

7.6 Frequency Stability

§15.407(g)

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



OPERATING FREQUENCY: 5,180,000,000 Hz
 CHANNEL: 36
 REFERENCE VOLTAGE: 3.80 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	5,179,999,841	-159	-0.00000306
100 %		- 30	5,179,999,894	-106	-0.00000204
100 %		- 20	5,179,999,994	-6	-0.00000012
100 %		- 10	5,179,999,995	-5	-0.00000009
100 %		0	5,179,999,898	-102	-0.00000196
100 %		+ 10	5,179,999,979	-21	-0.00000041
100 %		+ 20	5,179,999,821	-179	-0.00000345
100 %		+ 30	5,179,999,988	-12	-0.00000023
100 %		+ 40	5,179,999,886	-114	-0.00000221
100 %		+ 50	5,179,999,854	-146	-0.00000282
BATT. ENDPOINT	3.40	+ 20	5,179,999,908	-92	-0.00000178

Table 7-9. Frequency Stability Measurements for UNII Band 1 (Ch. 36)

Note:

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

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



OPERATING FREQUENCY: 5,260,000,000 Hz
 CHANNEL: 52
 REFERENCE VOLTAGE: 3.80 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	5,259,999,958	-42	-0.0000080
100 %		- 30	5,259,999,877	-123	-0.0000235
100 %		- 20	5,259,999,945	-55	-0.0000104
100 %		- 10	5,259,999,898	-102	-0.0000193
100 %		0	5,259,999,870	-130	-0.0000247
100 %		+ 10	5,259,999,981	-19	-0.0000037
100 %		+ 20	5,259,999,925	-75	-0.0000143
100 %		+ 30	5,259,999,873	-127	-0.0000241
100 %		+ 40	5,259,999,971	-29	-0.0000056
100 %		+ 50	5,259,999,886	-114	-0.0000216
BATT. ENDPOINT		3.40	+ 20	5,259,999,928	-72

Table 7-10. Frequency Stability Measurements for UNII Band 2A (Ch. 52)

Note:

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

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



OPERATING FREQUENCY: 5,500,000,000 Hz
 CHANNEL: 100
 REFERENCE VOLTAGE: 3.80 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	5,499,999,891	-109	-0.00000199
100 %		- 30	5,499,999,938	-62	-0.00000113
100 %		- 20	5,499,999,876	-124	-0.00000225
100 %		- 10	5,499,999,856	-144	-0.00000262
100 %		0	5,499,999,987	-13	-0.00000024
100 %		+ 10	5,499,999,986	-14	-0.00000026
100 %		+ 20	5,499,999,811	-189	-0.00000344
100 %		+ 30	5,499,999,907	-93	-0.00000170
100 %		+ 40	5,499,999,980	-20	-0.00000037
100 %		+ 50	5,499,999,948	-52	-0.00000094
BATT. ENDPOINT		3.40	+ 20	5,499,999,891	-109

Table 7-11. Frequency Stability Measurements for UNII Band 2C (Ch. 100)

Note:

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

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Frequency Stability

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



OPERATING FREQUENCY: 5,745,000,000 Hz
 CHANNEL: 149
 REFERENCE VOLTAGE: 3.80 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	5,744,999,915	-85	-0.00000149
100 %		- 30	5,744,999,876	-124	-0.00000216
100 %		- 20	5,744,999,811	-189	-0.00000330
100 %		- 10	5,744,999,921	-79	-0.00000137
100 %		0	5,744,999,802	-198	-0.00000345
100 %		+ 10	5,744,999,946	-54	-0.00000095
100 %		+ 20	5,744,999,821	-179	-0.00000311
100 %		+ 30	5,744,999,999	-1	-0.00000001
100 %		+ 40	5,744,999,907	-93	-0.00000162
100 %		+ 50	5,744,999,842	-158	-0.00000274
BATT. ENDPOINT		3.40	+ 20	5,744,999,903	-97

Table 7-12. Frequency Stability Measurements for UNII Band 3 (Ch. 149)

Note:

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

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7.7 Radiated Spurious Emission Measurements – Above 1GHz

§15.407(b.1)(b.6) §15.205 §15.209

Test Overview and Limit

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

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Table 7-13 per Section 15.209.

Frequency	Field Strength [$\mu\text{V/m}$]	Measured Distance [Meters]
Above 960.0 MHz	500	3

Table 7-13. 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 $\geq 2 \times \text{span/RBW}$)
6. Averaging type = power (RMS)
7. Sweep time = auto couple
8. Trace was averaged over 100 sweeps

Peak Measurements above 1GHz

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

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Peak Measurements below 1GHz

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

Test Setup

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

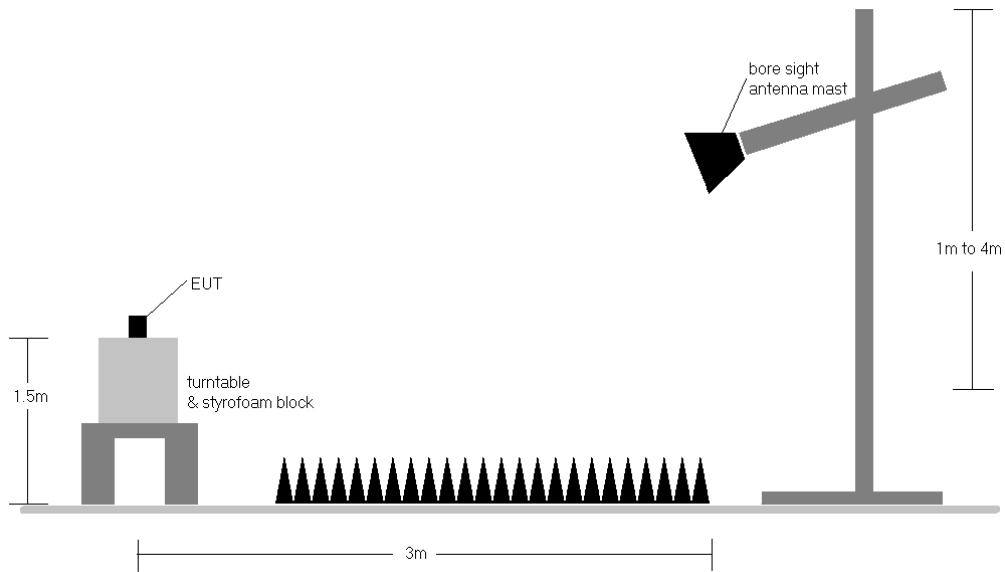




Figure 7-5. Test Instrument & Measurement Setup

Test Notes

1. All radiated spurious emissions levels were measured in a radiated test setup per the guidance of KDB 789033 D02 v01 Section H.
2. All emissions that lie in the restricted bands (denoted by a * next to the frequency) specified in §15.205 are below the limit shown in Table 7-13.
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.

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



Sample Calculations

Determining Spurious Emissions Levels

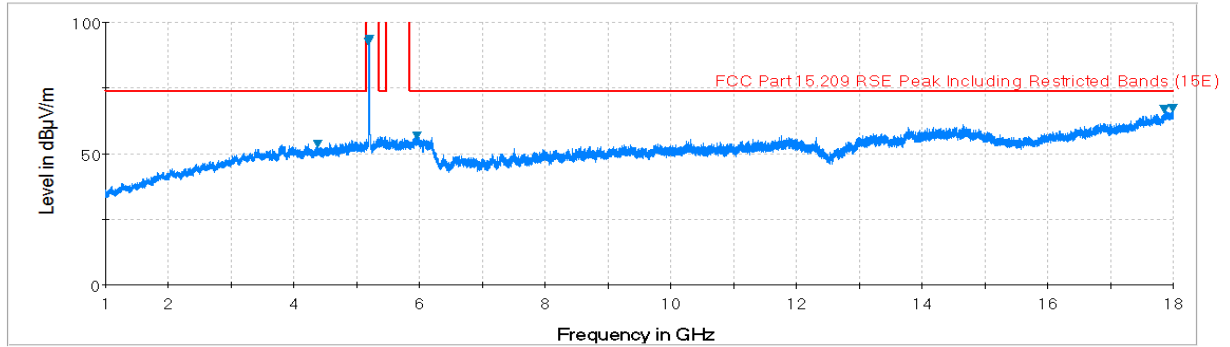
- Field Strength Level $_{[dB\mu V/m]} = \text{Analyzer Level }_{[dBm]} + 107 + \text{AFCL }_{[dB/m]}$
- $\text{AFCL }_{[dB/m]} = \text{Antenna Factor }_{[dB/m]} + \text{Cable Loss }_{[dB]}$
- $\text{Margin }_{[dB]} = \text{Field Strength Level }_{[dB\mu V/m]} - \text{Limit }_{[dB\mu V/m]}$

Radiated Band Edge Measurement Offset

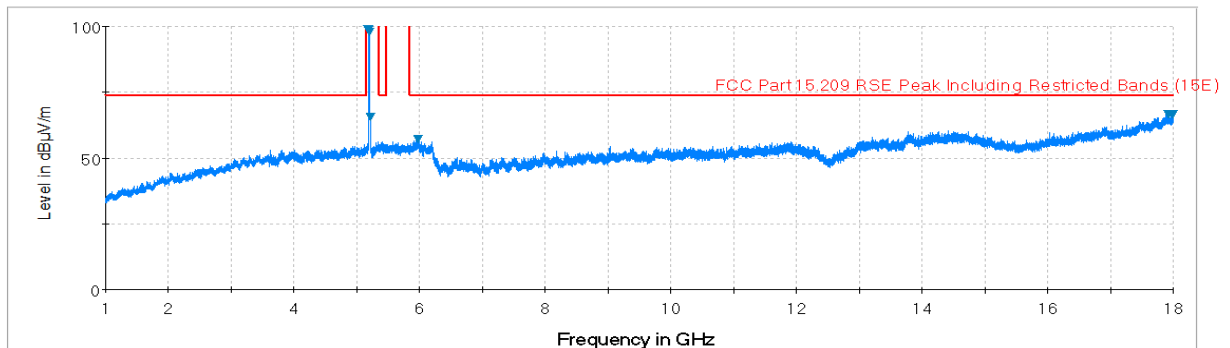
- The amplitude offset shown in the radiated restricted band edge plots in Section 6.8 was calculated using the formula:
Offset (dB) = (Antenna Factor + Cable Loss + 10 dB Attenuator) – Preamplifier Gain

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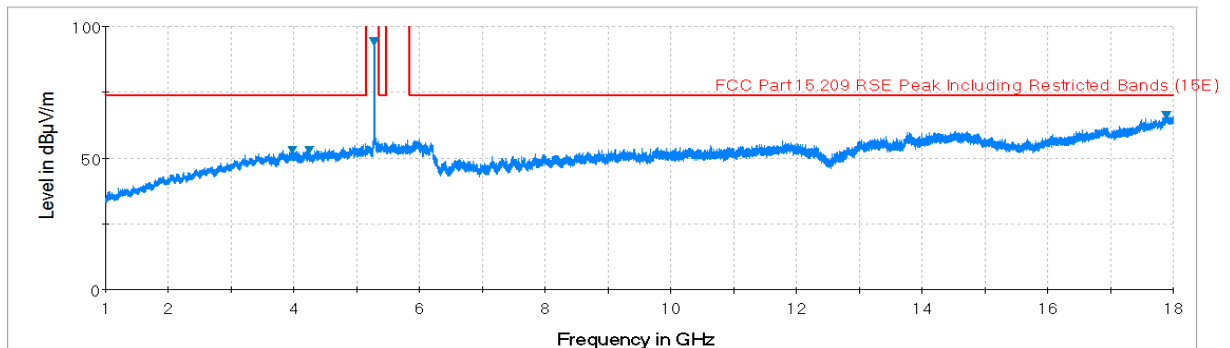
7.7.1 Radiated Spurious Emission Measurements



Plot 7-77. Radiated Spurious Plot above 1GHz (802.11a – U1 Ch. 40, Ant. Pol. H)

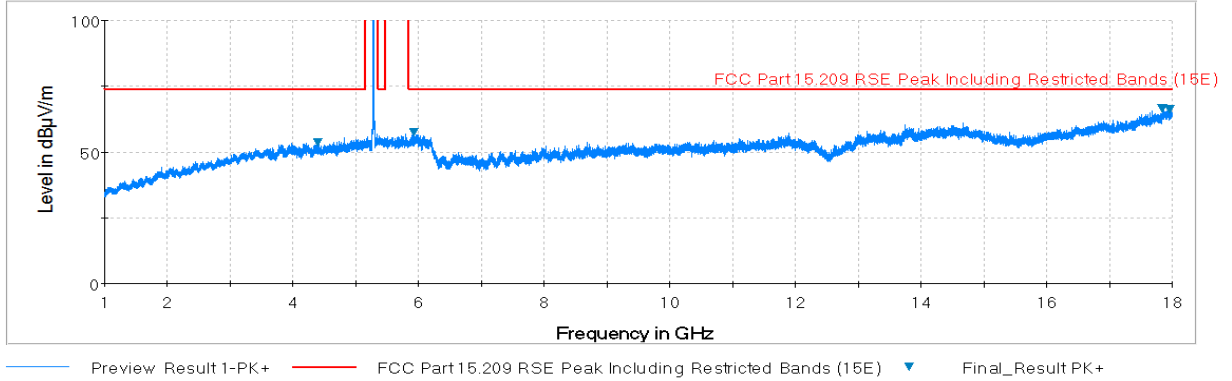


Plot 7-78. Radiated Spurious Plot above 1GHz (802.11a – U1 Ch. 40, Ant. Pol. V)

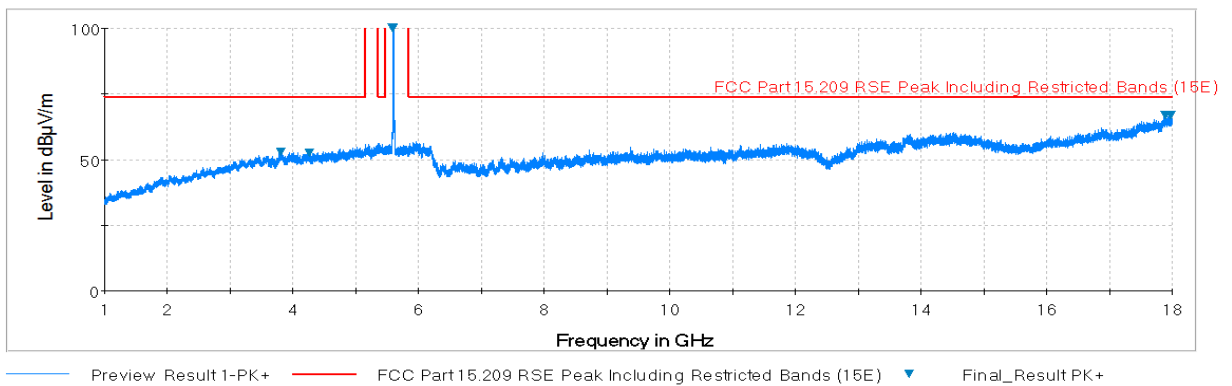


Plot 7-79. Radiated Spurious Plot above 1GHz (802.11a – U2A Ch. 56, Ant. Pol. H)

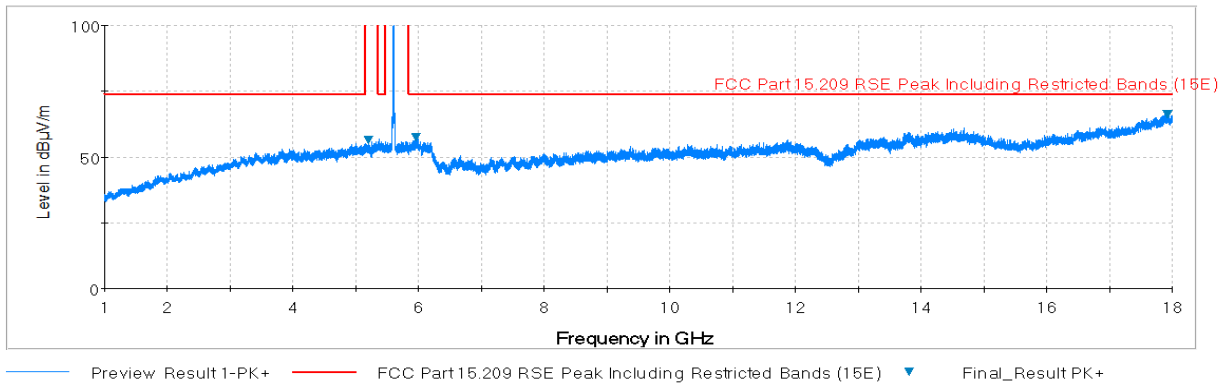
FCC ID: ACJFZN1A		FCC Pt. 15.407 802.11a/n/ac UNI MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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Plot 7-80. Radiated Spurious Plot above 1GHz (802.11a – U2A Ch. 56, Ant. Pol. V)

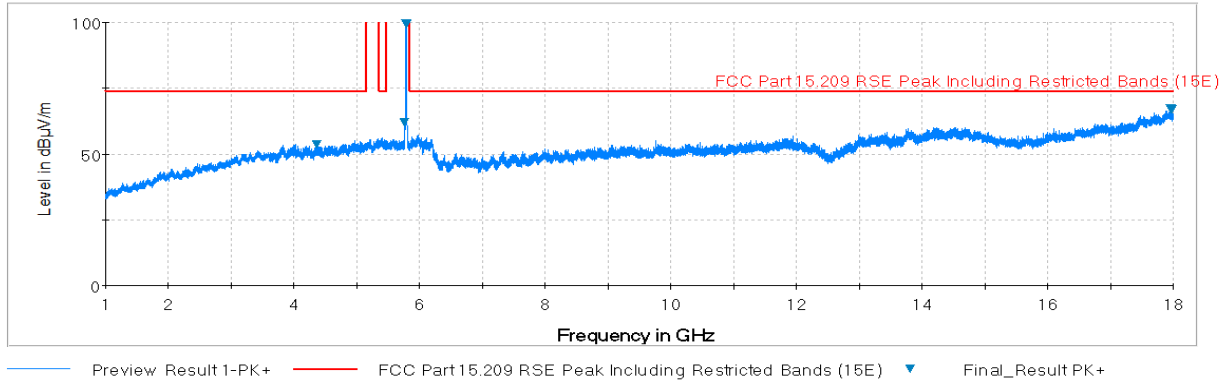


Plot 7-81. Radiated Spurious Plot above 1GHz (802.11a – U2C Ch. 120, Ant. Pol. H)

