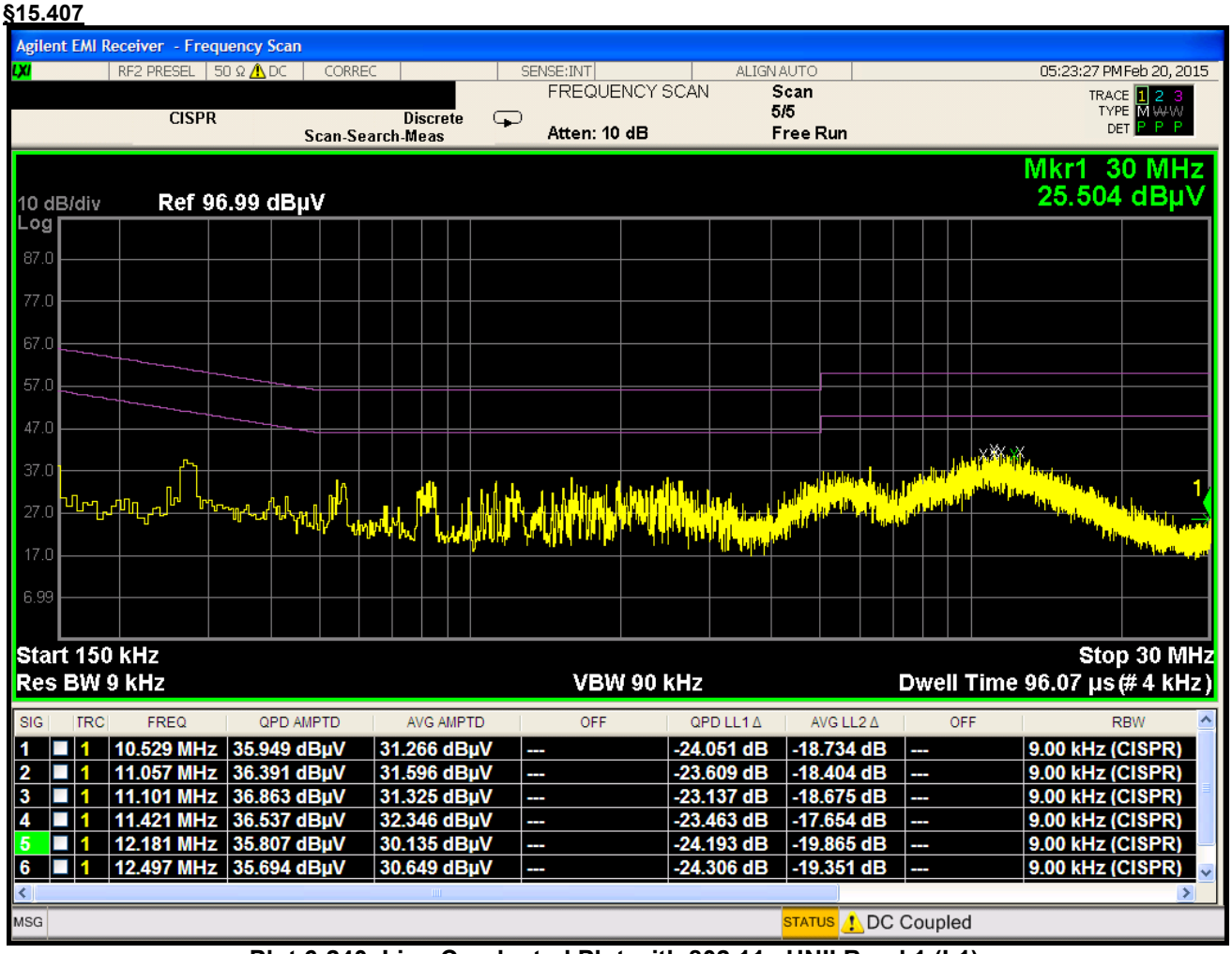
Plot 6-238. Radiated Spurious Plot below 1GHz (802.11a – U3 Ch. 157, Ant. Pol. H)



Plot 6-239. Radiated Spurious Plot below 1GHz (802.11a – U3 Ch. 157, Ant. Pol. V)

