

	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]		Max Permissible Power Density [dBm/500kHz]	Margin [dB]	Pass / Fail
	5745	149	а	6	3.10	30.0	-26.90	Pass
	5785	157	а	6	3.35	30.0	-26.65	Pass
	5825	165	а	6	-0.70	30.0	-30.70	Pass
e	5745	149	n (20MHz)	6.5/7.2 (MCS0)	3.10	30.0	-26.90	Pass
Band	5785	157	n (20MHz)	6.5/7.2 (MCS0)	2.84	30.0	-27.16	Pass
ä	5825	165	n (20MHz)	6.5/7.2 (MCS0)	-0.87	30.0	-30.87	Pass
	5755	151	n (40MHz)	13.5/15 (MCS0)	-2.72	30.0	-32.72	Pass
	5795	159	n (40MHz)	13.5/15 (MCS0)	-2.89	30.0	-32.89	Pass
	5775	155	ac (80MHz)	29.3/32.5 (MCS0)	-7.70	30.0	-37.70	Pass

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



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

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

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 94 of 949
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Plot 7-110. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) - Ch. 157)

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Demo 95 of 249
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Plot 7-112. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 3) - Ch. 151)

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Test Report S/N:	Test Dates:	EUT Type:		Demo 96 of 249	
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Plot 7-114. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 3) - Ch. 155)

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Antenna-2 Power Spectral Density Measurements

	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]		Max Permissible Power Density [dBm/MHz]	Margin [dB]	Pass / Fail
	5180	36	а	6	1.15	11.0	-9.86	Pass
	5200	40	а	6	5.42	11.0	-5.58	Pass
	5240	48	а	6	5.29	11.0	-5.71	Pass
-	5180	36	n (20MHz)	6.5/7.2 (MCS0)	0.73	11.0	-10.27	Pass
Band	5200	40	n (20MHz)	6.5/7.2 (MCS0)	4.58	11.0	-6.42	Pass
B	5240	48	n (20MHz)	6.5/7.2 (MCS0)	4.69	11.0	-6.31	Pass
	5190	38	n (40MHz)	13.5/15 (MCS0)	-4.35	11.0	-15.35	Pass
	5230	46	n (40MHz)	13.5/15 (MCS0)	-0.73	11.0	-11.73	Pass
	5210	42	ac (80MHz)	29.3/32.5 (MCS0)	-8.74	11.0	-19.74	Pass
	5260	52	а	6	4.71	11.0	-6.29	Pass
	5280	56	а	6	4.98	11.0	-6.02	Pass
	5320	64	а	6	1.22	11.0	-9.78	Pass
2A	5260	52	n (20MHz)	6.5/7.2 (MCS0)	4.74	11.0	-6.26	Pass
Band 2A	5280	56	n (20MHz)	6.5/7.2 (MCS0)	4.81	11.0	-6.19	Pass
Ba	5320	64	n (20MHz)	6.5/7.2 (MCS0)	1.04	11.0	-9.96	Pass
	5270	54	n (40MHz)	13.5/15 (MCS0)	-0.73	11.0	-11.73	Pass
	5310	62	n (40MHz)	13.5/15 (MCS0)	-4.46	11.0	-15.46	Pass
	5290	58	ac (80MHz)	29.3/32.5 (MCS0)	-8.54	11.0	-19.54	Pass
	5500	100	а	6	1.84	11.0	-9.16	Pass
	5580	116	а	6	5.81	11.0	-5.19	Pass
	5720	144	а	6	4.49	11.0	-6.51	Pass
	5500	100	n (20MHz)	6.5/7.2 (MCS0)	1.38	11.0	-9.63	Pass
2C	5580	116	n (20MHz)	6.5/7.2 (MCS0)	4.97	11.0	-6.03	Pass
Band	5720	144	n (20MHz)	6.5/7.2 (MCS0)	4.60	11.0	-6.40	Pass
Ba	5510	102	n (40MHz)	13.5/15 (MCS0)	-4.63	11.0	-15.63	Pass
	5550	110	n (40MHz)	13.5/15 (MCS0)	-0.30	11.0	-11.30	Pass
	5710	142	n (40MHz)	13.5/15 (MCS0)	-1.84	11.0	-12.84	Pass
	5530	106	ac (80MHz)	29.3/32.5 (MCS0)	-8.40	11.0	-19.40	Pass
	5690	138	ac (80MHz)	29.3/32.5 (MCS0)	-6.54	11.0	-17.54	Pass

Table 7-19. Conducted Power Spectral Density Measurements

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

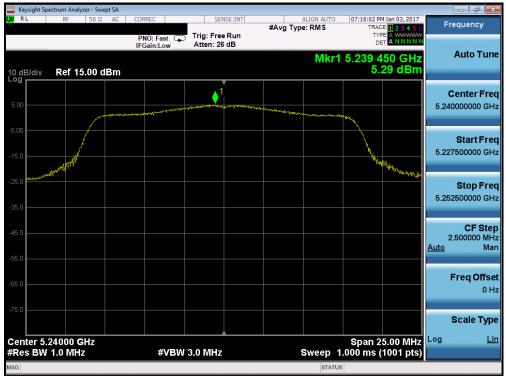


Plot 7-116. Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 40)

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager	
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Plot 7-118. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) - Ch. 36)