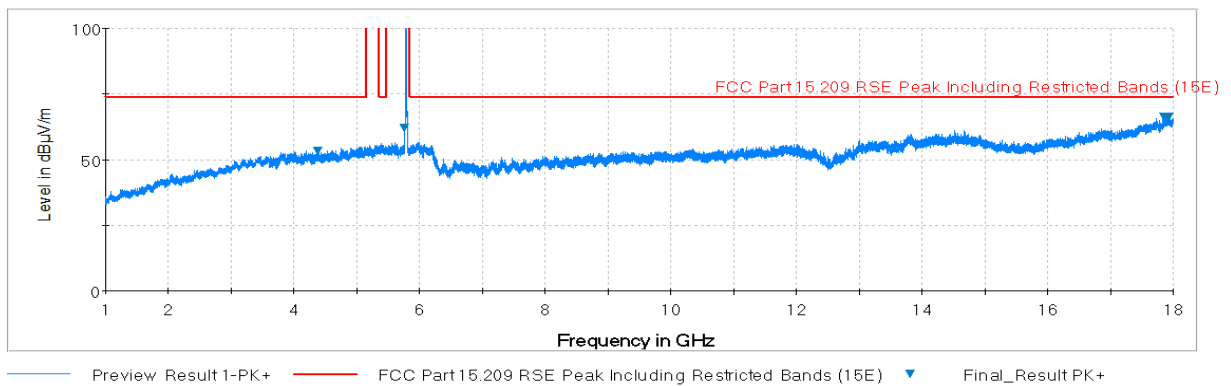


Plot 7-82. Radiated Spurious Plot above 1GHz (802.11a – U2C Ch. 120, Ant. Pol. V)


FCC ID: ACJFZN1A		FCC Pt. 15.407 802.11a/n/ac UNI MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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Plot 7-83. Radiated Spurious Plot above 1GHz (802.11a – U3 Ch. 157, Ant. Pol. H)

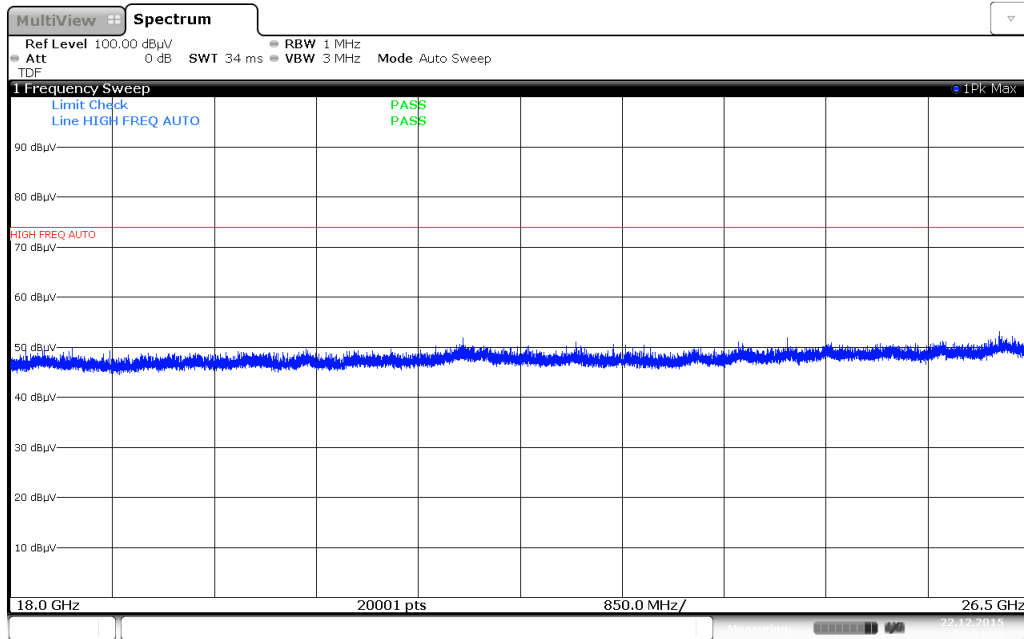


Plot 7-84. Radiated Spurious Plot above 1GHz (802.11a – U3 Ch. 157, Ant. Pol. V)

FCC ID: ACJFZN1A		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
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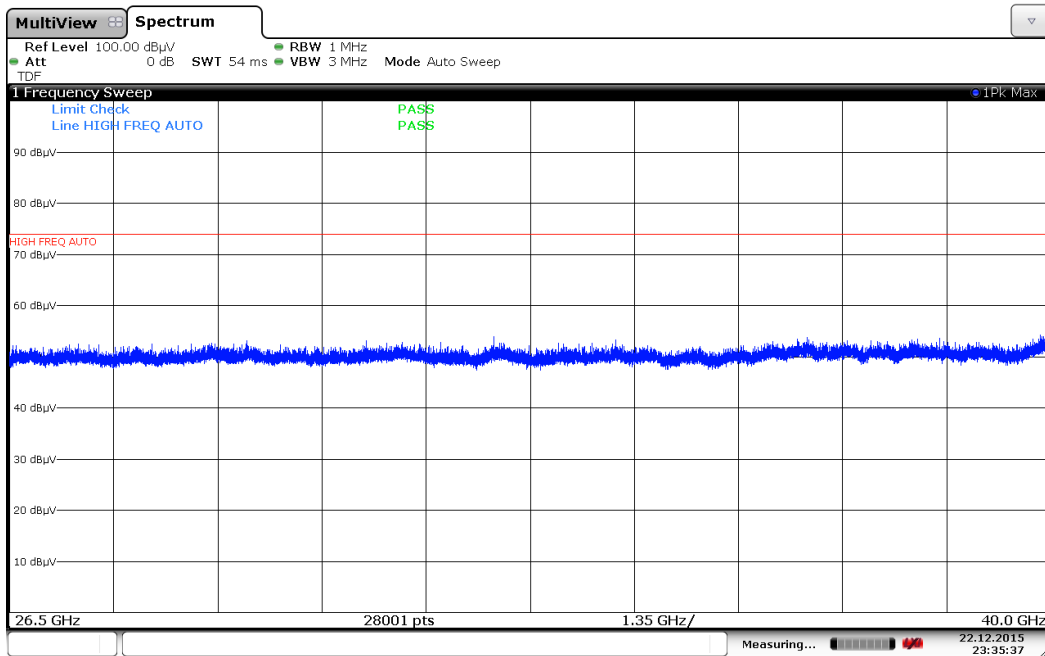
Radiated Spurious Emissions Measurements (Above 18GHz)

§15.209



Date: 22.DEC.2015 23:24:58

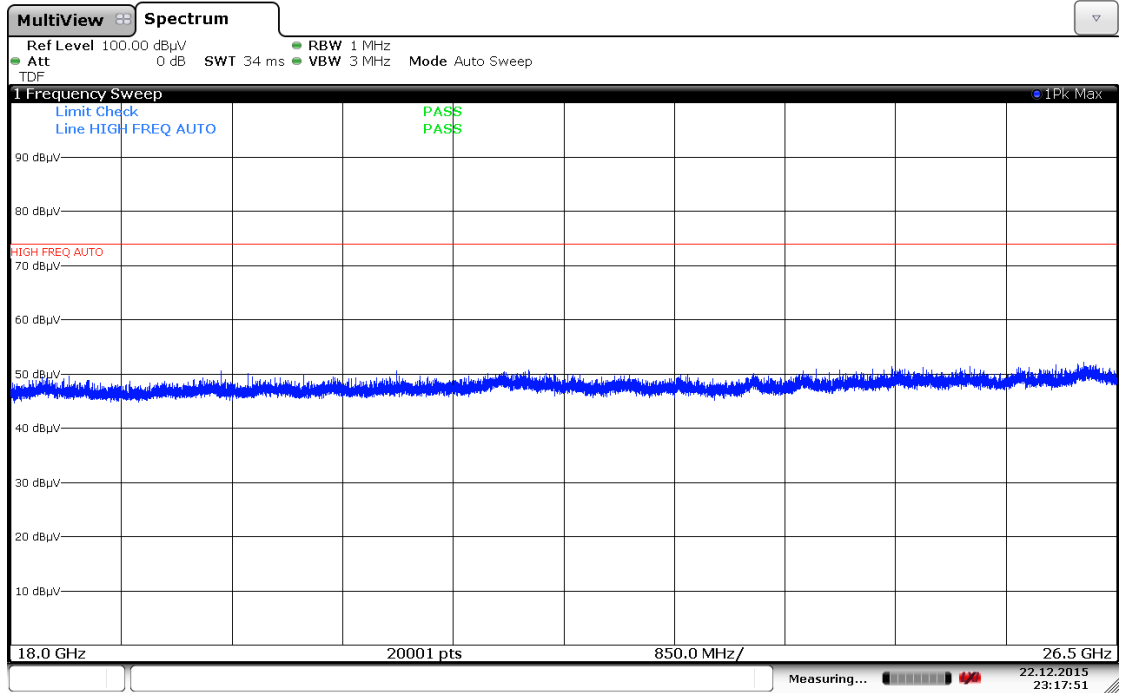
Plot 7-85. Radiated Spurious Plot above 18GHz (802.11a – Ant. Pol. H)



Date: 22.DEC.2015 23:35:37

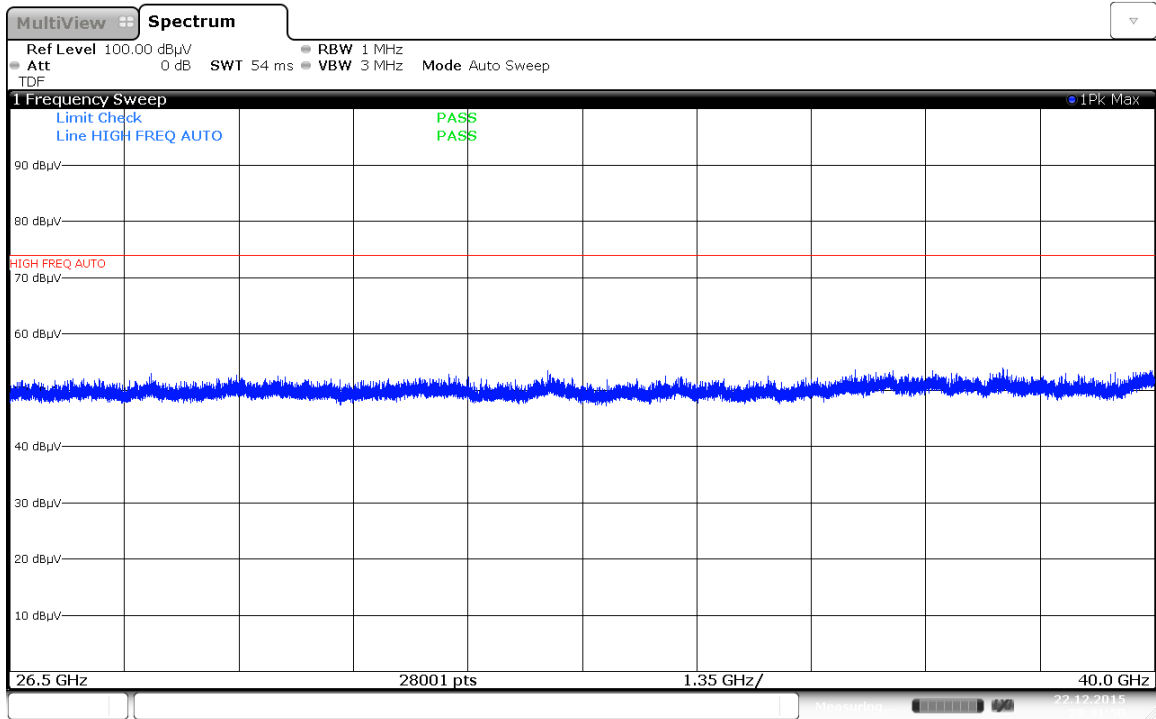
Plot 7-86. Radiated Spurious Plot above 18GHz (802.11a – Ant. Pol. H)

FCC ID: ACJFZN1A		FCC Pt. 15.407 802.11a/n/ac UNI MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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Date: 22.DEC.2015 23:17:50

Plot 7-87. Radiated Spurious Plot above 18GHz (802.11a – Ant. Pol. V)



Date: 22.DEC.2015 23:41:49

Plot 7-88. Radiated Spurious Plot above 18GHz (802.11a – Ant. Pol. V)

FCC ID: ACJFZN1A	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	Panasonic	Reviewed by: Quality Manager
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Radiated Spurious Emission Measurements

§15.247(d) §15.205 & §15.209

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



Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
10360.00	Peak	V	1.50	150	-99.57	47.38	0.00	54.81	68.20	-13.39
* 15540.00	Average	V	-	-	-112.47	55.69	0.00	50.22	53.98	-3.76
* 15540.00	Peak	V	-	-	-100.77	55.69	0.00	61.92	73.98	-12.06
* 20720.00	Average	V	1.00	137	-110.60	44.39	-9.54	31.25	53.98	-22.73
* 20720.00	Peak	V	1.00	137	-97.11	44.39	-9.54	44.74	73.98	-29.24
25900.00	Peak	V	-	-	-100.58	45.11	-9.54	41.99	68.20	-26.21

Table 7-14. Radiated Measurements

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
10400.00	Peak	V	2.21	100	-99.37	47.61	0.00	55.24	68.20	-12.96
* 15600.00	Average	V	-	-	-112.00	55.84	0.00	50.83	53.98	-3.15
* 15600.00	Peak	V	-	-	-100.32	55.84	0.00	62.51	73.98	-11.47
* 20800.00	Average	V	1.00	318	-110.72	44.39	-9.54	31.13	53.98	-22.85
* 20800.00	Peak	V	1.00	318	-98.64	44.39	-9.54	43.21	73.98	-30.77
26000.00	Peak	V	-	-	-100.49	45.12	-9.54	42.08	68.20	-26.12

Table 7-15. Radiated Measurements

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



Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
10480.00	Peak	V	1.29	310	-100.39	47.90	0.00	54.51	68.20	-13.69
* 15720.00	Average	V	-	-	-112.44	54.38	0.00	48.94	53.98	-5.04
* 15720.00	Peak	V	-	-	-100.89	54.38	0.00	60.49	73.98	-13.49
* 20960.00	Average	V	1.00	213	-111.93	44.31	-9.54	29.84	53.98	-24.14
* 20960.00	Peak	V	1.00	213	-99.82	44.31	-9.54	41.95	73.98	-32.03
26200.00	Peak	V	-	-	-101.64	45.01	-9.54	40.83	68.20	-27.37

Table 7-16. Radiated Measurements

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
10520.00	Peak	H	3.65	242	-99.13	47.93	0.00	55.81	68.20	-12.39
* 15780.00	Average	H	-	-	-111.65	54.47	0.00	49.82	53.98	-4.16
* 15780.00	Peak	H	-	-	-100.38	54.47	0.00	61.09	73.98	-12.89
* 21040.00	Average	H	1.00	145	-110.49	44.29	-9.54	31.25	53.98	-22.73
* 21040.00	Peak	H	1.00	145	-97.42	44.29	-9.54	44.32	73.98	-29.66
26300.00	Peak	H	-	-	-99.43	45.00	-9.54	43.03	68.20	-25.17

Table 7-17. Radiated Measurements

FCC ID: ACJFZN1A		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps
 Distance of Measurements: 1 & 3 Meters
 Operating Frequency: 5280MHz
 Channel: 56



Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
10560.00	Peak	H	1.00	53	-98.92	47.85	0.00	55.93	68.20	-12.27
* 15840.00	Average	H	-	-	-111.54	54.89	0.00	50.35	53.98	-3.63
* 15840.00	Peak	H	-	-	-100.32	54.89	0.00	61.57	73.98	-12.41
* 21120.00	Average	H	1.00	132	-111.29	44.28	-9.54	30.45	53.98	-23.53
* 21120.00	Peak	H	1.00	132	-97.50	44.28	-9.54	44.24	73.98	-29.74
26400.00	Peak	H	-	-	-99.75	45.02	-9.54	42.73	68.20	-25.47

Table 7-18. Radiated Measurements

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 10640.00	Average	H	3.52	100	-109.60	47.76	0.00	45.16	53.98	-8.82
* 10640.00	Peak	H	3.52	100	-99.00	47.76	0.00	55.76	73.98	-18.22
* 15960.00	Average	H	-	-	-112.03	55.69	0.00	50.66	53.98	-3.32
* 15960.00	Peak	H	-	-	-99.63	55.69	0.00	63.06	73.98	-10.92
* 21280.00	Average	H	1.00	120	-111.32	44.26	-9.54	30.40	53.98	-23.58
* 21280.00	Peak	H	1.00	120	-99.18	44.26	-9.54	42.54	73.98	-31.44
26600.00	Peak	H	-	-	-103.52	47.61	-9.54	41.55	68.20	-26.65

Table 7-19. Radiated Measurements

FCC ID: ACJFZN1A		FCC Pt. 15.407 802.11a/n/ac UNI MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1512142135.ACJ	Test Dates: 12/08/2015 - 1/11/2016	EUT Type: Portable Handset	Page 74 of 112	

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



Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 11000.00	Average	H	1.25	125	-110.98	48.21	0.00	44.22	53.98	-9.76
* 11000.00	Peak	H	1.25	125	-99.41	48.21	0.00	55.79	73.98	-18.19
16500.00	Peak	H	-	-	-100.21	55.40	0.00	62.19	68.20	-6.01
22000.00	Peak	H	1.00	158	-99.57	44.50	-9.54	42.38	68.20	-25.82
27500.00	Peak	H	-	-	-102.05	47.97	-9.54	43.38	68.20	-24.82

Table 7-20. Radiated Measurements

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 11200.00	Average	H	1.89	301	-110.53	48.06	0.00	44.53	53.98	-9.45
* 11200.00	Peak	H	1.89	301	-98.77	48.06	0.00	56.29	73.98	-17.69
16800.00	Peak	H	-	-	-99.84	55.20	0.00	62.36	68.20	-5.84
* 22400.00	Average	H	1.00	127	-109.46	44.57	-9.54	32.57	53.98	-21.41
* 22400.00	Peak	H	1.00	127	-98.94	44.57	-9.54	43.09	73.98	-30.89
28000.00	Peak	H	-	-	-103.84	48.11	-9.54	41.73	68.20	-26.47