6.9 Line-Conducted Test Data

§15.407



SIG	TRC	FREQ	QPD AMPTD	AVG AMPTD	OFF	QPD LL1 Δ	AVG LL2 Δ	OFF	RBW
1	1	10.529 MHz	35.949 dBµV	31.266 dBµV	---	-24.051 dB	-18.734 dB	---	9.00 kHz (CISPR)
2	1	11.057 MHz	36.391 dBµV	31.596 dBµV	---	-23.609 dB	-18.404 dB	---	9.00 kHz (CISPR)
3	1	11.101 MHz	36.863 dBµV	31.325 dBµV	---	-23.137 dB	-18.675 dB	---	9.00 kHz (CISPR)
4	1	11.421 MHz	36.537 dBµV	32.346 dBµV	---	-23.463 dB	-17.654 dB	---	9.00 kHz (CISPR)
5	1	12.181 MHz	35.807 dBµV	30.135 dBµV	---	-24.193 dB	-19.865 dB	---	9.00 kHz (CISPR)
6	1	12.497 MHz	35.694 dBµV	30.649 dBµV	---	-24.306 dB	-19.351 dB	---	9.00 kHz (CISPR)

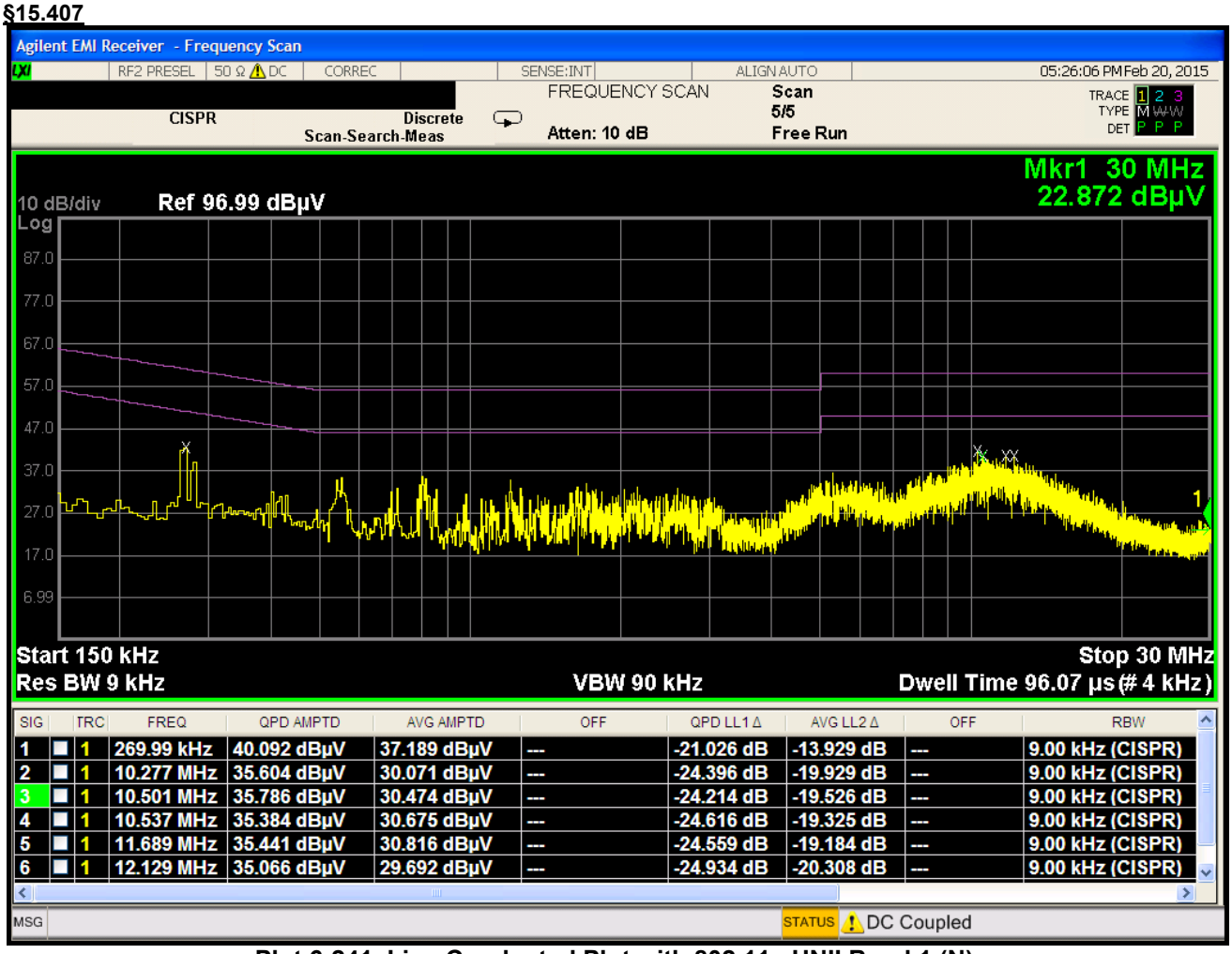
Plot 6-240. Line Conducted Plot with 802.11a UNII Band 1 (L1)

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. Corr. (dB) = Cable loss (dB) + LISN insertion factor (dB)
5. QP/AV Level (dBµV) = QP/AV Analyzer/Receiver Level (dBµV) + Corr. (dB)
6. Margin (dB) = QP/AVLimit (dBµV) - QP/AV Level (dBµV)
7. Traces shown in plot are made using a peak detector.
8. Deviations to the Specifications: None.

