9.5.3 Limits:

15.407: The Maximum Power Spectral Density shall not exceed the limits given the following table for antennas that do not exceed a directional gain > 6dBi:

Band of Operation (MHz)	15.407 Limits
5150 – 5250	11dBm/MHz
5250 – 5350	11dBm/MHz
5470 – 5725	11dBm/MHz
5725 – 5825	30dBm/500kHz

Band of Operation (MHz)	RSS-247 Limits
5150 – 5250	10dBm/MHz e.i.r.p.
5250 – 5350	11dBm/MHz
5470 – 5725	11dBm/MHz
5725 – 5825	30dBm/500kHz

For antenna gains >6dBi, the PSD limits are reduced by the amount it exceeds 6dBi.

PSD measurements for Straddle Channels, 5720, 5710 and 5690, were compared against the 5470 – 5725 MHz band limits demonstrating compliance with the less stringent 5725 - 5825 MHz band limits as well.

9.5.4 Test Results:

Pass.

9.5.5 Test Data

9.5.5.1 Chain A 802.11a Maximum Conducted Output Power

Chan. No.	Freq. (MHz)	Chain A Power (dBm)	Duty cycle factor (dB)	Chain A Total Power (dBm)	15.407 Limit (dBm)	RSS-247 Limit (dBm)	15.407 Margin (dB)	RSS-247 Margin (dB)
36	5180	7.84	0.19	8.03	24	--	-15.97	--
44	5220	8.01	0.19	8.20	24	--	-15.80	--
48	5240	8.00	0.19	8.19	24	--	-15.81	--
52	5260	7.88	0.19	8.07	24	23.36	-15.93	-15.29
60	5300	7.97	0.19	8.16	24	23.35	-15.84	-15.19
64	5320	7.80	0.19	7.99	24	23.34	-16.01	-15.35
100	5500	7.81	0.19	8.00	24	23.49	-16.00	-15.49
116	5580	7.99	0.19	8.18	24	23.47	-15.82	-15.29
140	5700	7.92	0.19	8.11	24	23.39	-15.89	-15.28
149	5745	7.86	0.19	8.05	30	30	-21.95	-21.95
157	5785	7.83	0.19	8.02	30	30	-21.98	-21.98
165	5825	7.79	0.19	7.98	30	30	-22.02	-22.02

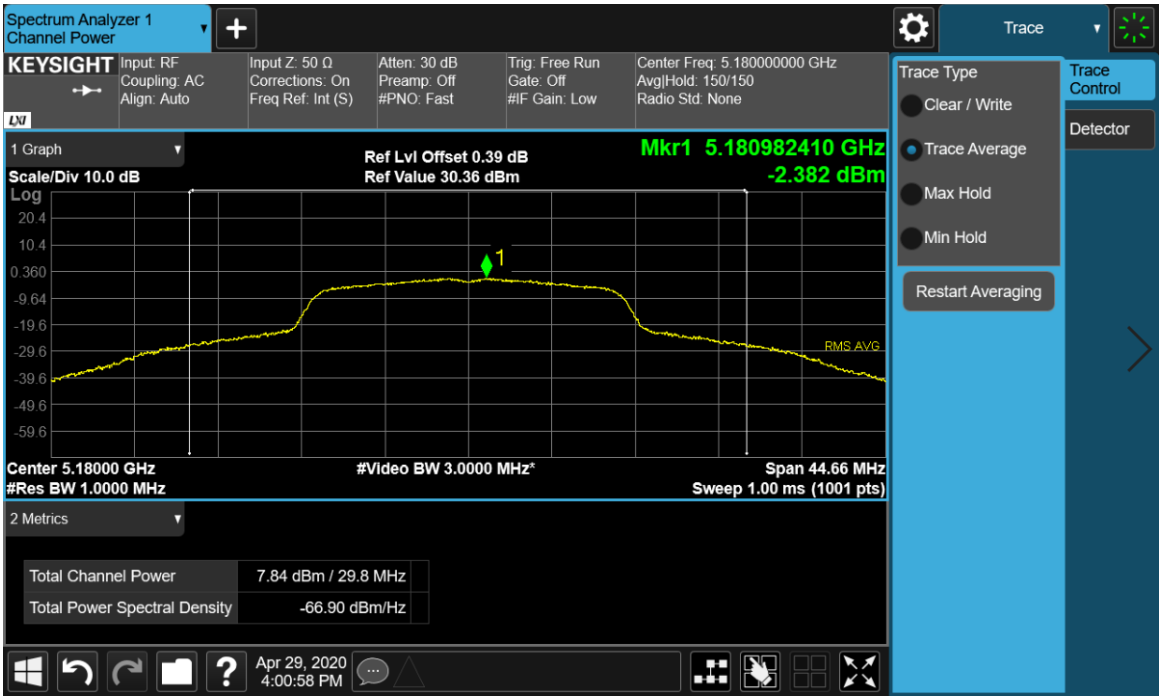
Chain A 802.11a E.I.R.P						
Channel No.	Frequency (MHz)	Chain A Total Power (dBm)	Antenna Gain (dBi)	E.I.R.P (dBm)	RSS-247 E.I.R.P Limit (dBm)	RSS-247 E.I.R.P. Margin (dB)
36	5180	8.03	3.77	11.80	22.41	-10.61
44	5220	8.20	3.77	11.97	22.37	-10.40
48	5240	8.19	3.77	11.96	22.36	-10.40
52	5260	8.07	4.40	12.47	29.36	-16.89
60	5300	8.16	4.40	12.56	29.35	-16.79
64	5320	7.99	4.40	12.39	29.34	-16.95
100	5500	8.00	4.12	12.12	29.49	-17.37
116	5580	8.18	4.12	12.30	29.47	-17.17
140	5700	8.11	4.12	12.23	29.39	-17.16
149	5745	8.05	3.71	11.76	--	--
157	5785	8.02	3.71	11.73	--	--
165	5825	7.98	3.71	11.69	--	--

9.5.5.2 Chain A 802.11a Maximum Power Spectral Density

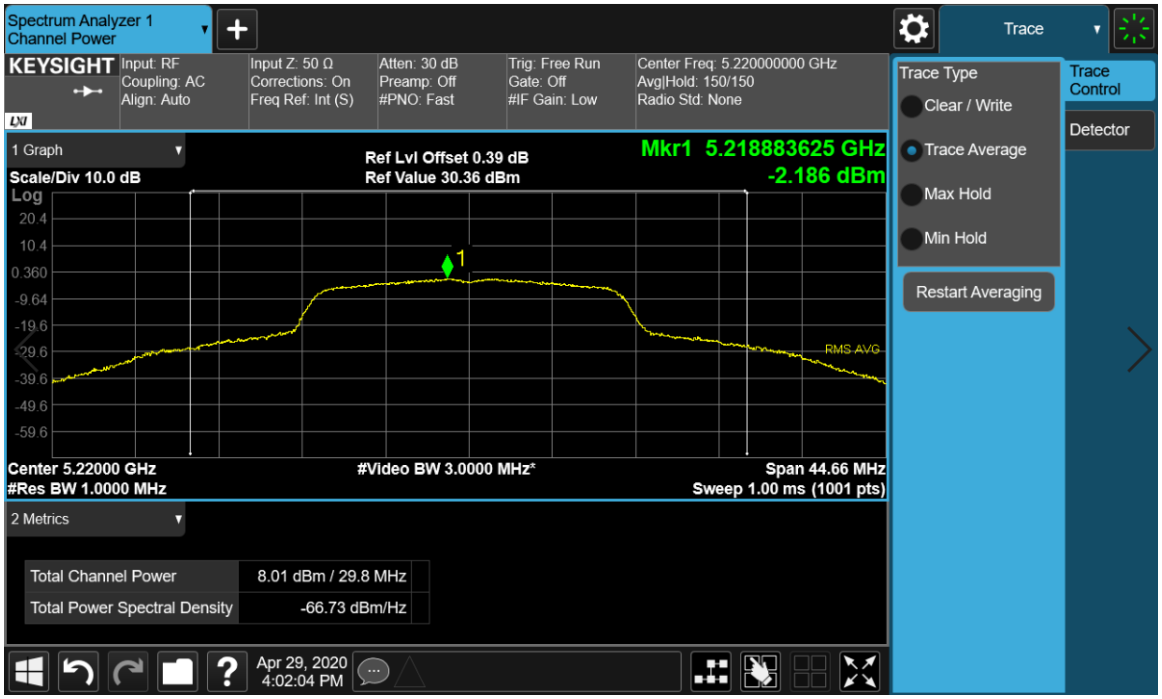
UNII-1 Chain A 802.11a Maximum Power Spectral Density/MHz										
Chan. No.	Freq. (MHz)	PSD $(\frac{dBm}{MHz})$	Duty cycle factor (dB)	Total PSD $(\frac{dBm}{MHz})$	Ant. Gain (dBi)	EIRP PSD $(\frac{dBm}{MHz})$	15.407 Limit $(\frac{dBm}{MHz})$	RSS-247 EIRP PSD Limit $(\frac{dBm}{MHz})$	15.407 Margin (dB)	RSS- 247 Margin (dB)
36	5180	-2.38	0.19	-2.19	3.77	1.58	11.00	10.00	-13.19	-8.42
44	5220	-2.19	0.19	-2.00	3.77	1.77	11.00	10.00	-13.00	-8.23
48	5240	-1.87	0.19	-1.68	3.77	2.09	11.00	10.00	-12.68	-7.91

UNII-2A and UNII-2C Chain A 802.11a Maximum Power Spectral Density/MHz								
Channel No.	Frequency (MHz)	PSD $(\frac{dBm}{MHz})$	Duty cycle factor (dB)	Total PSD $(\frac{dBm}{MHz})$	15.407 Limit $(\frac{dBm}{MHz})$	RSS-247 Limit $(\frac{dBm}{MHz})$	15.407 Margin (dB)	RSS-247 Margin (dB)
52	5260	-2.27	0.19	-2.08	11.00	11.00	-13.08	-13.08
60	5300	-1.81	0.19	-1.62	11.00	11.00	-12.62	-12.62
64	5320	-2.17	0.19	-1.98	11.00	11.00	-12.98	-12.98
100	5500	-2.15	0.19	-1.96	11.00	11.00	-12.96	-12.96
116	5580	-1.88	0.19	-1.69	11.00	11.00	-12.69	-12.69
140	5700	-2.17	0.19	-1.98	11.00	11.00	-12.98	-12.98

UNII-3 Chain A 802.11a Maximum Power Spectral Density/500kHz								
Chan. No.	Freq. (MHz)	PSD $(\frac{dBm}{500\ kHz})$	Duty cycle factor (dB)	Total PSD $(\frac{dBm}{500\ kHz})$	15.407 Limit $(\frac{dBm}{500\ kHz})$	RSS-247 Limit $(\frac{dBm}{500\ kHz})$	15.407 Margin (dB)	RSS-247 Margin (dB)
149	5745	-4.32	0.19	-4.13	30.00	30.00	-34.32	-34.32
157	5785	-4.03	0.19	-4.03	30.00	30.00	-34.03	-34.03
165	5825	-4.12	0.19	-4.12	30.00	30.00	-34.12	-34.12

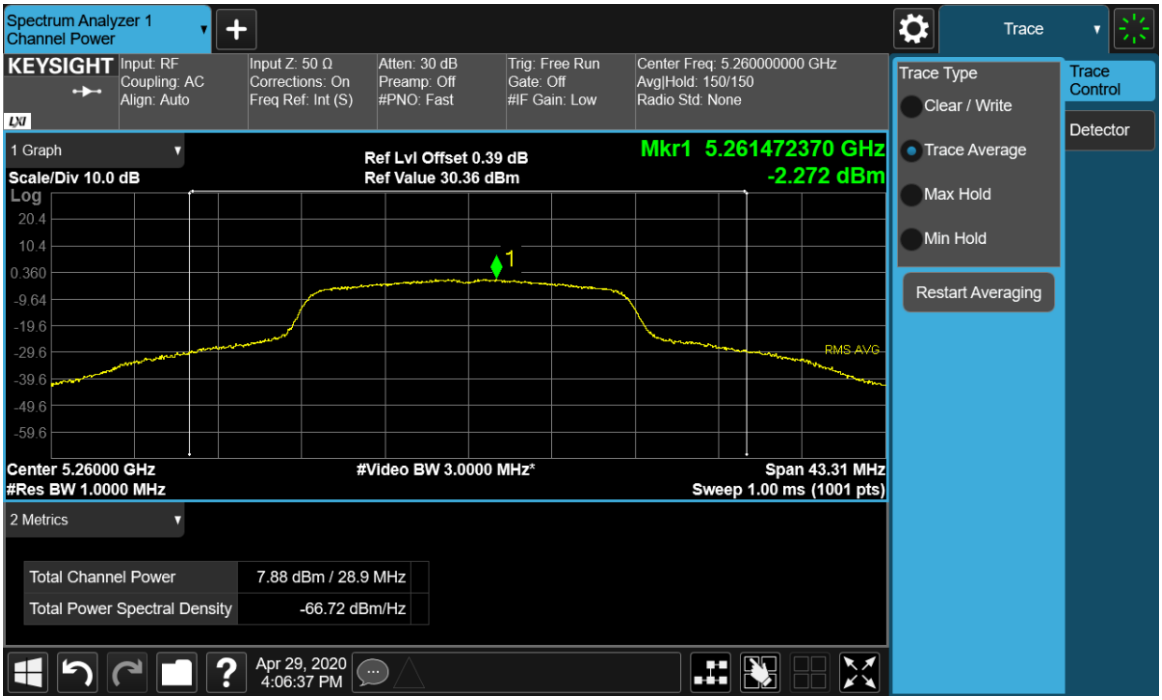


Plot 9-31. Maximum Conducted Output Power and PSD Chain A 802.11a (Ch. 36)

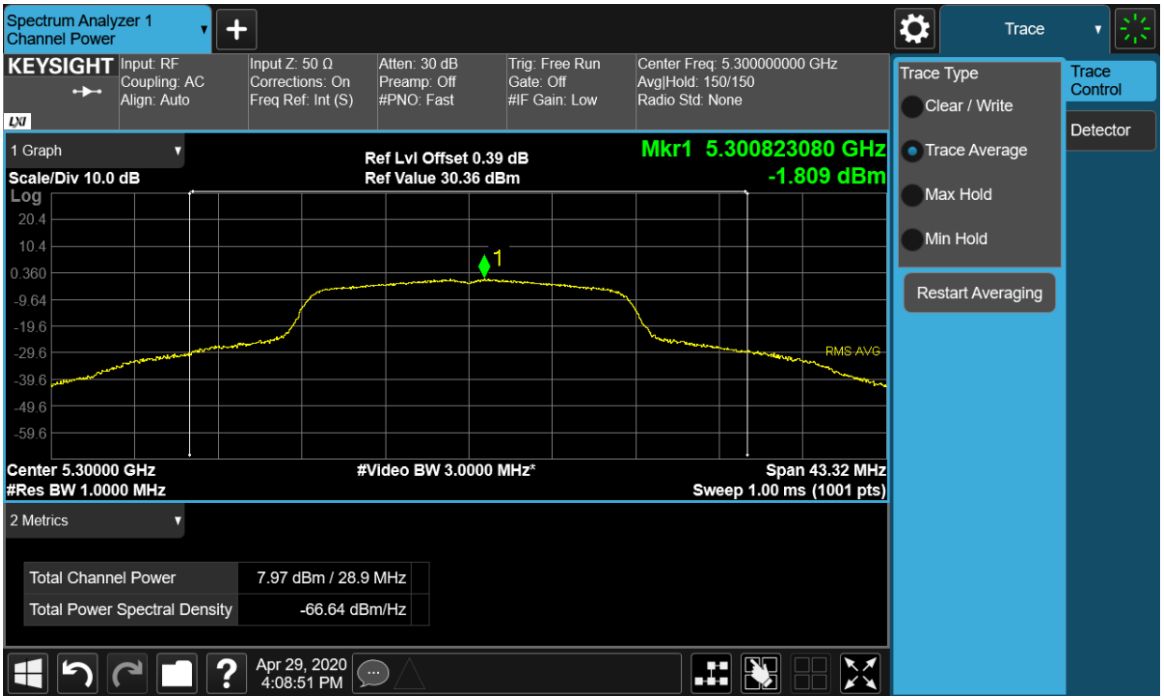


Plot 9-32. Maximum Conducted Output Power and PSD Chain A 802.11a (Ch. 44)

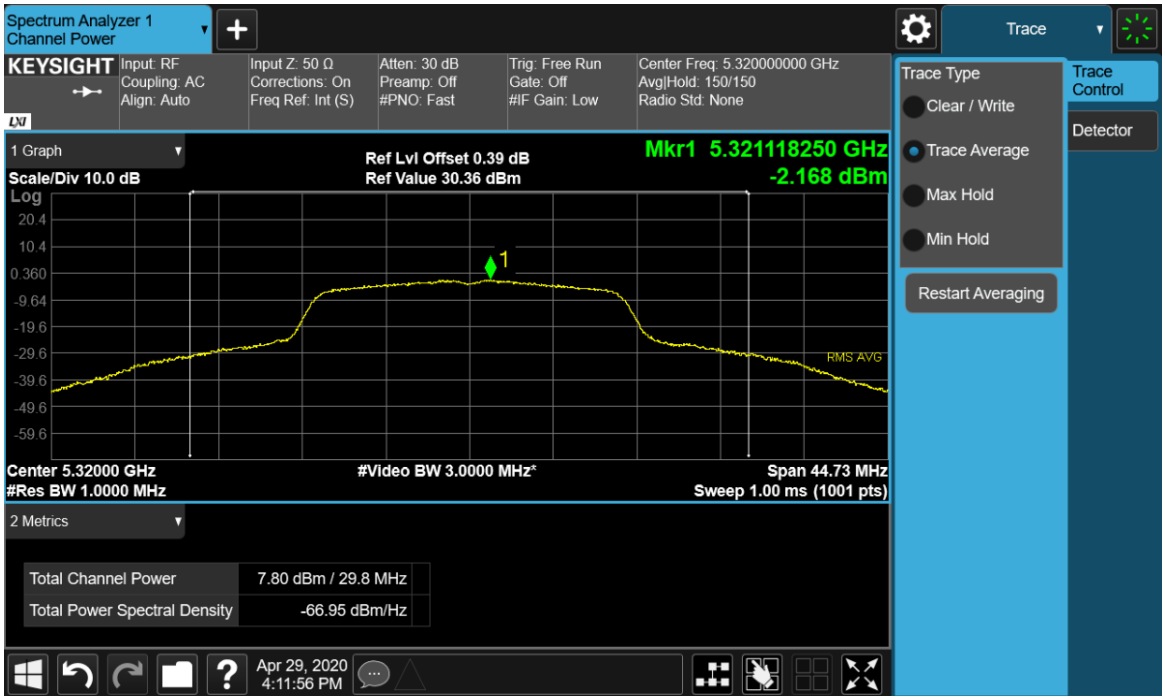
Plot 9-33. Maximum Conducted Output Power and PSD Chain A 802.11a (Ch. 48)



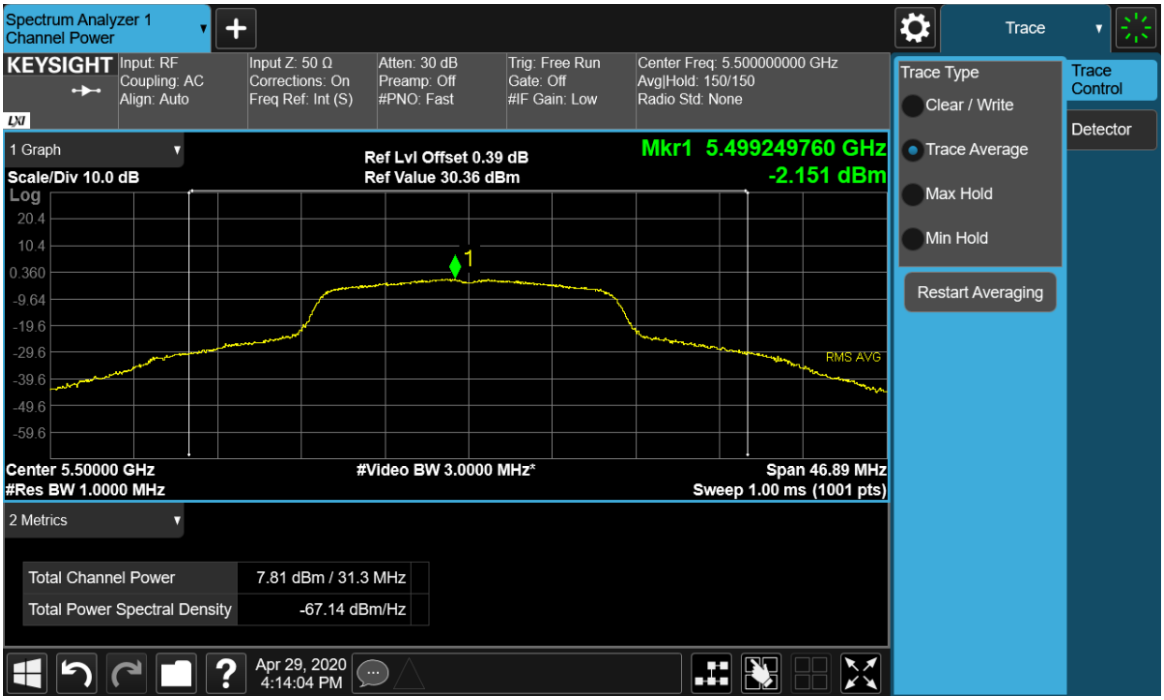
Plot 9-34. Maximum Conducted Output Power and PSD Chain A 802.11a (Ch. 52)



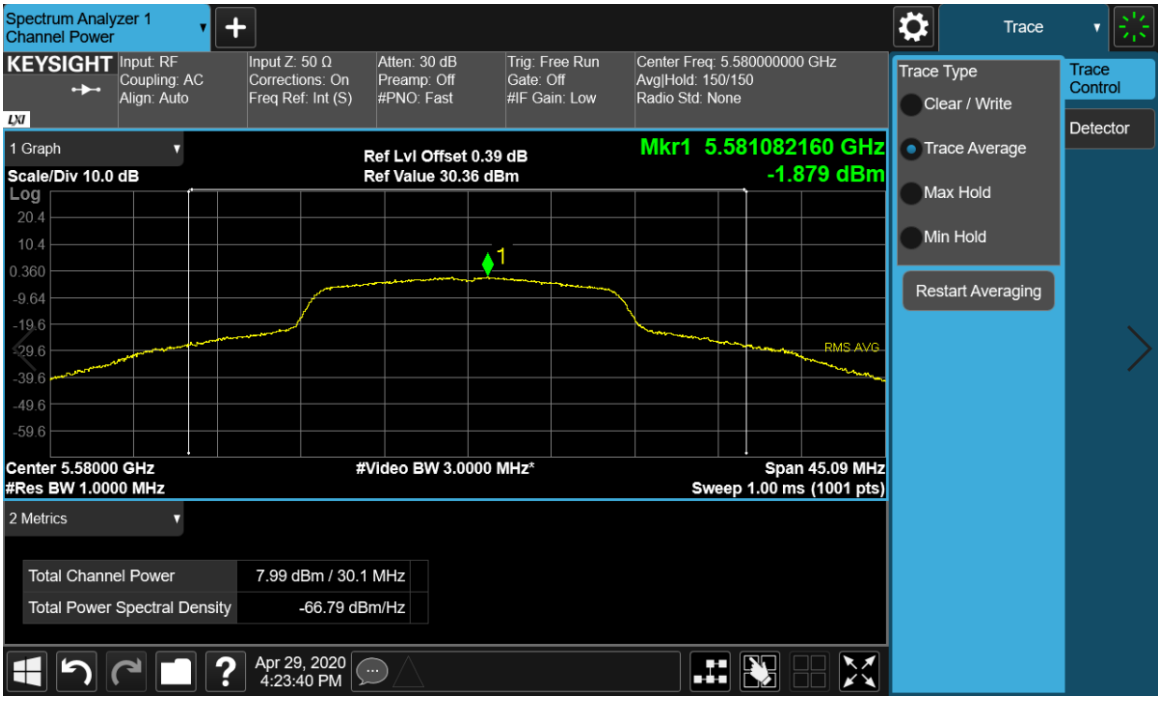
Plot 9-35. Maximum Conducted Output Power and PSD Chain A 802.11a (Ch. 60)



Plot 9-36. Maximum Conducted Output Power and PSD Chain A 802.11a (Ch. 64)



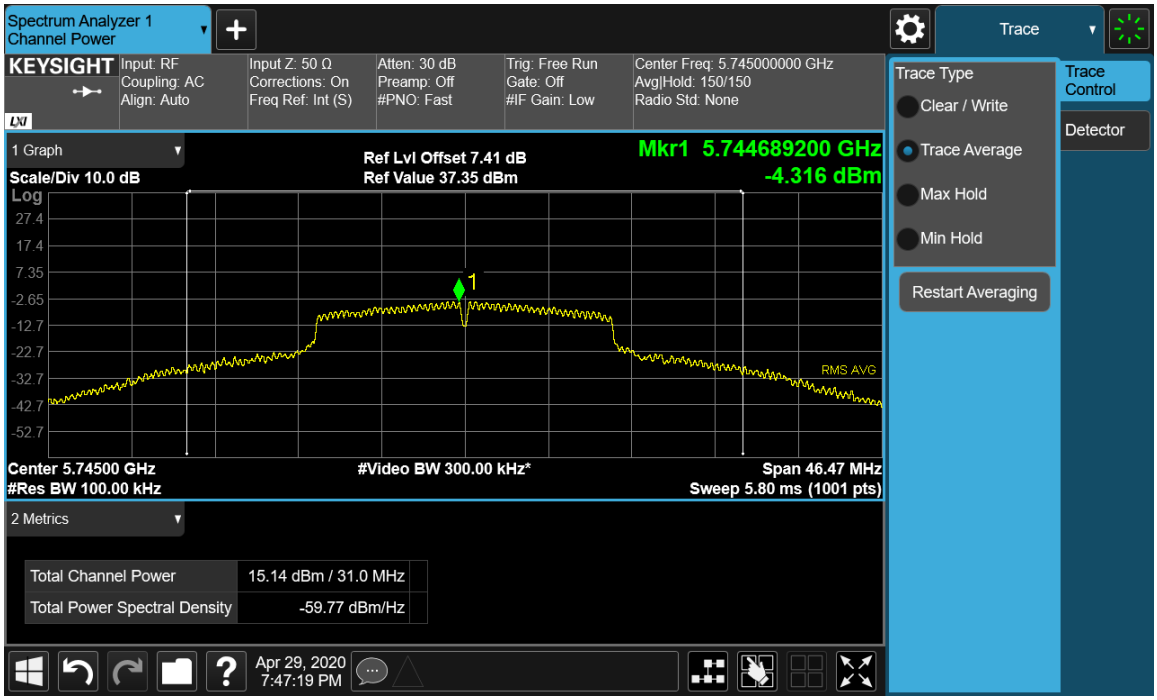
Plot 9-37. Maximum Conducted Output Power and PSD Chain A 802.11a (Ch. 100)