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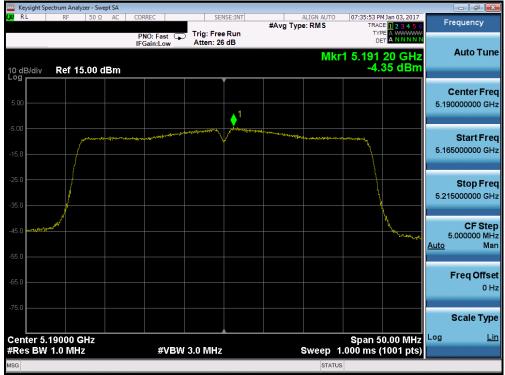
Plot 7-119. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 40)

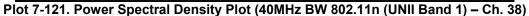


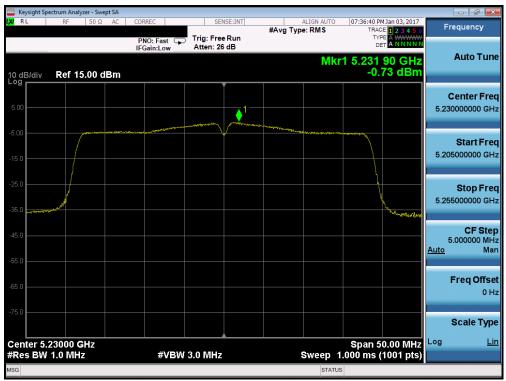
Plot 7-120. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) - Ch. 48)

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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Plot 7-122. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 1) – Ch. 46)

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

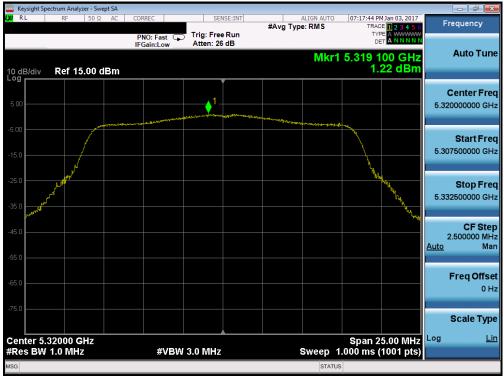
FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Approved by: Quality Manager
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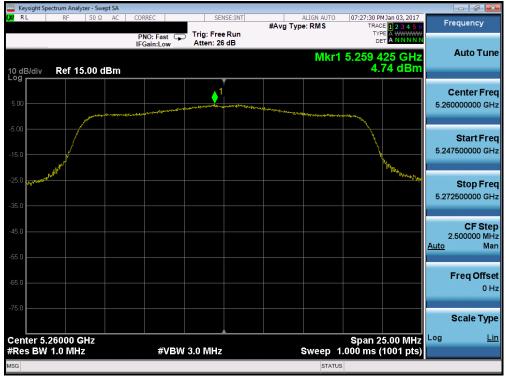
Plot 7-125. Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 56)



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

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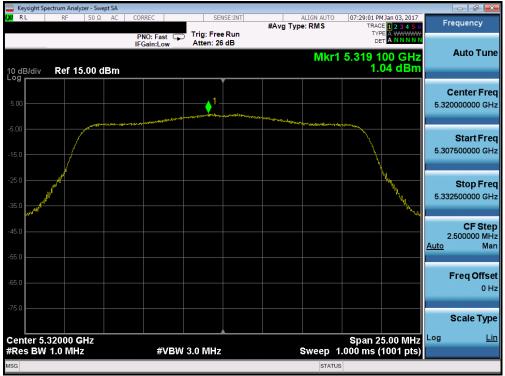
Plot 7-127. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 52)



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

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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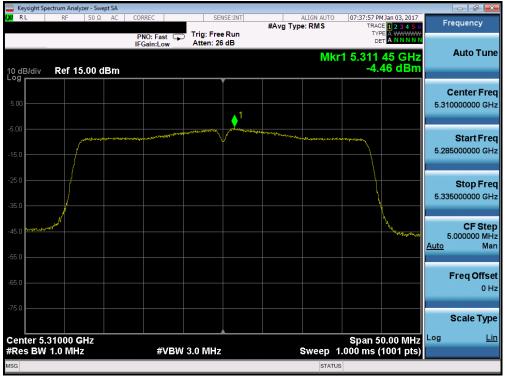
Plot 7-129. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 64)



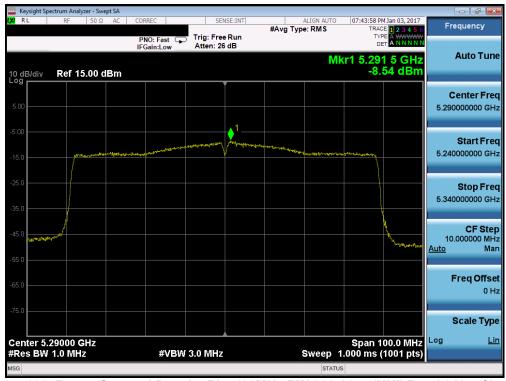
Plot 7-130. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2A) - Ch. 54)

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



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

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

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

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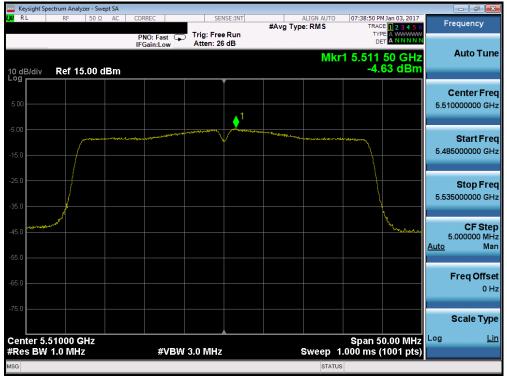


Plot 7-138. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) - Ch. 144)