Line-Conducted Test Data

§15.407



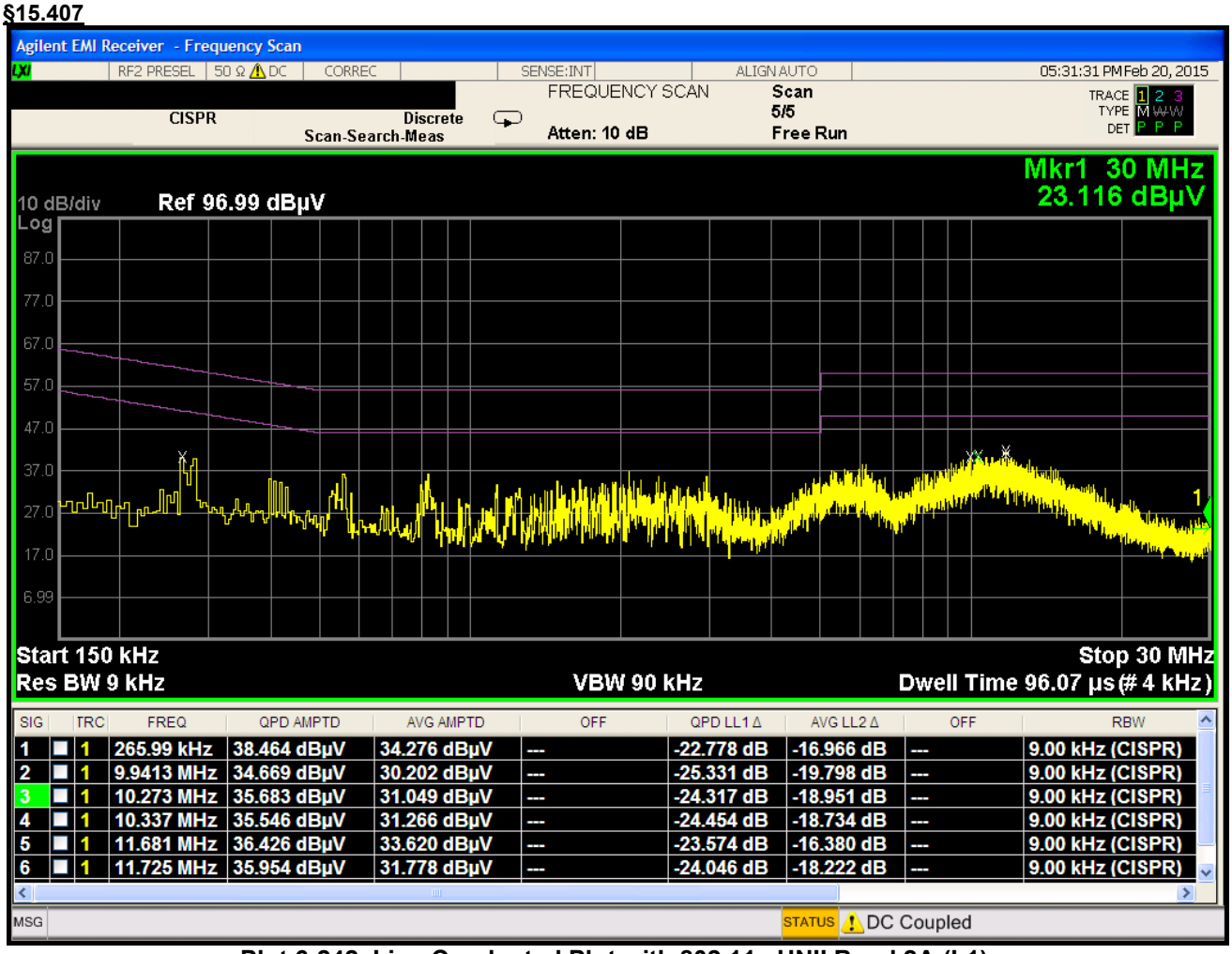
Plot 6-241. Line Conducted Plot with 802.11a UNII Band 1 (N)

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. Corr. (dB) = Cable loss (dB) + LISN insertion factor (dB)
5. QP/AV Level (dBµV) = QP/AV Analyzer/Receiver Level (dBµV) + Corr. (dB)
6. Margin (dB) = QP/AVLimit (dBµV) - QP/AV Level (dBµV)
7. Traces shown in plot are made using a peak detector.
8. Deviations to the Specifications: None.