Plot 9-38. Maximum Conducted Output Power and PSD Chain A 802.11a (Ch. 116)

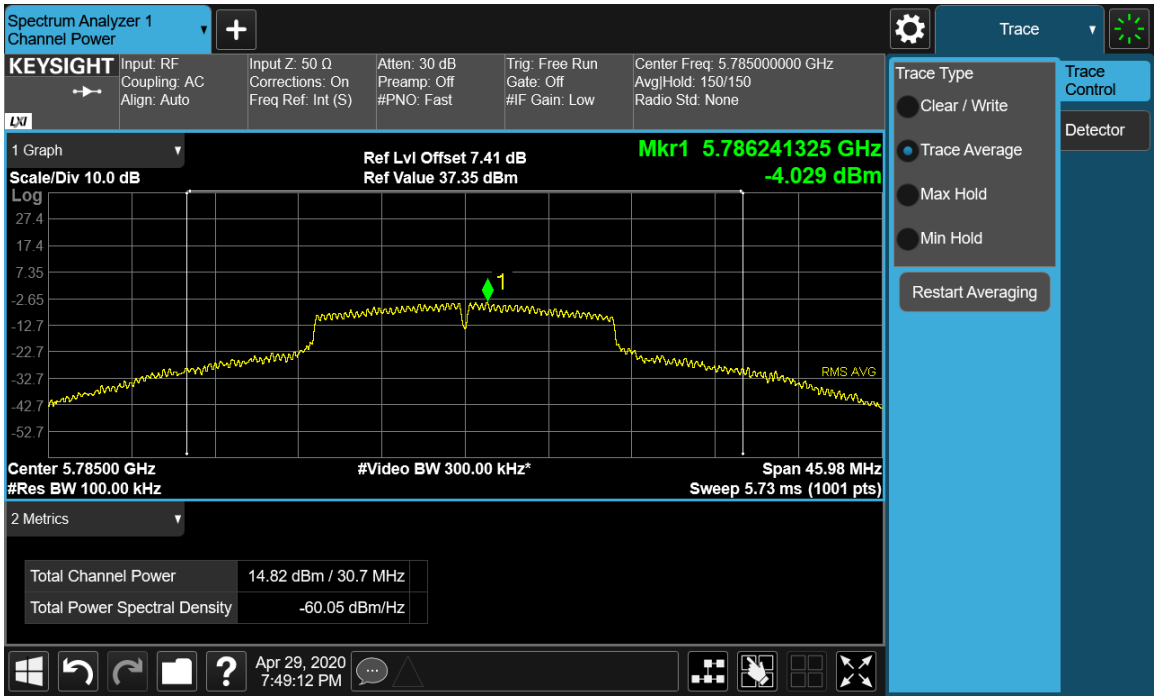
Plot 9-39. Maximum Conducted Output Power and PSD Chain A 802.11a (Ch. 140)

Plot 9-40. Maximum Conducted Output Power Chain A 802.11a (Ch. 149)



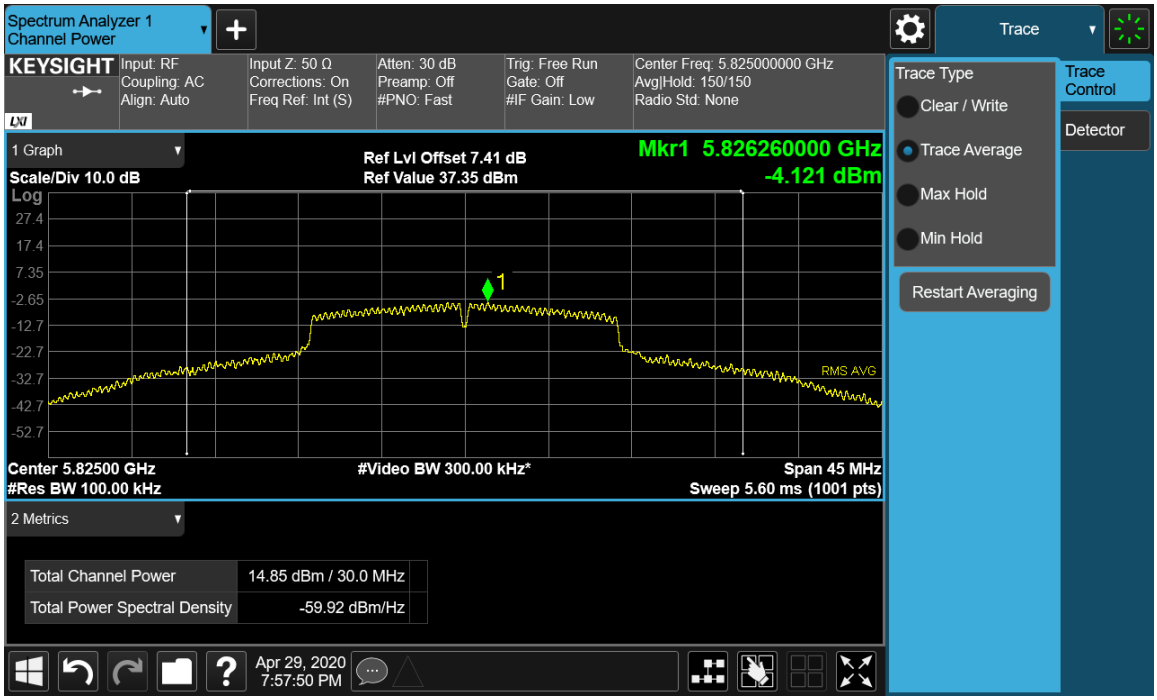
Plot 9-41. Maximum 500KHz PSD Chain A 802.11a (Ch. 149)

Plot 9-42. Maximum Conducted Output Power Chain A 802.11a (Ch. 157)



Plot 9-43. Maximum 500KHz PSD Chain A 802.11a (Ch. 157)

Plot 9-44. Maximum Conducted Output Power Chain A 802.11a (Ch. 165)



Plot 9-45. Maximum 500KHz PSD Chain A 802.11a (Ch. 165)

9.5.5.3 Chain A 802.11n HT20 Maximum Conducted Output Power

Chan. No.	Freq. (MHz)	Chain A Power (dBm)	Duty cycle factor (dB)	Total Chain A Power (dBm)	15.407 Limit (dBm)	RSS-247 Limit (dBm)	15.407 Margin (dB)	RSS-247 Margin (dB)
36	5180	7.97	0.2	8.17	24	--	-15.83	--
44	5220	7.77	0.2	7.97	24	--	-16.03	--
48	5240	7.88	0.2	8.08	24	--	-15.92	--
52	5260	7.68	0.2	7.88	24	23.52	-16.12	-15.64
60	5300	7.90	0.2	8.10	24	23.53	-15.90	-15.43
64	5320	7.71	0.2	7.91	24	23.53	-16.09	-15.62
100	5500	7.76	0.2	7.96	24	23.55	-16.04	-15.59
116	5580	7.77	0.2	7.97	24	23.55	-16.03	-15.58
140	5700	7.96	0.2	8.16	24	23.53	-15.84	-15.37
149	5745	7.86	0.2	8.06	30	30.00	-21.94	-21.94
157	5785	7.82	0.2	8.02	30	30.00	-21.98	-21.98
165	5825	7.79	0.2	7.99	30	30.00	-22.01	-22.01

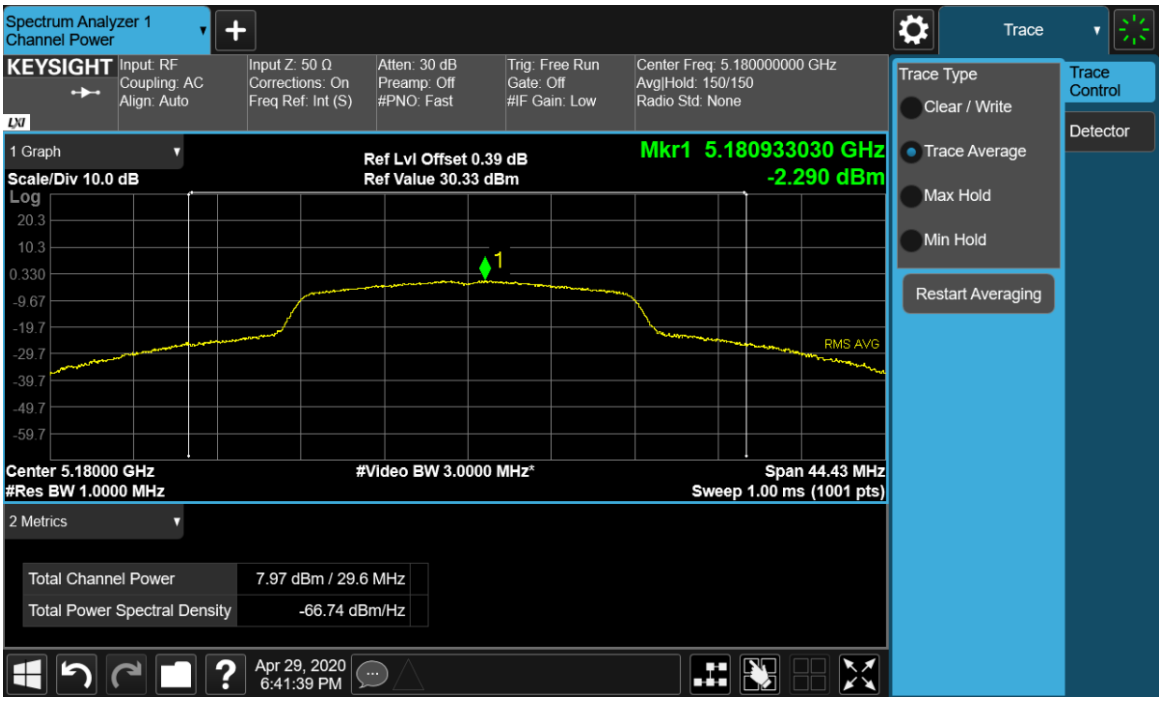
Chain A 802.11n HT20 E.I.R.P						
Channel No.	Frequency (MHz)	Total Chain A Power (dBm)	Antenna Gain (dBi)	E.I.R.P (dBm)	RSS-247 E.I.R.P Limit (dBm)	RSS-247 E.I.R.P. Margin (dB)
36	5180	8.17	3.77	11.94	22.55	-10.61
44	5220	7.97	3.77	11.74	22.56	-10.82
48	5240	8.08	3.77	11.85	22.52	-10.67
52	5260	7.88	4.40	12.28	29.52	-17.24
60	5300	8.10	4.40	12.50	29.53	-17.03
64	5320	7.91	4.40	12.31	29.53	-17.22
100	5500	7.96	4.12	12.08	29.55	-17.47
116	5580	7.97	4.12	12.09	29.55	-17.46
140	5700	8.16	4.12	12.28	29.53	-17.25
149	5745	8.06	3.71	11.77	--	--
157	5785	8.02	3.71	11.73	--	--
165	5825	7.99	3.71	11.70	--	--

9.5.5.4 Chain A 802.11n Maximum Power Spectral Density

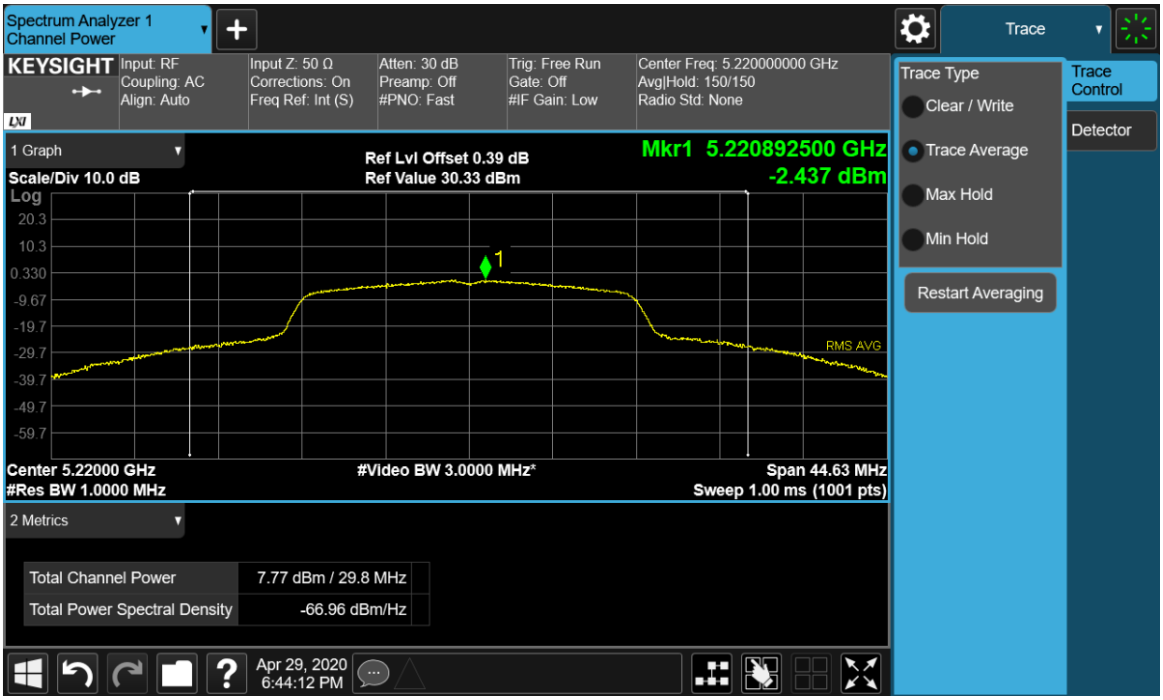
UNII-1 Chain A 802.11n Maximum Power Spectral Density/MHz										
Chan. No.	Freq. (MHz)	PSD $(\frac{dBm}{MHz})$	Duty cycle factor (dB)	Total PSD $(\frac{dBm}{MHz})$	Ant. Gain (dBi)	EIRP PSD $(\frac{dBm}{MHz})$	15.407 Limit $(\frac{dBm}{MHz})$	RSS-247 EIRP PSD Limit $(\frac{dBm}{MHz})$	15.407 Margin (dB)	RSS-247 Margin (dB)
36	5180	-2.29	0.2	-2.09	3.77	1.68	11.00	10.00	-13.09	-8.32
44	5220	-2.44	0.2	-2.24	3.77	1.53	11.00	10.00	-13.24	-8.47
48	5240	-2.32	0.2	-2.12	3.77	1.65	11.00	10.00	-13.12	-8.35

UNII-2A and UNII-2C Chain A 802.11n Maximum Power Spectral Density/MHz								
Channel No.	Frequency (MHz)	PSD $(\frac{dBm}{MHz})$	Duty cycle factor (dB)	Total PSD $(\frac{dBm}{MHz})$	15.407 Limit $(\frac{dBm}{MHz})$	RSS-247 Limit $(\frac{dBm}{MHz})$	15.407 Margin (dB)	RSS-247 Margin (dB)
52	5260	-2.53	0.2	-2.33	11.00	11.00	-13.33	-13.33
60	5300	-2.04	0.2	-1.84	11.00	11.00	-12.84	-12.84
64	5320	-2.47	0.2	-2.27	11.00	11.00	-13.27	-13.27
100	5500	-2.51	0.2	-2.31	11.00	11.00	-13.31	-13.31
116	5580	-2.44	0.2	-2.24	11.00	11.00	-13.24	-13.24
140	5700	-1.98	0.2	-1.78	11.00	11.00	-12.78	-12.78

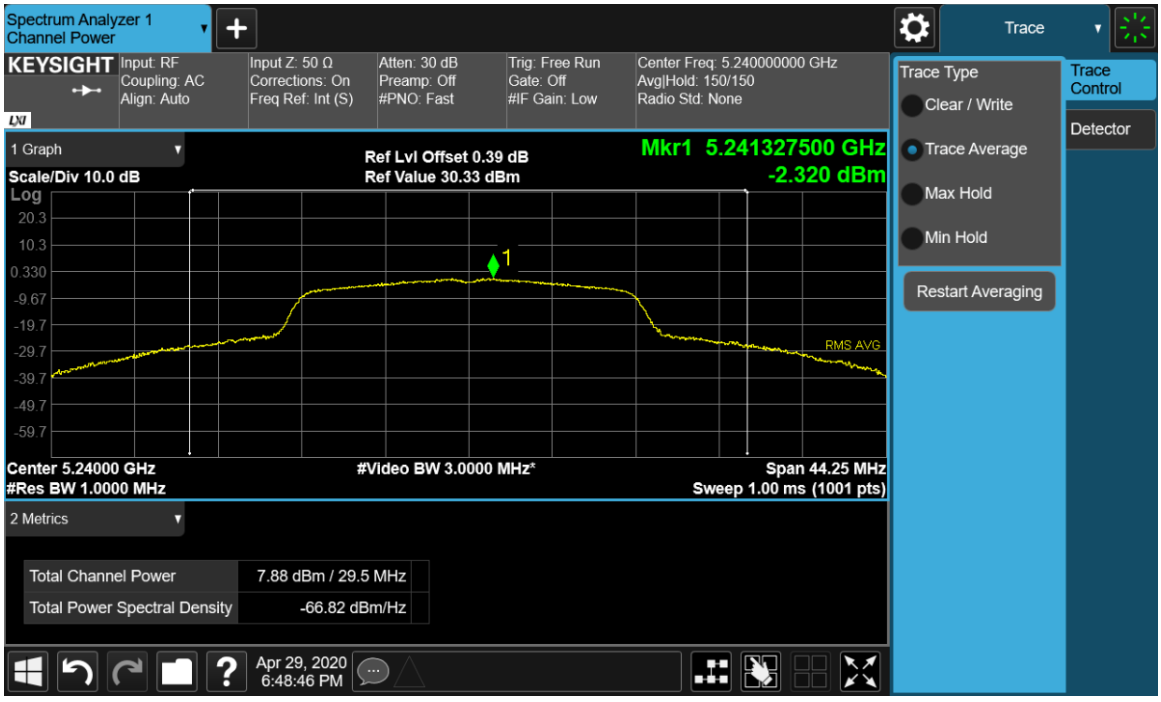
UNII-3 Chain A 802.11n Maximum Power Spectral Density/500kHz								
Chan. No.	Freq. (MHz)	PSD $(\frac{dBm}{500\ kHz})$	Duty cycle factor (dB)	Total PSD $(\frac{dBm}{500\ kHz})$	15.407 Limit $(\frac{dBm}{500\ kHz})$	RSS-247 Limit $(\frac{dBm}{500\ kHz})$	15.407 Margin (dB)	RSS-247 Margin (dB)
149	5745	-4.04	0.2	-3.84	30.00	30.00	-33.84	-33.84
157	5785	-4.28	0.2	-4.08	30.00	30.00	-34.08	-34.08
165	5825	-4.36	0.2	-4.16	30.00	30.00	-34.16	-34.16



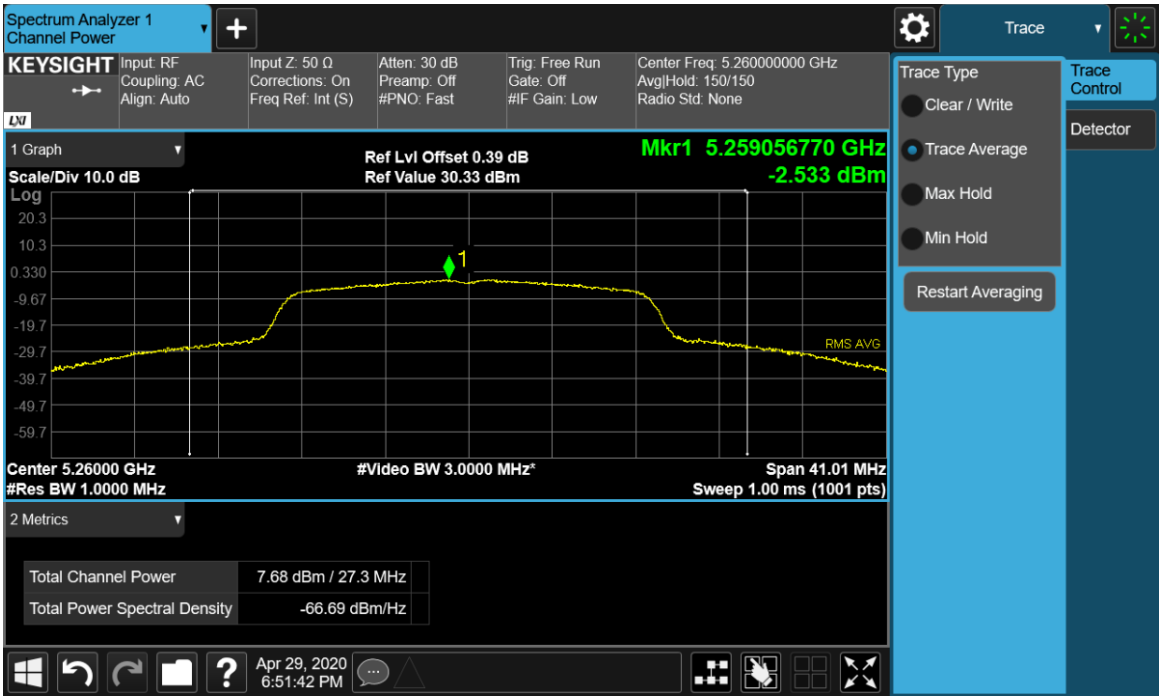
Plot 9-46. Maximum Conducted Output Power and PSD Chain A 802.11a (Ch. 36)



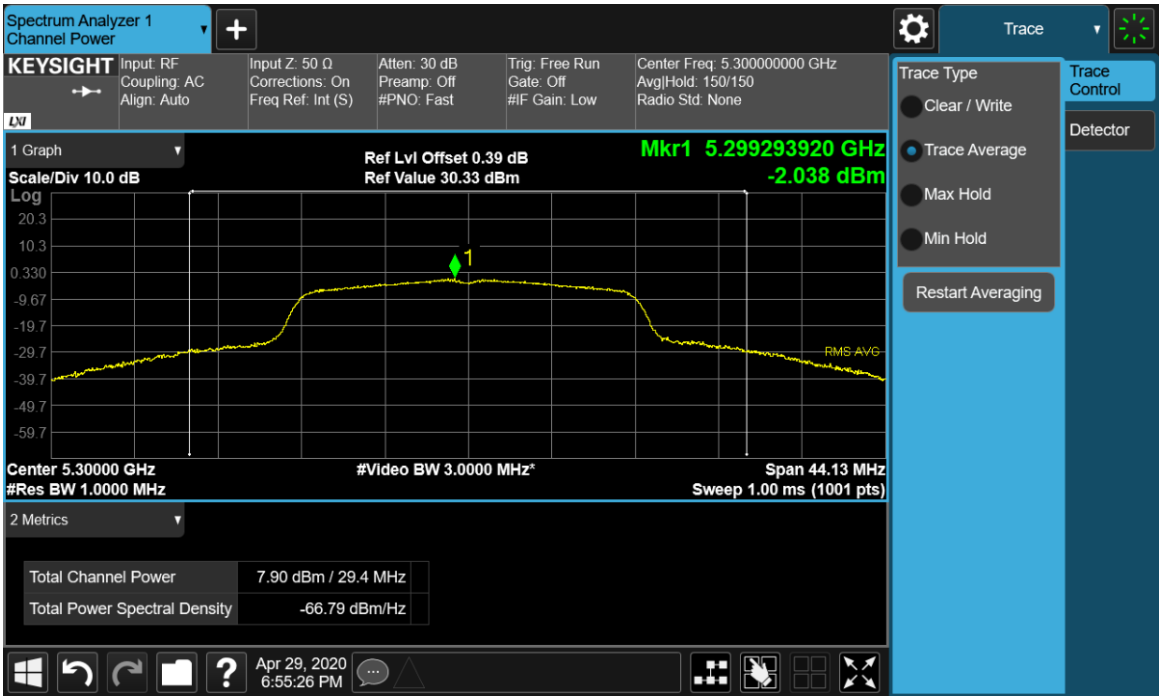
Plot 9-47. Maximum Conducted Output Power and PSD Chain A 802.11a (Ch. 44)



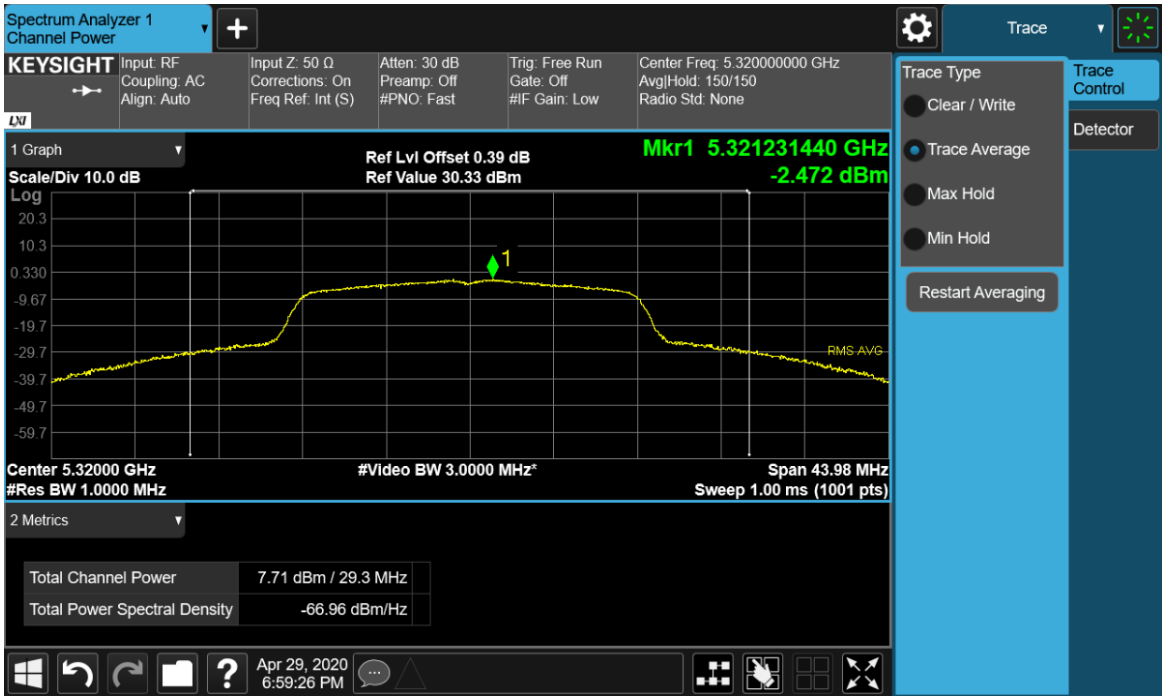
Plot 9-48. Maximum Conducted Output Power and PSD Chain A 802.11a (Ch. 48)