Table 7-21. Radiated Measurements

FCC ID: ACJFZN1A		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1512142135.ACJ	Test Dates: 12/08/2015 - 1/11/2016	EUT Type: Portable Handset	Page 75 of 112	

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



Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 11400.00	Average	H	2.59	180	-110.65	49.00	0.00	45.36	53.98	-8.62
* 11400.00	Peak	H	2.59	180	-99.19	49.00	0.00	56.82	73.98	-17.16
17100.00	Peak	H	-	-	-99.09	55.02	0.00	62.93	68.20	-5.27
* 22800.00	Average	H	1.00	125	-108.50	44.56	-9.54	33.51	53.98	-20.47
* 22800.00	Peak	H	1.00	125	-97.67	44.56	-9.54	44.34	73.98	-29.64
28500.00	Peak	H	-	-	-105.63	48.32	-9.54	40.15	68.20	-28.05

Table 7-22. Radiated Measurements

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 11490.00	Average	H	2.59	100	-109.40	49.32	0.00	46.92	53.98	-7.06
* 11490.00	Peak	H	2.59	100	-99.40	49.32	0.00	56.92	73.98	-17.06
17235.00	Peak	H	-	-	-99.11	55.04	0.00	62.94	68.20	-5.26
* 22980.00	Average	H	1.00	155	-109.62	44.68	-9.54	32.52	53.98	-21.46
* 22980.00	Peak	H	1.00	155	-99.42	44.68	-9.54	42.72	73.98	-31.26
28725.00	Peak	H	-	-	-103.38	48.26	-9.54	42.34	68.20	-25.86

Table 7-23. Radiated Measurements

FCC ID: ACJFZN1A		FCC Pt. 15.407 802.11a/n/ac UNI MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1512142135.ACJ	Test Dates: 12/08/2015 - 1/11/2016	EUT Type: Portable Handset	Page 76 of 112	

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



Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 11570.00	Average	H	3.10	250	-108.98	49.22	0.00	47.24	53.98	-6.73
* 11570.00	Peak	H	3.10	250	-99.20	49.22	0.00	57.02	73.98	-16.95
17355.00	Peak	H	-	-	-99.83	55.50	0.00	62.66	68.20	-5.54
23140.00	Peak	H	1.00	129	-99.53	44.75	-9.54	42.68	68.20	-25.52
28925.00	Peak	H	-	-	-103.35	48.29	-9.54	42.40	68.20	-25.80

Table 7-24. Radiated Measurements

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 11650.00	Average	H	1.50	210	-108.81	49.11	0.00	47.30	53.98	-6.68
* 11650.00	Peak	H	1.50	210	-99.65	49.11	0.00	56.46	73.98	-17.52
17475.00	Peak	H	-	-	-100.55	56.46	0.00	62.91	68.20	-5.29
23300.00	Peak	H	1.00	150	-98.68	44.75	-9.54	43.52	68.20	-24.68
29125.00	Peak	H	-	-	-101.52	48.28	-9.54	44.23	68.20	-23.97

Table 7-25. Radiated Measurements

FCC ID: ACJFZN1A		FCC Pt. 15.407 802.11a/n/ac UNI MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1512142135.ACJ	Test Dates: 12/08/2015 - 1/11/2016	EUT Type: Portable Handset	Page 77 of 112	

7.7.2 Radiated Band Edge Measurements (20MHz BW) §15.407(b.1)(b.2) §15.205 §15.209

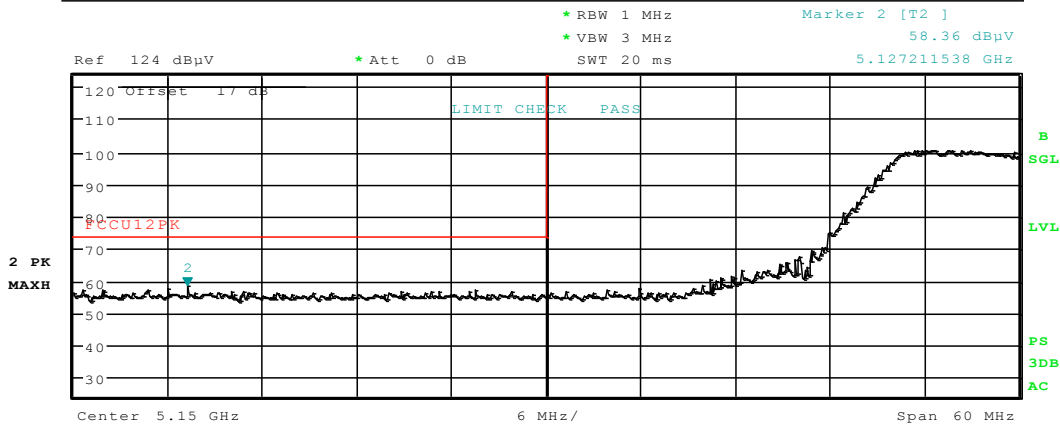
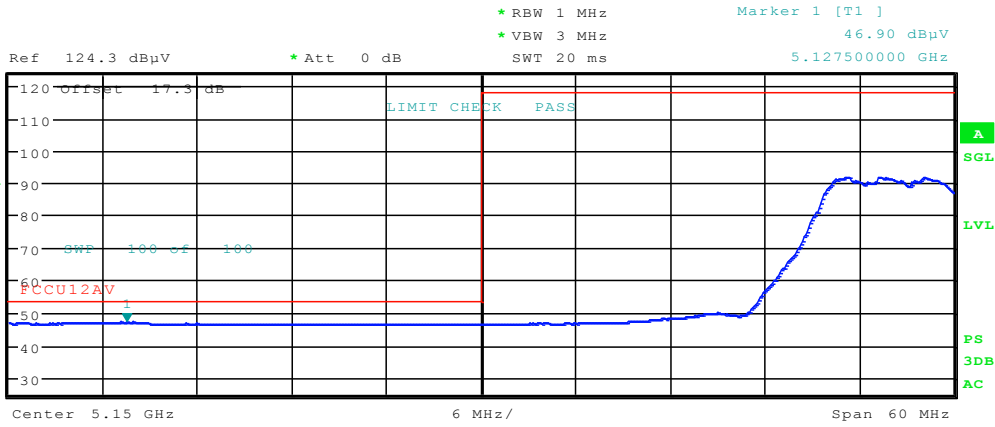
Worst Case Mode: 802.11a

Worst Case Transfer Rate: 6 Mbps

Distance of Measurements: 3 Meters

Operating Frequency: 5180MHz

Channel: 36



Date: 8.DEC.2015 23:14:57

Plot 7-89. Radiated Restricted Lower Band Edge Plot (Average & Peak – UNII Band 1)

FCC ID: ACJFZN1A		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1512142135.ACJ	Test Dates: 12/08/2015 - 1/11/2016	EUT Type: Portable Handset		Page 78 of 112

Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

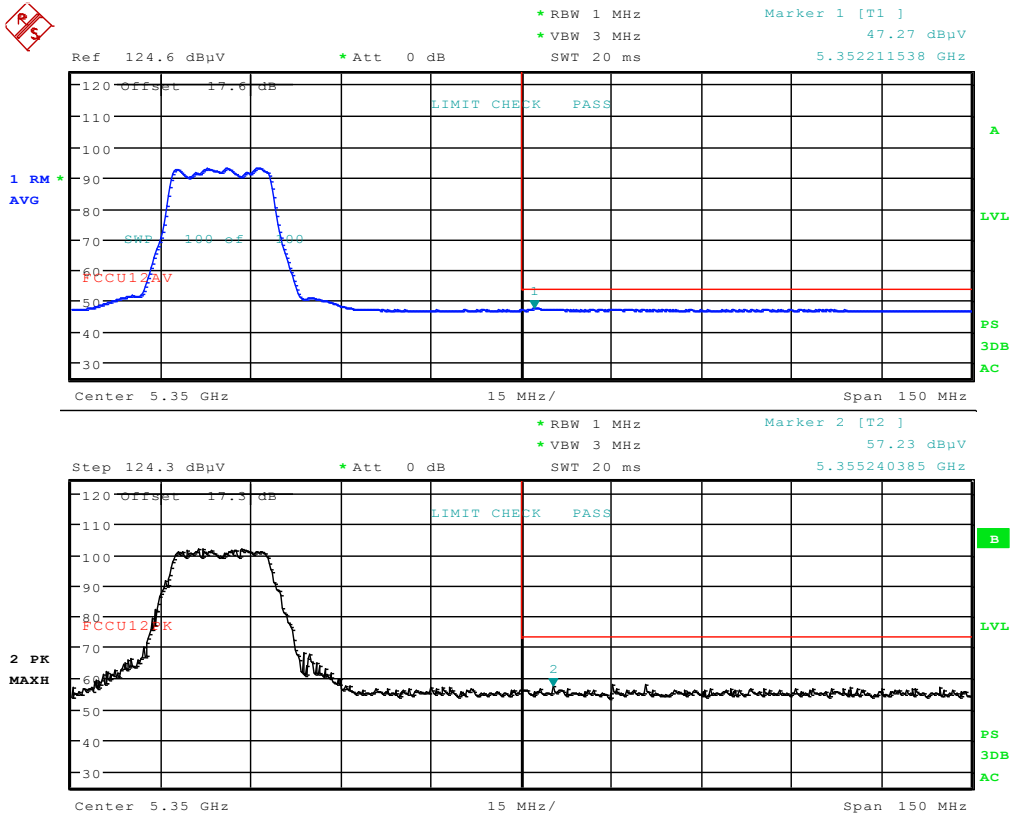
Worst Case Mode: 802.11a

Worst Case Transfer Rate: 6 Mbps

Distance of Measurements: 3 Meters

Operating Frequency: 5300MHz

Channel: 60



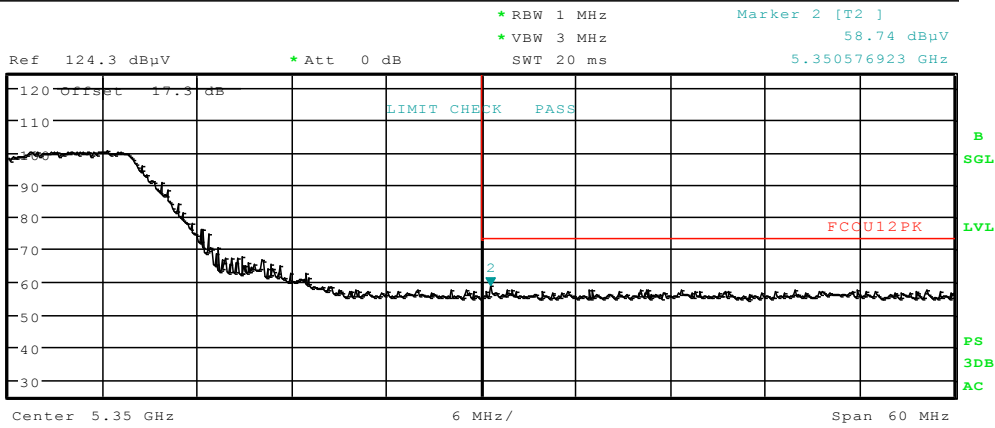
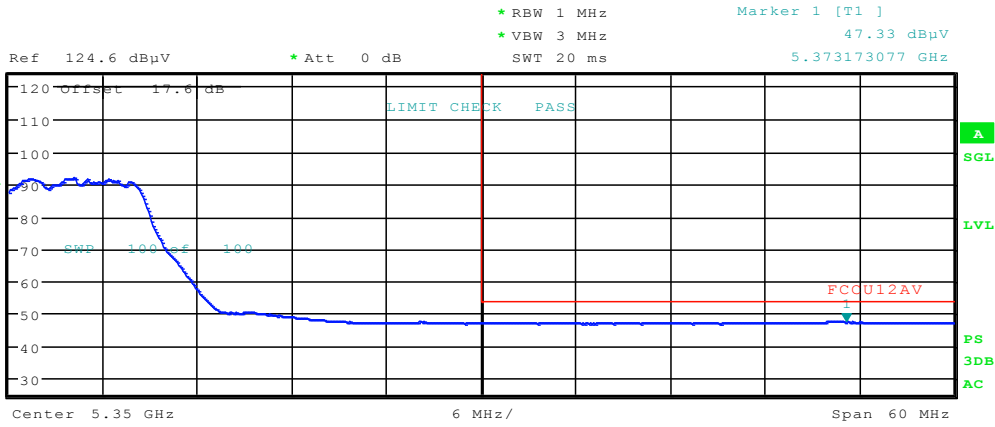
Date: 10.DEC.2015 06:21:04

Plot 7-90. Radiated Restricted Upper Band Edge Plot (Average & Peak – UNII Band 2A)

FCC ID: ACJFZN1A		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1512142135.ACJ	Test Dates: 12/08/2015 - 1/11/2016	EUT Type: Portable Handset		Page 79 of 112

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: 8.DEC.2015 23:42:36

Plot 7-91. Radiated Restricted Upper Band Edge Plot (Average & Peak– UNII Band 2A)

FCC ID: ACJFZN1A		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1512142135.ACJ	Test Dates: 12/08/2015 - 1/11/2016	EUT Type: Portable Handset		Page 80 of 112

Radiated Band Edge Measurements (20MHz BW)
§15.407(b.1)(b.2) §15.205 §15.209

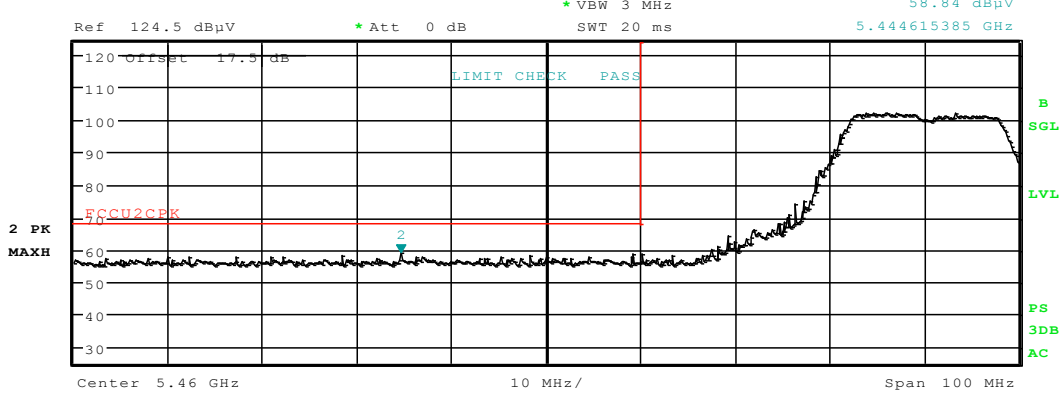
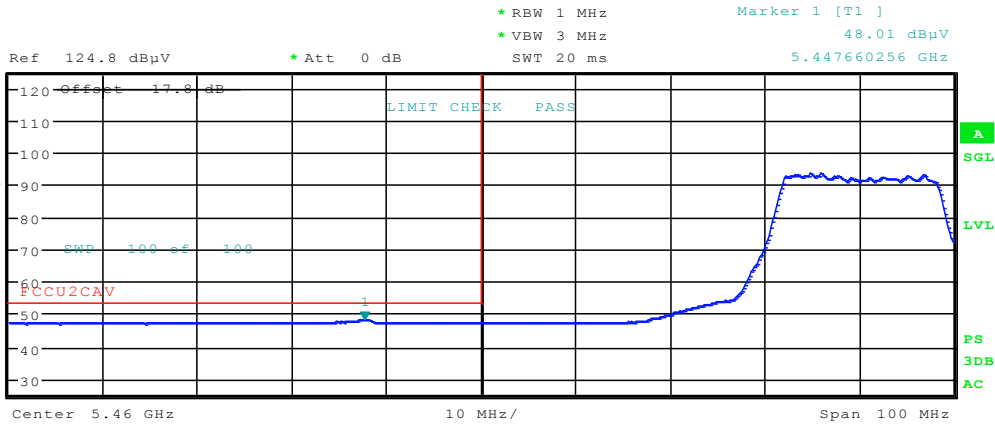
Worst Case Mode: 802.11a

Worst Case Transfer Rate: 6 Mbps

Distance of Measurements: 3 Meters

Operating Frequency: 5500MHz

Channel: 100



Date: 9.DEC.2015 00:00:01

Plot 7-92. Radiated Restricted Lower Band Edge Plot (Average & Peak – UNII Band 2C)

FCC ID: ACJFZN1A		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1512142135.ACJ	Test Dates: 12/08/2015 - 1/11/2016	EUT Type: Portable Handset		Page 81 of 112