Line-Conducted Test Data

§15.407



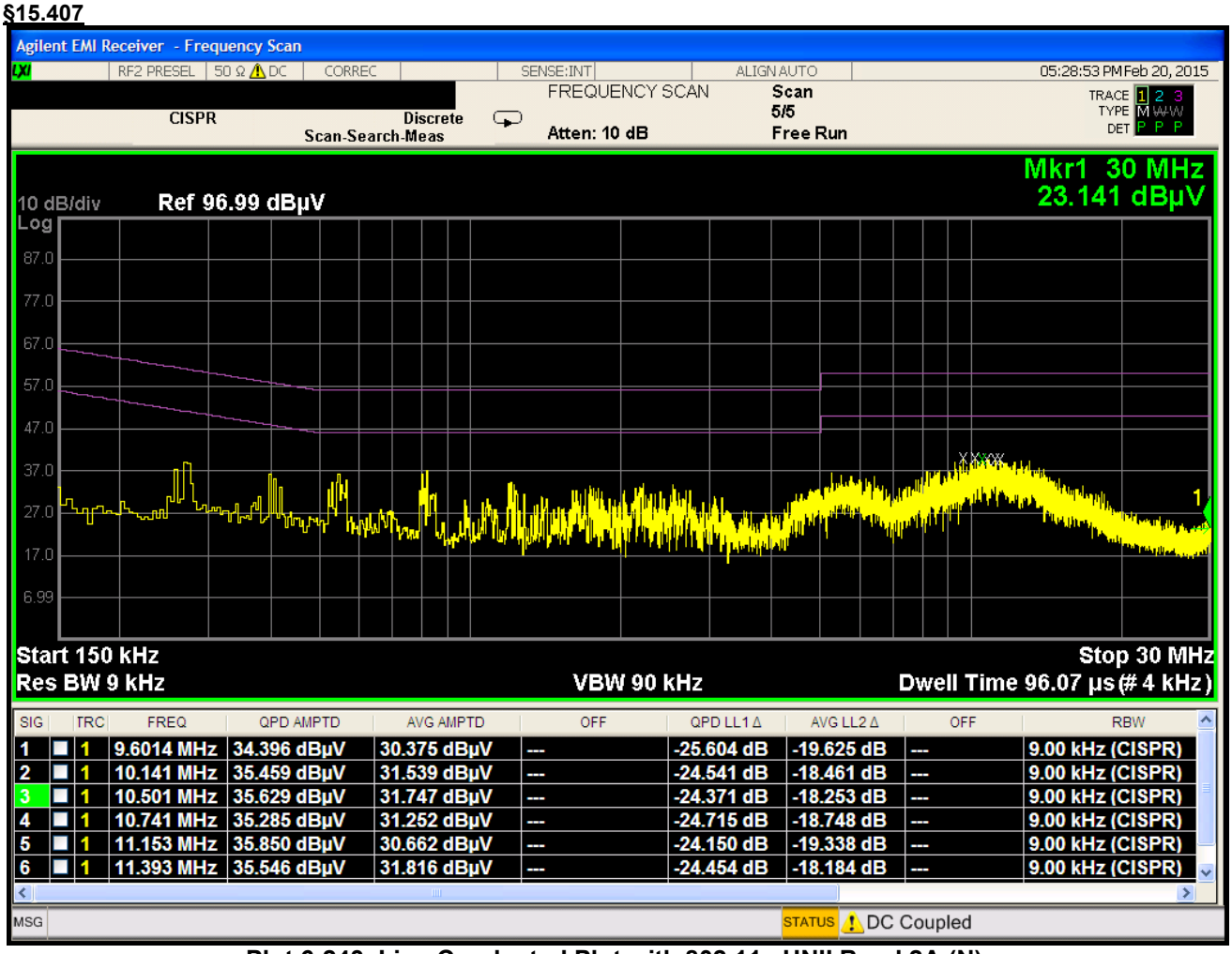
Plot 6-242. Line Conducted Plot with 802.11a UNII Band 2A (L1)

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. Corr. (dB) = Cable loss (dB) + LISN insertion factor (dB)
5. QP/AV Level (dBµV) = QP/AV Analyzer/Receiver Level (dBµV) + Corr. (dB)
6. Margin (dB) = QP/AVLimit (dBµV) - QP/AV Level (dBµV)
7. Traces shown in plot are made using a peak detector.
8. Deviations to the Specifications: None.