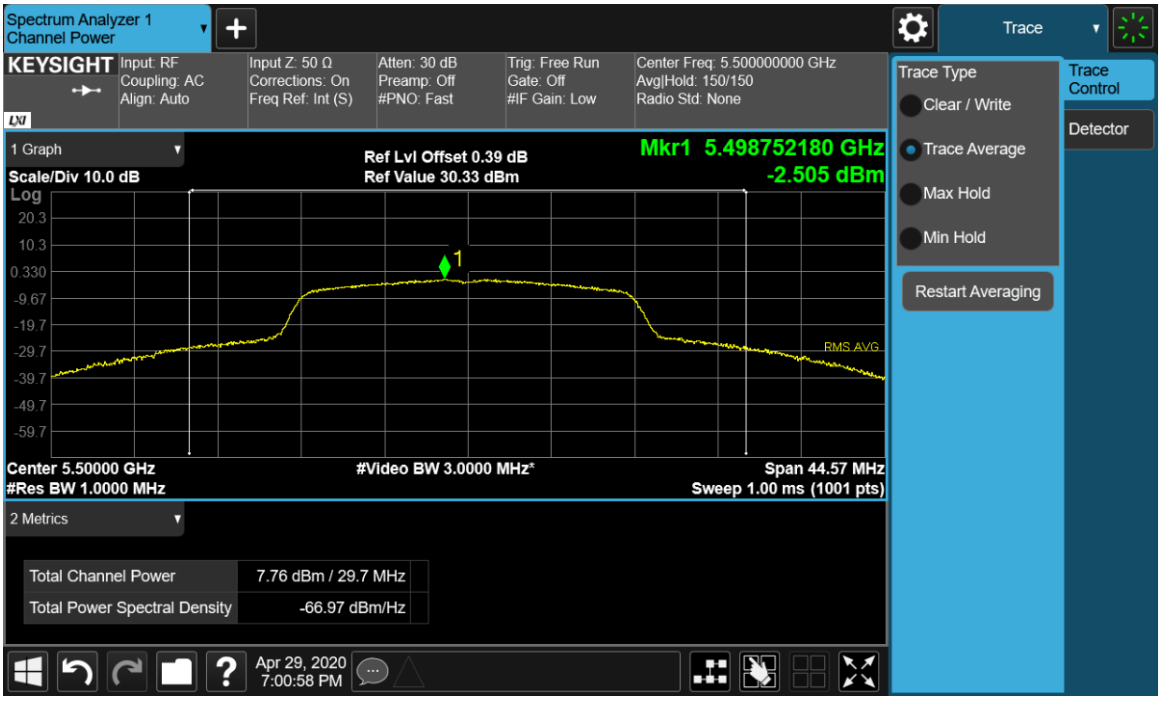
Plot 9-49. Maximum Conducted Output Power and PSD Chain A 802.11a (Ch. 52)



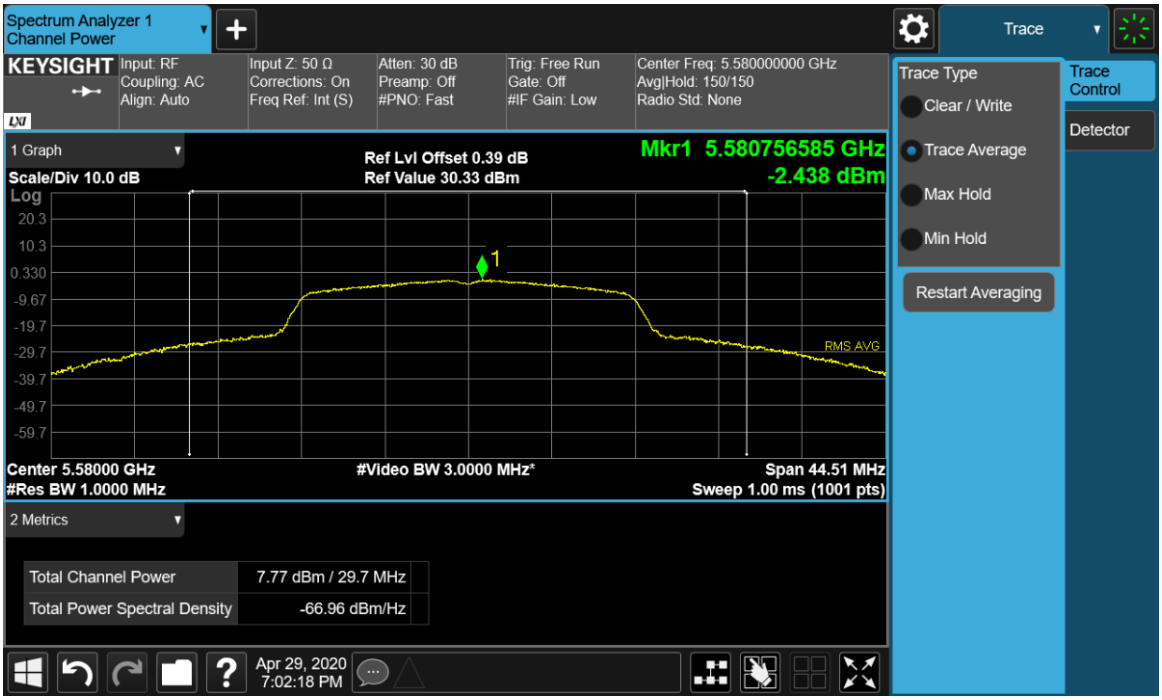
Plot 9-50. Maximum Conducted Output Power and PSD Chain A 802.11a (Ch. 60)



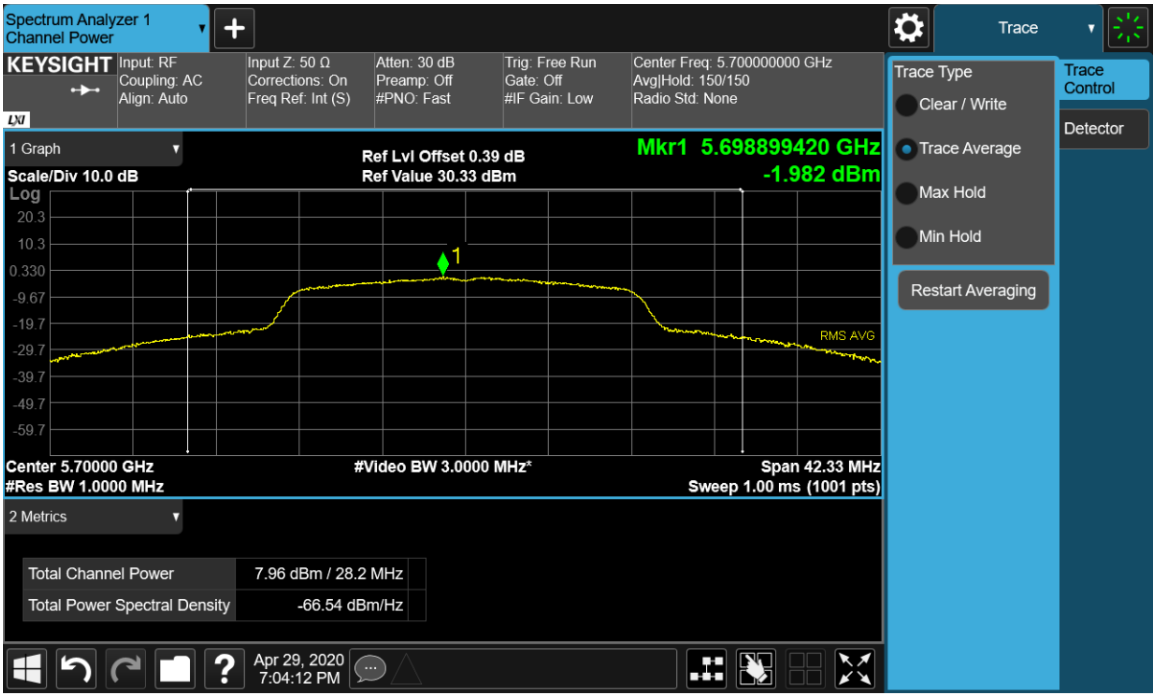
Plot 9-51. Maximum Conducted Output Power and PSD Chain A 802.11a (Ch. 64)



Plot 9-52. Maximum Conducted Output Power and PSD Chain A 802.11a (Ch. 100)

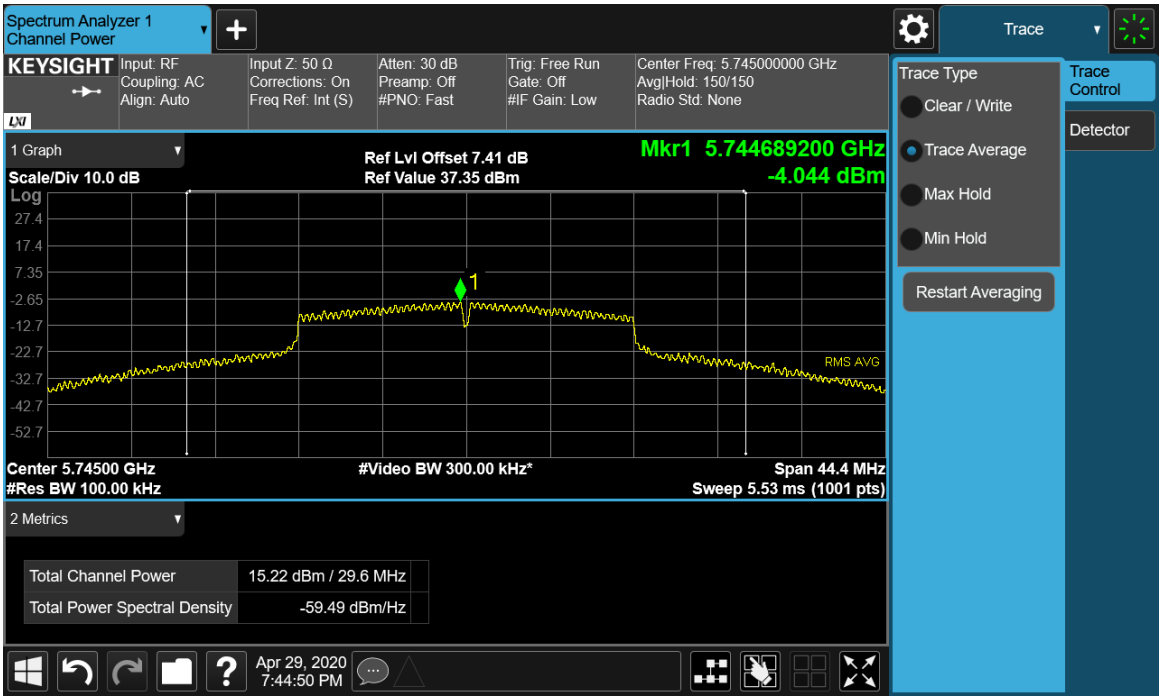


Plot 9-53. Maximum Conducted Output Power and PSD Chain A 802.11a (Ch. 116)



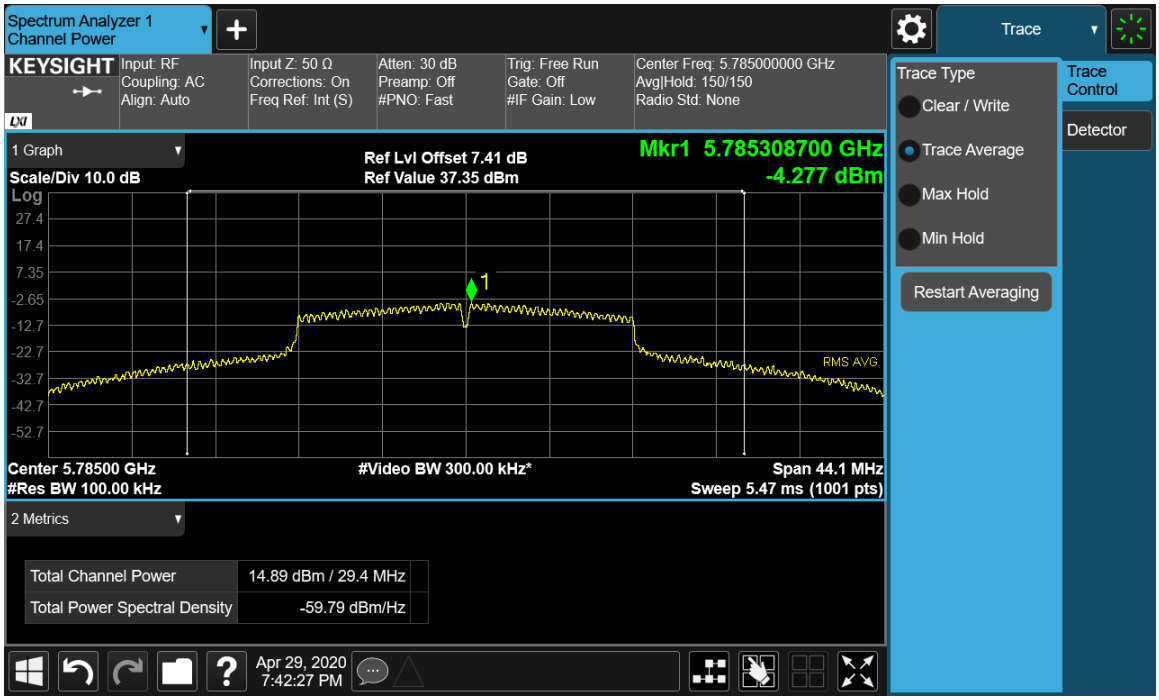
Plot 9-54. Maximum Conducted Output Power and PSD Chain A 802.11a (Ch. 140)

Plot 9-55. Maximum Conducted Output Power Chain A 802.11a (Ch. 149)



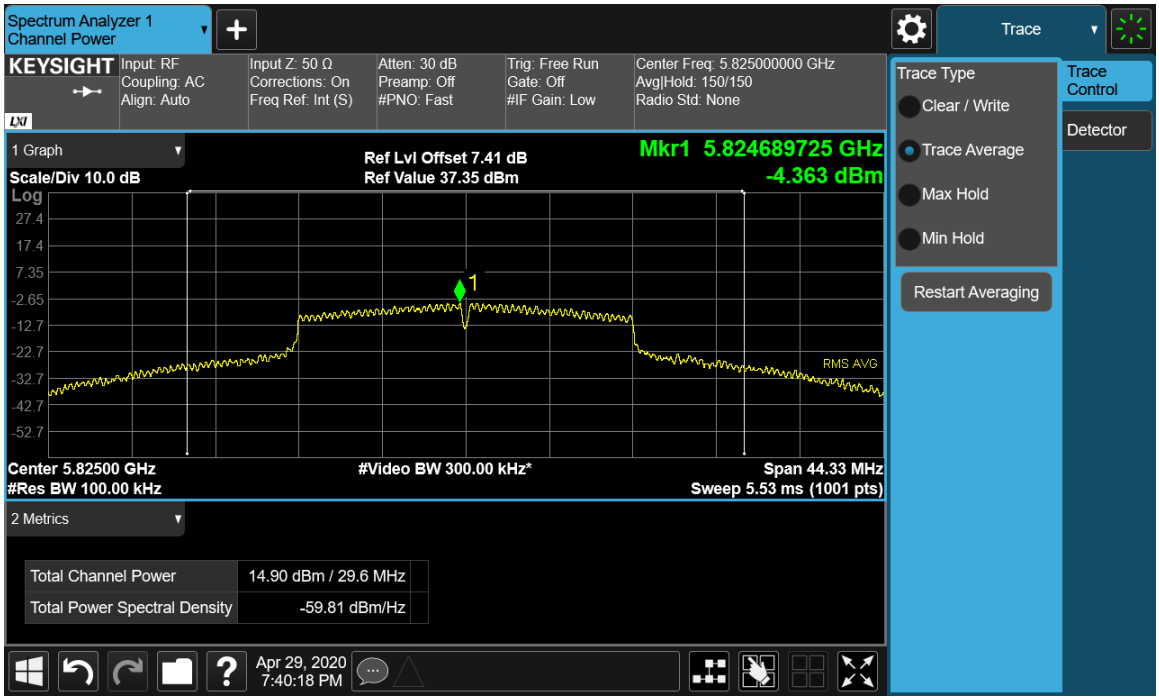
Plot 9-56. Maximum 500KHz PSD Chain A 802.11a (Ch. 149)

Plot 9-57. Maximum Conducted Output Power Chain A 802.11a (Ch. 157)



Plot 9-58. Maximum 500KHz PSD Chain A 802.11a (Ch. 157)

Plot 9-59. Maximum Conducted Output Power Chain A 802.11a (Ch. 165)



Plot 9-60. Maximum 500KHz PSD Chain A 802.11a (Ch. 165)

9.6 Radiated Spurious and Band Edge Emissions

9.6.1 Test Requirement:

FCC CFR 47 Rule Part 15.407 (b)
ISED RSS-247 [6.2] and RSS GEN [8.9]

9.6.2 Test Method:

Measurements were performed according to the procedure defined in KDB 789033 D02 v02r01 - Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E and ANSI C63.10 2013.

Radiated spurious measurements are made from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The limit for radiated spurious emissions is per 15.209 and RSS-247 [5.5]. Additionally, emissions found in the restricted bands as listed in 15.205 and RSS-Gen were tested for compliance per limits in 15.209 and RSS-Gen.

The EUT was tested near the low, middle and high channels of operation in each sub band. Guidelines in ANSI C63.10:2013 were followed with respect to maximizing the emissions.

A pre-amp and a high pass filter were required for this test, to provide the measuring system with sufficient sensitivity. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength.
All tests were performed in MIMO transmission mode to measure the worst case for both antennas.

Both horizontal and vertical antenna polarizations were investigated. Worst case maximized data for both polarizations is shown in this test report.

Radiated Spurious Emissions
Spectrum Analyzer Settings:
30 MHz- 1 GHz:
RBW= 120 kHz
VBW ≥ 3 X RBW
Trace Mode: Peak Detector (Max Hold). Final measurements performed using QP Detector.
Span= 30 MHz- 1 GHz
Sweep time= Auto Couple
Sweep points ≥ 2 x Span/RBW
Above 1 GHz:
RBW= 1 MHz
VBW= 10 MHz
Trace Mode: Peak Detector (Max Hold) and RMS Average Detector (Max Hold) (Pre-scan Only)
Span= 1- 18 GHz, 18- 26.5 GHz and 26.5- 40 GHz
Sweep time= Auto Couple
Sweep points ≥ 2 x Span/RBW

Final Peak Measurements above 1 GHz

Spectrum Analyzer Settings:

RBW= 1 MHz
VBW≥ 3 × RBW
Detector= Peak
Span= wide enough to encompass the emission
Sweep points≥ 2 × Span/RBW
Sweep time = Auto Couple
Trace= Max Hold

Final RMS Average Measurements above 1 GHz

Spectrum Analyzer Settings:

RBW= 1 MHz
VBW≥ 3 × RBW
Detector= RMS
Span= wide enough to encompass the emission
Sweep points≥ 2 × Span/RBW
Sweep time = Auto Couple
Trace= Average at least 100 traces
Trace Averaging type= power (RMS)
The duty cycle correction factor is added to the emission level.

Restricted Band-Edge Emissions

Peak Measurements

Spectrum Analyzer Settings:

RBW= 1 MHz
VBW= 10 MHz
Trace Mode: Peak Detector (Max Hold)
Span= 5000 – 5470 MHz; 5350 – 5850 MHz; 5600 – 5950 MHz
Sweep Points = 1001; 801; 801
Sweep Time = Auto Couple

Average Measurements

Spectrum analyzer Settings:

RBW= 1 MHz
VBW= 3 MHz
VBW Mode= Linear
Trace Mode: Peak Detector (Max Hold)
Span = 5000 – 5470 MHz; 5350 – 5700 MHz;
Sweep Points: 1001; 801
Sweep Time = Auto Couple
Sweep Count = 200

Sample Calculation:

Field Strength Level: Amplitude (Analyzer level) + AFCL (Antenna Factor and Cable losses) – Amplifier Gain = 50 dBuV + 33 dB – 25 dB = 58dBuV/m

9.6.3 Limits:

Frequency (MHz)	Field Strength (µV/m)	Measurement Distance (meters)	Corrected Field Strength for 3m measurement distance (dBµV/m)
0.009-0.490	2400/F (kHz)	300	48.5- 13.8
0.490-1.705	24000/F (kHz)	30	33.8- 23.0
1.705-30	30	30	29.5
30-88	100	3	40
88-216	150	3	43.5
216-960	200	3	46
960-1000	500	3	54
Above 1000	500	3	54 (Average) 74 (Peak) **Note**: The peak limit for emissions in unrestricted bands is -27dBm EIRP (68.2dBµV/m at 3m).
The limits in CFR 47, Part 15, Subpart C, paragraph 15.209 (a), are identical to those in RSS-GEN Section 8.9, Table 6, since the measurements are performed in terms of magnetic field strength and converted to electric field strength levels (as reported in the table) using the free space impedance of 377Ω. For example, the measurement frequency X kHz resulted in a level of Y dBµV/m, which is equivalent to Y-51.5 = Z dBµA/m, which has the same margin, W dB, to the corresponding RSS-GEN Table 6 limit as it has to be 15.209(a) limit.			

9.6.4 Test Result:

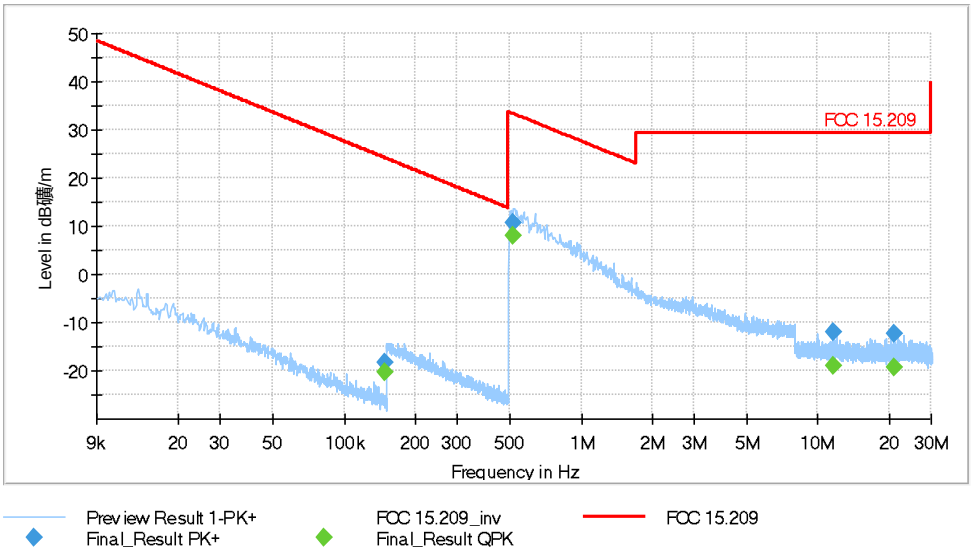
Pass.

9.6.5 Test Data:

9.6.5.1 Radiated Emissions in 9 kHz - 30 MHz range

All channels and modes were tested, and worst-case from 802.11a mode, channel 100 results shown here.

Emission Frequency (MHz)	Raw Quasi-Peak Amplitude (dBµV/m)	Correction Factor (dB)	Corrected Quasi-Peak Field Strength (dBµV/m)	Quasi-Peak Limit (dBµV/m)	Quasi-Peak Margin (dB)
0.147	-20.42	-17.3	-37.72	24.26	-61.98
0.514	7.93	12	19.93	33.38	-13.45
11.641	-18.85	-4.7	-23.55	29.54	-53.09
21.12	-19.25	-5.4	-24.65	29.54	-54.19

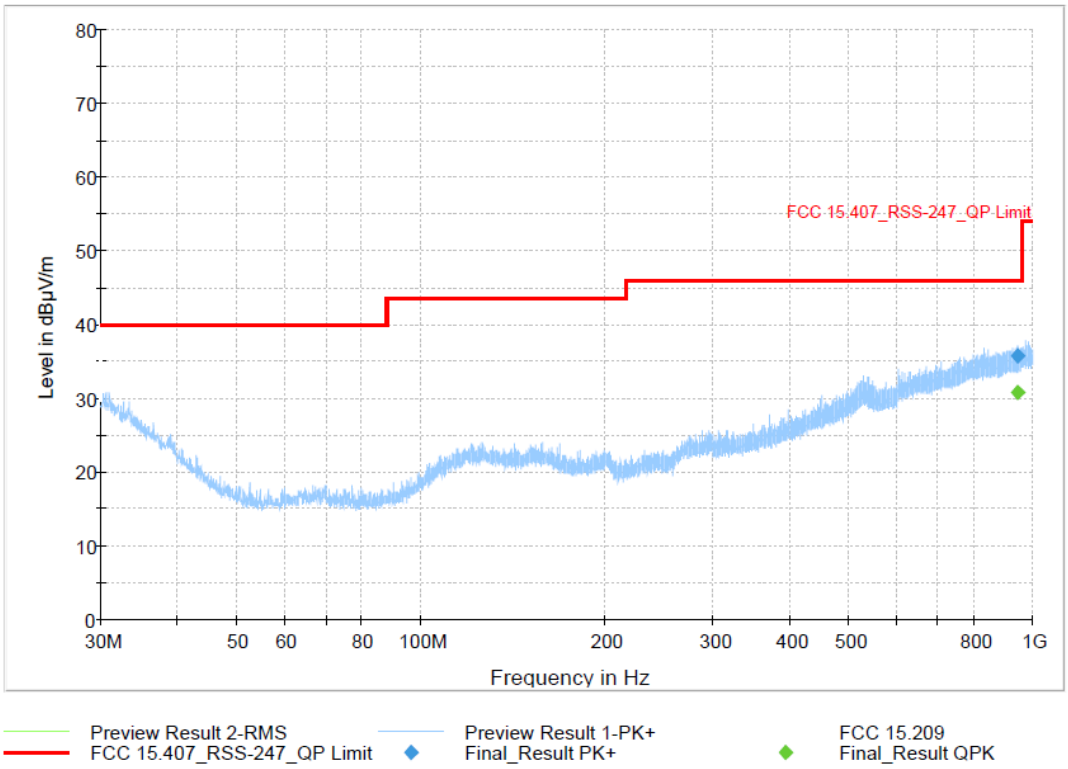


Plot 9-61. Radiated Spurious Emissions 9k-30 MHz Tx Chain A 802.11a (Ch. 100)

9.6.5.2 Radiated Emissions in 30 MHz- 1 GHz range

All channels and modes were tested and worst-case results from 802.11a mode, channel 100 shown here.