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

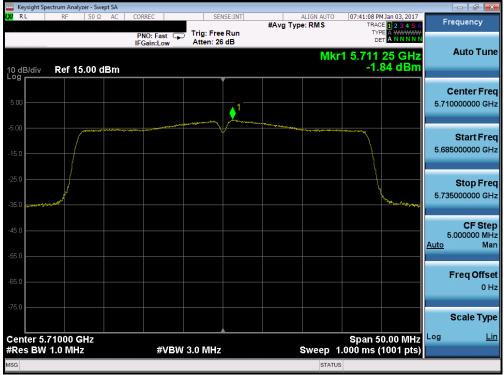


Plot 7-140. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) - Ch. 110)

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



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

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

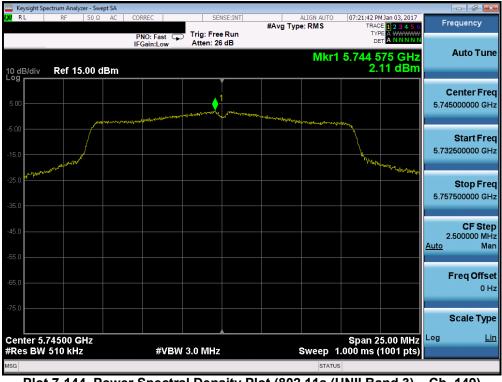
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	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]		Max Permissible Power Density [dBm/500kHz]	Margin [dB]	Pass / Fail
	5745	149	а	6	2.11	30.0	-27.89	Pass
	5785	157	а	6	2.23	30.0	-27.77	Pass
	5825	165	а	6	-1.40	30.0	-31.40	Pass
e	5745	149	n (20MHz)	6.5/7.2 (MCS0)	2.18	30.0	-27.82	Pass
Band	5785	157	n (20MHz)	6.5/7.2 (MCS0)	2.15	30.0	-27.85	Pass
ä	5825	165	n (20MHz)	6.5/7.2 (MCS0)	-1.74	30.0	-31.74	Pass
	5755	151	n (40MHz)	13.5/15 (MCS0)	-2.89	30.0	-32.89	Pass
	5795	159	n (40MHz)	13.5/15 (MCS0)	-3.49	30.0	-33.49	Pass
	5775	155	ac (80MHz)	29.3/32.5 (MCS0)	-7.96	30.0	-37.96	Pass

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



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

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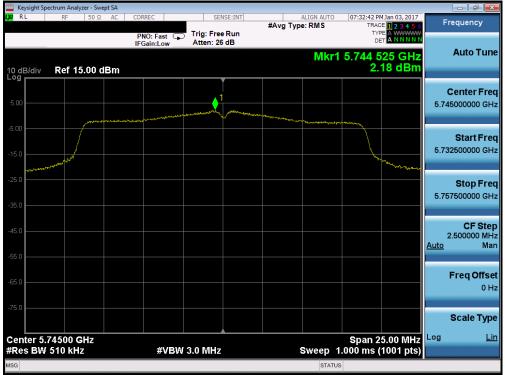


Plot 7-146. Power Spectral Density Plot (802.11a (UNII Band 3) - Ch. 165)

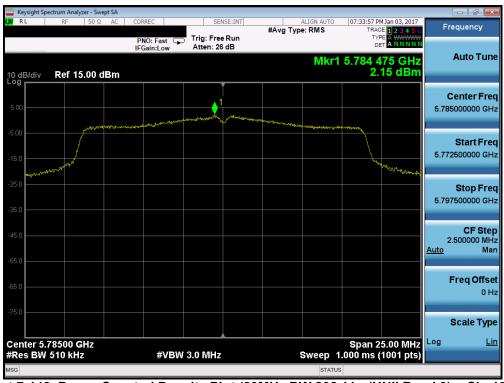
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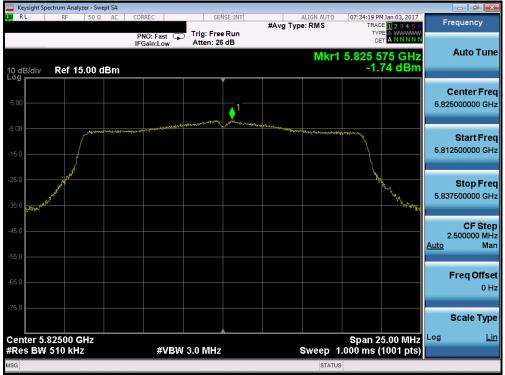




Plot 7-148. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) - Ch. 157)