Line-Conducted Test Data

§15.407



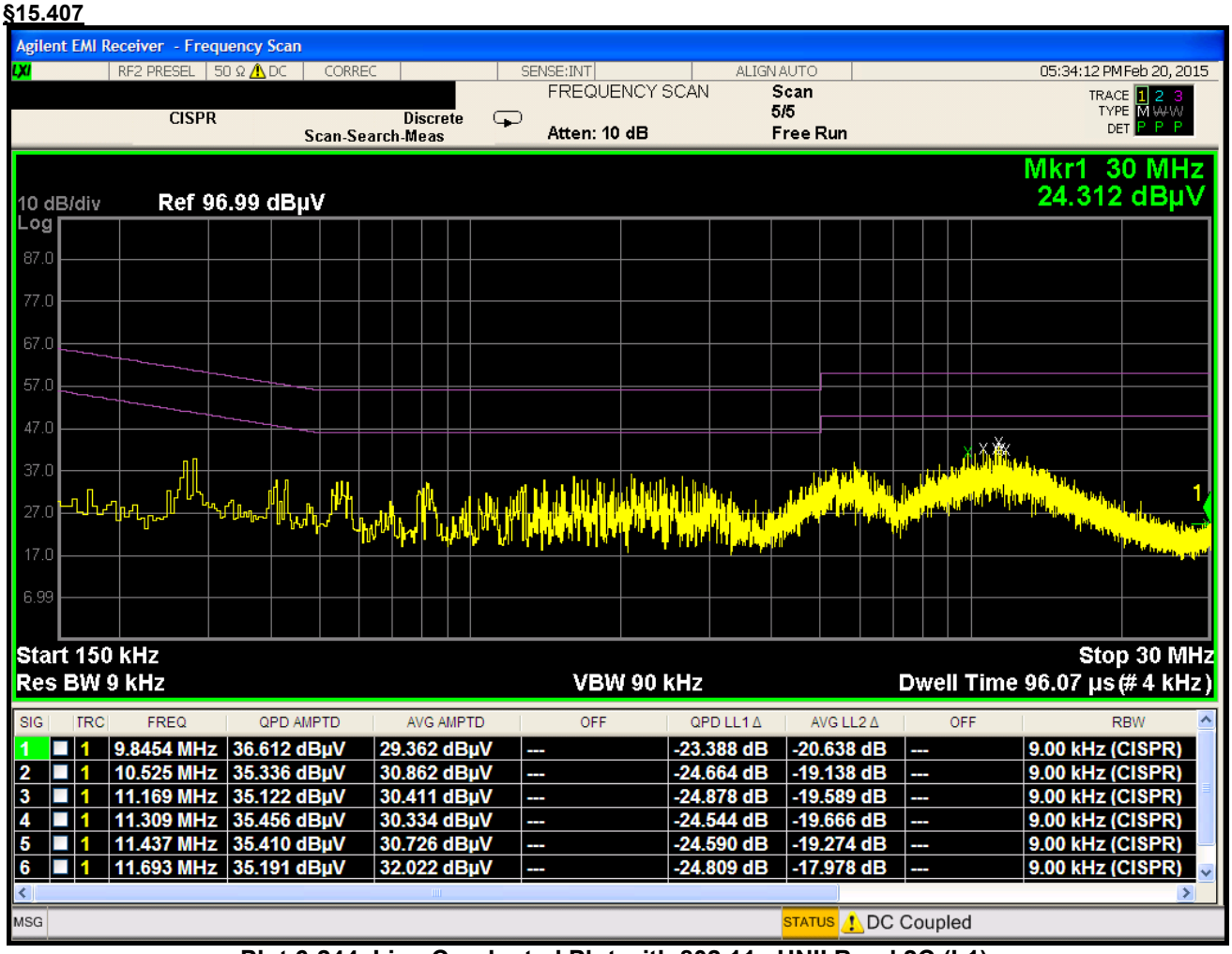
Plot 6-243. Line Conducted Plot with 802.11a UNII Band 2A (N)

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. Corr. (dB) = Cable loss (dB) + LISN insertion factor (dB)
5. QP/AV Level (dBµV) = QP/AV Analyzer/Receiver Level (dBµV) + Corr. (dB)
6. Margin (dB) = QP/AVLimit (dBµV) - QP/AV Level (dBµV)
7. Traces shown in plot are made using a peak detector.
8. Deviations to the Specifications: None.