RSE 30-1000 MHz					
Frequency (MHz)	**Raw Quasi-Peak Amplitude (dBµV/m)**	**Correction Factor (dB)**	**Corrected Quasi-Peak Field Strength (dBµV/m)**	**Quasi-Peak Limit (dBµV/m)**	**Quasi-Peak Margin (dB)**
945.40	-0.96	31.8	30.84	46.00	-15.16



Plot 9-62. Radiated Spurious Emissions 30-1000 MHz Tx Chain A 802.11a (Ch. 100)

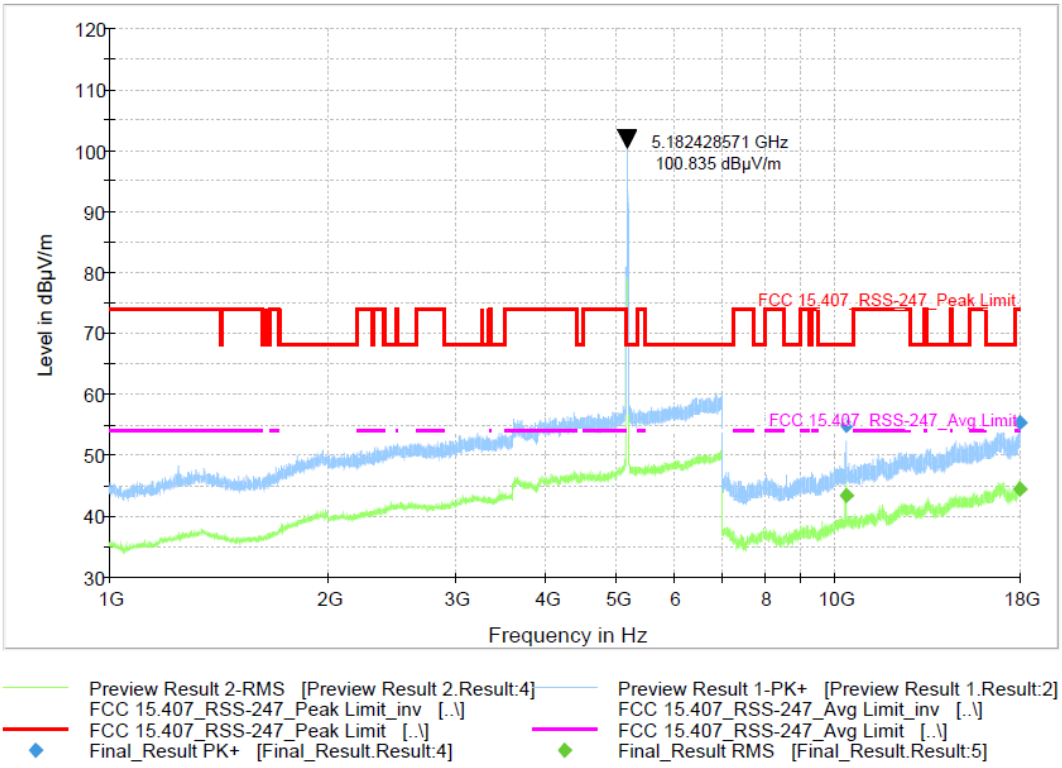
9.6.5.3 Radiated Emissions in 1-18 GHz range

802.11a RSE 1 – 18GHz Peak Data						
Carrier Frequency (MHz)	**Frequency (MHz)**	**Raw Peak Amplitude (dBµV)**	**Correction Factor (dB)**	**Corrected Peak Field Strength (dBµV/m)**	**Peak Limit (dBµV/m)**	**Margin (dB)**
5180	10358.66*	38.56	16.4	54.96	68.2	-13.24
5180	17968.37	31.97	23.5	55.47	74	-18.53
5220	10441.22*	39.78	16.3	56.08	68.2	-12.12
5220	17913.48	32.19	23.5	55.69	74	-18.31
5240	10482.07*	38.99	16.3	55.29	68.2	-12.91
5240	17888.13	31.37	23.4	54.77	74	-19.23
5260	10516.58*	37.99	16.3	54.29	68.2	-13.91
5260	17965.00	32.5	23.5	56	74	-18
5300	10598.82*	37.25	16.5	53.75	68.2	-14.45
5300	17994.25	32.01	23.7	55.71	74	18.29
5320	10638.88*	37.14	16.8	53.94	74	-20.06
5320	17992.36	32.61	23.7	56.31	74	-17.69
5500	10014.46*	33.21	15.4	48.61	68.2	-19.59
5500	17750.11	32.15	22.8	54.95	74	-19.05
5580	11163.15	36.82	17.9	54.72	74	-19.28
5580	17996.54	32.08	23.7	55.78	74	-18.22
5700	11401.50	39	17.3	56.3	74	-17.7
5700	17954.56	31.86	23.6	55.46	74	-18.54
5745	11489.56	37.95	17.5	55.45	74	-18.55
5745	17859.41	31.77	23.4	55.17	74	-18.83
5785	11574.44	36.58	17.7	54.28	74	-19.72
5785	17992.54	32.41	23.7	56.11	74	-17.89
5825	11649.32	38.74	17.8	56.54	74	-17.46
5825	17972.69	32.69	23.5	56.19	74	-17.81

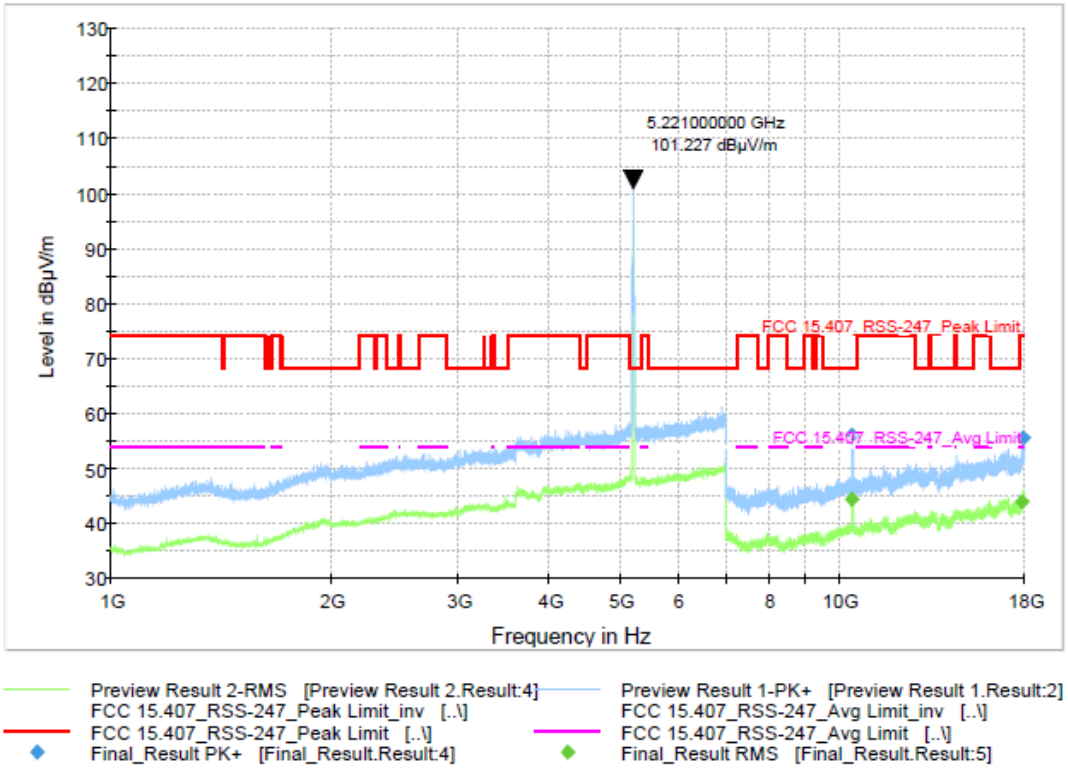
802.11a RSE 1 - 18GHz Average Data						
Carrier Frequency (MHz)	**Frequency (MHz)**	**Raw Avg. Amplitude (dBµV)**	**Correction Factor (incl DCF=0dB) (dB)**	**Corrected Avg. Field Strength (dBµV/m)**	**Average Limit (dBµV/m)**	**Margin (dB)**
5180	10358.73*	27.09	16.4	43.49	54	-10.51
5180	17982.21	20.81	23.6	44.41	54	-9.59
5220	10440.03*	28.13	16.4	44.53	54	-9.47
5220	17876.29	20.55	23.5	44.05	54	-9.95
5240	10479.22*	28.6	16.3	44.9	54	-9.1
5240	17935.29	20.51	23.6	44.11	54	-9.89
5260	10518.24*	27.54	16.3	43.84	54	-10.16
5260	17979.81	20.85	23.6	44.45	54	-9.55
5300	10599.75*	26.2	16.5	42.7	54	-11.3
5300	17985.80	20.84	23.6	44.44	54	-9.56
5320	10638.83*	25.39	16.8	42.19	54	-11.81
5320	17963.83	20.83	23.5	44.33	54	-9.67

5500	10163.34*	21.13	16.4	37.53	54	-16.47
5500	17749.32	20.6	22.8	43.4	54	-10.6
5580	11163.15	23.59	17.9	41.49	54	-12.51
5580	17996.54	20.82	23.6	44.42	54	-9.58
5700	11398.63	26.91	17.3	44.21	54	-9.79
5700	17945.43	20.54	23.6	44.14	54	-9.86
5745	11490.75	27.24	17.5	44.74	54	-9.26
5745	17869.41	20.55	23.4	43.95	54	-10.05
5785	11571.24	27.29	17.7	44.99	54	-9.01
5785	17989.98	20.7	23.7	44.4	54	-9.6
5825	11649.55	26.35	17.8	44.15	54	-9.85
5825	17986.54	20.85	23.6	44.45	54	-9.55

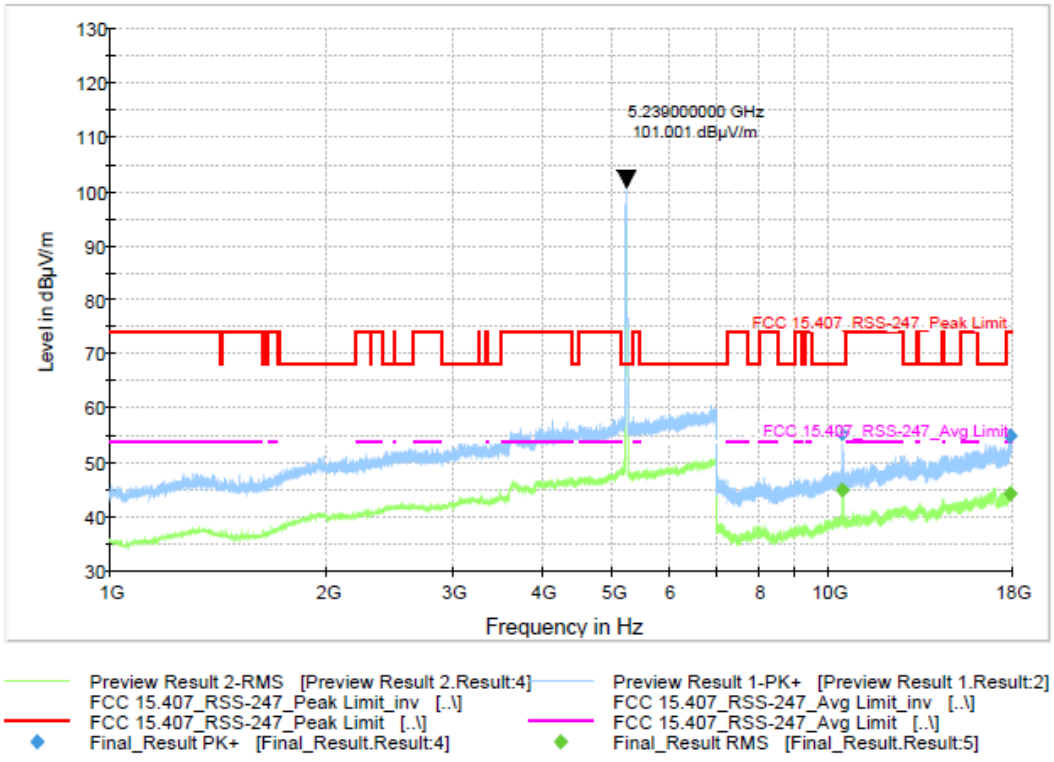
Note: Frequencies with (*) mark do not fall within the restricted bands.



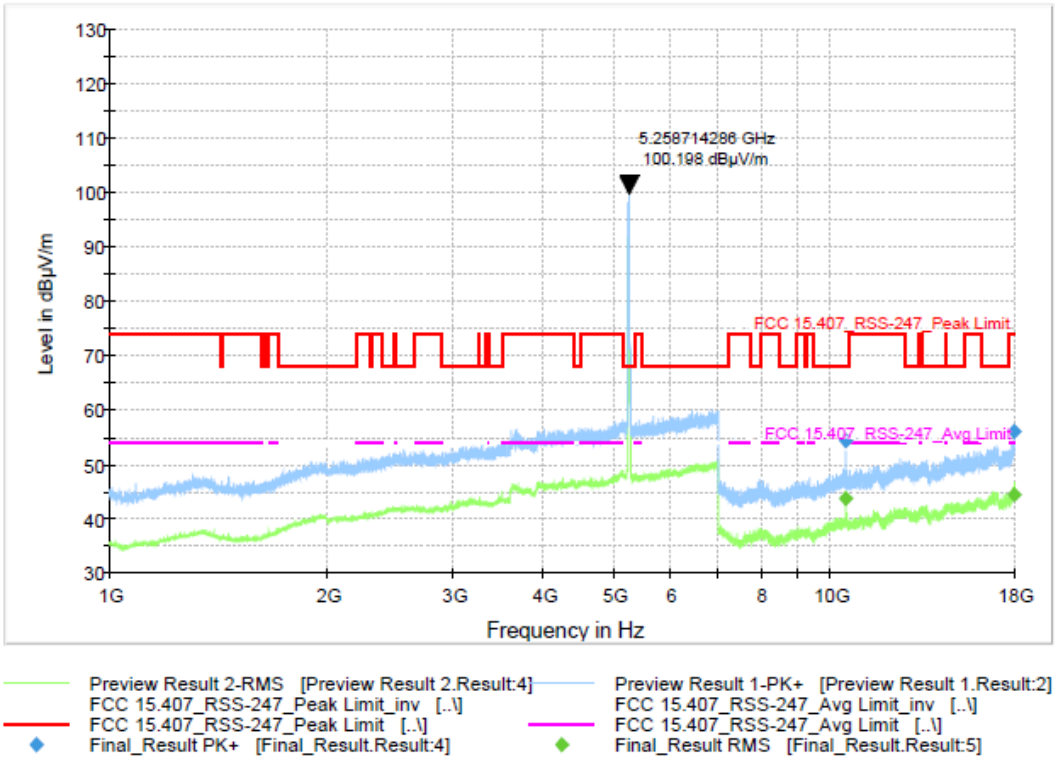
Plot 9-63. Radiated Spurious Emissions 1-18 GHz Tx Chain A 802.11a (Ch. 36)



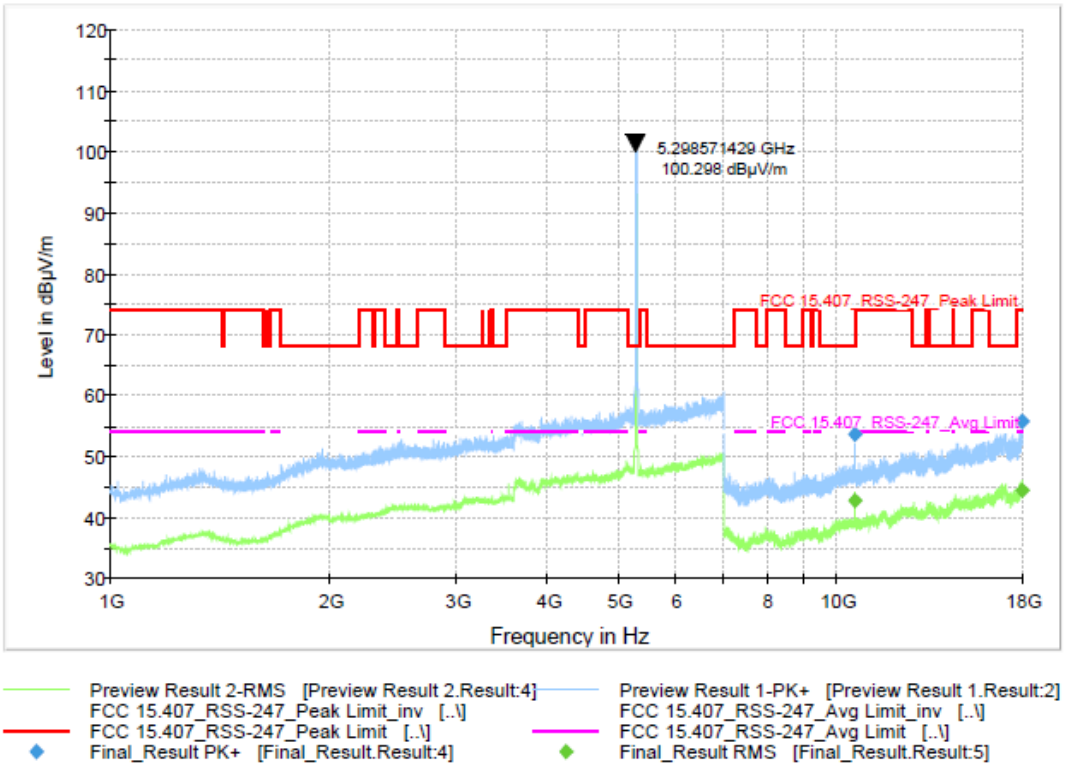
Plot 9-64. Radiated Spurious Emissions 1-18 GHz Tx Chain A 802.11a (Ch. 44)



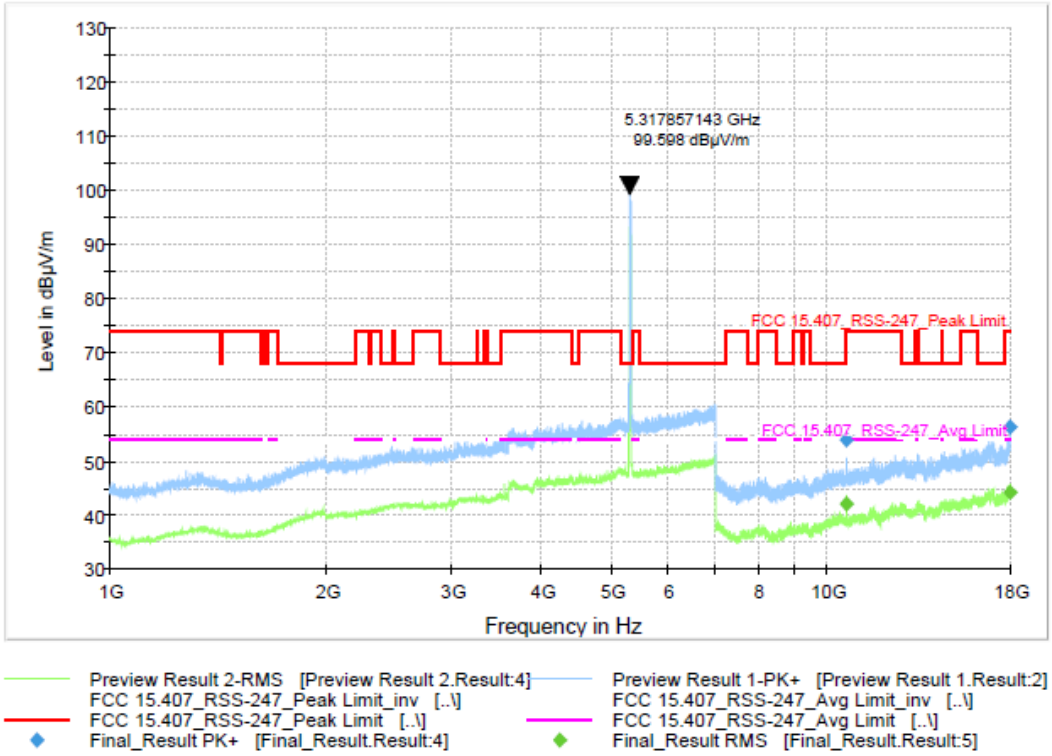
Plot 9-65. Radiated Spurious Emissions 1-18 GHz Tx Chain A 802.11a (Ch. 48)



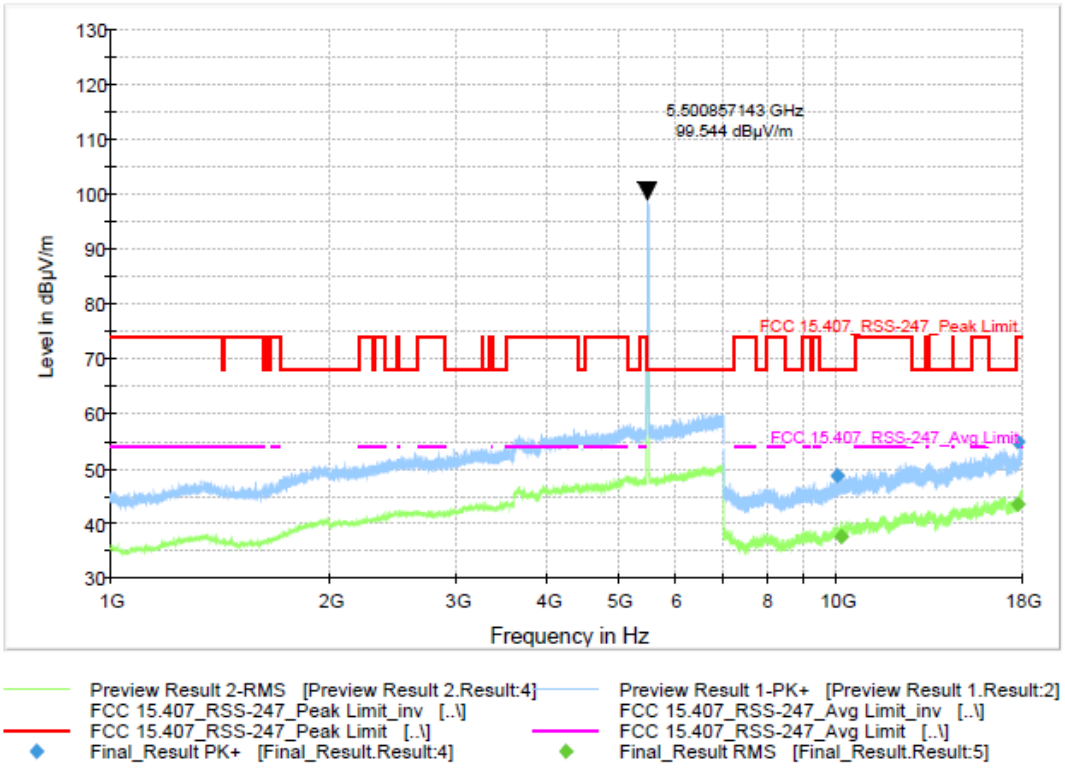
Plot 9-66. Radiated Spurious Emissions 1-18 GHz Tx Chain A 802.11a (Ch. 52)



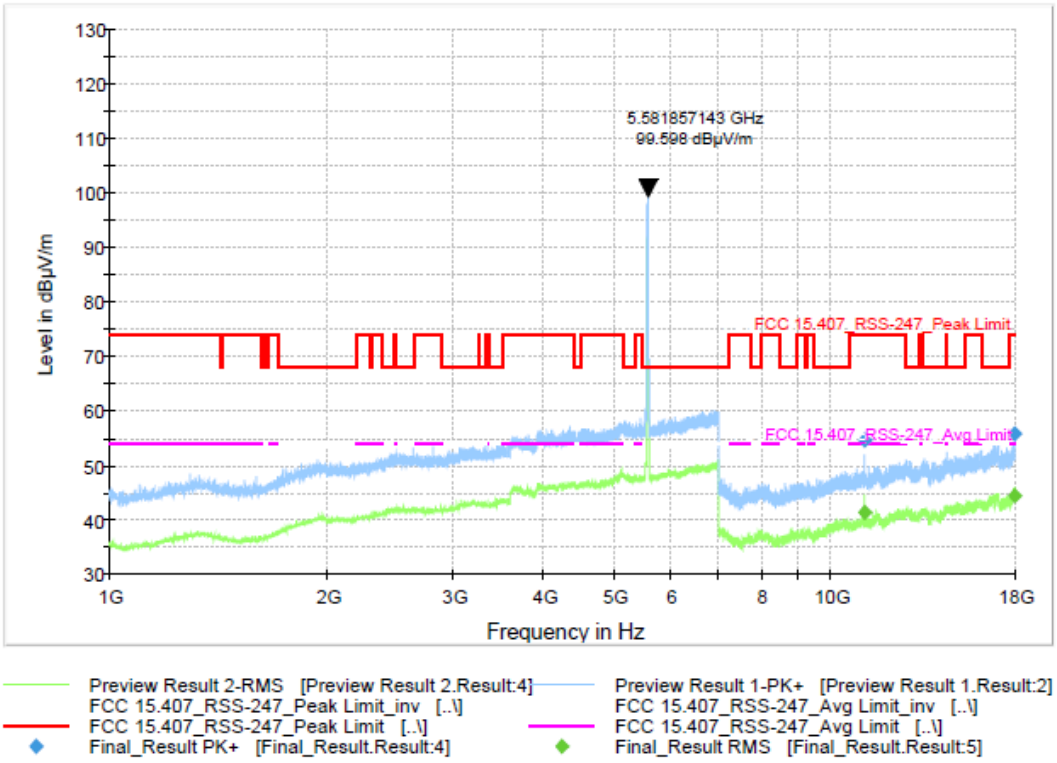
Plot 9-67. Radiated Spurious Emissions 1-18 GHz Tx Chain 802.11a (Ch. 60)



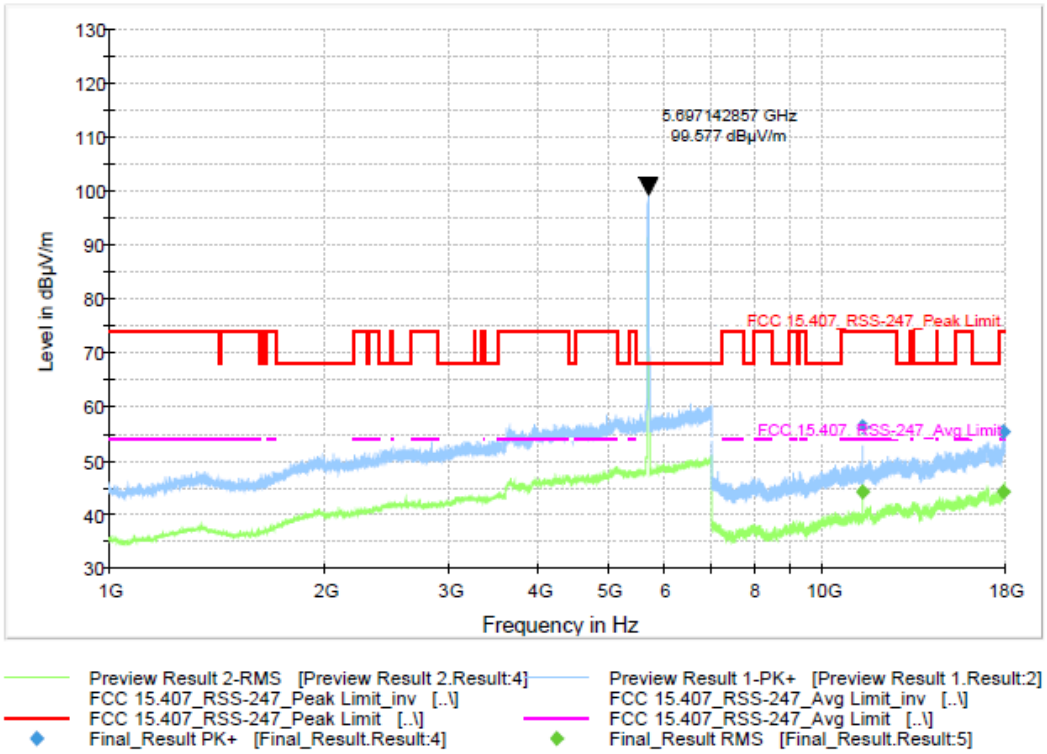
Plot 9-68. Radiated Spurious Emissions 1-18 GHz Tx Chain A 802.11a (Ch. 64)