Radiated Band Edge Measurements (20MHz BW)
§15.407(b.1)(b.2) §15.205 §15.209

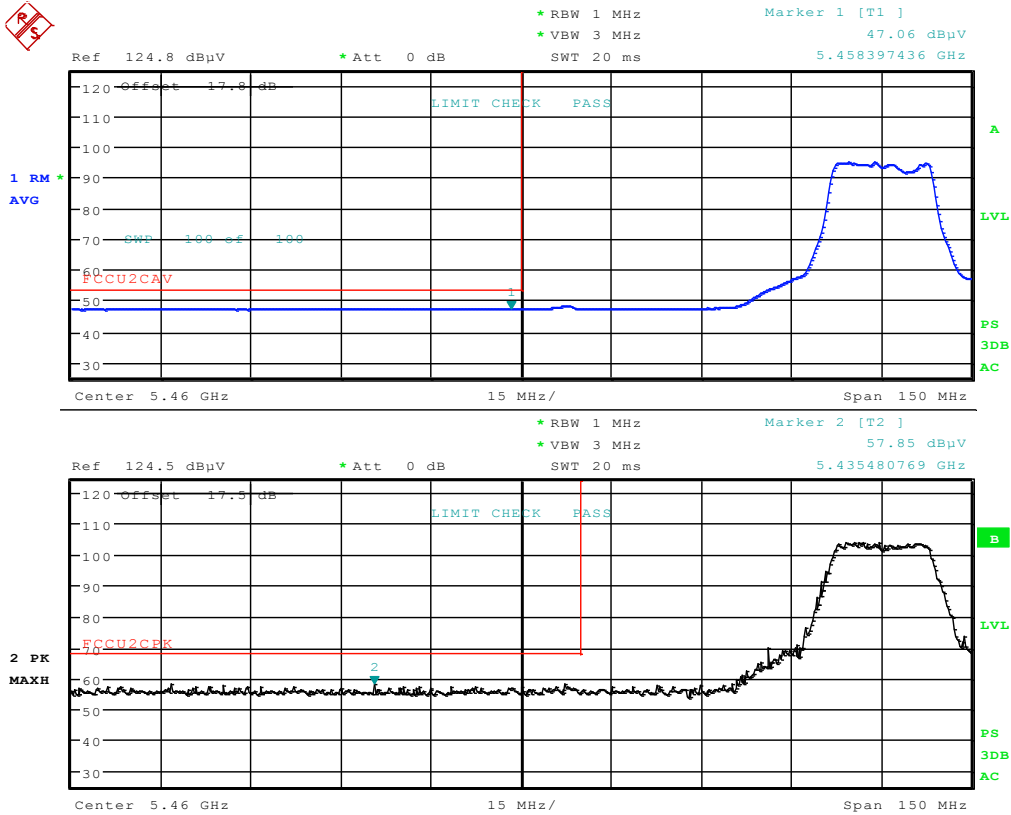
Worst Case Mode: 802.11a

Worst Case Transfer Rate: 6 Mbps

Distance of Measurements: 3 Meters

Operating Frequency: 5520MHz

Channel: 104



Date: 9.DEC.2015 00:17:50

Plot 7-93. Radiated Restricted Lower Band Edge Plot (Average & Peak – UNII Band 2C)

FCC ID: ACJFZN1A	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	Panasonic	Reviewed by: Quality Manager
Test Report S/N: 0Y1512142135.ACJ	Test Dates: 12/08/2015 - 1/11/2016	EUT Type: Portable Handset	Page 82 of 112	

Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

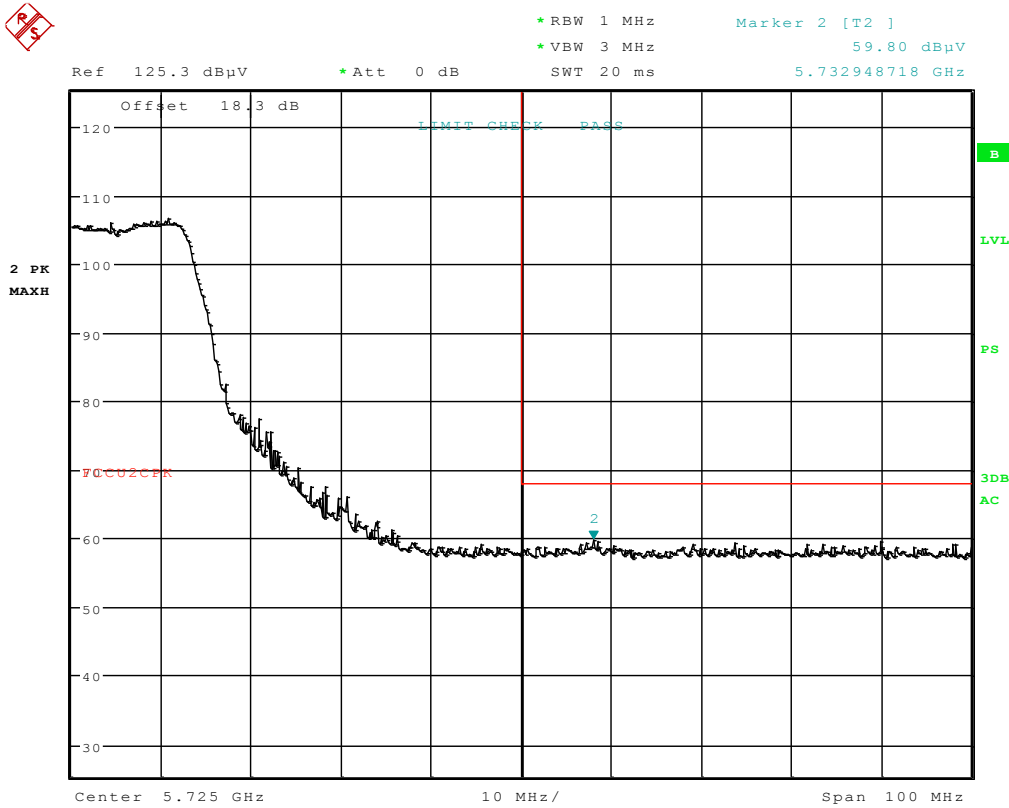
Worst Case Mode: 802.11a

Worst Case Transfer Rate: 6 Mbps

Distance of Measurements: 3 Meters

Operating Frequency: 5680MHz

Channel: 136



Date: 9.DEC.2015 00:33:11

Plot 7-94. Radiated Upper Band Edge Plot (Peak – UNII Band 2C)

FCC ID: ACJFZN1A		FCC Pt. 15.407 802.11a/n/ac UNI MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1512142135.ACJ	Test Dates: 12/08/2015 - 1/11/2016	EUT Type: Portable Handset		Page 83 of 112

Radiated Band Edge Measurements (20MHz BW)
§15.407(b.1)(b.2) §15.205 §15.209

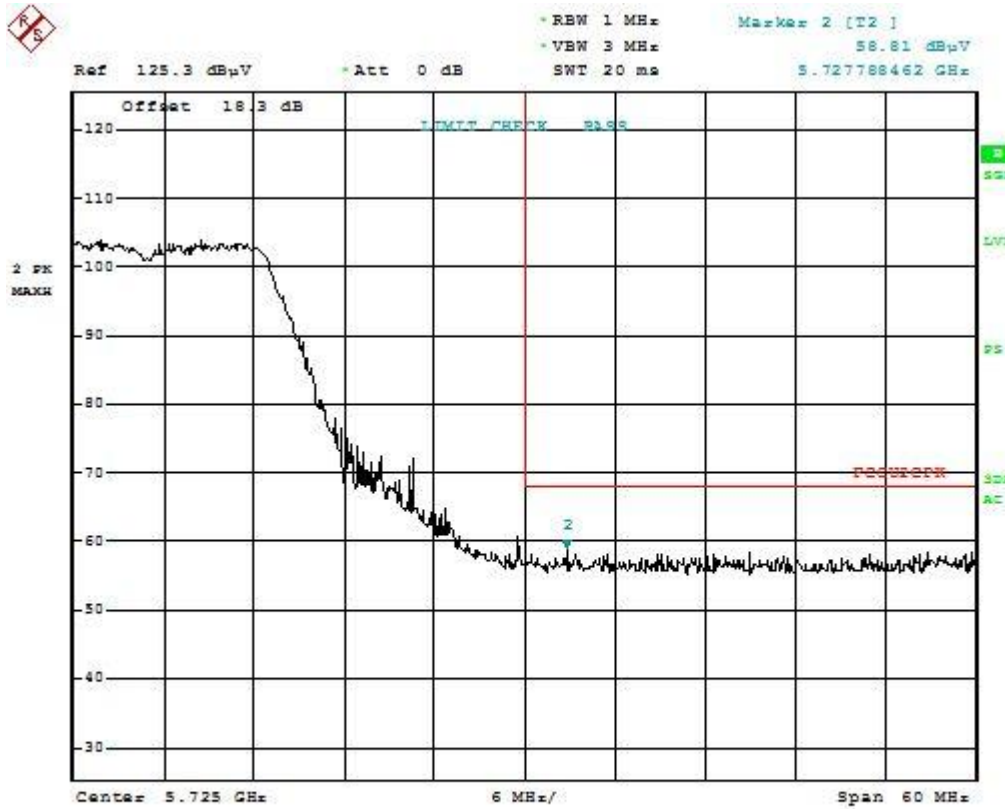
Worst Case Mode: 802.11a

Worst Case Transfer Rate: 6 Mbps

Distance of Measurements: 3 Meters

Operating Frequency: 5700MHz

Channel: 140



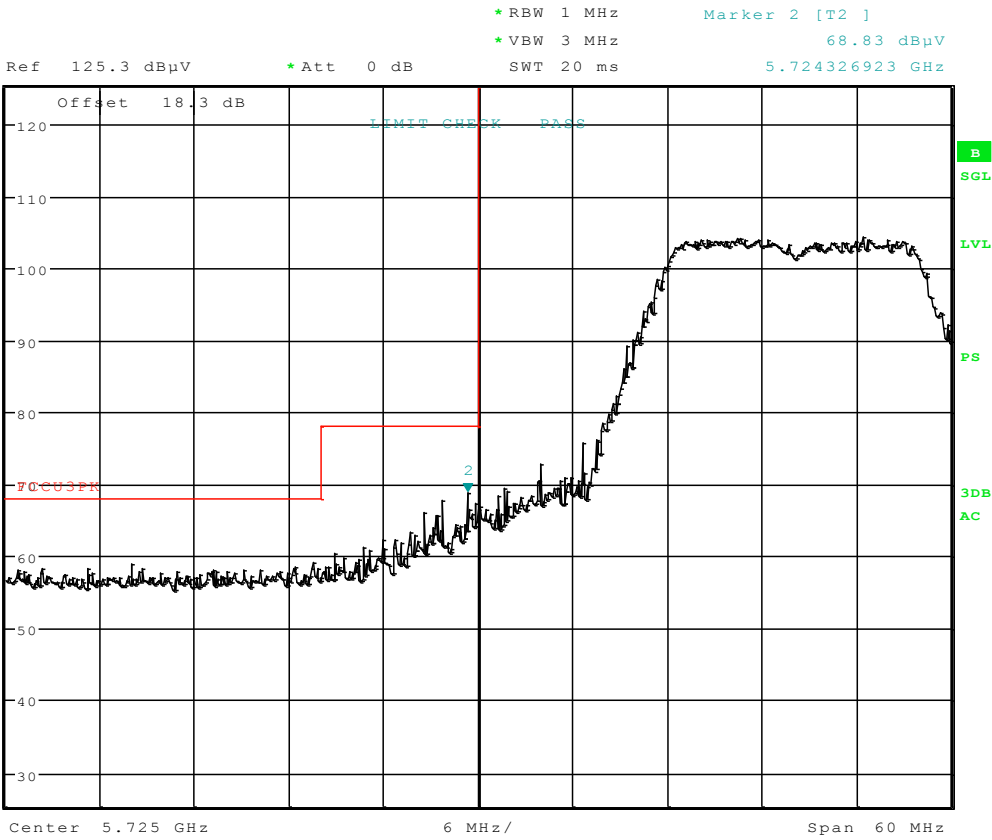
Date: 9.DEC.2015 00:37:47

Plot 7-95. Radiated Upper Band Edge Plot (Peak – UNII Band 2C)

FCC ID: ACJFZN1A	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	Panasonic	Reviewed by: Quality Manager
Test Report S/N: 0Y1512142135.ACJ	Test Dates: 12/08/2015 - 1/11/2016	EUT Type: Portable Handset		Page 84 of 112

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: 5745MHz
 Channel: 149



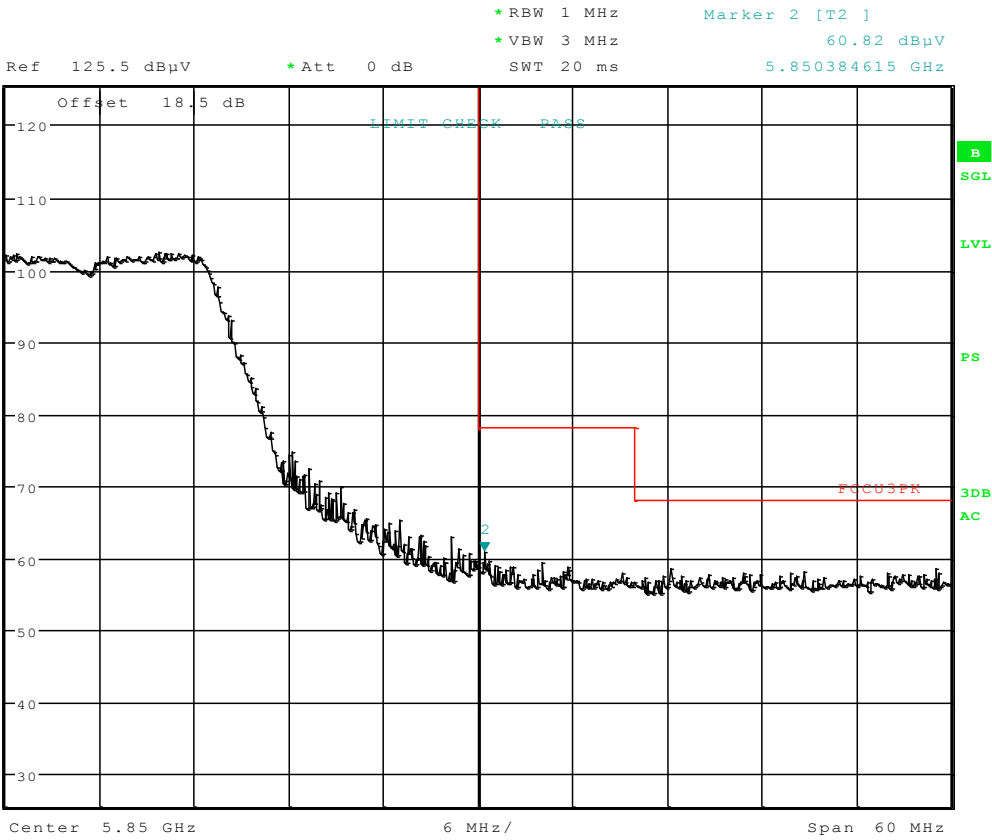
Date: 9.DEC.2015 00:42:11

Plot 7-96. Radiated Lower Band Edge Plot (Peak – UNII Band 3)

FCC ID: ACJFZN1A		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1512142135.ACJ	Test Dates: 12/08/2015 - 1/11/2016	EUT Type: Portable Handset	Page 85 of 112	

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



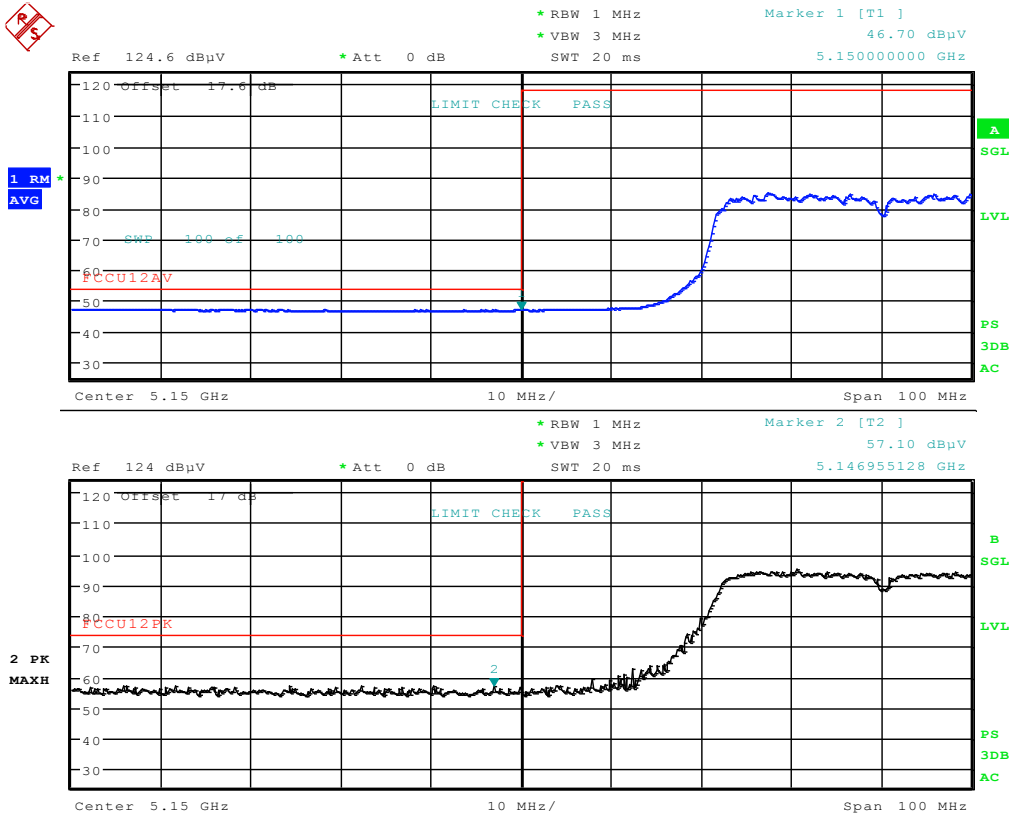
Date: 9.DEC.2015 00:46:00

Plot 7-97. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

FCC ID: ACJFZN1A		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1512142135.ACJ	Test Dates: 12/08/2015 - 1/11/2016	EUT Type: Portable Handset		Page 86 of 112