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

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

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	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Antenn-1 Power Density [dBm]	Antenn-2 Power Density [dBm]	Summed MIMO Power Density [dBm]	Max Permissible Power Density [dBm/MHz]	Margin [dB]	Pass / Fail
	5180	36	n (20MHz)	6.5/7.2 (MCS0)	1.07	0.73	3.91	11.0	-7.09	Pass
	5200	40	n (20MHz)	6.5/7.2 (MCS0)	4.71	4.58	7.65	11.0	-3.35	Pass
d 1	5240	48	n (20MHz)	6.5/7.2 (MCS0)	5.21	4.69	7.97	11.0	-3.03	Pass
Band	5190	38	n (40MHz)	13.5/15 (MCS0)	-4.25	-4.35	-1.29	11.0	-12.29	Pass
-	5230	46	n (40MHz)	13.5/15 (MCS0)	-0.24	-0.73	2.54	11.0	-8.46	Pass
	5210	42	ac (80MHz)	29.3/32.5 (MCS0)	-8.29	-8.74	-5.50	11.0	-16.50	Pass
	5260	52	n (20MHz)	6.5/7.2 (MCS0)	5.29	4.74	8.03	11.0	-2.97	Pass
-	5280	56	n (20MHz)	6.5/7.2 (MCS0)	4.82	4.81	7.83	11.0	-3.17	Pass
4 2A	5320	64	n (20MHz)	6.5/7.2 (MCS0)	0.86	1.04	3.96	11.0	-7.04	Pass
Band	5270	54	n (40MHz)	13.5/15 (MCS0)	-0.59	-0.73	2.35	11.0	-8.65	Pass
-	5310	62	n (40MHz)	13.5/15 (MCS0)	-4.64	-4.46	-1.53	11.0	-12.53	Pass
	5290	58	ac (80MHz)	29.3/32.5 (MCS0)	-7.93	-8.54	-5.21	11.0	-16.21	Pass
	5500	100	n (20MHz)	6.5/7.2 (MCS0)	1.21	1.38	4.30	11.0	-6.70	Pass
	5580	116	n (20MHz)	6.5/7.2 (MCS0)	5.15	4.97	8.07	11.0	-2.93	Pass
0	5720	144	n (20MHz)	6.5/7.2 (MCS0)	5.08	4.60	7.86	11.0	-3.14	Pass
1 2C	5510	102	n (40MHz)	13.5/15 (MCS0)	-3.85	-4.63	-1.21	11.0	-12.21	Pass
Band	5550	110	n (40MHz)	13.5/15 (MCS0)	-0.30	-0.30	2.71	11.0	-8.29	Pass
-	5710	142	n (40MHz)	13.5/15 (MCS0)	-0.49	-1.84	1.90	11.0	-9.10	Pass
	5530	106	ac (80MHz)	29.3/32.5 (MCS0)	-7.97	-8.40	-5.17	11.0	-16.17	Pass
	5690	138	ac (80MHz)	29.3/32.5 (MCS0)	-5.15	-6.54	-2.78	11.0	-13.78	Pass

Summed MIMO Power Spectral Density Measurements

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

_	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Antenn-1 Power Density [dBm]	-		Max Permissible Power Density [dBm/500kHz]	Margin	Pass / Fail
	5745	149	n (20MHz)	6.5/7.2 (MCS0)	3.10	2.18	5.68	30.0	-24.32	Pass
	5785	157	n (20MHz)	6.5/7.2 (MCS0)	2.84	2.15	5.52	30.0	-24.48	Pass
q 3	5825	165	n (20MHz)	6.5/7.2 (MCS0)	-0.87	-1.74	1.73	30.0	-28.27	Pass
Ban	5755	151	n (40MHz)	13.5/15 (MCS0)	-2.72	-2.89	0.21	30.0	-29.79	Pass
_	5795	159	n (40MHz)	13.5/15 (MCS0)	-2.89	-3.49	-0.17	30.0	-30.17	Pass
	5775	155	ac (80MHz)	29.3/32.5 (MCS0)	-7.70	-7.96	-4.82	30.0	-34.82	Pass

Table 7-22. Band 3 MIMO Conducted Power Spectral Density Measurements

Note:

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

Sample MIMO Calculation:

At 5180MHz the average conducted power spectral density was measured to be 1.07 dBm for Antenna-1 and 0.73 dBm for Antenna-2.

Antenna 1 + Antenna 2 = MIMO

(1.07 dBm + 0.73 dBm) = (1.28 mW + 1.18 mW) = 2.46 mW = 3.91 dBm

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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.

5,180,000,000	Hz
36	
3.80	VDC
	36

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	5,180,000,270	270	0.00000521
100 %		- 30	5,179,999,848	-152	-0.00000293
100 %		- 20	5,180,000,446	446	0.00000861
100 %		- 10	5,180,000,088	88	0.00000170
100 %		0	5,179,999,991	-9	-0.00000017
100 %		+ 10	5,180,000,031	31	0.00000060
100 %		+ 20	5,179,999,970	-30	-0.00000058
100 %		+ 30	5,179,999,785	-215	-0.00000415
100 %		+ 40	5,180,000,320	320	0.00000618
100 %		+ 50	5,180,000,158	158	0.00000305
BATT. ENDPOINT	3.40	+ 20	5,179,999,627	-373	-0.00000720
Table 7-23	B. Frequency	Stability Mea	asurements for U	NII 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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Frequency Stability §15.407(g)

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

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

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	5,260,000,001	1	0.00000002
100 %		- 30	5,259,999,895	-105	-0.00000200
100 %		- 20	5,260,000,349	349	0.00000663
100 %		- 10	5,260,000,009	9	0.00000017
100 %		0	5,259,999,958	-42	-0.0000080
100 %		+ 10	5,259,999,815	-185	-0.00000352
100 %		+ 20	5,259,999,991	-9	-0.00000017
100 %		+ 30	5,259,999,680	-320	-0.00000608
100 %		+ 40	5,259,999,993	-7	-0.00000013
100 %		+ 50	5,259,999,971	-29	-0.00000055
BATT. ENDPOINT	3.40	+ 20	5,260,000,339	339	0.00000644
Table 7-24	. Frequency S	Stability Mea	surements for UN	III 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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Frequency Stability §15.407(g)

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

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

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)	
100 %	3.80	+ 20 (Ref)	5,500,000,041	41	0.00000075	
100 %		- 30	5,499,999,669	-331	-0.00000602	
100 %		- 20	5,500,000,236	236	0.00000429	
100 %		- 10	5,499,999,997	-3	-0.00000005	
100 %		0	5,500,000,242	242	0.00000440	
100 %		+ 10	5,500,000,346	346	0.00000629	
100 %		+ 20	5,499,999,753	-247	-0.00000449	
100 %		+ 30	5,499,999,990	-10	-0.00000018	
100 %		+ 40	5,500,000,137	137	0.00000249	
100 %		+ 50	5,499,999,851	-149	-0.00000271	
BATT. ENDPOINT	3.40	+ 20	5,499,999,557	-443	-0.00000805	
Table 7-25.	Table 7-25. Frequency Stability Measurements for UNII Band 2C (Ch. 100)					