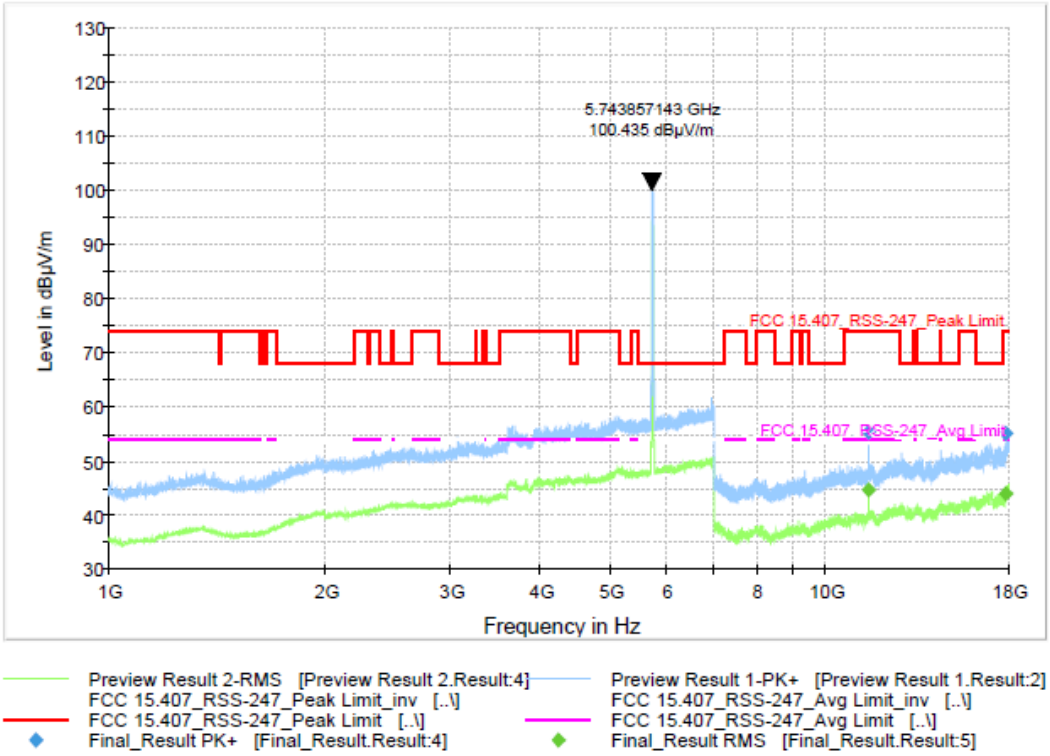
Plot 9-69. Radiated Spurious Emissions 1-18 GHz Tx Chain A 802.11a (Ch. 100)



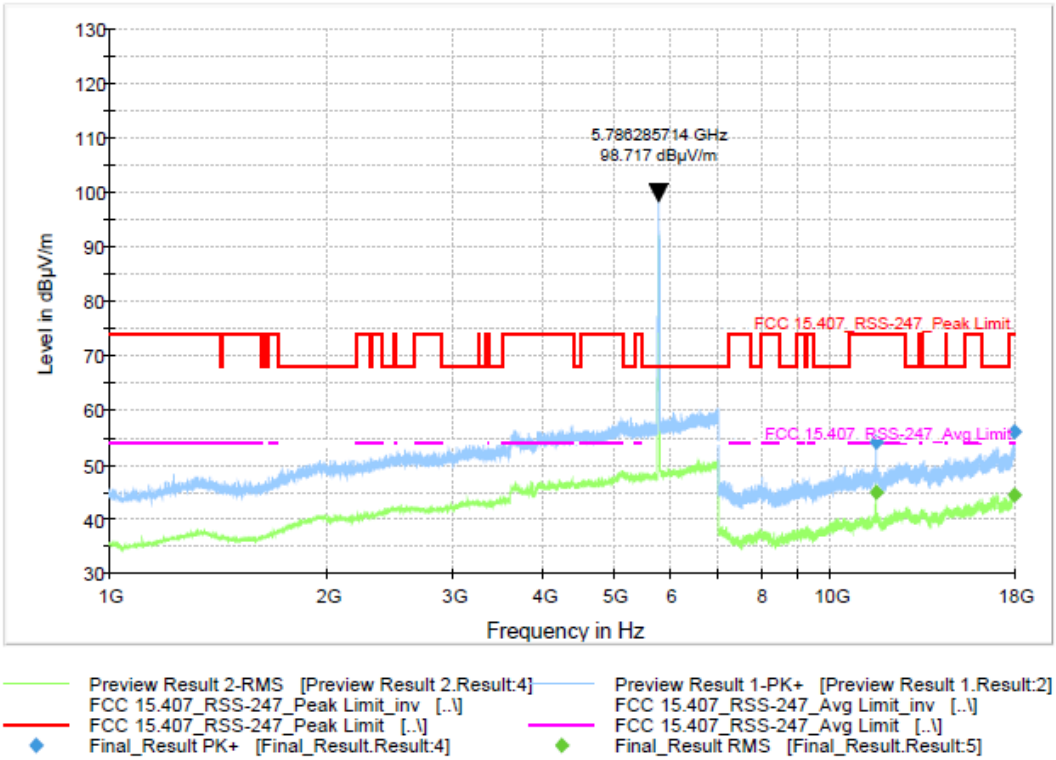
Plot 9-70. Radiated Spurious Emissions 1-18 GHz Tx Chain A 802.11a (Ch. 116)



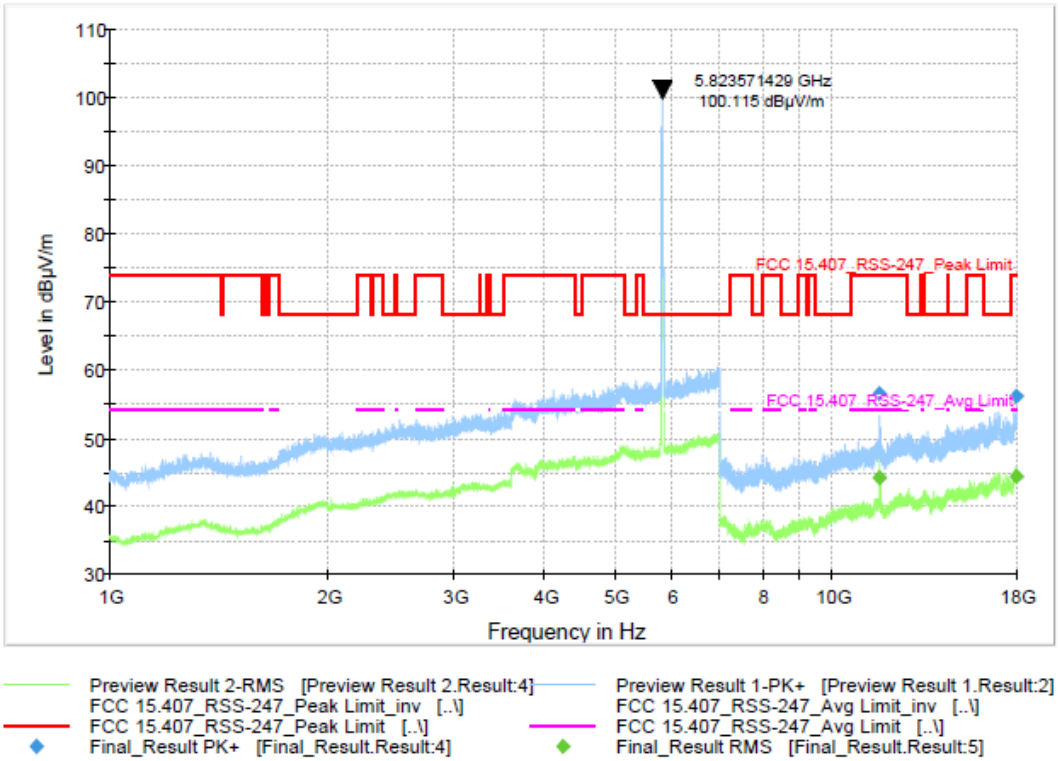
Plot 9-71. Radiated Spurious Emissions 1-18 GHz Tx Chain A 802.11a (Ch. 140)



Plot 9-72. Radiated Spurious Emissions 1-18 GHz Tx Chain A 802.11a (Ch. 149)



Plot 9-73. Radiated Spurious Emissions 1-18 GHz Tx Chain A 802.11a (Ch. 157)

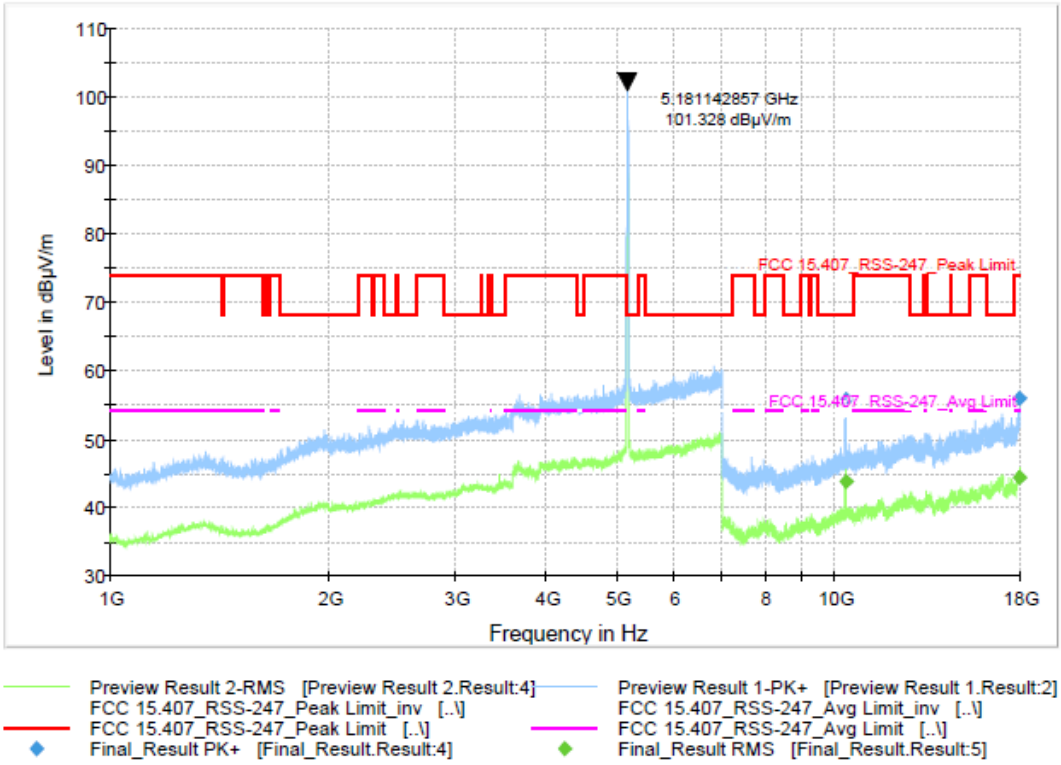


Plot 9-74. Radiated Spurious Emissions 1-18 GHz Tx Chain A 802.11a (Ch. 165)

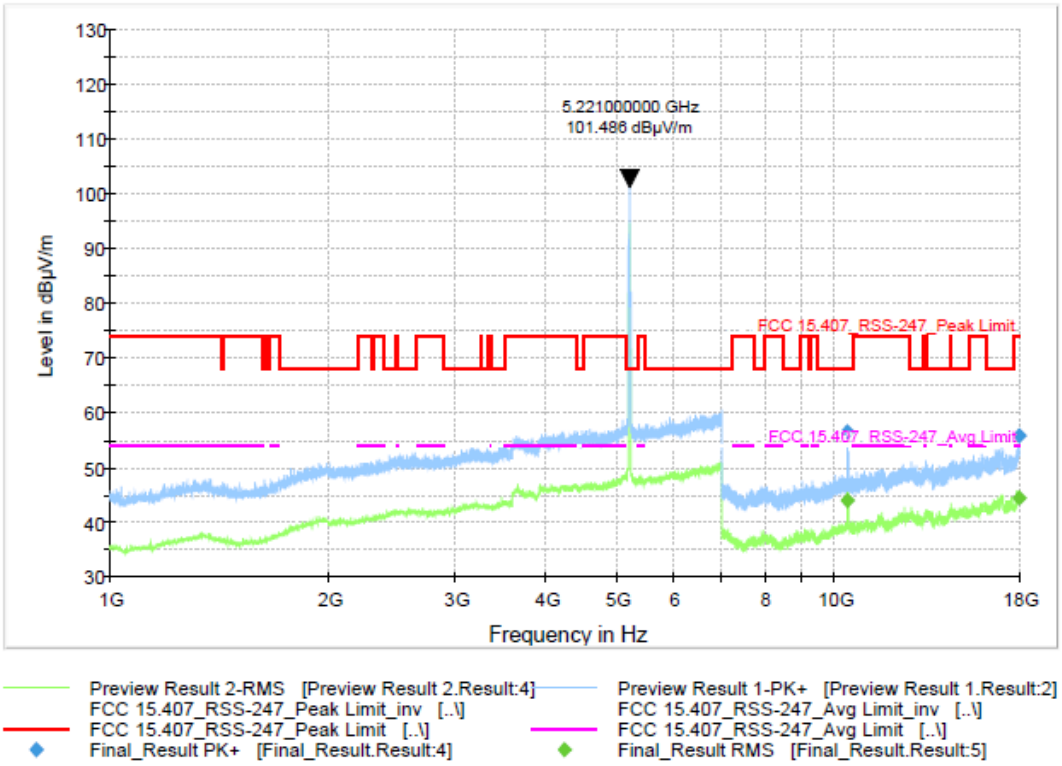
802.11n HT20 RSE 1 – 18GHz Peak Data						
Carrier Frequency (MHz)	**Frequency (MHz)**	**Raw Peak Amplitude (dBµV)**	**Correction Factor (dB)**	**Corrected Peak Field Strength (dBµV/m)**	**Peak Limit (dBµV/m)**	**Margin (dB)**
5180	10359.01*	39.21	16.5	55.71	68.2	-12.49
5180	17983.74	32.32	23.6	55.92	74	-18.08
5220	10437.26*	40.2	16.4	56.6	68.2	-11.6
5220	17963.52	32.42	23.5	55.92	74	-18.08
5240	10477.83*	39.6	16.3	55.9	68.2	-12.3
5240	17979.77	32.05	23.6	55.65	74	-18.35
5260	10521.71*	36.89	16.3	53.19	68.2	-15.01
5260	17977.67	32.16	23.5	55.66	74	-18.34
5300	10599.30*	38.42	16.5	54.92	68.2	-13.28
5300	17981.15	32.13	23.6	55.73	74	-18.27
5320	10639.80*	37.06	16.8	53.86	74	-20.14
5320	17968.04	32.58	23.5	56.08	74	-17.92
5500	17958.14	32.11	23.5	55.61	74	-18.39
5580	11159.83	36.77	17.9	54.67	74	-19.33
5580	17989.93	31.82	23.7	55.52	74	-18.48
5700	11399.88	38.06	17.3	55.36	74	-18.64
5700	17961.86	32.99	23.5	56.49	74	-17.51
5745	11489.43	38.48	17.5	55.98	74	-18.02
5745	17987.60	31.98	23.6	55.58	74	-18.42
5785	11569.64	38.27	17.7	55.97	74	-18.03
5785	17979.88	32.19	23.6	55.79	74	-18.21
5825	11644.53	37.45	17.8	55.25	74	-18.75
5825	17847.81	31.54	23.2	54.74	74	-19.26
802.11n HT20 RSE 1 - 18GHz Average Data						
Carrier Frequency (MHz)	**Frequency (MHz)**	**Raw Avg. Amplitude (dBµV)**	**Correction Factor (incl DCF=0dB) (dB)**	**Corrected Avg. Field Strength (dBµV/m)**	**Average Limit (dBµV/m)**	**Margin (dB)**
5180	10361.53*	27.49	16.4	43.89	54	-10.11
5180	17986.35	20.87	23.6	44.47	54	-9.53
5220	10439.90*	27.69	16.4	44.09	54	-9.91
5220	17972.88	20.9	23.5	44.4	54	-9.6
5240	10478.87*	27.95	16.3	44.25	54	-9.75
5240	17983.25	20.86	23.6	44.46	54	-9.54
5260	10521.94*	28.16	16.3	44.46	54	-9.54
5260	17983.42	20.88	23.6	44.48	54	-9.52
5300	10599.63*	25.69	16.5	42.19	54	-11.81
5300	17983.45	20.83	23.6	44.43	54	-9.57
5320	10641.27*	26.28	16.8	43.08	54	-10.92
5320	17979.24	20.78	23.6	44.38	54	-9.62
5500	17976.14	20.92	23.5	44.42	54	-9.58
5580	11162.23	26.16	17.9	44.06	54	-9.94
5580	17989.93	20.73	23.7	44.43	54	-9.57

5700	11399.88	27.71	17.3	45.01	54	-8.99
5700	17979.81	20.79	23.6	44.39	54	-9.61
5745	11490.98	27.39	17.5	44.89	54	-9.11
5745	17980.10	20.8	23.6	44.4	54	-9.6
5785	11571.24	26.76	17.7	44.46	54	-9.54
5785	17986.34	20.85	23.6	44.45	54	-9.55
5825	11649.86	27.17	17.8	44.97	54	-9.03
5825	17847.81	20.36	23.3	43.66	54	-10.34

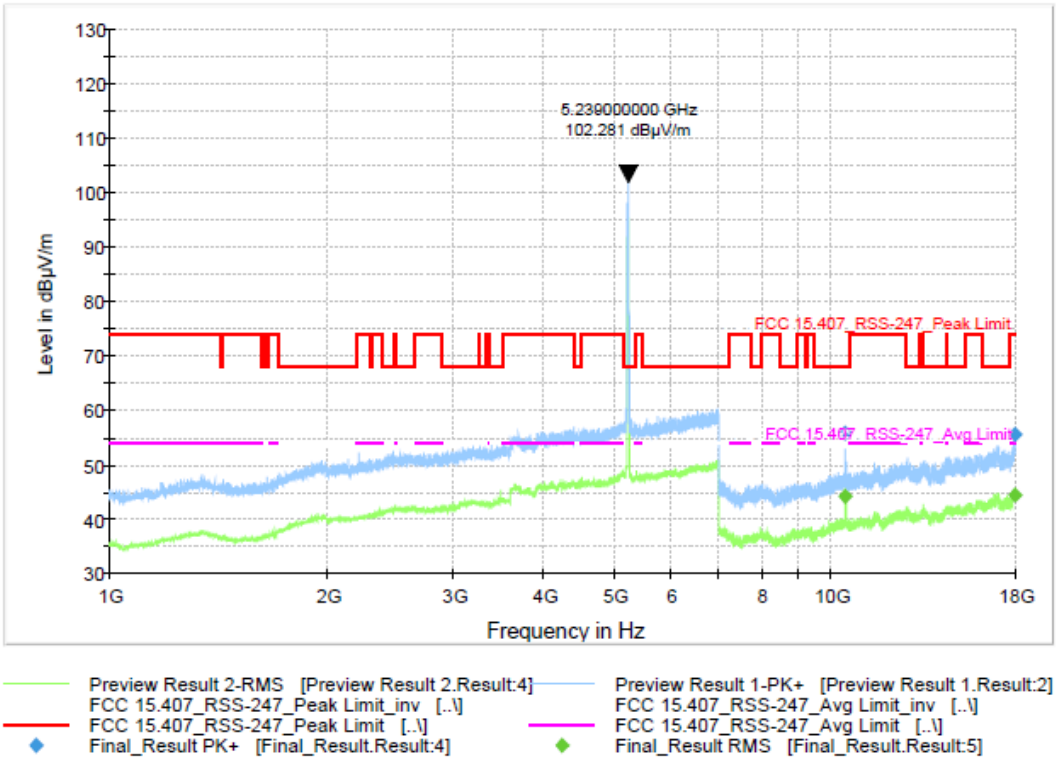
Note: Frequencies with (*) mark do not fall within the restricted bands.



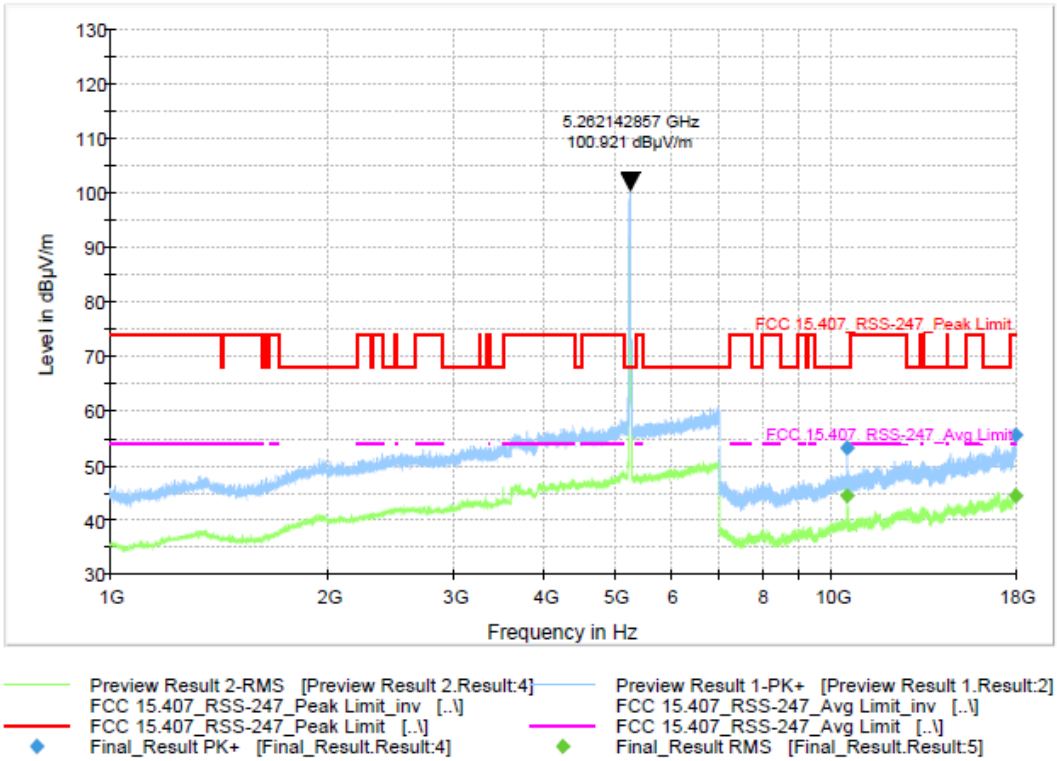
Plot 9-75. Radiated Spurious Emissions 1-18 GHz Tx Chain A 802.11n (Ch. 36)



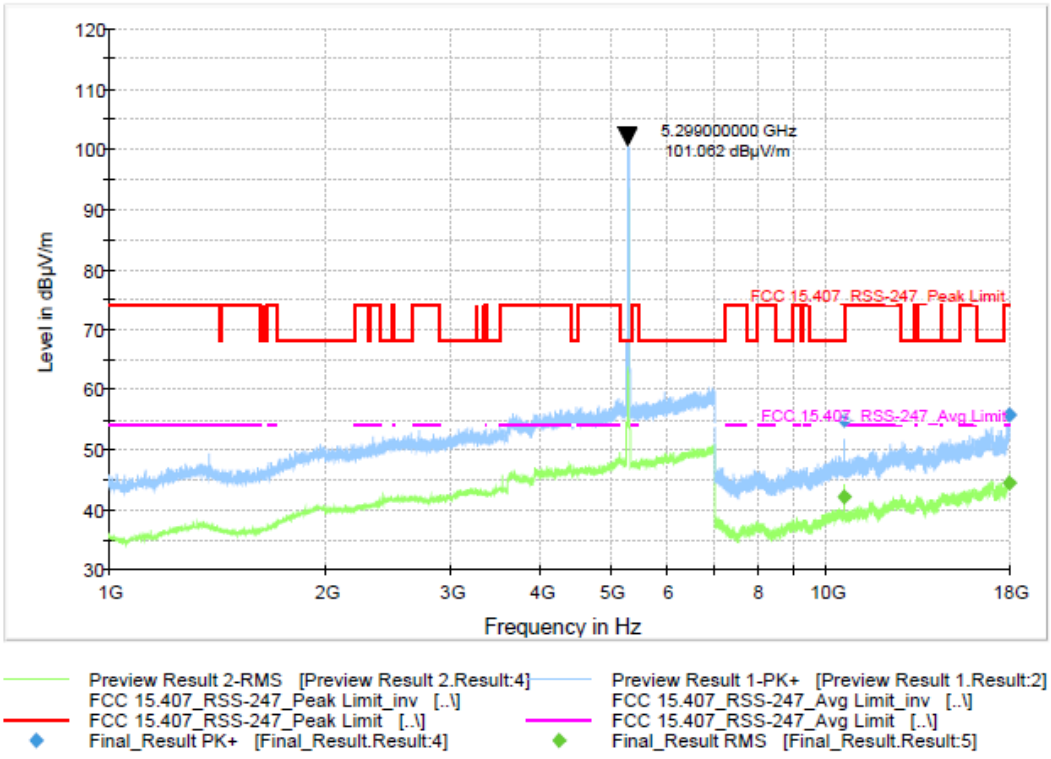
Plot 9-76. Radiated Spurious Emissions 1-18 GHz Tx Chain A 802.11n (Ch. 44)