7.7.3 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



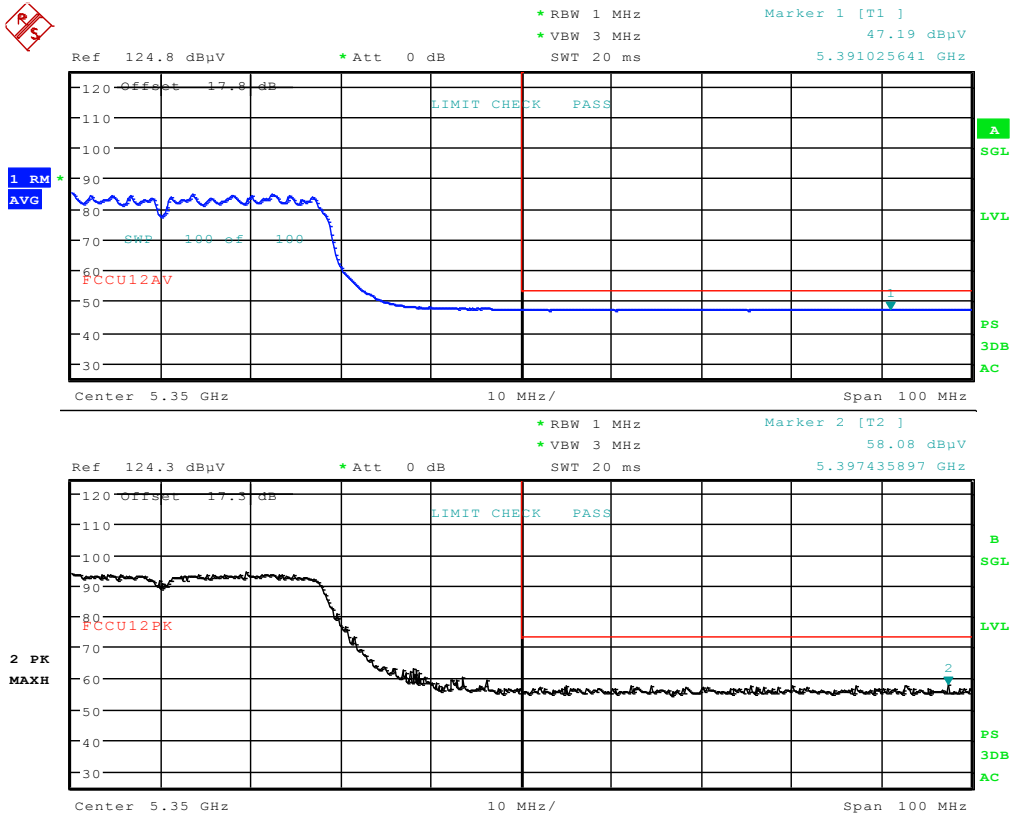
Date: 8.DEC.2015 23:17:37

Plot 7-98. Radiated Restricted Lower Band Edge Plot (Average & Peak – UNII Band 1)

FCC ID: ACJFZN1A		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1512142135.ACJ	Test Dates: 12/08/2015 - 1/11/2016	EUT Type: Portable Handset		Page 87 of 112

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



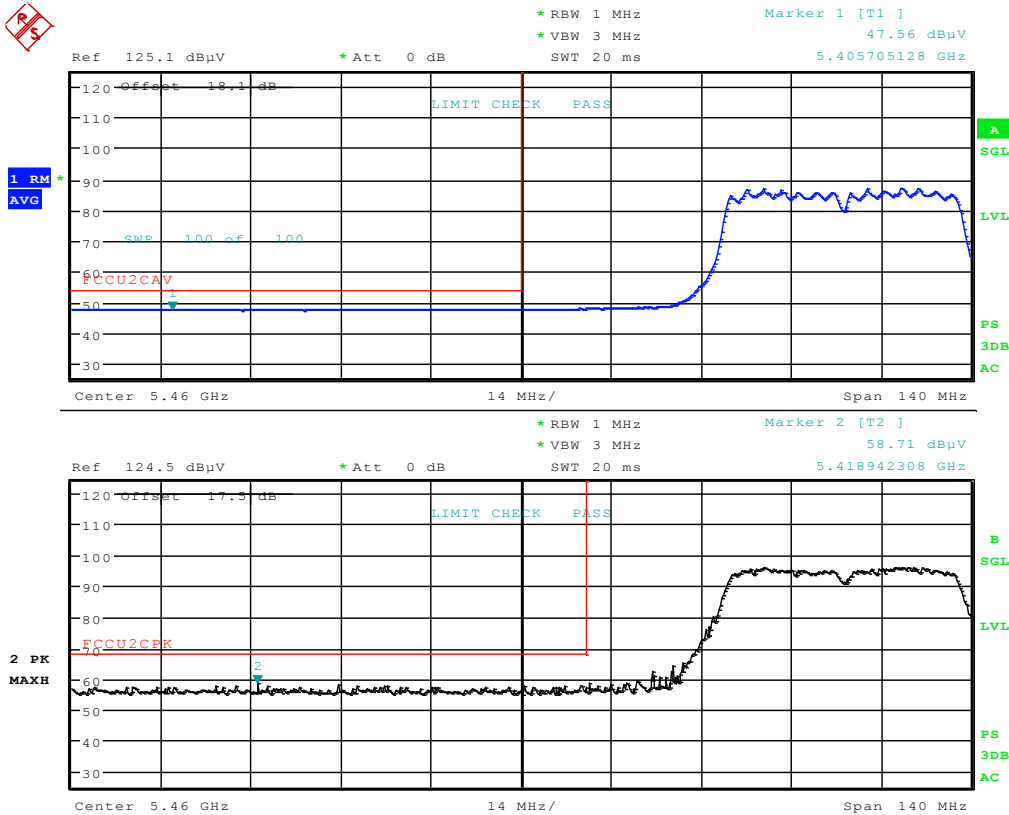
Date: 8.DEC.2015 23:46:06

Plot 7-99. Radiated Restricted Upper Band Edge Plot (Average & Peak – UNII Band 2A)

FCC ID: ACJFZN1A		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1512142135.ACJ	Test Dates: 12/08/2015 - 1/11/2016	EUT Type: Portable Handset		Page 88 of 112

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



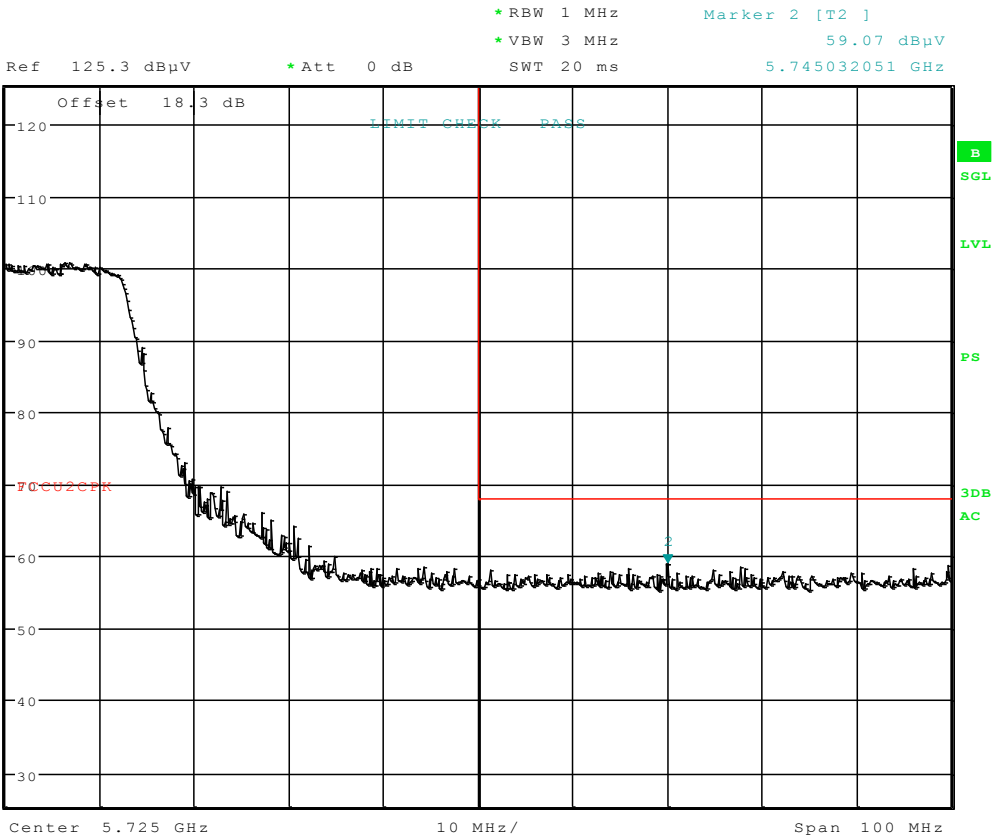
Date: 9.DEC.2015 00:04:06

Plot 7-100. Radiated Restricted Lower Band Edge Plot (Average & Peak – UNII Band 2C)

FCC ID: ACJFZN1A		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1512142135.ACJ	Test Dates: 12/08/2015 - 1/11/2016	EUT Type: Portable Handset		Page 89 of 112

Radiated Band Edge Measurements (40MHz BW)
§15.407(b.1)(b.2) §15.205 §15.209

Worst Case Mode: 802.11n (40MHz)
 Worst Case Transfer Rate: MCS0
 Distance of Measurements: 3 Meters
 Operating Frequency: 5670MHz
 Channel: 134



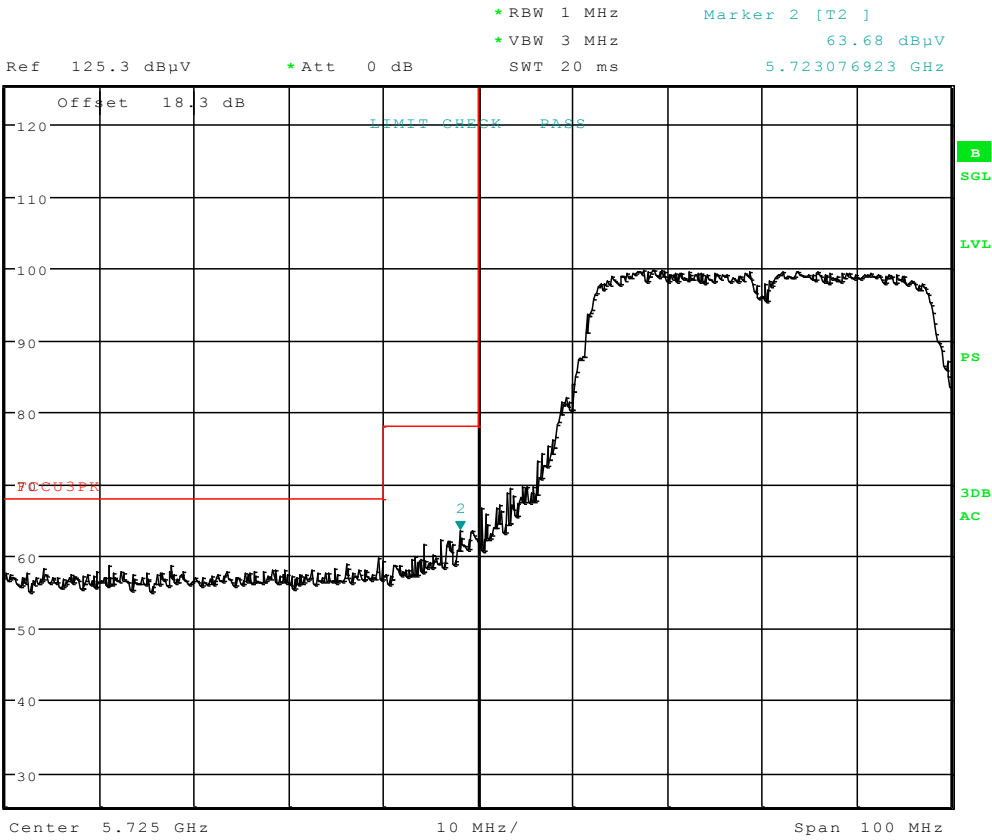
Date: 16.DEC.2015 01:45:43

Plot 7-101. Radiated Upper Band Edge Plot (Peak – UNII Band 2C)

FCC ID: ACJFZN1A		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1512142135.ACJ	Test Dates: 12/08/2015 - 1/11/2016	EUT Type: Portable Handset		Page 90 of 112

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: 5755MHz
 Channel: 151



Date: 16.DEC.2015 01:51:00

Plot 7-102. Radiated Lower Band Edge Plot (Peak – UNII Band 3)

FCC ID: ACJFZN1A	ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1512142135.ACJ	Test Dates: 12/08/2015 - 1/11/2016	EUT Type: Portable Handset	Page 91 of 112	

Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

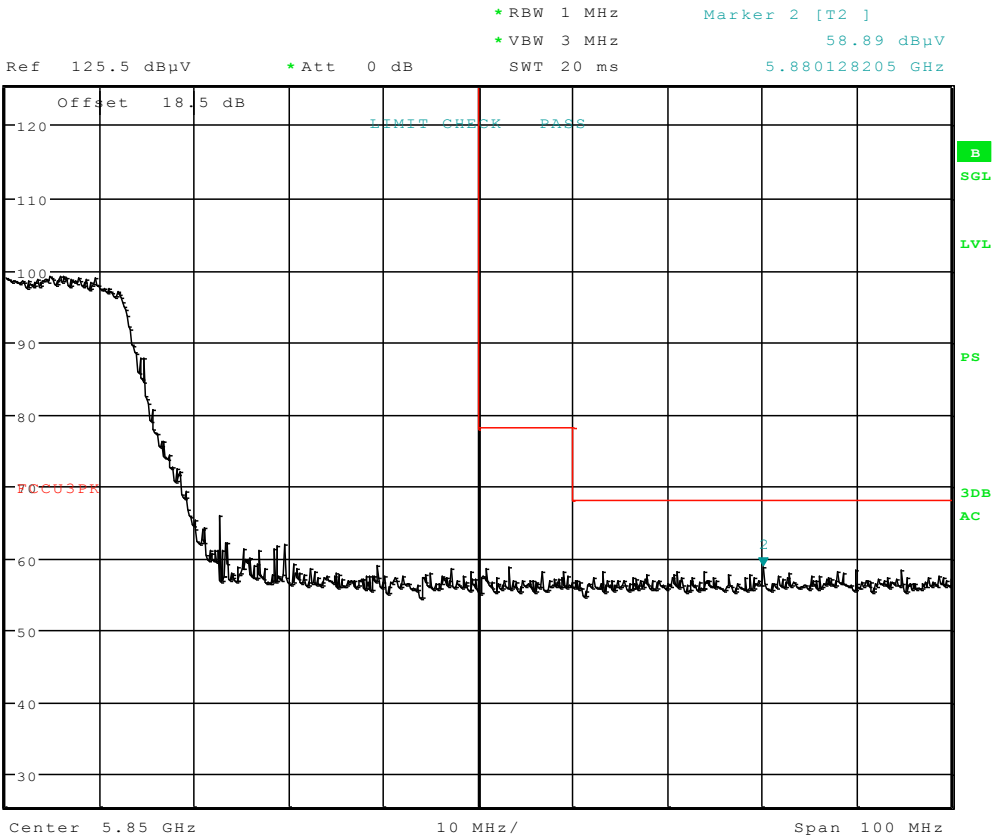
Worst Case Mode: 802.11n (40MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5795MHz

Channel: 159



Date: 16.DEC.2015 01:56:01

Plot 7-103. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

FCC ID: ACJFZN1A		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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7.7.4 Radiated Band Edge Measurements (80MHz BW) §15.407(b.1)(b.2) §15.205 §15.209

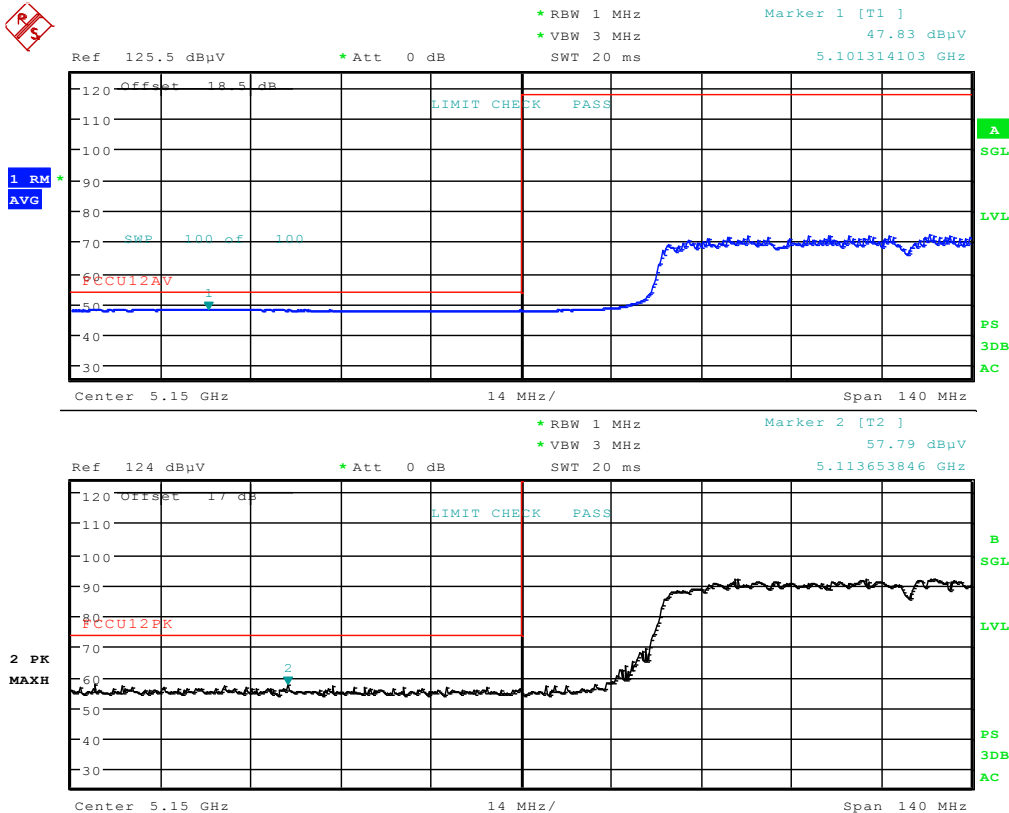
Worst Case Mode: 802.11ac (80MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5210MHz