Note:

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

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Frequency Stability §15.407(g)

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

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

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	5,745,000,155	155	0.00000270
100 %		- 30	5,745,000,173	173	0.00000301
100 %		- 20	5,745,000,380	380	0.00000661
100 %		- 10	5,745,000,138	138	0.00000240
100 %		0	5,744,999,878	-122	-0.00000212
100 %		+ 10	5,744,999,936	-64	-0.00000111
100 %		+ 20	5,744,999,680	-320	-0.00000557
100 %		+ 30	5,745,000,046	46	0.00000080
100 %		+ 40	5,744,999,876	-124	-0.00000216
100 %		+ 50	5,744,999,927	-73	-0.00000127
BATT. ENDPOINT	3.40	+ 20	5,744,999,994	-6	-0.00000010
Table 7-26	. Frequency S	Stability Mea	surements for UN	VII Band 3 (C	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) §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 v01r03, 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.

For transmitters operating in the 5.15-5.25 GHz and 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.

For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz.

For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge.

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Table 7-27 per Section 15.209.

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

Table 7-27. Radiated Limits

Test Procedures Used

KDB 789033 D02 v01r03 - 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

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Peak Measurements above 1GHz

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

Peak Measurements below 1GHz

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

Test Setup

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

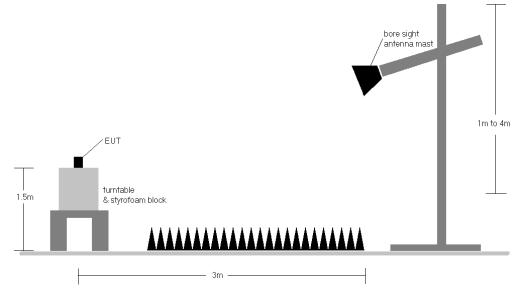


Figure 7-5. Test Instrument & Measurement Setup

Test Notes

 All radiated spurious emissions levels were measured in a radiated test setup per the guidance of KDB 789033 D02 v01r03 Section G.

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- 2. All emissions that lie in the restricted bands (denoted by a * next to the frequency) specified in §15.205 are below the limit shown in Table 7-27.
- 3. All spurious emissions lying in restricted bands specified in §15.205 are below the limit shown in Table 7-27. All spurious emissions that do not lie in a restricted band are subject to a peak limit of -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBµV/m can be determined by adding a "conversion" factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions of 68.2dBµV/m.
- 4. The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
- 5. This unit was tested with its standard battery.
- 6. The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter using CISPR quasi peak detector below 1GHz. Above 1 GHz, average and peak measurements were taken using linearly polarized horn antennas. The worst-case emissions are reported however emissions whose levels were not within 20dB of the respective limits were not reported.
- 7. Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.
- Radiated spurious emissions were investigated while operating in MIMO mode, however, it was determined that single antenna operation produced the worst case emissions. Since the emissions produced from MIMO operation were found to be more than 20dB below the limit, the MIMO emissions are not reported.
- 9. The wide spectrum spurious emissions plots shown on the following pages are used only for the purpose of emission identification. Any emissions found to be within 20dB of the limit are fully investigated and the results are shown in this section. Rohde & Schwarz EMC32, Version 9.15.00 automated test software was used to perform the Radiated Spurious Emissions Pre-Scan testing.
- 10. The "-" shown in the following RSE tables are used to denote a noise floor measurement.

Sample Calculations

Determining Spurious Emissions Levels

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

Radiated Band Edge Measurement Offset

• The amplitude offset shown in the radiated restricted band edge plots in Section 7.7 was calculated using the formula:

Offset (dB) = (Antenna Factor + Cable Loss + Attenuator) - Preamplifier Gain

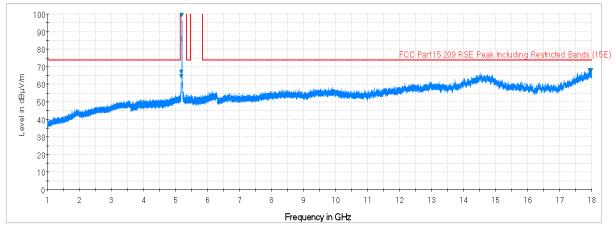
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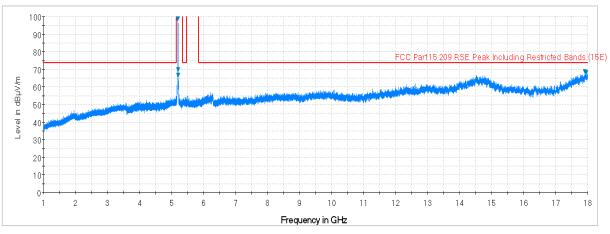
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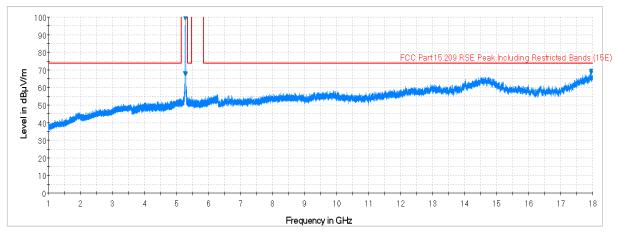
7.7.1 Antenna-1 Radiated Spurious Emission Measurements