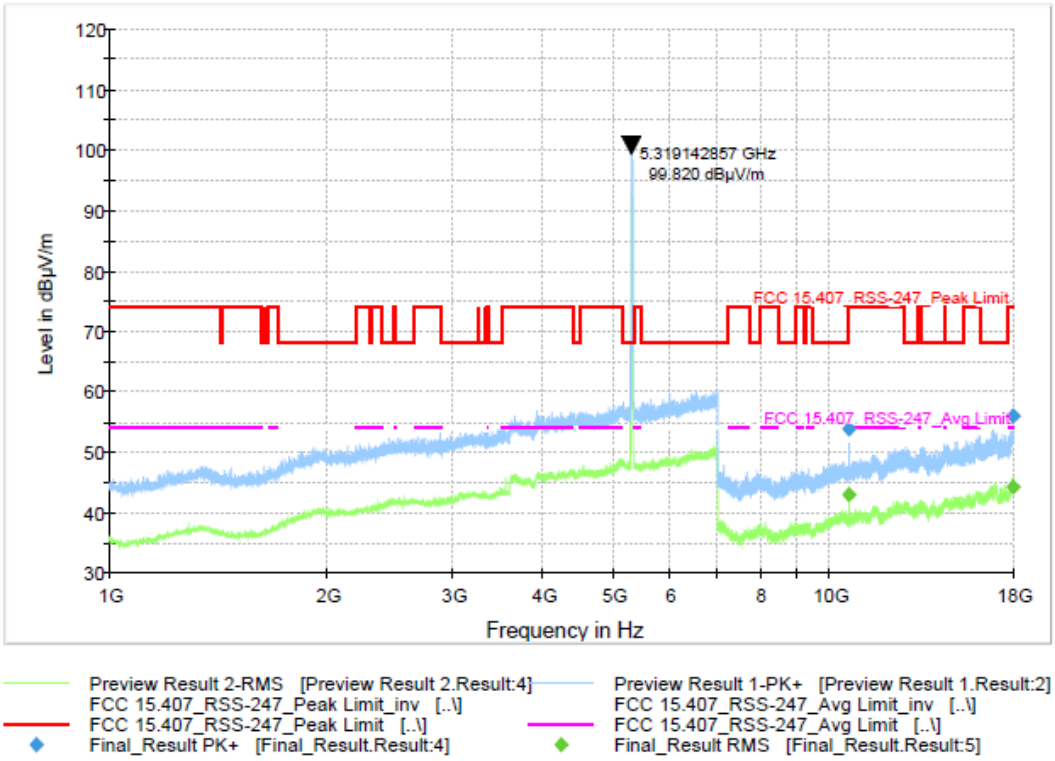
Plot 9-77. Radiated Spurious Emissions 1-18 GHz Tx Chain A 802.11n (Ch. 48)



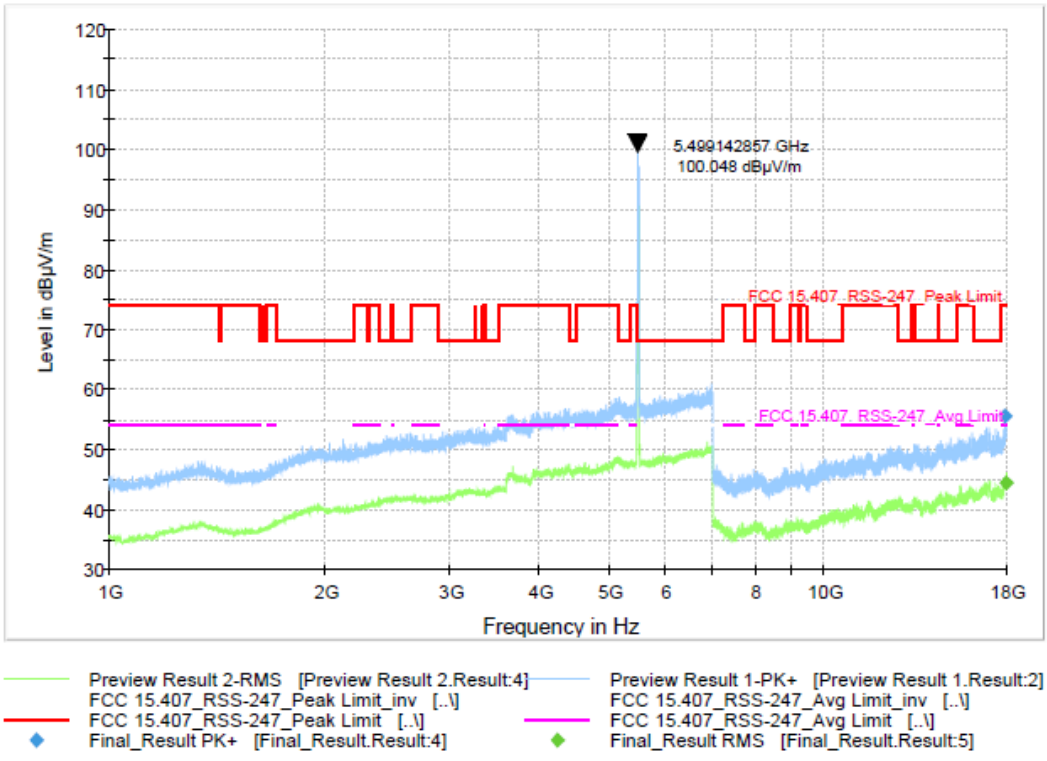
Plot 9-78. Radiated Spurious Emissions 1-18 GHz Tx Chain A 802.11n (Ch. 52)



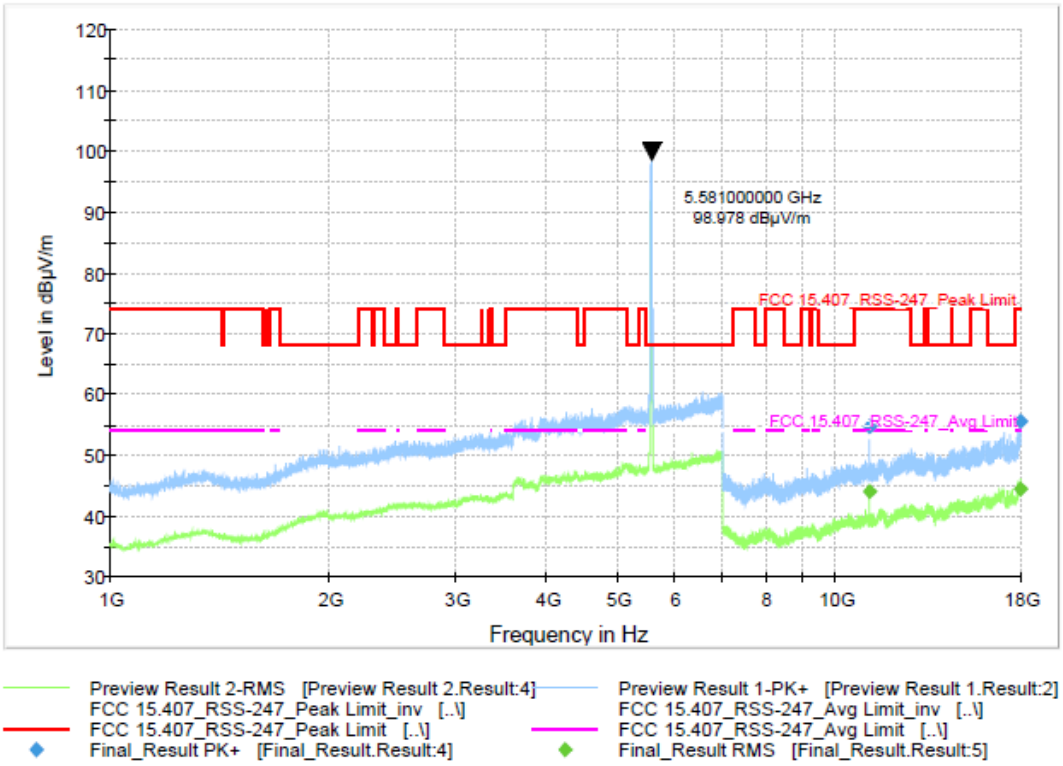
Plot 9-79. Radiated Spurious Emissions 1-18 GHz Tx Chain A 802.11n (Ch. 60)



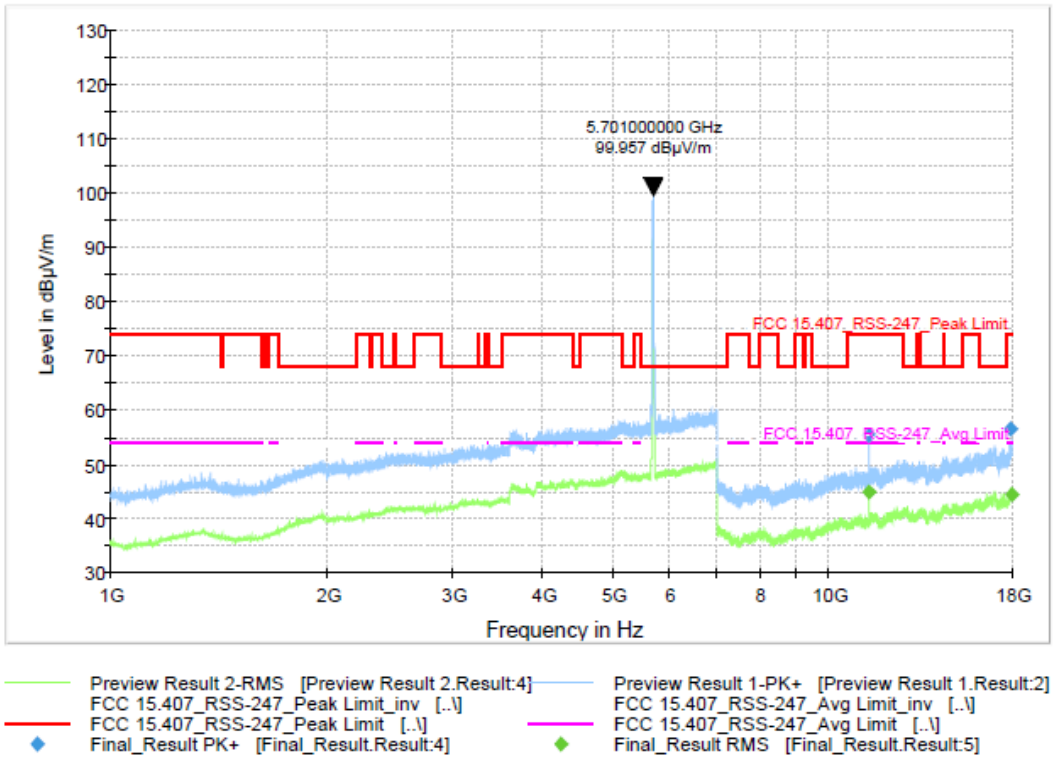
Plot 9-80. Radiated Spurious Emissions 1-18 GHz Tx Chain A 802.11n (Ch. 64)



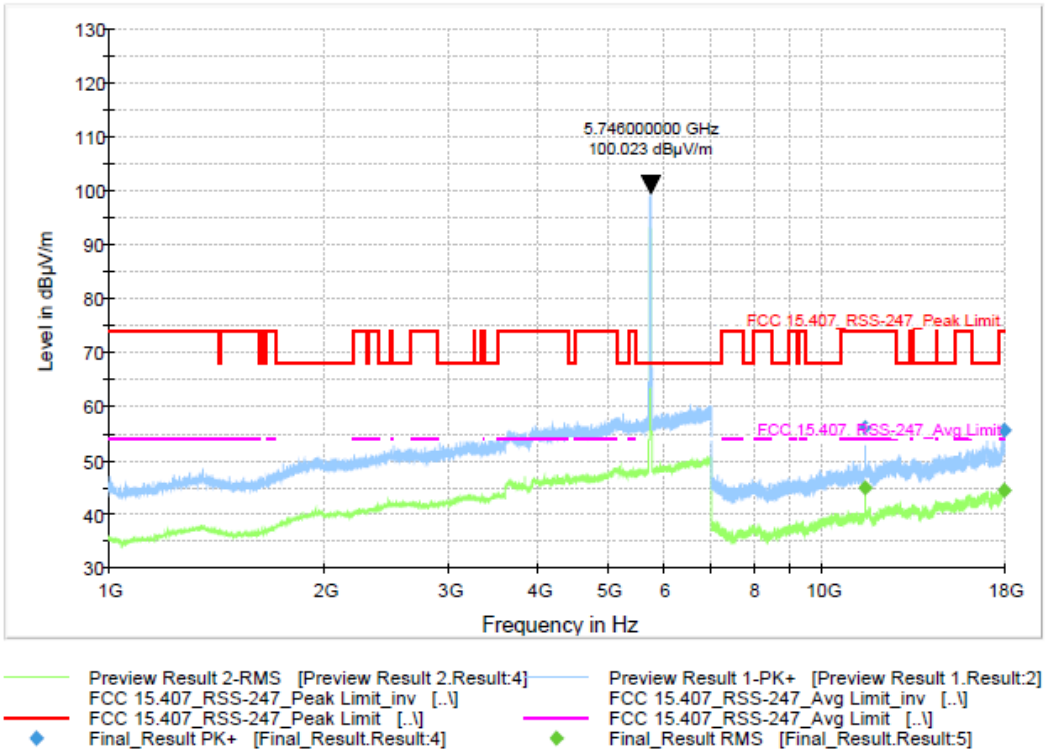
Plot 9-81. Radiated Spurious Emissions 1-18 GHz Tx Chain A 802.11n (Ch. 100)



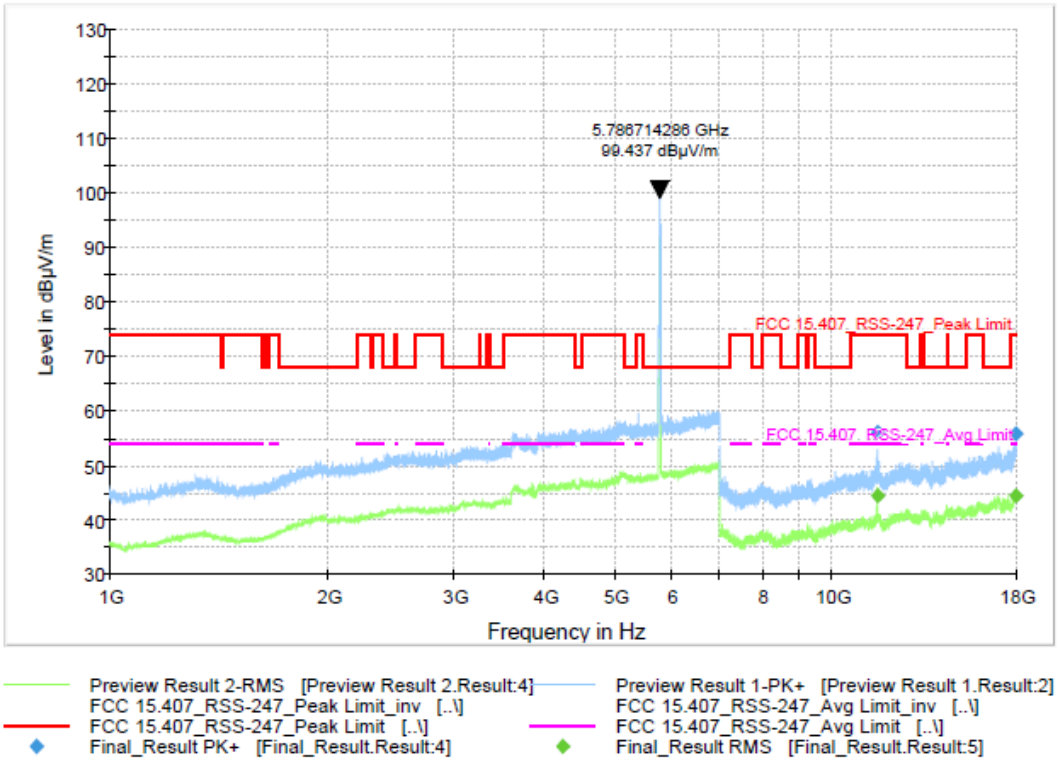
Plot 9-82. Radiated Spurious Emissions 1-18 GHz Tx Chain A 802.11n (Ch. 116)



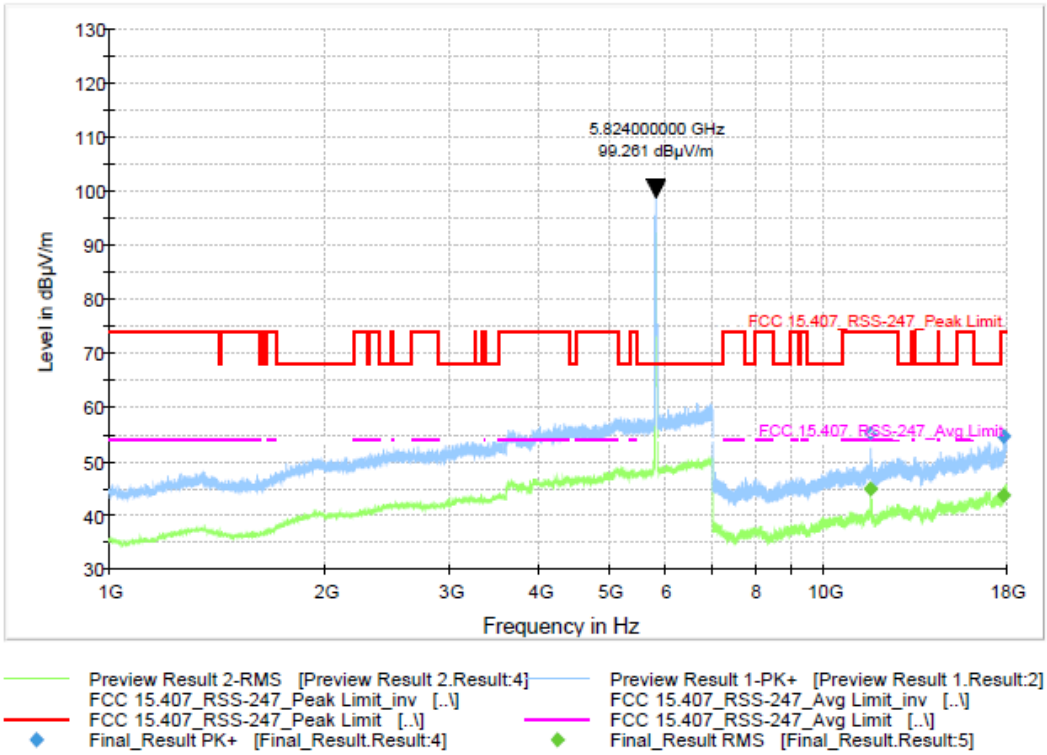
Plot 9-83. Radiated Spurious Emissions 1-18 GHz Tx Chain A 802.11n (Ch. 140)



Plot 9-84. Radiated Spurious Emissions 1-18 GHz Tx Chain A 802.11n (Ch. 149)



Plot 9-85. Radiated Spurious Emissions 1-18 GHz Tx Chain A 802.11n (Ch. 157)



Plot 9-86. Radiated Spurious Emissions 1-18 GHz Tx Chain A 802.11n (Ch. 165)

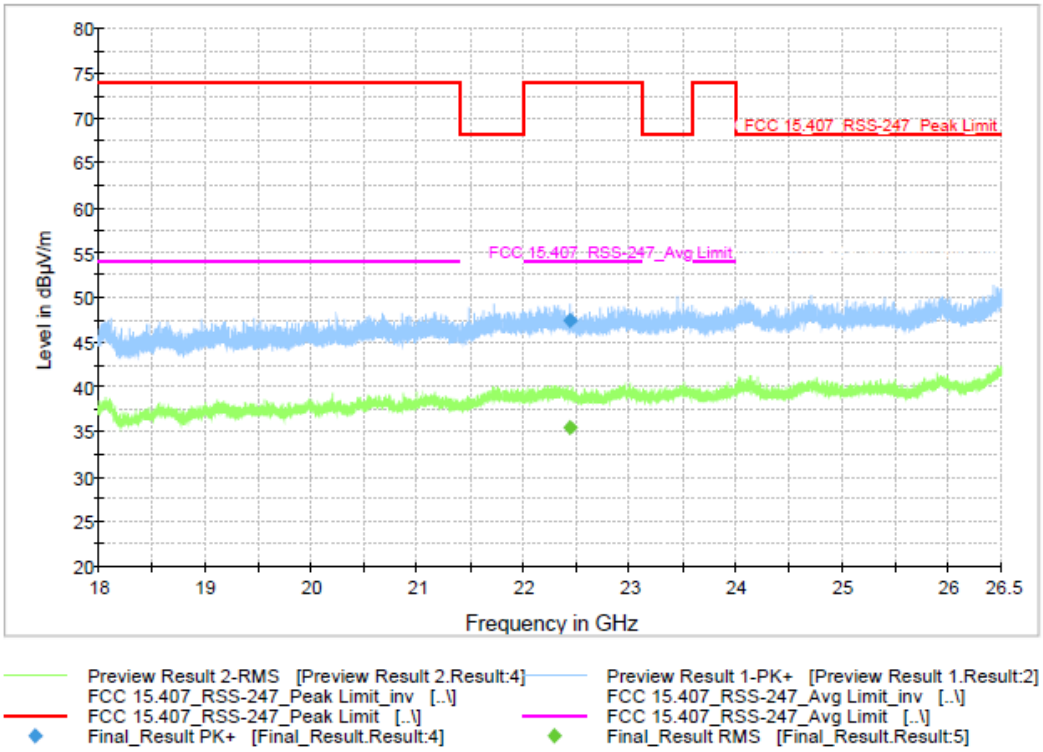
9.6.5.4 Emissions in 18-26.5 GHz range

No significant emissions to report above noise floor.

All channels and modes were tested and data from 802.11n mode, channel 100 shown here.

802.11n HT20 RSE 18 – 26.5GHz Peak Data						
Carrier Frequency (MHz)	**Frequency (MHz)**	**Raw Peak Amplitude (dBµV)**	**Correction Factor (dB)**	**Corrected Peak Field Strength (dBµV/m)**	**Peak Limit (dBµV/m)**	**Margin (dB)**
5500	22445.08	35.79	11.6	47.39	74	-26.61

802.11n HT20 RSE 18 – 26.5GHz Average Data						
Carrier Frequency (MHz)	**Frequency (MHz)**	**Raw Avg. Amplitude (dBµV)**	**Correction Factor (incl DCF=0dB) (dB)**	**Corrected Avg. Field Strength (dBµV/m)**	**Average Limit (dBµV/m)**	**Margin (dB)**
5500	22444.23	23.87	11.6	35.47	54	-18.53



Plot 9-87. Radiated Spurious Emissions 18-26.5 GHz Tx Chain A 802.11n HT20 (Ch. 100)

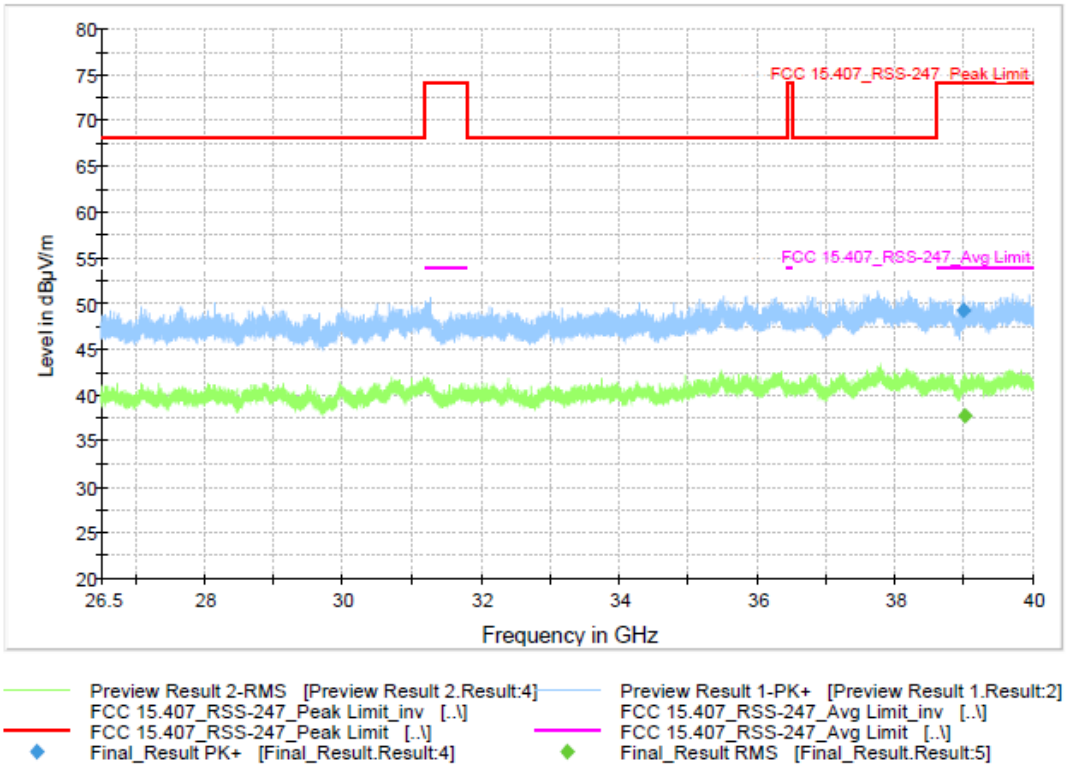
9.6.5.5 Emissions in 26.5-40 GHz range

No significant emissions to report above noise floor.

All channels and modes were tested and data from 802.11a mode, channel 100 shown here.