Channel: 42



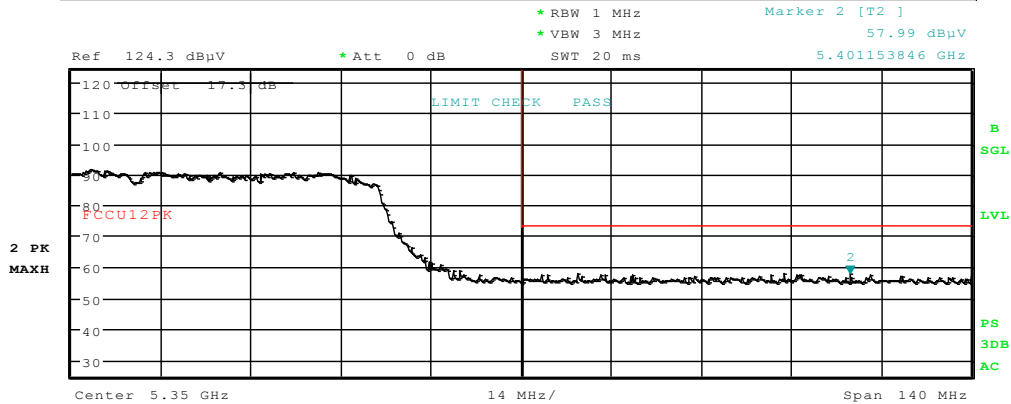
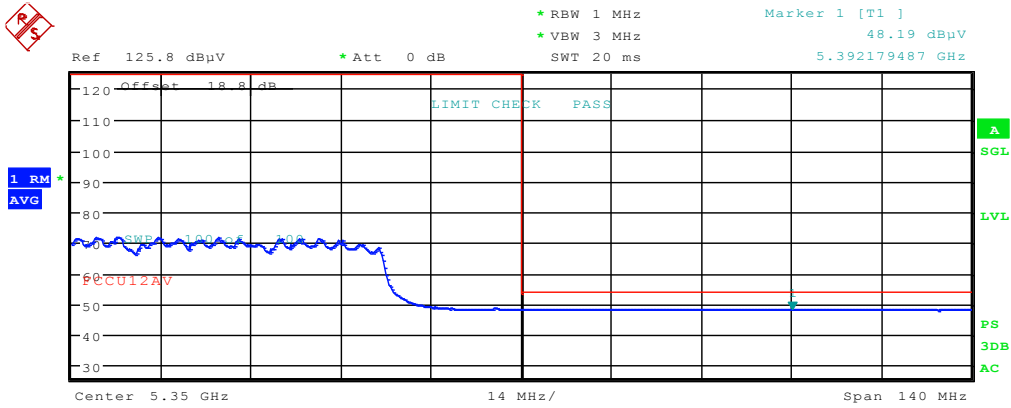
Date: 8.DEC.2015 23:21:38

Plot 7-104. Radiated Restricted Lower Band Edge Plot (Average & Peak – UNII Band 1)

FCC ID: ACJFZN1A		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1512142135.ACJ	Test Dates: 12/08/2015 - 1/11/2016	EUT Type: Portable Handset		Page 93 of 112

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



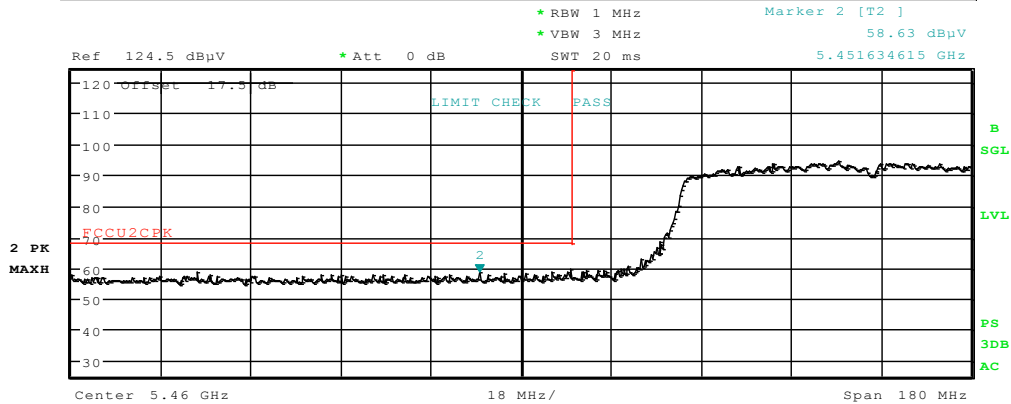
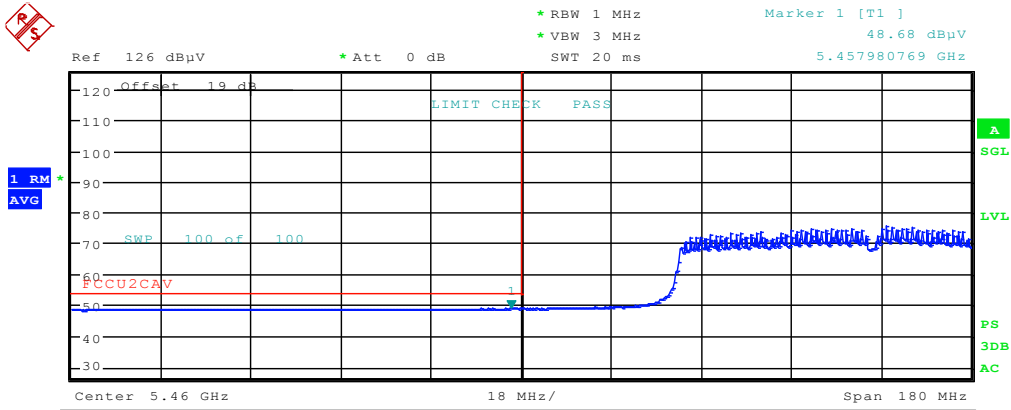
Date: 8.DEC.2015 23:49:39

Plot 7-105. Radiated Restricted Upper Band Edge Plot (Average & Peak – UNII Band 2A)

FCC ID: ACJFZN1A		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1512142135.ACJ	Test Dates: 12/08/2015 - 1/11/2016	EUT Type: Portable Handset		Page 94 of 112

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



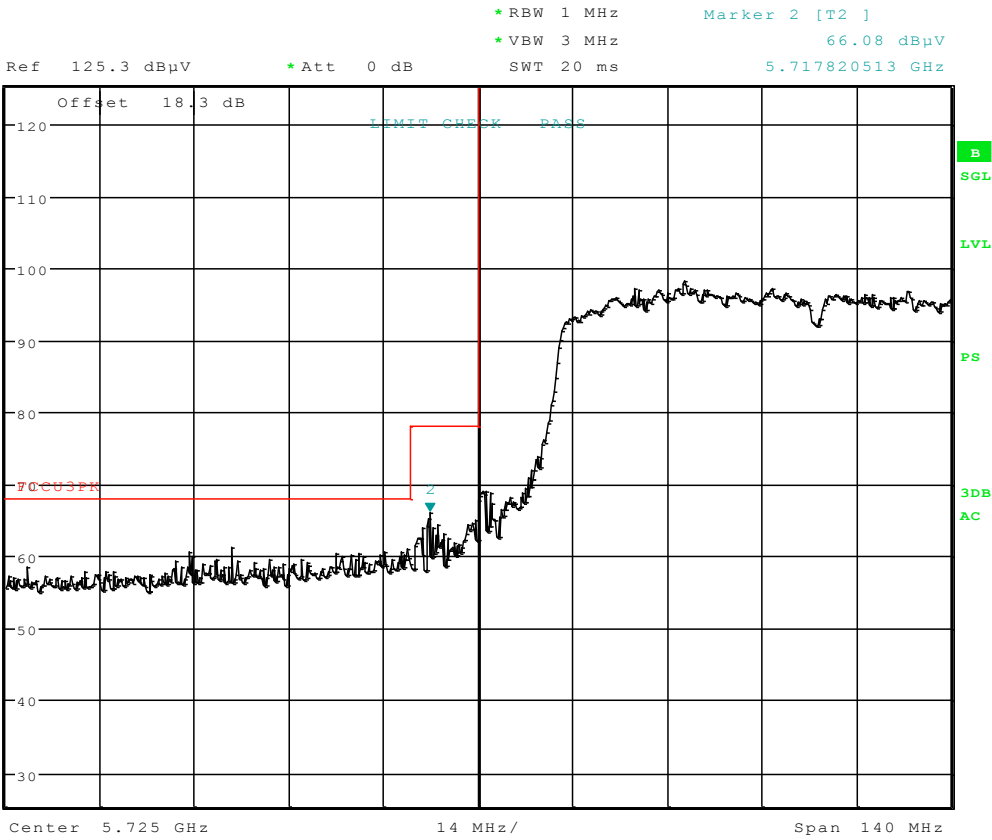
Date: 9.DEC.2015 00:08:08

Plot 7-106. Radiated Restricted Lower Band Edge Plot (Average & Peak – UNII Band 2C)

FCC ID: ACJFZN1A		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1512142135.ACJ	Test Dates: 12/08/2015 - 1/11/2016	EUT Type: Portable Handset		Page 95 of 112

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



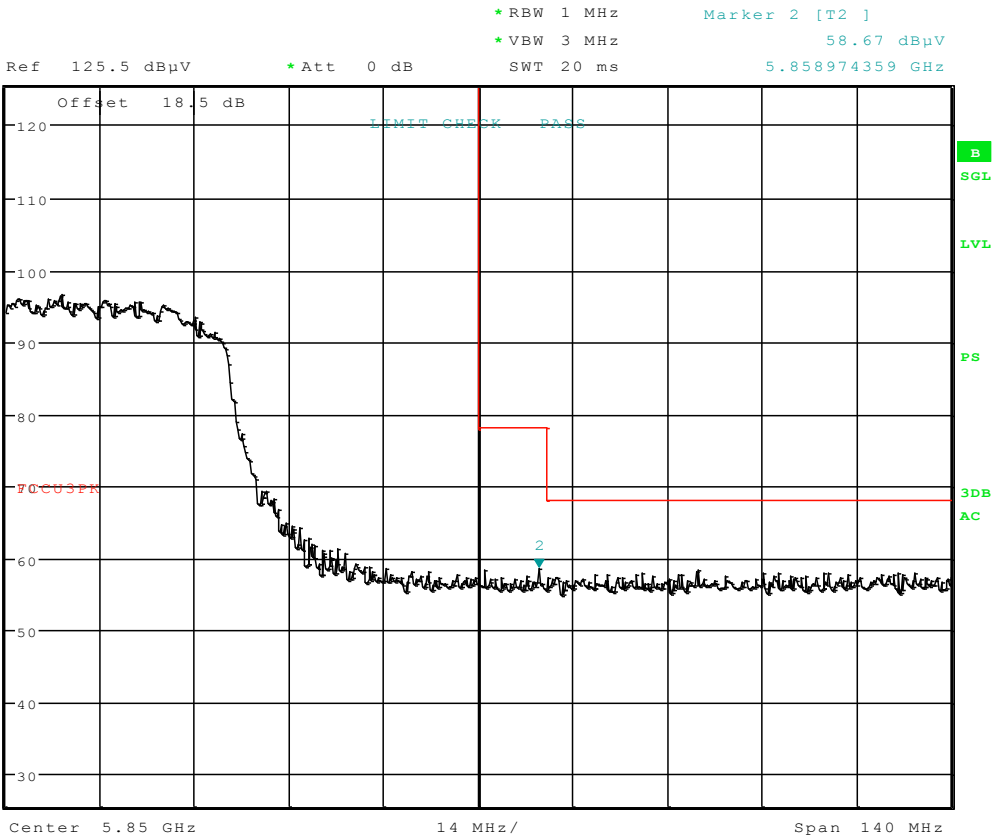
Date: 16.DEC.2015 02:03:13

Plot 7-107. Radiated Lower Band Edge Plot (Peak – UNII Band 3)

FCC ID: ACJFZN1A	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	Panasonic	Reviewed by: Quality Manager
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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: 16.DEC.2015 02:08:16

Plot 7-108. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

FCC ID: ACJFZN1A		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1512142135.ACJ	Test Dates: 12/08/2015 - 1/11/2016	EUT Type: Portable Handset	Page 97 of 112	

7.8 Radiated Spurious Emissions Measurements – Below 1GHz

§15.209

Test Overview and Limit

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

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Table 7-26 per Section 15.209.

Frequency	Field Strength [μ V/m]	Measured Distance [Meters]
0.009 – 0.490 MHz	2400/F (kHz)	300
0.490 – 1.705 MHz	24000/F (kHz)	30
1.705 – 30.00 MHz	30	30
30.00 – 88.00 MHz	100	3
88.00 – 216.0 MHz	150	3
216.0 – 960.0 MHz	200	3
Above 960.0 MHz	500	3

Table 7-26. Radiated Limits



Test Procedures Used

ANSI C63.4-2014

Test Settings

Quasi-Peak Field Strength Measurements

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

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Test Setup

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

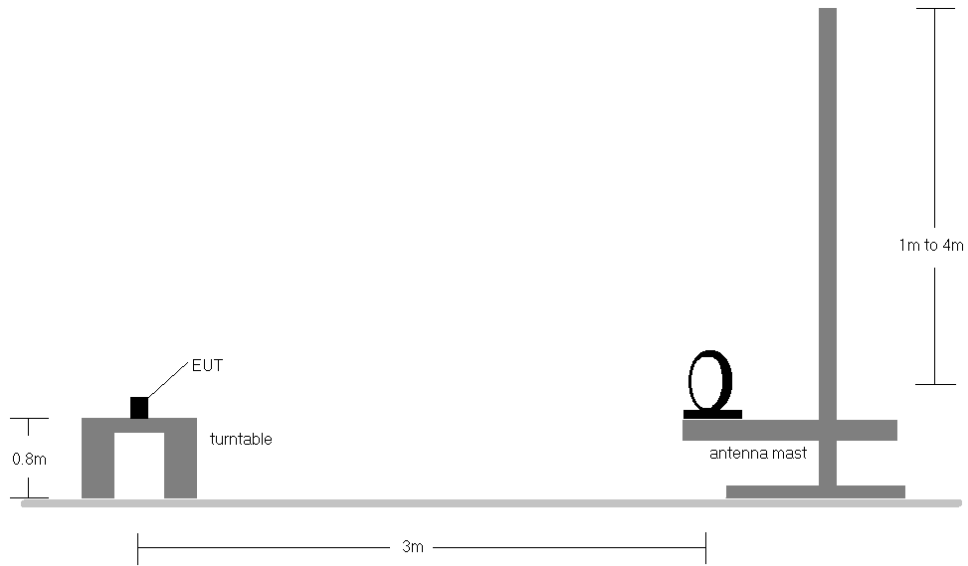


Figure 7-6. Radiated Test Setup < 30MHz

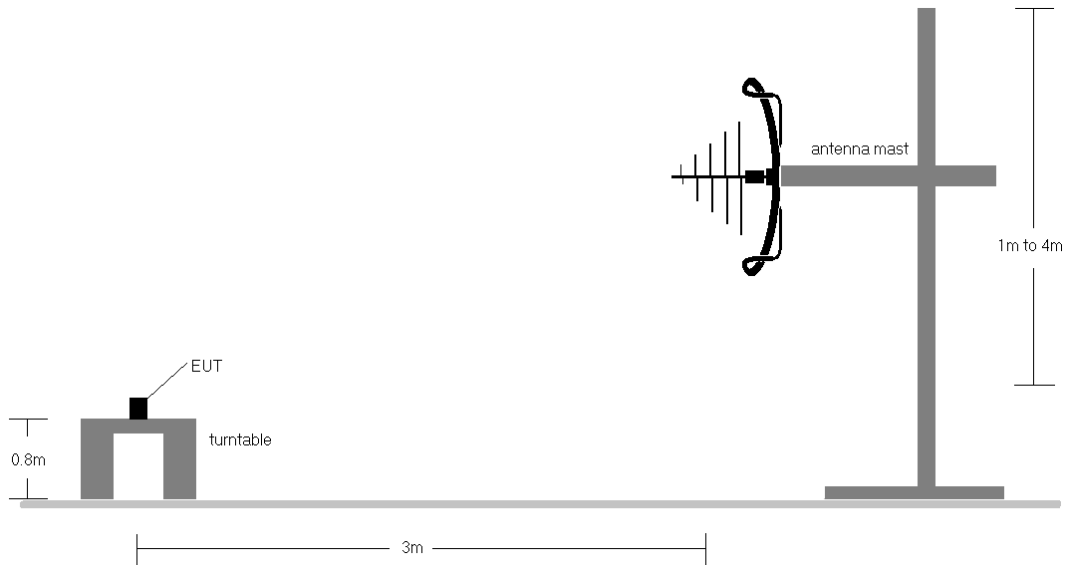





Figure 7-7. Radiated Test Setup < 1GHz

FCC ID: ACJFZN1A		FCC Pt. 15.407 802.11a/n/ac UNI MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
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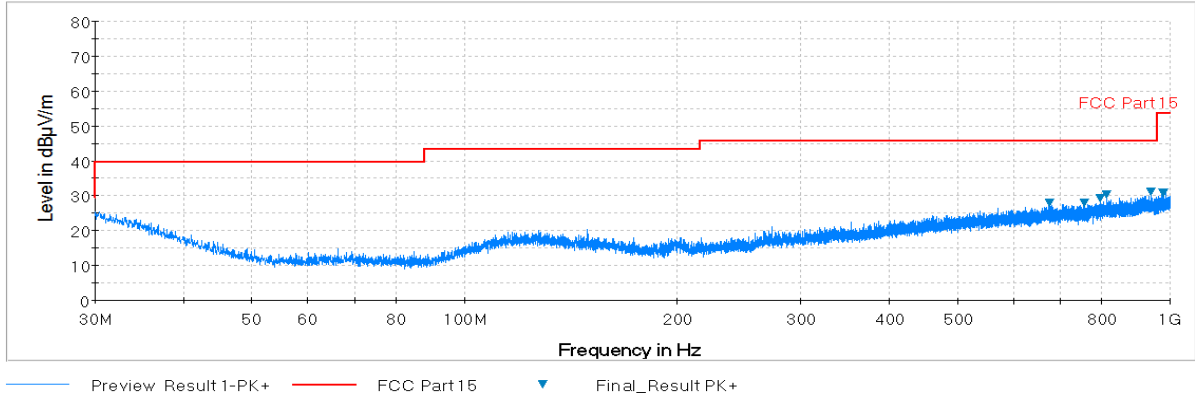
Test Notes

1. All emissions lying in restricted bands specified in §15.205 are below the limit shown in Table 7-13.
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.