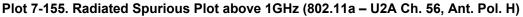


Plot 7-153. Radiated Spurious Plot above 1GHz (802.11a – U1 Ch. 40, Ant. Pol. H)



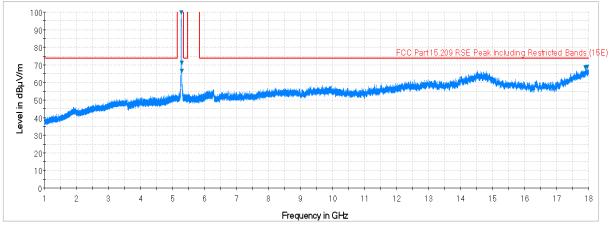
Plot 7-154. Radiated Spurious Plot above 1GHz (802.11a – U1 Ch. 40, Ant. Pol. V)



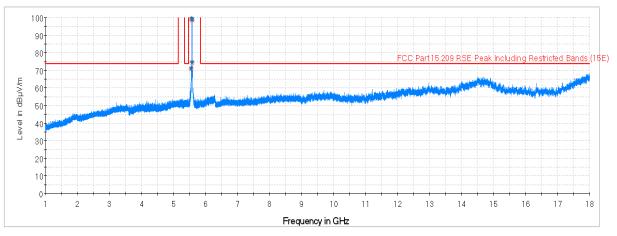


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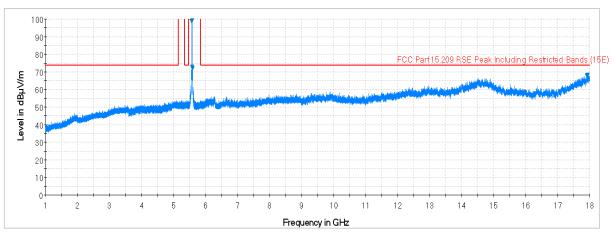








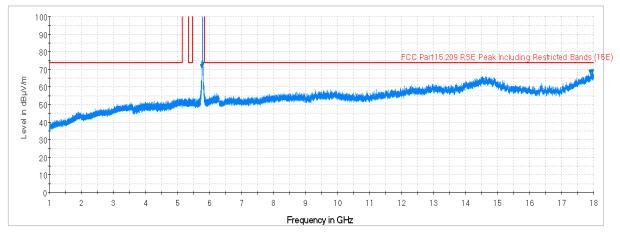
Plot 7-157. Radiated Spurious Plot above 1GHz (802.11a – U2C Ch. 116, Ant. Pol. H)



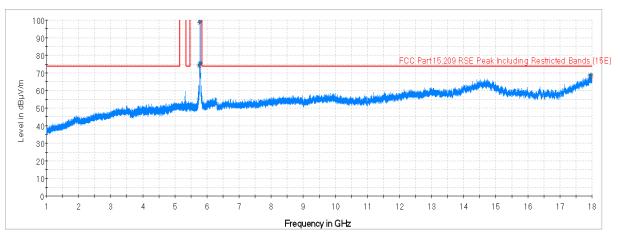
Plot 7-158. Radiated Spurious Plot above 1GHz (802.11a - U2C Ch. 116, Ant. Pol. V)

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



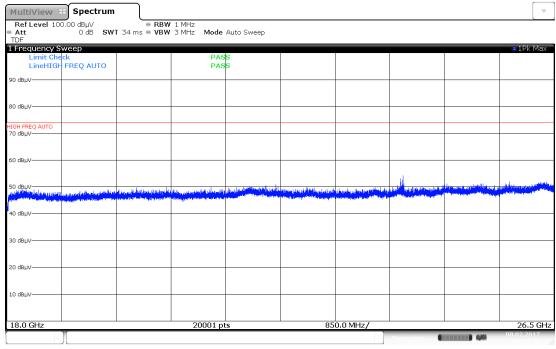
Plot 7-160. Radiated Spurious Plot above 1GHz (802.11a - U3 Ch. 157, Ant. Pol. V)

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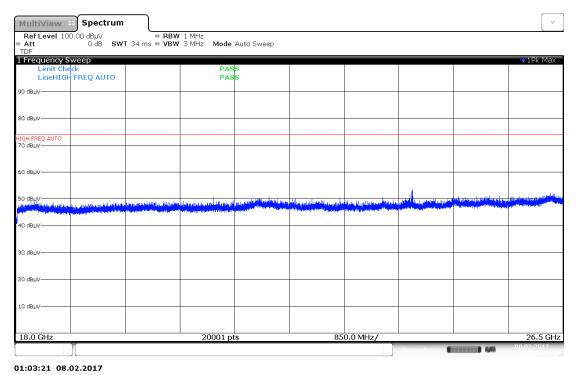


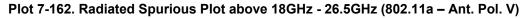
Antenna-1 Radiated Spurious Emissions Measurements (Above 18GHz)









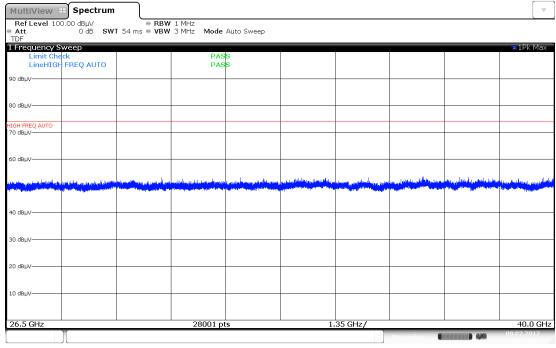


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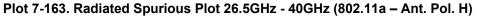
12/26/2016