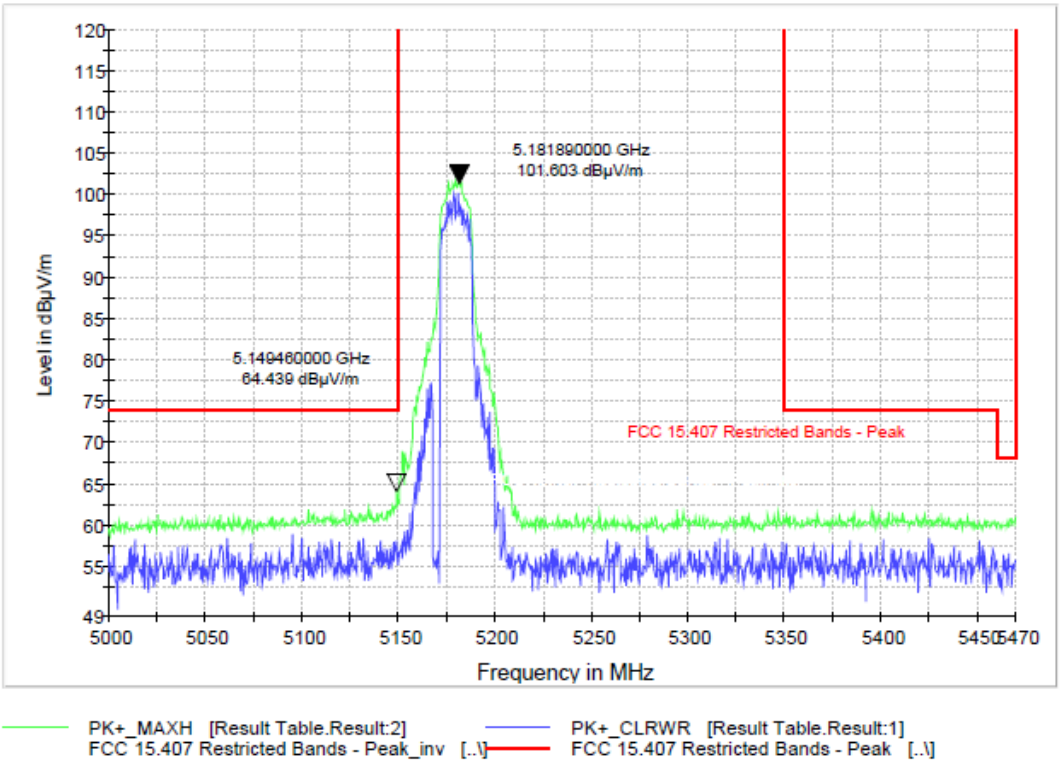
802.11n HT20 RSE 26.5 – 40GHz Peak Data						
Carrier Frequency (MHz)	**Frequency (MHz)**	**Raw Peak Amplitude (dBµV)**	**Correction Factor (dB)**	**Corrected Peak Field Strength (dBµV/m)**	**Peak Limit (dBµV/m)**	**Margin (dB)**
5500	38995.29	47.95	1.3	49.25	74	-24.75

802.11n HT20 RSE 26.5 – 40GHz Average Data						
Carrier Frequency (MHz)	**Frequency (MHz)**	**Raw Avg. Amplitude (dBµV)**	**Correction Factor (incl DCF=0dB) (dB)**	**Corrected Avg. Field Strength (dBµV/m)**	**Average Limit (dBµV/m)**	**Margin (dB)**
5500	39012.89	36.52	1.3	37.82	54	-16.18

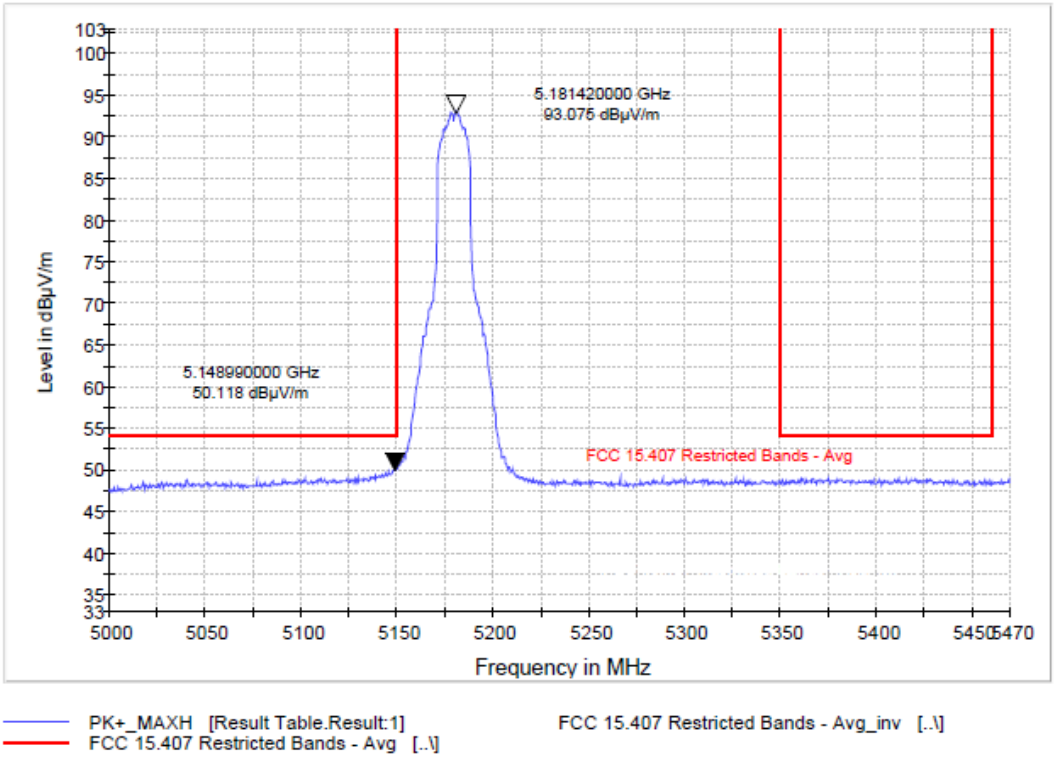


Plot 9-88. Radiated Spurious Emissions 26.5-40 GHz Tx Chain A 802.11n (Ch. 100)

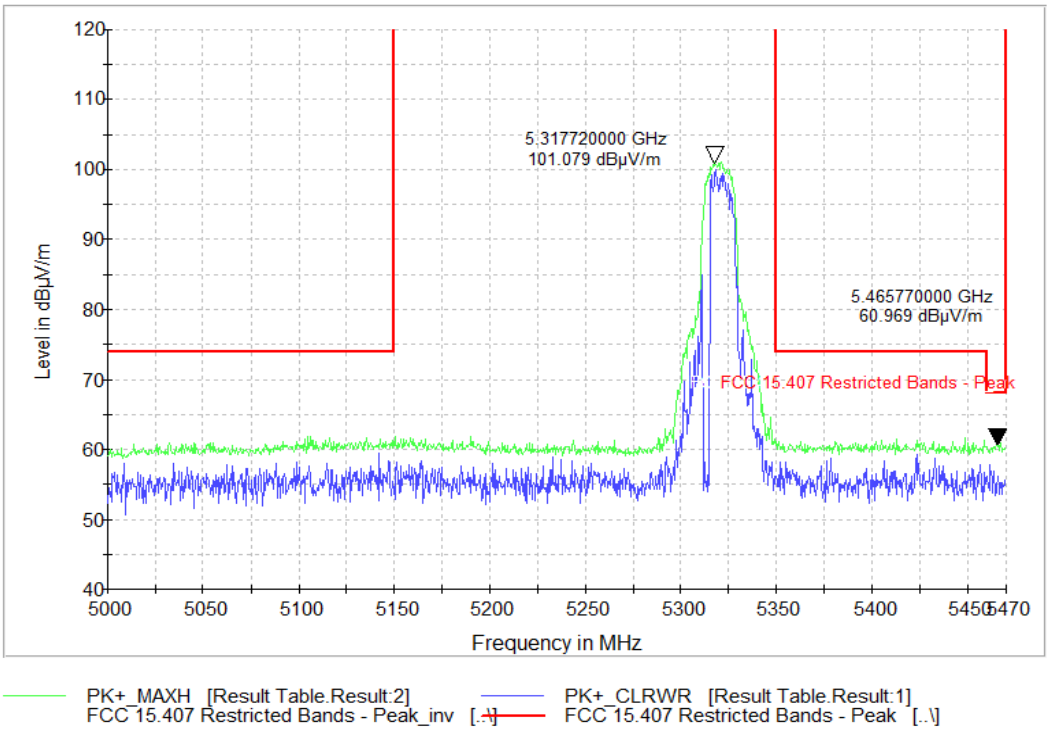
9.6.5.6 Radiated Band-edge emissions 802.11a



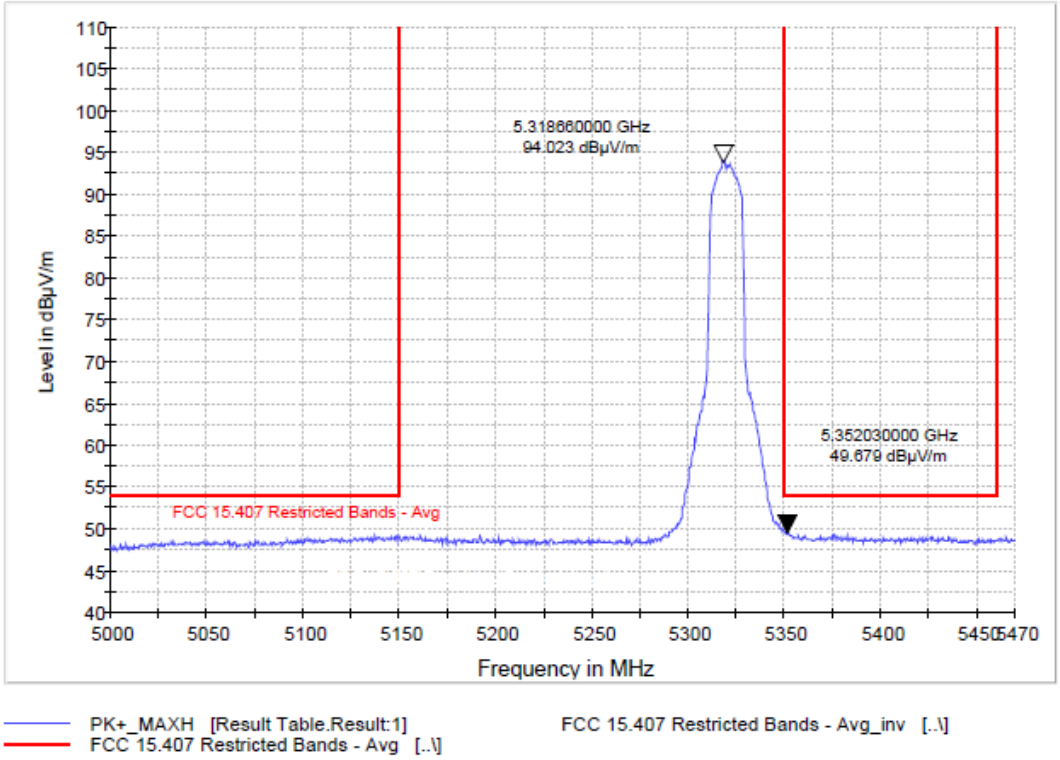
Plot 9-89. Peak Radiated Band Edge Emissions Tx Chains A & B 802.11a (Ch. 36)



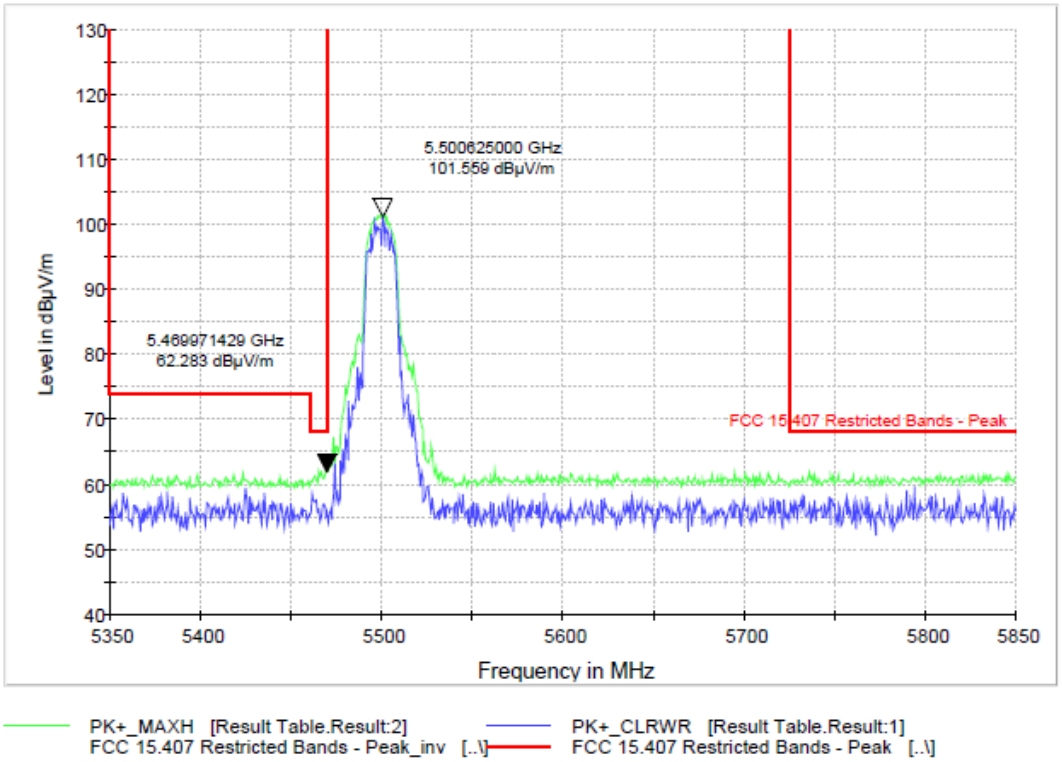
Plot 9-90. Average Radiated Band Edge Emissions Tx Chains A & B 802.11a (Ch. 36)



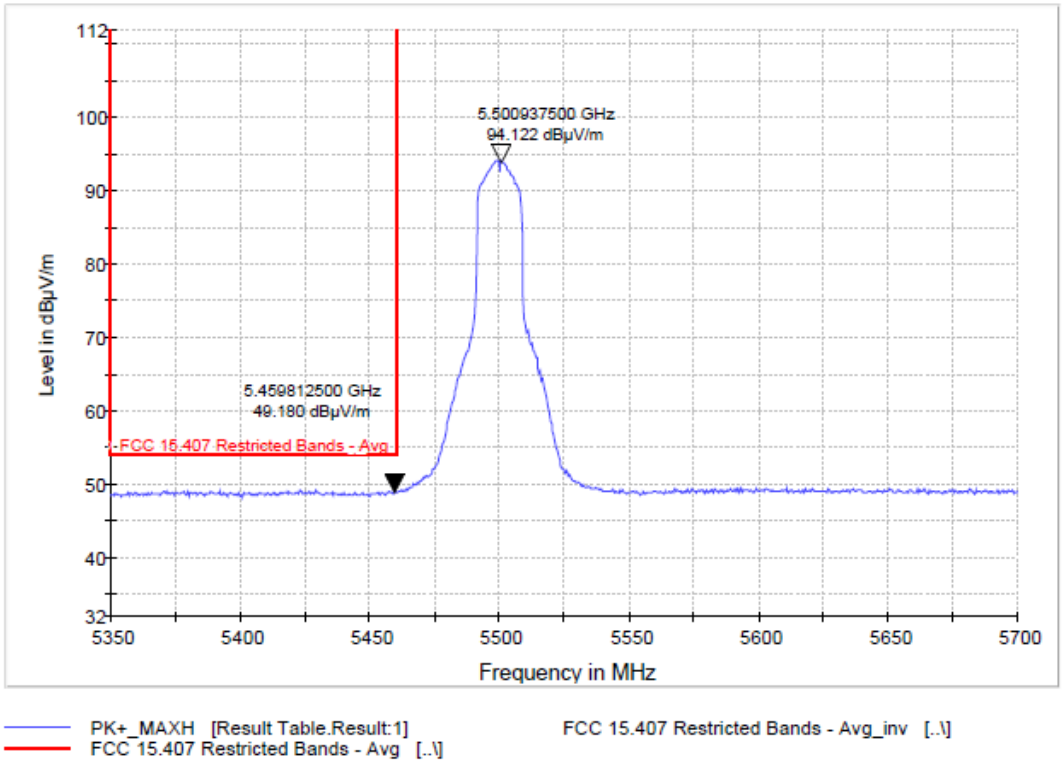
Plot 9-91. Peak Radiated Band Edge Emissions Tx Chains A & B 802.11a (Ch. 64)



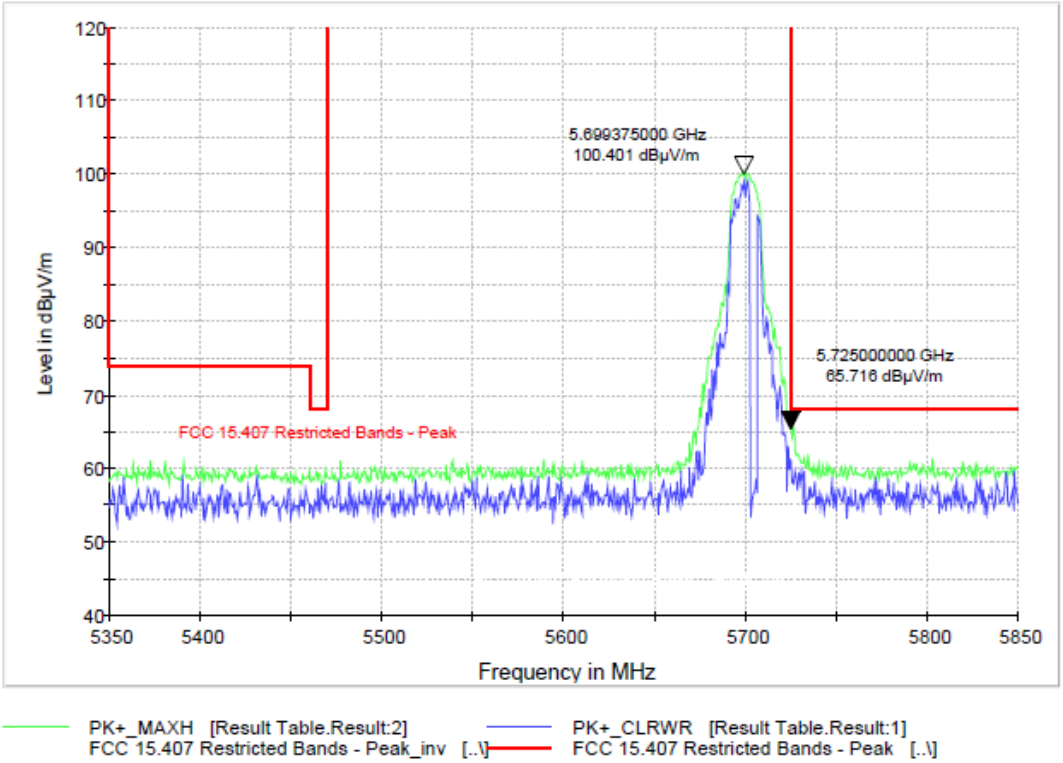
Plot 9-92. Average Radiated Band Edge Emissions Tx Chains A & B 802.11a (Ch. 64)



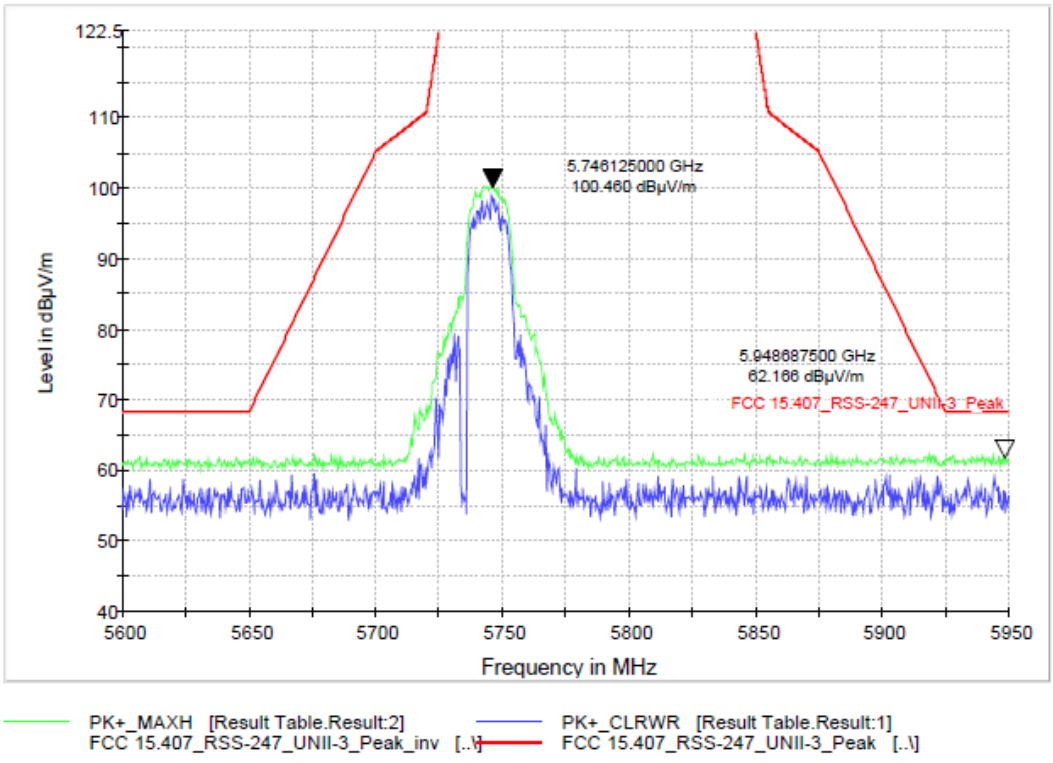
Plot 9-93. Peak Radiated Band Edge Emissions Tx Chains A & B 802.11a (Ch. 100)



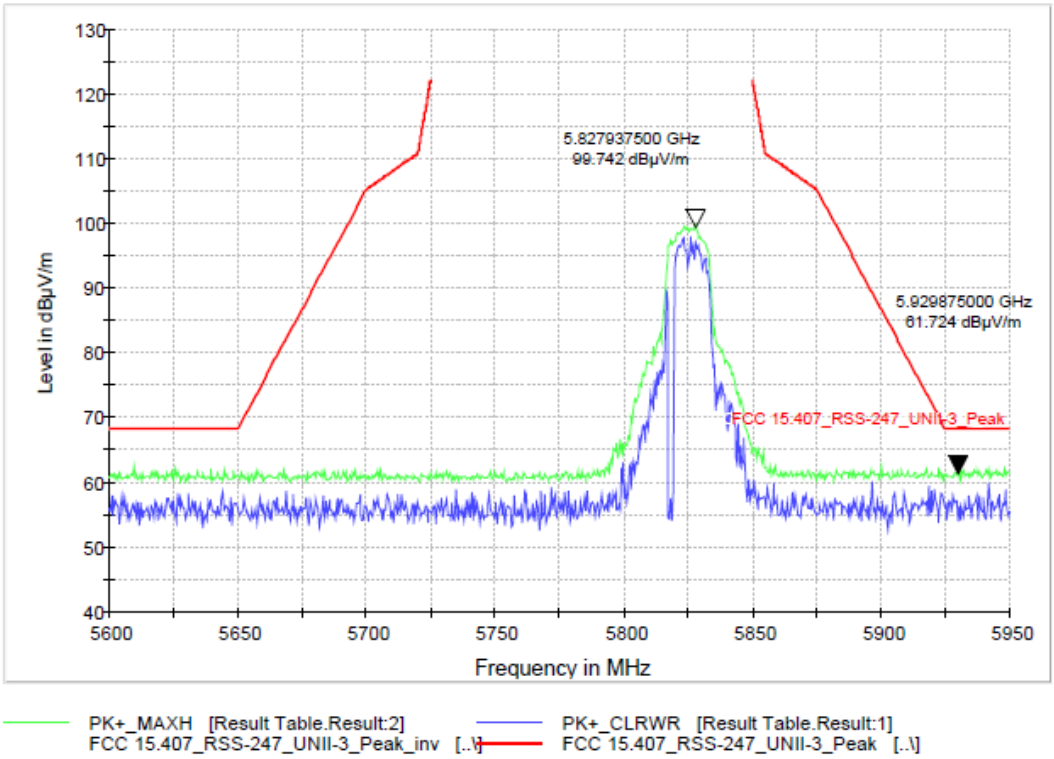
Plot 9-94. Average Radiated Band Edge Emissions Tx Chains A & B 802.11a (Ch. 100)



Plot 9-95. Peak Radiated Band Edge Emissions Tx Chains A & B 802.11a (Ch. 140)

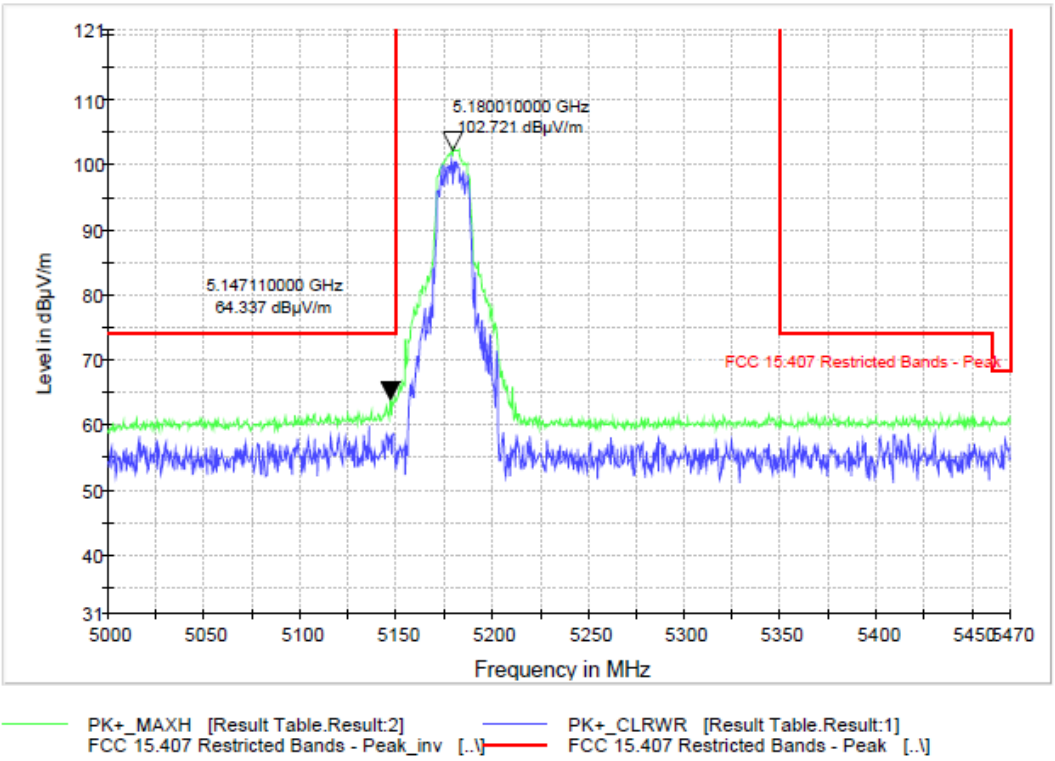


Plot 9-96. Peak Radiated Band Edge Emissions Tx Chains A & B 802.11a (Ch. 149)

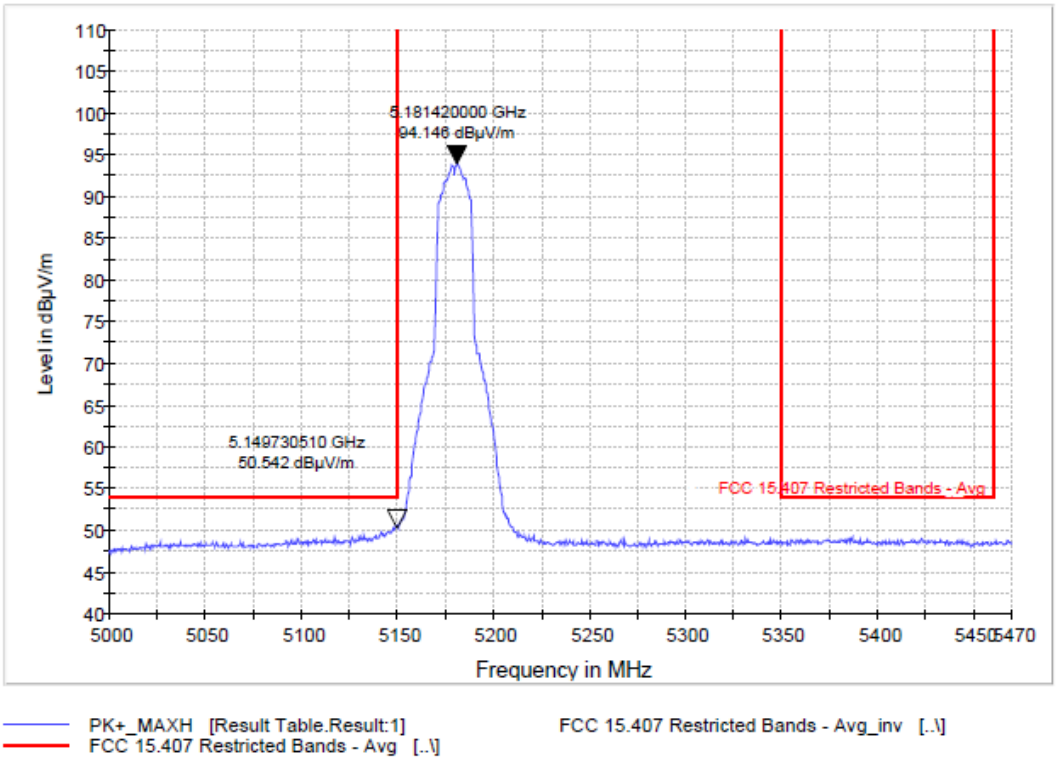


Plot 9-97. Peak Radiated Band Edge Emissions Tx Chains A & B 802.11a (Ch. 165)