Line-Conducted Test Data

§15.407



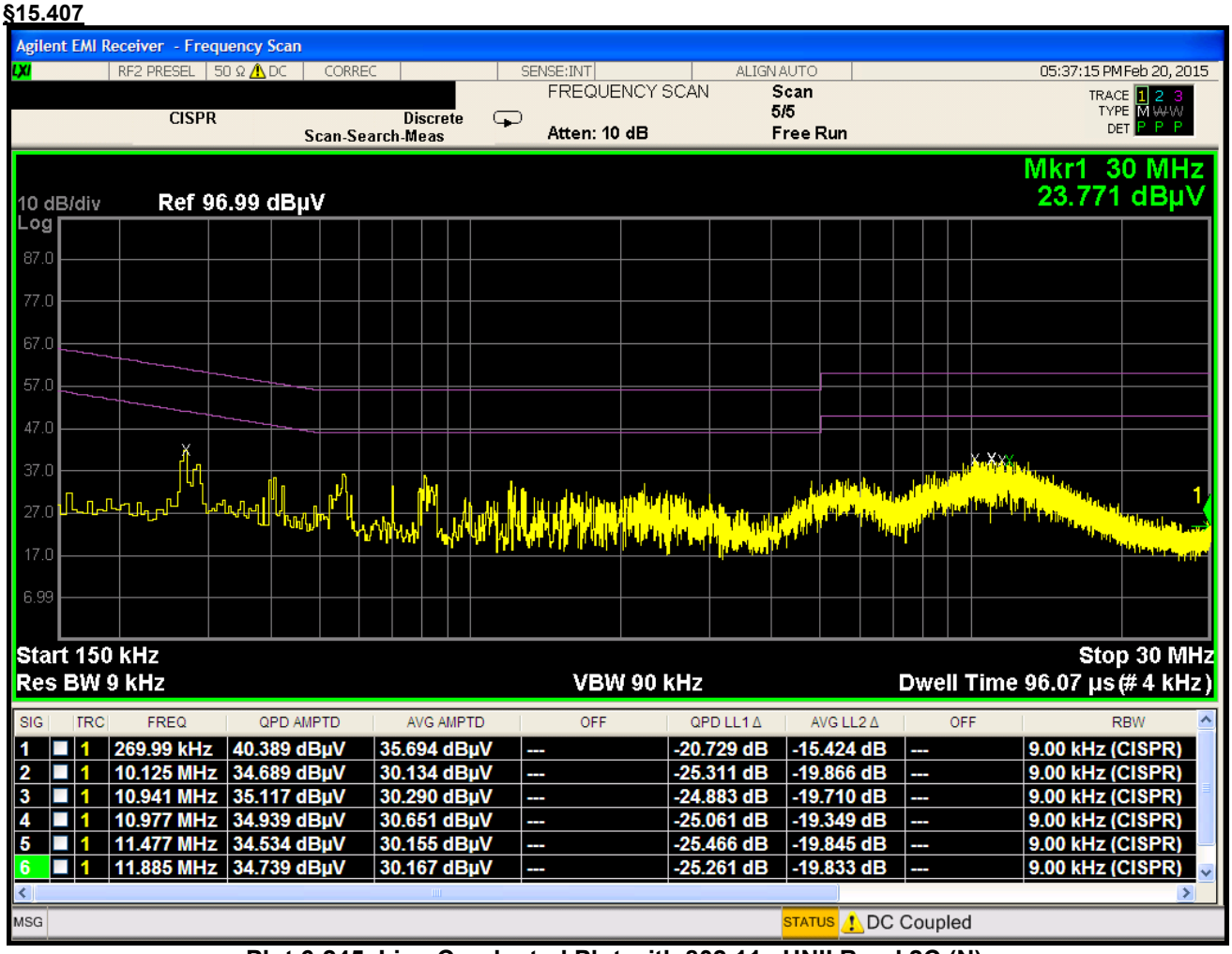
Plot 6-244. Line Conducted Plot with 802.11a UNII Band 2C (L1)

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. Corr. (dB) = Cable loss (dB) + LISN insertion factor (dB)
5. QP/AV Level (dBµV) = QP/AV Analyzer/Receiver Level (dBµV) + Corr. (dB)
6. Margin (dB) = QP/AVLimit (dBµV) - QP/AV Level (dBµV)
7. Traces shown in plot are made using a peak detector.
8. Deviations to the Specifications: None.