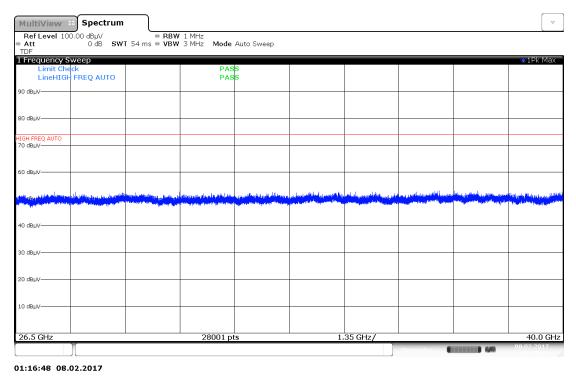


Antenna-1 Radiated Spurious Emissions Measurements (Above 18GHz)



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Antenna-1 Radiated Spurious Emission Measurements §15.247(d) §15.205 & §15.209

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

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10360.00	Peak	Н	-	-	-58.86	12.28	0.00	60.42	68.20	-7.78
*	15540.00	Average	Н	-	-	-74.42	16.89	0.00	49.47	53.98	-4.51
*	15540.00	Peak	Н	-	-	-57.23	16.89	0.00	66.66	73.98	-7.32
*	20720.00	Average	Н	-	-	-70.92	8.13	-9.54	34.67	53.98	-19.31
*	20720.00	Peak	Н	-	-	-60.35	8.13	-9.54	45.24	73.98	-28.74
	25900.00	Peak	Н	-	-	-56.24	8.50	-9.54	49.72	68.20	-18.48

Table 7-28. Radiated Measurements

Worst Case Mode: Worst Case Transfer Rate: Distance of Measurements: **Operating Frequency:** Channel:

802.11a	
6 Mbps	
1 & 3 Meters	
5200MHz	
40	

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10400.00	Peak	н	-	-	-58.93	12.44	0.00	60.51	68.20	-7.69
*	15600.00	Average	Н	-	-	-74.00	16.99	0.00	49.99	53.98	-3.99
*	15600.00	Peak	Н	-	-	-57.75	16.99	0.00	66.24	73.98	-7.74
*	20800.00	Average	Н	-	-	-71.20	8.16	-9.54	34.41	53.98	-19.57
*	20800.00	Peak	Н	-	-	-59.20	8.16	-9.54	46.41	73.98	-27.57
	26000.00	Peak	Н	-	-	-57.16	8.52	-9.54	48.82	68.20	-19.38
	26000.00	Peak	Н	- Tal		-57.16			48.82	68.20	

Table 7-29. 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 [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10480.00	Peak	Н	-	-	-58.99	13.05	0.00	61.06	68.20	-7.14
*	15720.00	Average	Н	-	-	-73.72	16.38	0.00	49.66	53.98	-4.32
*	15720.00	Peak	Н	-	-	-57.40	16.38	0.00	65.98	73.98	-8.00
*	20960.00	Average	Н	-	-	-71.52	8.12	-9.54	34.06	53.98	-19.92
*	20960.00	Peak	Н	-	-	-59.51	8.12	-9.54	46.07	73.98	-27.91
	26200.00	Peak	н	-	-	-57.79	8.62	-9.54	48.29	68.20	-19.91

Table 7-30. Radiated Measurements

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

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10400.00	Peak	н	-	-	-59.58	12.44	0.00	59.86	68.20	-8.34
*	15600.00	Average	Н	-	-	-73.93	16.99	0.00	50.06	53.98	-3.92
*	15600.00	Peak	н	-	-	-57.46	16.99	0.00	66.53	73.98	-7.45
*	20800.00	Average	Н	-	-	-71.34	8.16	-9.54	34.27	53.98	-19.71
*	20800.00	Peak	н	-	-	-59.39	8.16	-9.54	46.22	73.98	-27.76
	26000.00	Peak	Н	-	-	-57.19	8.52	-9.54	48.79	68.20	-19.41

Table 7-31. Radiated Measurements with WCP

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

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10520.00	Peak	Н	-	-	-58.54	12.46	0.00	60.92	68.20	-7.28
*	15780.00	Average	Н	-	-	-74.10	16.43	0.00	49.33	53.98	-4.65
*	15780.00	Peak	Н	-	-	-57.22	16.43	0.00	66.21	73.98	-7.77
*	21040.00	Average	Н	-	-	-71.21	8.10	-9.54	34.35	53.98	-19.63
*	21040.00	Peak	Н	-	-	-60.23	8.10	-9.54	45.33	73.98	-28.65
	26300.00	Peak	Н	-	-	-55.44	8.76	-9.54	50.78	68.20	-17.42

Table 7-32. Radiated Measurements

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

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10560.00	Peak	н	-	-	-59.43	12.59	0.00	60.16	68.20	-8.04
*	15840.00	Average	Н	-	-	-74.12	16.07	0.00	48.94	53.98	-5.04
*	15840.00	Peak	Н	-	-	-57.77	16.07	0.00	65.30	73.98	-8.68
*	21120.00	Average	Н	-	-	-70.93	8.09	-9.54	34.61	53.98	-19.37
*	21120.00	Peak	Н	-	-	-59.96	8.09	-9.54	45.58	73.98	-28.40
	26400.00	Peak	Н	-	-	-56.12	8.99	-9.54	50.33	68.20	-17.87

Table 7-33. 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:	5320MHz			
Channel:	64			