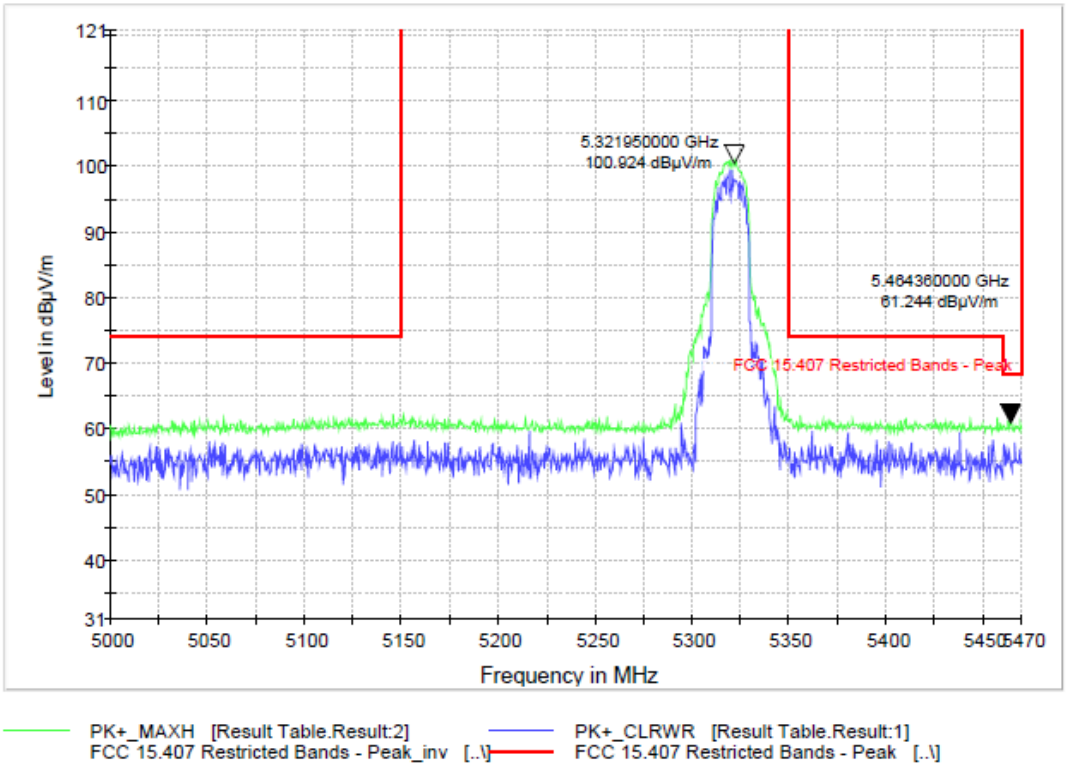
9.6.5.7 Radiated Band-edge emissions 802.11n HT20



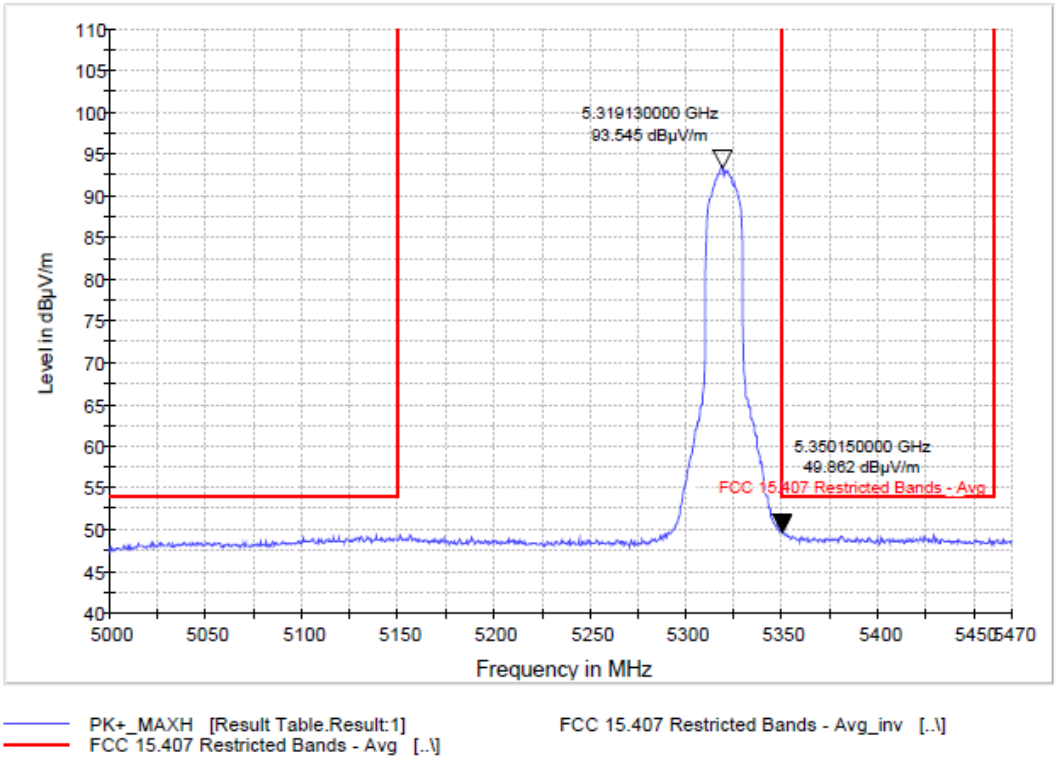
Plot 9-98. Peak Radiated Band Edge Emissions Tx Chains A & B 802.11n HT20 (Ch. 36)



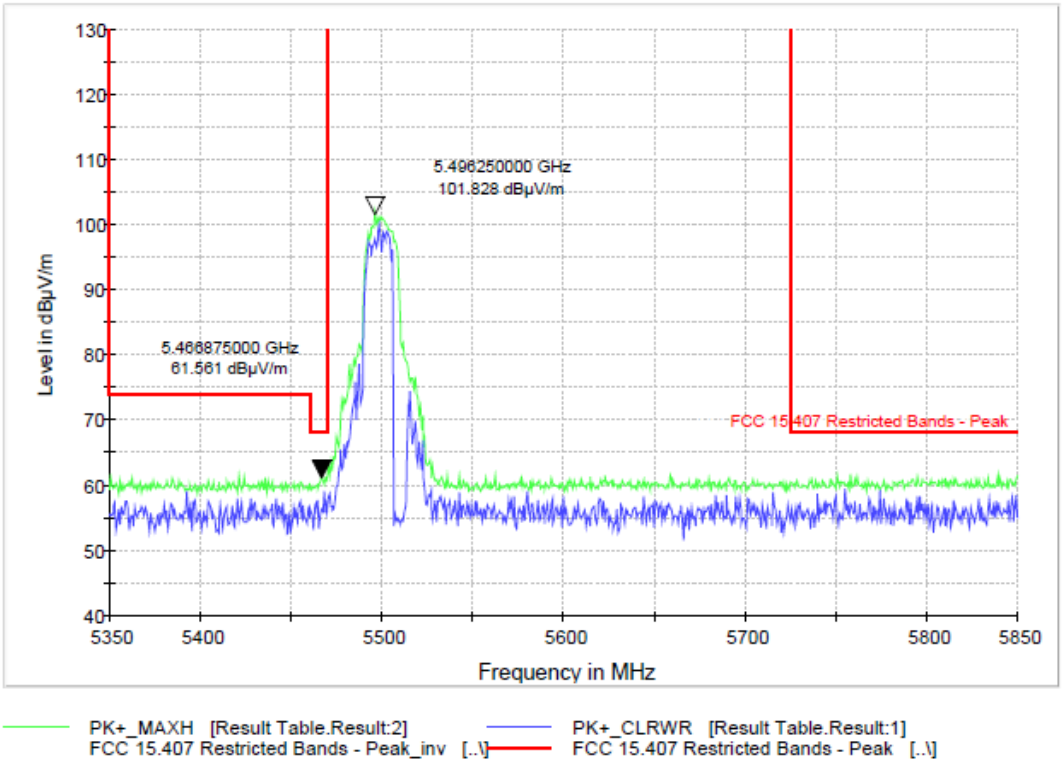
Plot 9-99. Average Radiated Band Edge Emissions Tx Chains A & B 802.11n HT20 (Ch. 36)



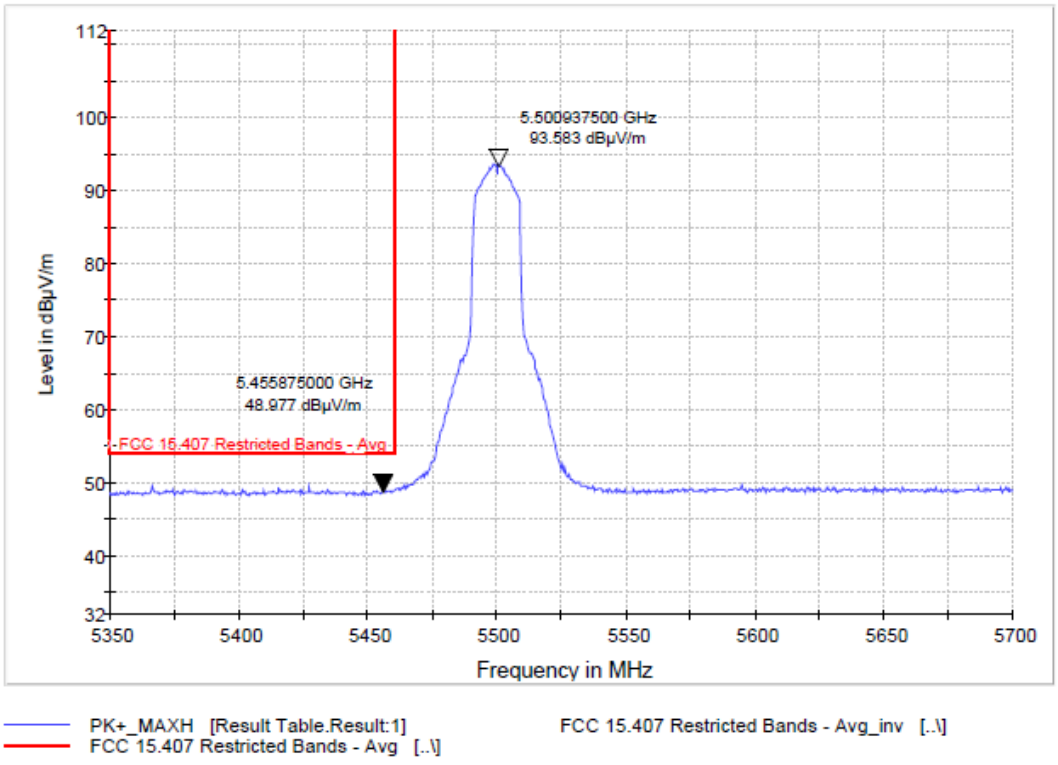
Plot 9-100. Peak Radiated Band Edge Emissions Tx Chains A & B 802.11n HT20 (Ch. 64)



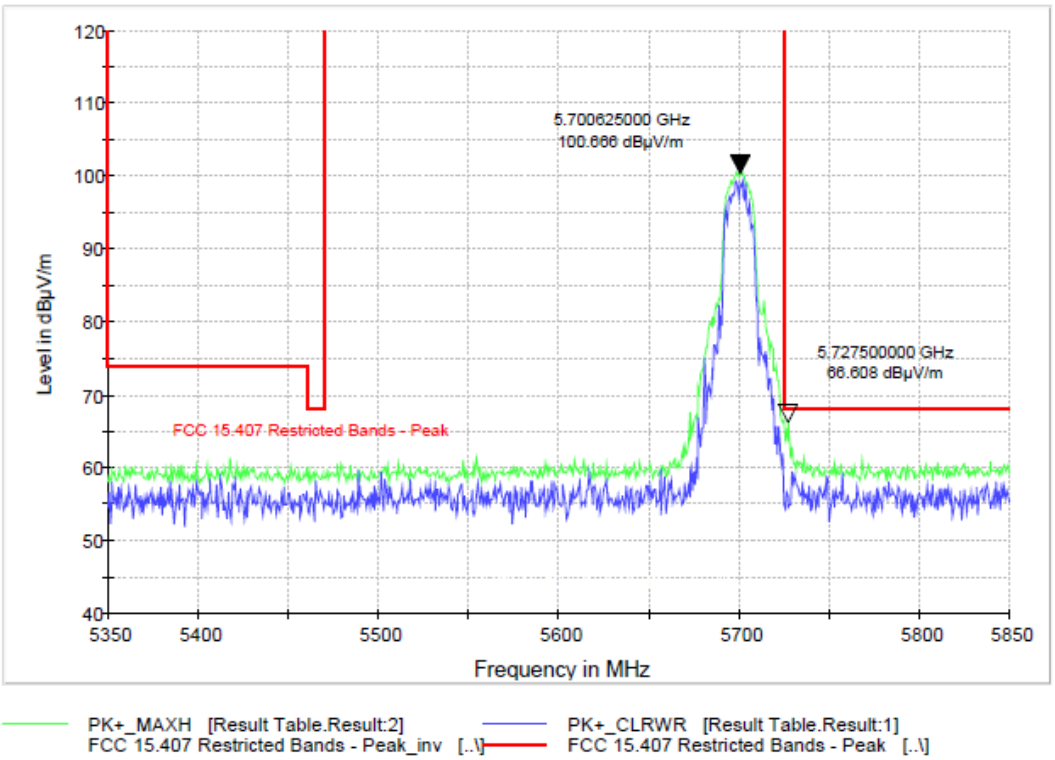
Plot 9-101. Average Radiated Band Edge Emissions Tx Chains A & B 802.11n HT20 (Ch. 64)



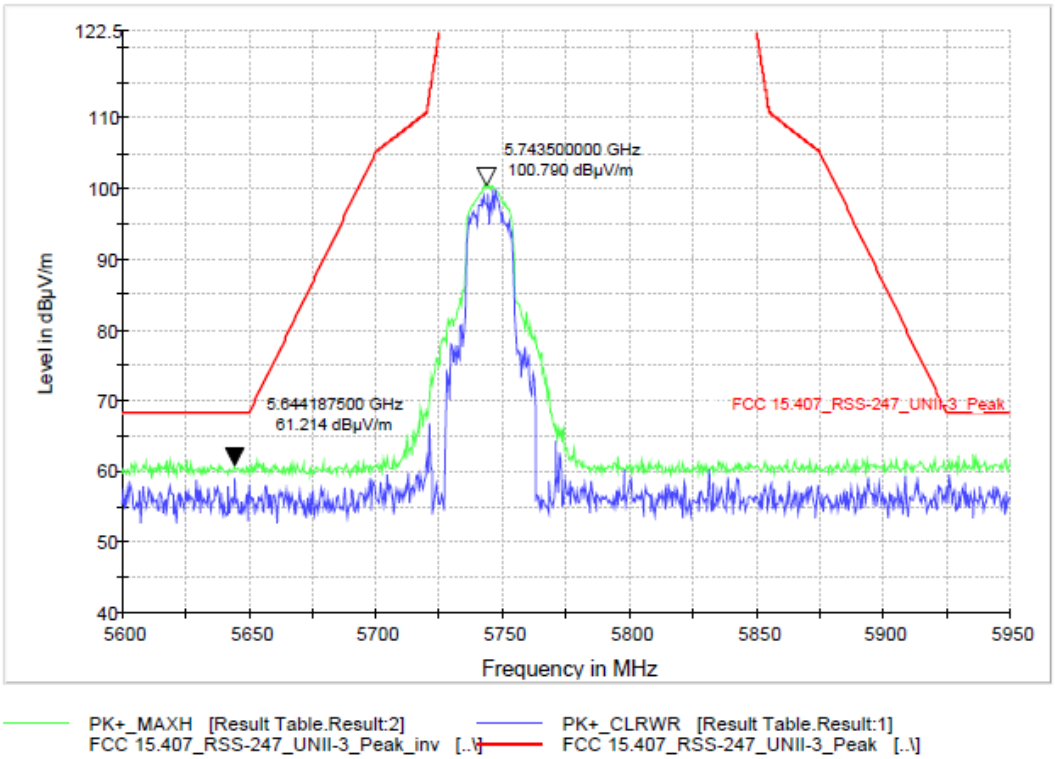
Plot 9-102. Peak Radiated Band Edge Emissions Tx Chains A & B 802.11n HT20 (Ch. 100)



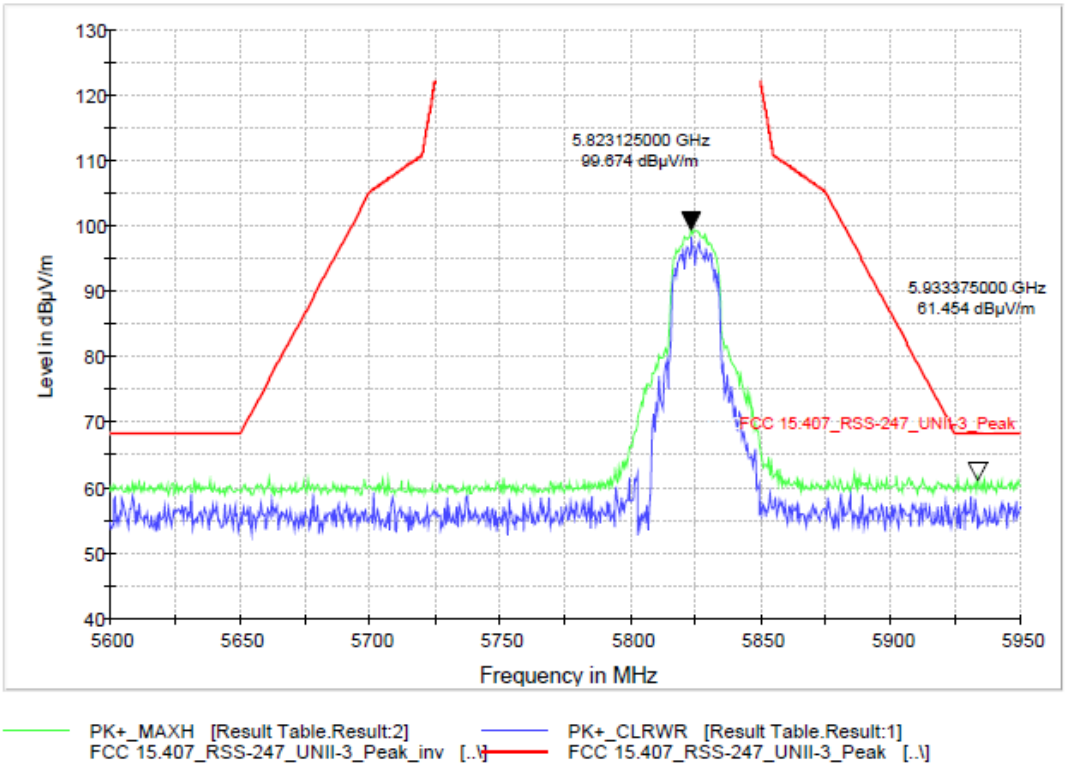
Plot 9-103. Average Radiated Band Edge Emissions Tx Chains A & B 802.11n HT20 (Ch. 100)



Plot 9-104. Peak Radiated Band Edge Emissions Tx Chains A & B 802.11n HT20 (Ch. 140)



Plot 9-105. Peak Radiated Band Edge Emissions Tx Chains A & B 802.11n HT20 (Ch. 149)



Plot 9-106. Peak Radiated Band Edge Emissions Tx Chains A & B 802.11n HT20 (Ch. 165)

9.7 AC Line Conducted Emissions

9.7.1 Test Requirements

FCC CFR 47 Rule Part 15.207 (a)
ISED RSS Gen [8.8]

9.7.2 Test Method

Conducted power line measurements were made, unless otherwise specified, over the frequency range from 150 kHz to 30 MHz to determine the line-to-ground radio-noise voltage that is conducted from the EUT power-input terminals that are directly (or indirectly via separate transformer or power supplies) connected to a public power network. Equipment was tested with the power cords that were used under normal operating conditions. The following measurements were made using a LISN (Line Impedance Stabilization Network). AC powered peripherals were attached to a second LISN with the 50-ohm measurement port terminated by a 50 ohm resistive load.

EMI Receiver Settings:

150 kHz – 30 MHz:

RBW= 9 kHz
VBW ≥ 3 X RBW
Trace Mode: Peak Detector (Max Hold).
Final measurements were performed using Quasi-Peak and Average Detectors.
Span= 150 kHz – 30 MHz
Sweep time= Auto

EUT Exercising:

Technology: 802.11a
RF Channel: Channel 100, 5500GHz
Antenna Path: Path A
Power Level Setting: 8 dBm

9.7.3 Limit

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

9.7.4 Test Result:

Pass.

9.7.5 Test Data:

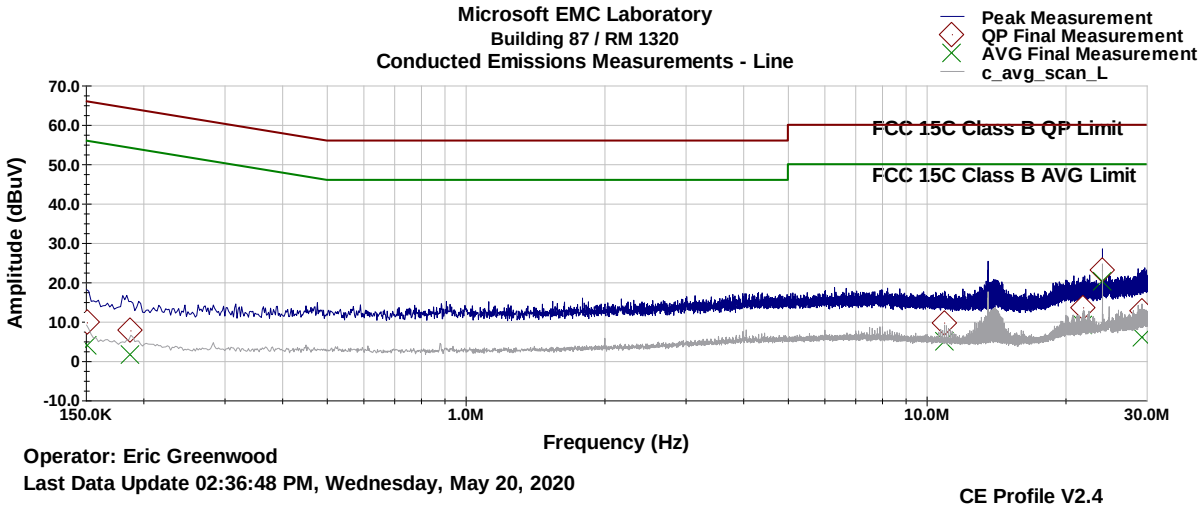


Figure 9-107. AC Line Conducted Emissions- Line (150 kHz- 30 MHz)

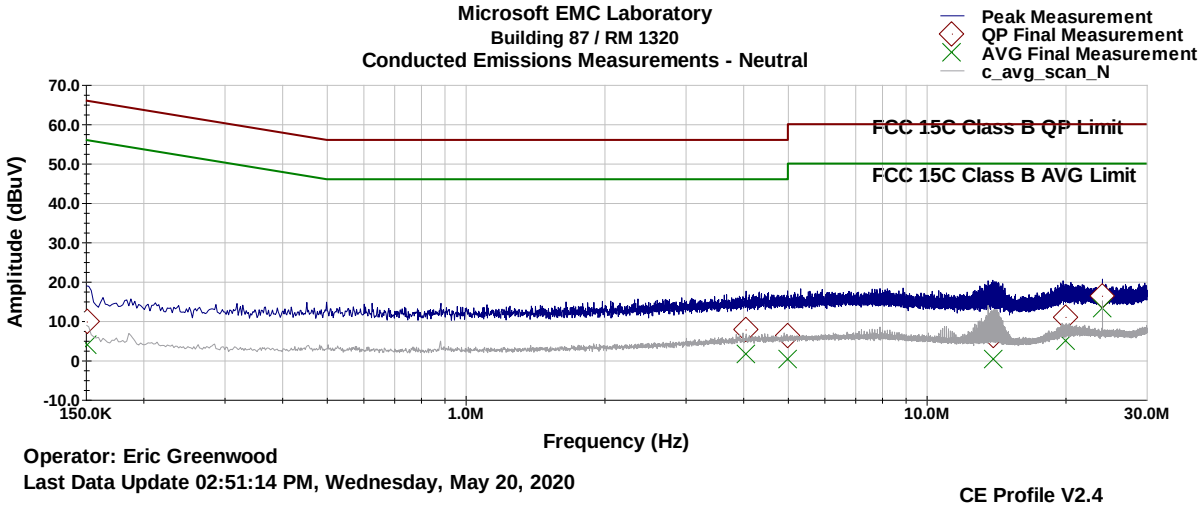


Figure 9-108. AC Line Conducted Emissions- Neutral (150 kHz- 30 MHz)

Frequency (MHz)	Line Tested (L or N)	AVG Amplitude (dBuV)	QP Amplitude (dBuV)	AVG Limit (dBuV)	QP Limit (dBuV)	AVG Margin (dB)	QP Margin (dB)
0.151	L	3.96	9.82	55.95	65.95	-52.00	-56.13
0.187	L	1.53	7.77	54.15	64.15	-52.62	-56.38
10.912	L	4.95	9.77	50.00	60.00	-45.05	-50.23
21.840	L	9.08	13.63	50.00	60.00	-40.92	-46.37
23.998	L	20.39	23.06	50.00	60.00	-29.61	-36.94
29.370	L	6.12	12.71	50.00	60.00	-43.88	-47.29
0.151	N	3.97	9.87	55.96	65.96	-51.99	-56.09
4.047	N	1.77	7.85	46.00	56.00	-44.23	-48.15
4.981	N	0.23	6.23	46.00	56.00	-45.77	-49.77
13.927	N	0.37	6.40	50.00	60.00	-49.63	-53.60
20.001	N	5.02	11.03	50.00	60.00	-44.99	-48.97
24.000	N	13.36	16.41	50.00	60.00	-36.64	-43.59

End of Report