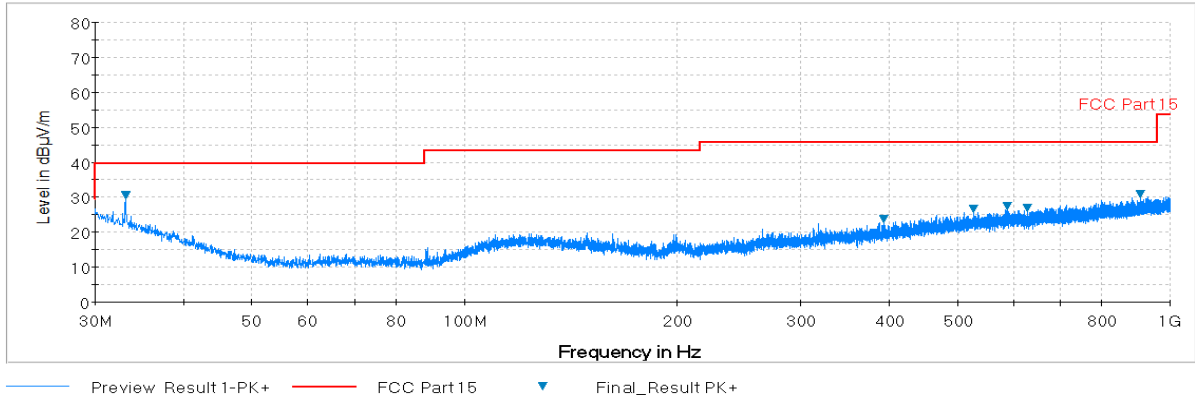
FCC ID: ACJFZN1A		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1512142135.ACJ	Test Dates: 12/08/2015 - 1/11/2016	EUT Type: Portable Handset	Page 100 of 112	

Radiated Spurious Emissions Measurements (Below 1GHz)

§15.209



Plot 7-109. Radiated Spurious Plot below 1GHz (802.11a – U3 Ch. 157, Ant. Pol. H)



Plot 7-110. Radiated Spurious Plot below 1GHz (802.11a – U3 Ch. 157, Ant. Pol. V)

FCC ID: ACJFZN1A		FCC Pt. 15.407 802.11a/n/ac UNI MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
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7.9 Line-Conducted Test Data

§15.407

Test Overview and Limit

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

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

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

Table 7-27. Conducted Limits

*Decreases with the logarithm of the frequency.

Test Procedures Used

ANSI C63.10-2013, Section 6.2



Test Settings

Quasi-Peak Field Strength Measurements

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

Average Field Strength Measurements

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

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Test Setup

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

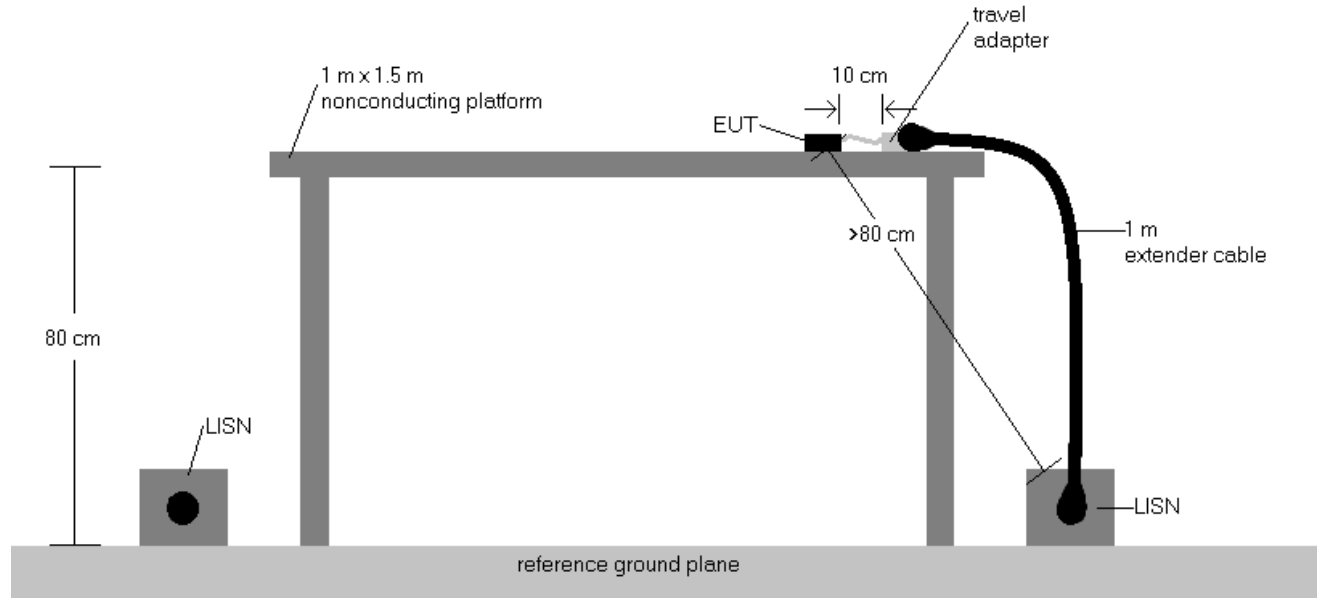




Figure 7-8. Test Instrument & Measurement Setup

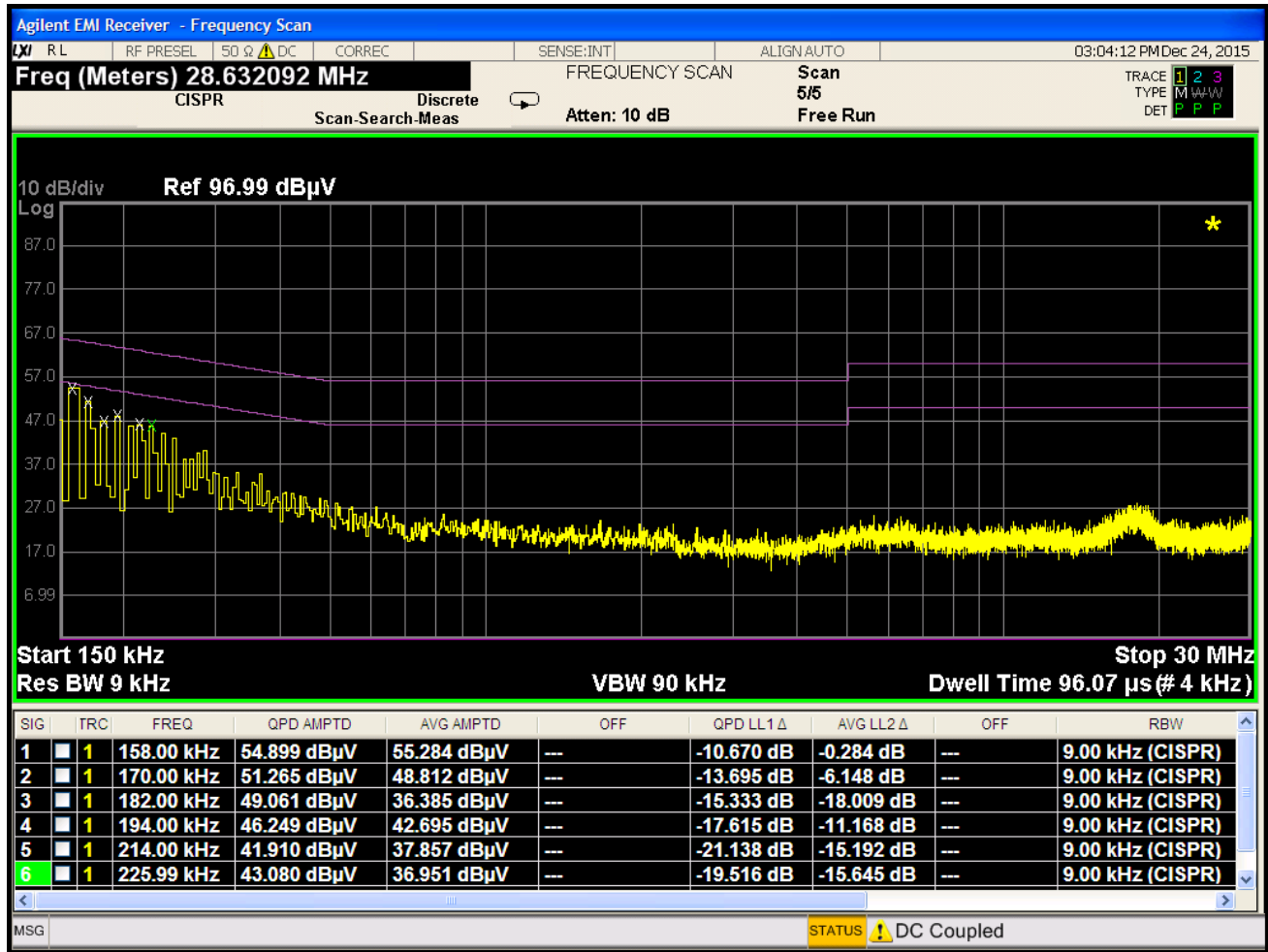
Test Notes

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

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Line-Conducted Test Data

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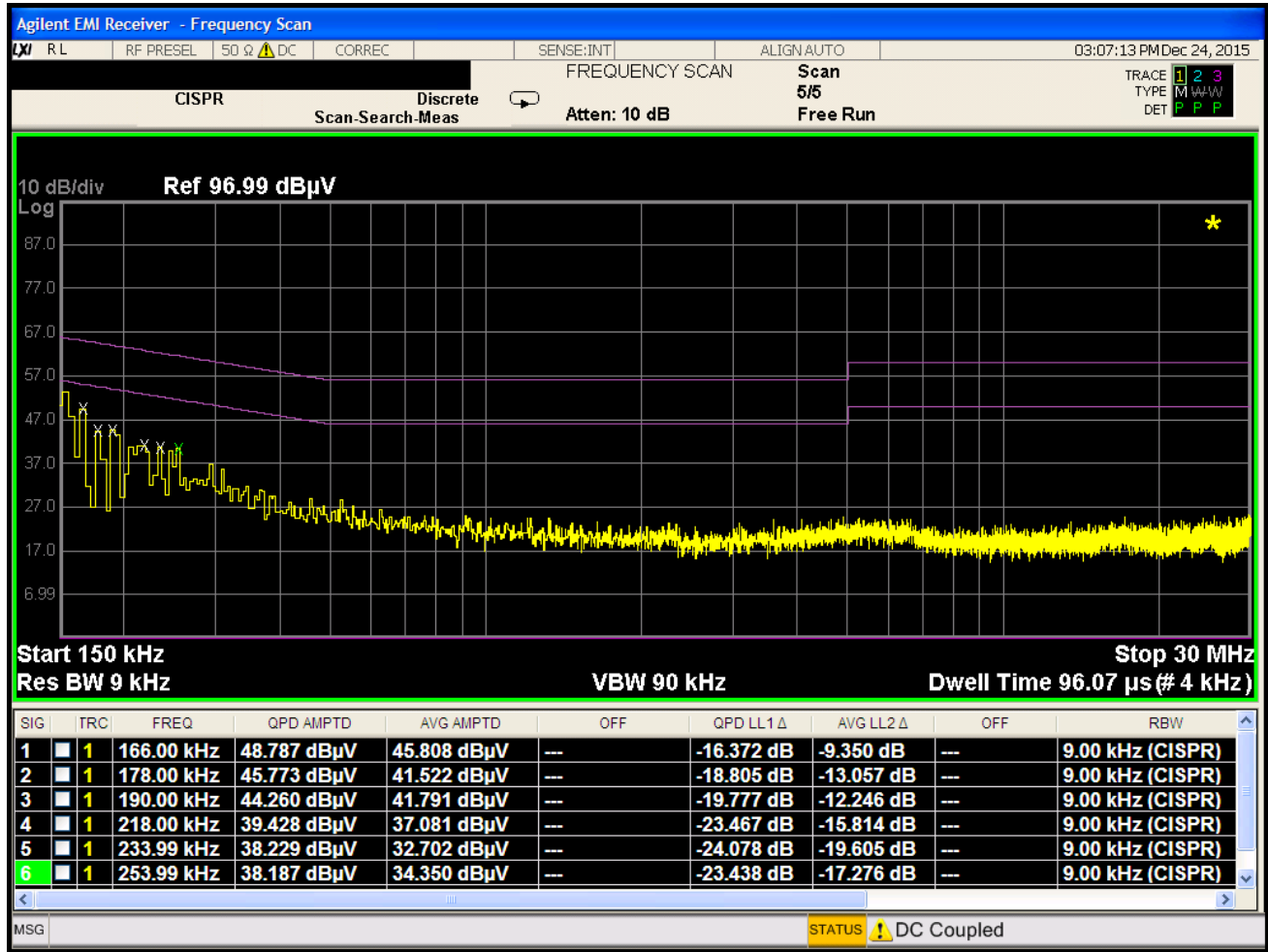


Plot 7-111. Line Conducted Plot with 802.11a UNII Band 1 (L1)

FCC ID: ACJFZN1A	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	Panasonic	Reviewed by: Quality Manager
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Line-Conducted Test Data

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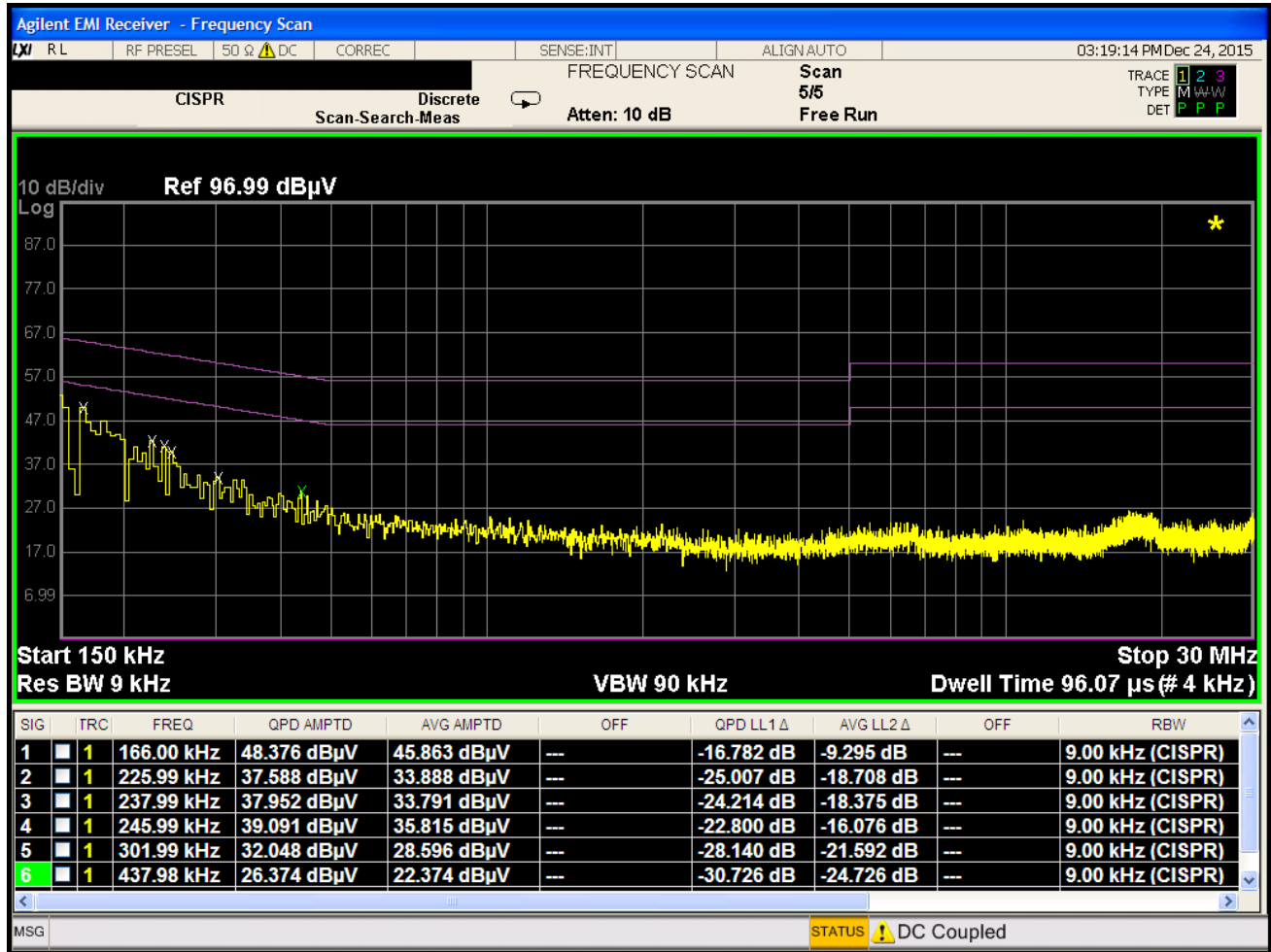


Plot 7-112. Line Conducted Plot with 802.11a UNII Band 1 (N)

FCC ID: ACJFZN1A		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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Line-Conducted Test Data