Line-Conducted Test Data

§15.407



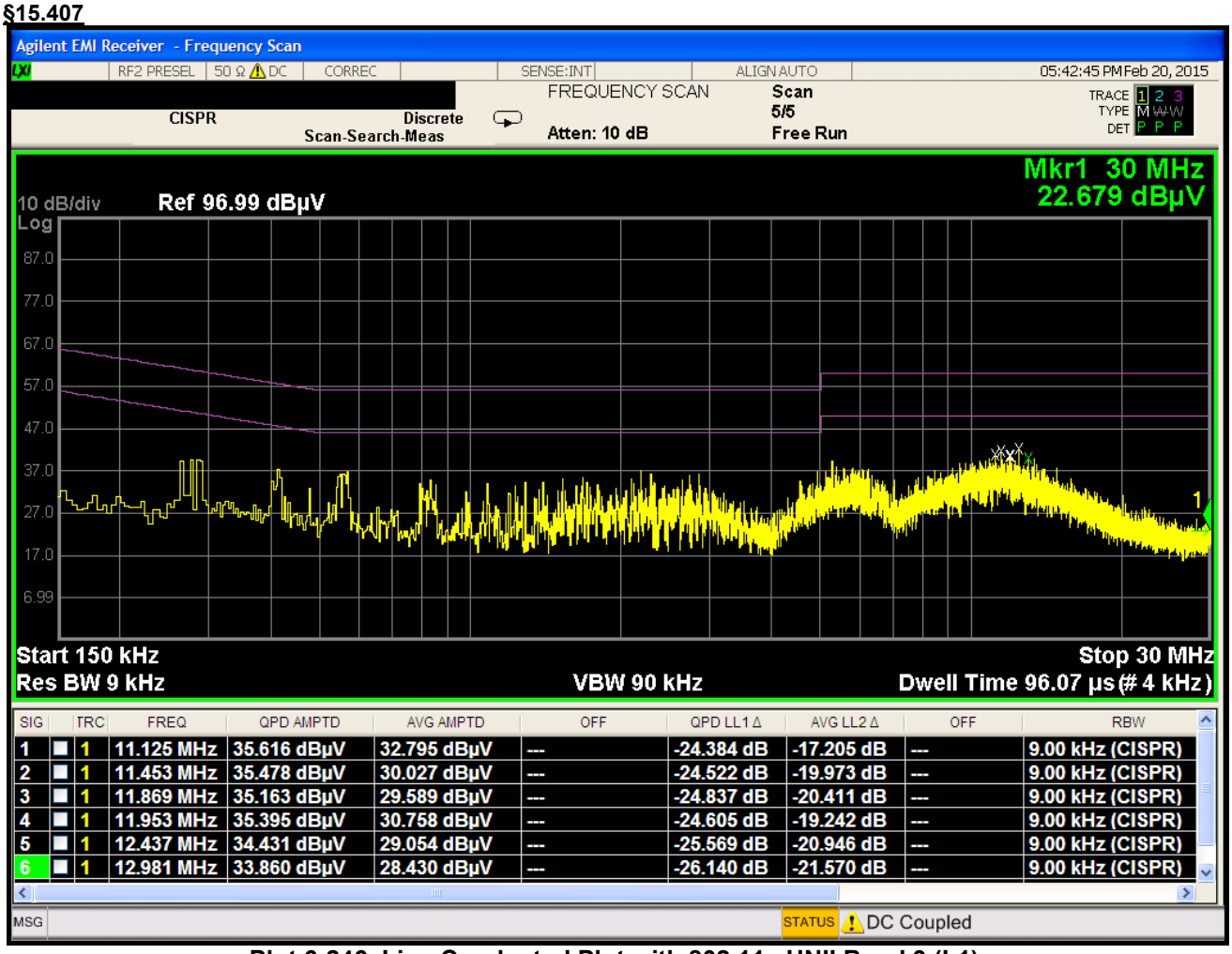
Plot 6-245. Line Conducted Plot with 802.11a UNII Band 2C (N)

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. Corr. (dB) = Cable loss (dB) + LISN insertion factor (dB)
5. QP/AV Level (dBµV) = QP/AV Analyzer/Receiver Level (dBµV) + Corr. (dB)
6. Margin (dB) = QP/AVLimit (dBµV) - QP/AV Level (dBµV)
7. Traces shown in plot are made using a peak detector.
8. Deviations to the Specifications: None.

Line-Conducted Test Data

§15.407



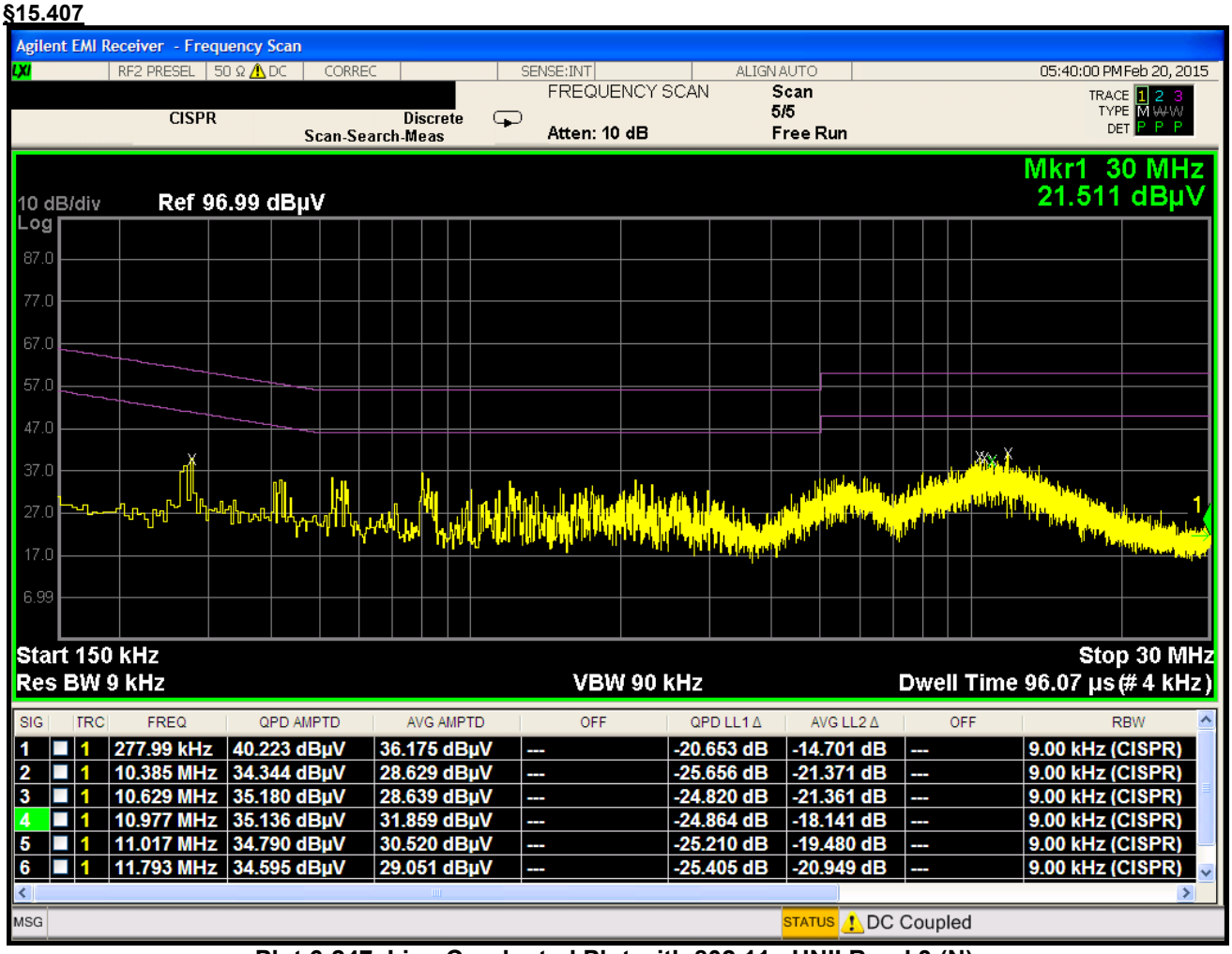
Plot 6-246. Line Conducted Plot with 802.11a UNII Band 3 (L1)

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 149. 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. Corr. (dB) = Cable loss (dB) + LISN insertion factor (dB)
5. QP/AV Level (dBµV) = QP/AV Analyzer/Receiver Level (dBµV) + Corr. (dB)
6. Margin (dB) = QP/AVLimit (dBµV) - QP/AV Level (dBµV)
7. Traces shown in plot are made using a peak detector.
8. Deviations to the Specifications: None.

Line-Conducted Test Data

§15.407



Plot 6-247. Line Conducted Plot with 802.11a UNII Band 3 (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 149. 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. Corr. (dB) = Cable loss (dB) + LISN insertion factor (dB)
5. QP/AV Level (dBµV) = QP/AV Analyzer/Receiver Level (dBµV) + Corr. (dB)
6. Margin (dB) = QP/AVLimit (dBµV) - QP/AV Level (dBµV)
7. Traces shown in plot are made using a peak detector.
8. 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: A3L404SC** is in compliance with Part 15E of the FCC Rules.