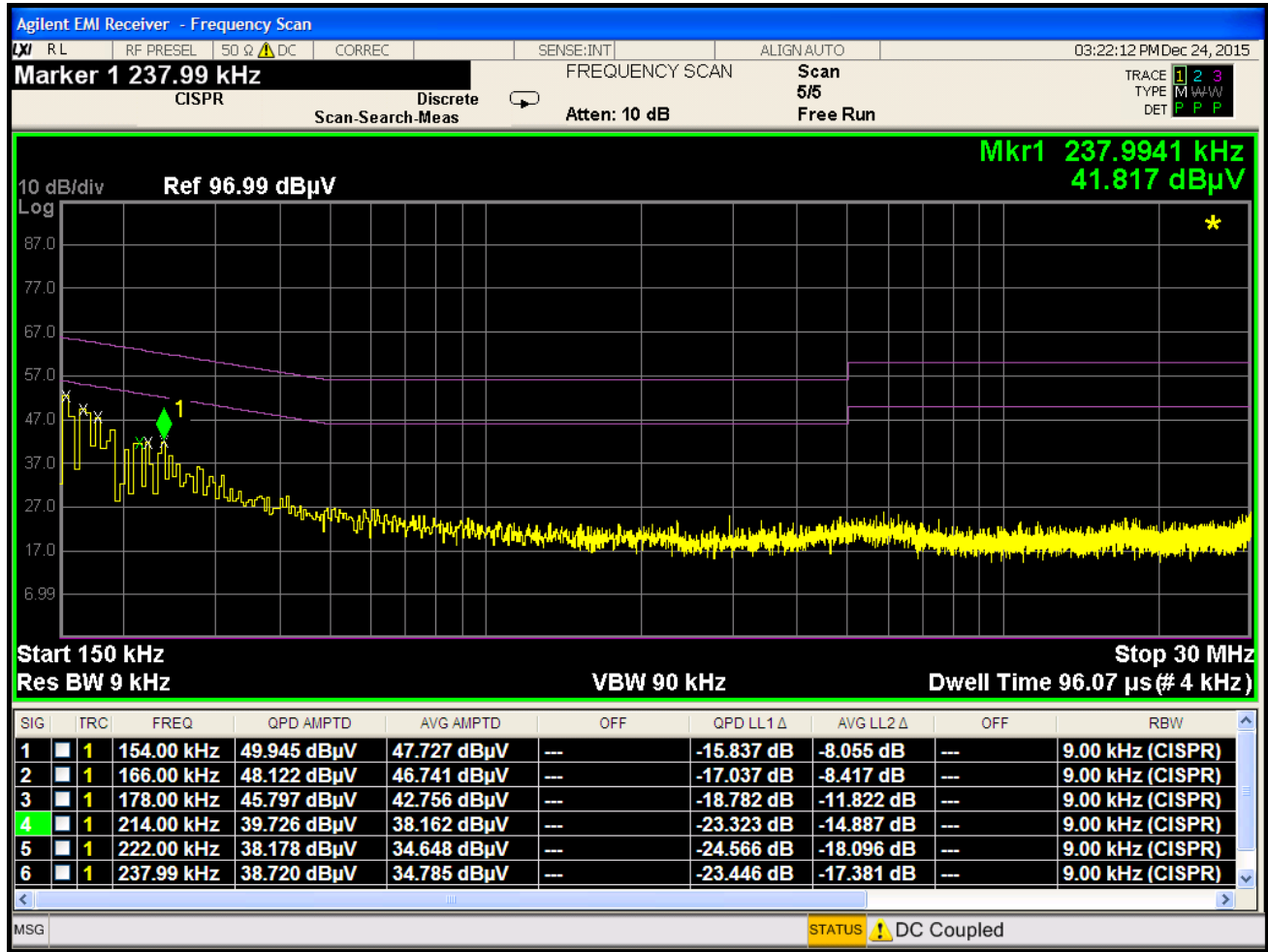
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Line-Conducted Test Data

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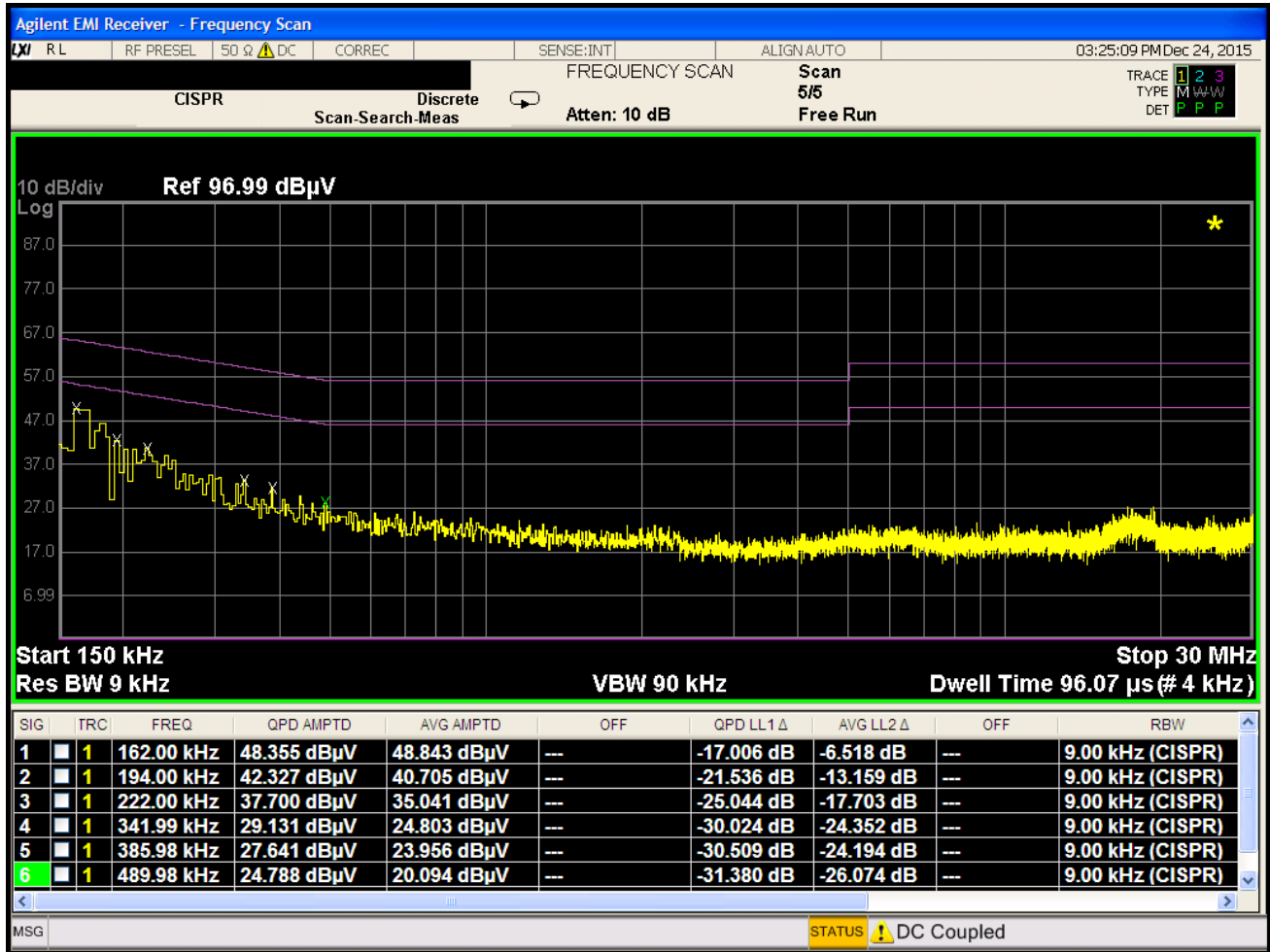


Plot 7-114. Line Conducted Plot with 802.11a UNII Band 2A (N)

FCC ID: ACJFZN1A	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	Panasonic	Reviewed by: Quality Manager
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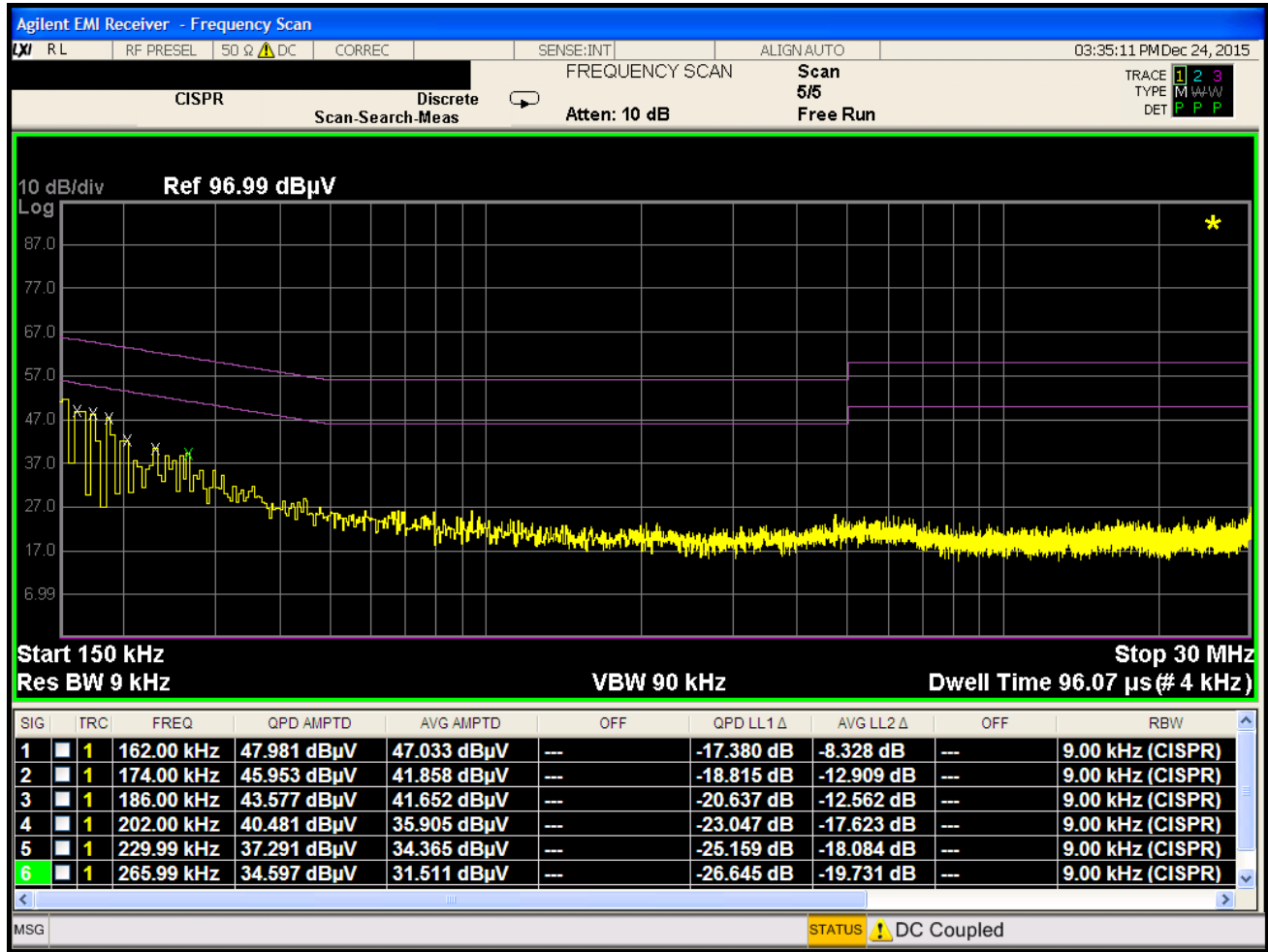


Plot 7-115. Line Conducted Plot with 802.11a UNII Band 2C (L1)

FCC ID: ACJFZN1A	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	Panasonic	Reviewed by: Quality Manager
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Line-Conducted Test Data

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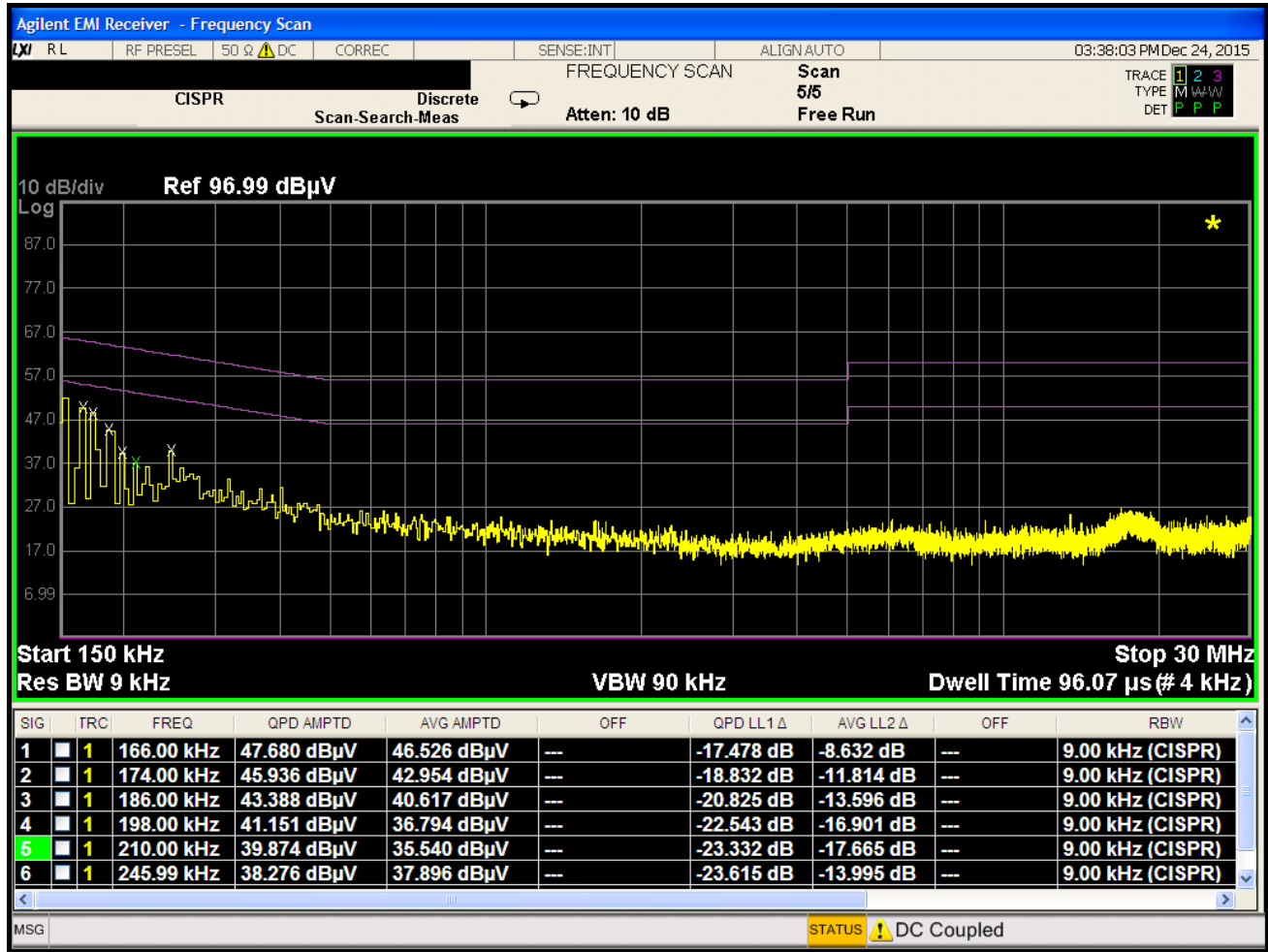


Plot 7-116. Line Conducted Plot with 802.11a UNII Band 2C (N)

FCC ID: ACJFZN1A		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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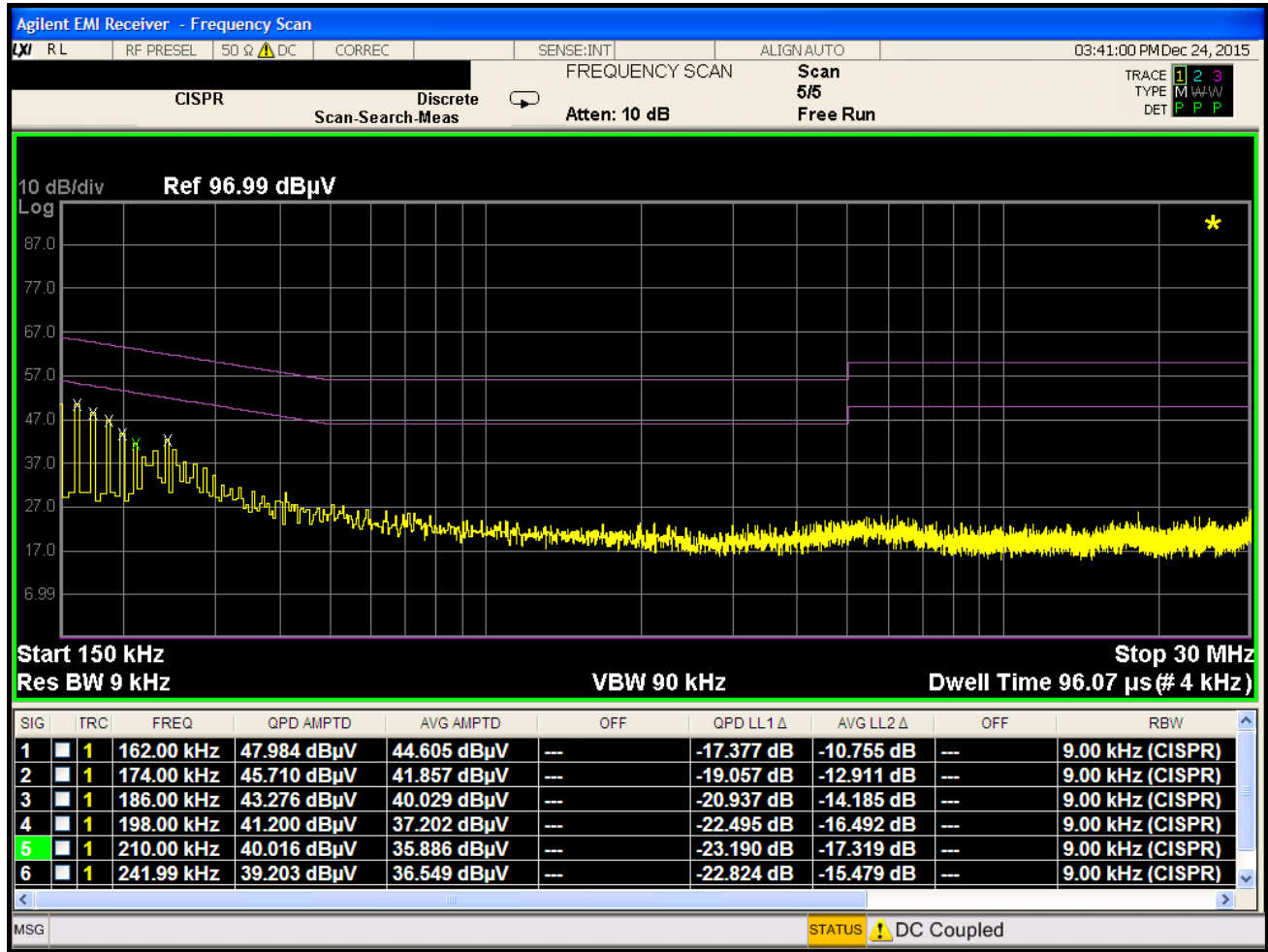


Plot 7-117. Line Conducted Plot with 802.11a UNII Band 3 (L1)

FCC ID: ACJFZN1A	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	Panasonic	Reviewed by: Quality Manager
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8.0 CONCLUSION

The data collected relate only the item(s) tested and show that the **Panasonic Portable Handset FCC ID: ACJFZN1A** is in compliance with Part 15E of the FCC Rules.

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