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	10640.00	Average	н	-	-	-70.38	12.78	0.00	49.40	53.98	-4.58
*	10640.00	Peak	н	-	-	-59.42	12.78	0.00	60.36	73.98	-13.62
*	15960.00	Average	Н	-	-	-74.11	16.21	0.00	49.10	53.98	-4.88
*	15960.00	Peak	Н	-	-	-56.94	16.21	0.00	66.27	73.98	-7.71
*	21280.00	Average	Н	-	-	-70.38	8.07	-9.54	35.15	53.98	-18.83
*	21280.00	Peak	н	-	-	-58.45	8.07	-9.54	47.08	73.98	-26.90
	26600.00	Peak	н	-	-	-47.13	-8.30	-9.54	42.03	68.20	-26.17

Table 7-34. Radiated Measurements

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

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10520.00	Peak	н	-	-	-58.74	12.46	0.00	60.72	68.20	-7.48
*	15780.00	Average	н	-	-	-74.17	16.43	0.00	49.26	53.98	-4.72
*	15780.00	Peak	н	-	-	-57.21	16.43	0.00	66.22	73.98	-7.76
*	21040.00	Average	н	-	-	-71.31	8.10	0.00	43.79	53.98	-10.19
*	21040.00	Peak	н	-	-	-60.32	8.10	-9.54	45.24	73.98	-28.74
	26300.00	Peak	Н	-	-	-55.47	8.76	-9.54	50.75	68.20	-17.45

Table 7-35. Radiated Measurements with WCP

		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Approved by: Quality Manager						
Test Report S/N:	Test Dates:	EUT Type:		Dega 105 of 049						
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Worst Case Mode:	802.11a
Worst Case Transfer Rate:	6 Mbps
Distance of Measurements:	1 & 3 Meters
Operating Frequency:	5500MHz
Channel:	100

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	i Factor I	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11000.00	Average	Н	-	-	-70.52	12.51	0.00	48.99	53.98	-4.99
*	11000.00	Peak	Н	-	-	-59.24	12.51	0.00	60.27	73.98	-13.71
	16500.00	Peak	Н	-	-	-58.42	15.70	0.00	64.28	68.20	-3.92
	22000.00	Peak	Н	-	-	-59.67	8.35	-9.54	46.13	68.20	-22.07
	27500.00	Peak	н	-	-	-46.07	-8.93	-9.54	42.46	68.20	-25.74

Table 7-36. Rac	iated Measurements
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Worst Case Mode: Worst Case Transfer Rate: Distance of Measurements: Operating Frequency: Channel: 802.11a 6 Mbps 1 & 3 Meters 5580MHz 116

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11160.00	Average	Н	-	-	-70.31	12.68	0.00	49.37	53.98	-4.61
*	11160.00	Peak	Н	-	-	-59.46	12.68	0.00	60.22	73.98	-13.76
	16740.00	Peak	Н	-	-	-59.59	16.25	0.00	63.66	68.20	-4.54
*	22320.00	Average	Н	-	-	-70.62	8.20	-9.54	35.04	53.98	-18.94
*	22320.00	Peak	н	-	-	-60.20	8.20	-9.54	45.46	73.98	-28.52
	27900.00	Peak	н	-	-	-46.11	-9.24	-9.54	42.11	68.20	-26.09

Table 7-37. Radiated Measurements

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager		
Test Report S/N:	Test Dates:	EUT Type:		Degra 106 of 049		
1M1701180032-05-R3.ZNF 12/27/2016 - 2/15/2017		Portable Handset		Page 126 of 248		
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Worst Case Mode:	802.11a
Worst Case Transfer Rate:	6 Mbps
Distance of Measurements:	1 & 3 Meters
Operating Frequency:	5720MHz
Channel:	144

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11400.00	Average	н	-	-	-70.12	13.68	0.00	50.56	53.98	-3.42
*	11400.00	Peak	Н	-	-	-57.99	13.68	0.00	62.69	73.98	-11.29
	17100.00	Peak	н	-	-	-61.32	18.22	0.00	63.90	68.20	-4.30
*	22800.00	Average	н	-	-	-70.64	8.29	-9.54	35.10	53.98	-18.88
*	22800.00	Peak	н	-	-	-60.10	8.29	-9.54	45.64	73.98	-28.34
	28500.00	Peak	н	-	-	-45.60	-9.03	-9.54	42.83	68.20	-25.37

Table 7-38. Radiated Measurements

Worst Case Mode: Worst Case Transfer Rate: Distance of Measurements: Operating Frequency: Channel:

802.11a 6 Mbps 1 & 3 Meters 5550MHz 100

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Factor	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11000.00	Average	Н	-	-	-70.63	12.51	0.00	48.88	53.98	-5.10
*	11000.00	Peak	Н	-	-	-59.54	12.51	0.00	59.97	73.98	-14.01
	16500.00	Peak	Н	-	-	-59.37	15.70	0.00	63.33	68.20	-4.87
	22000.00	Peak	Н	-	-	-59.70	8.35	-9.54	46.10	68.20	-22.10
	27500.00	Peak	н	-	-	-46.08	-8.93	-9.54	42.45	68.20	-25.75

Table 7-39. Radiated Measurements with WCP

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager		
Test Report S/N:	Test Dates:	EUT Type:		Page 127 of 248		
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Worst Case Mode:	802.11a
Worst Case Transfer Rate:	6 Mbps
Distance of Measurements:	1 & 3 Meters
Operating Frequency:	5745MHz
Channel:	149

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11490.00	Average	Н	-	-	-70.63	14.14	0.00	50.51	53.98	-3.47
*	11490.00	Peak	Н	-	-	-59.63	14.14	0.00	61.51	73.98	-12.47
	17235.00	Peak	н	-	-	-62.94	19.18	0.00	63.24	68.20	-4.96
*	22980.00	Average	н	-	-	-71.16	8.19	-9.54	34.49	53.98	-19.49
*	22980.00	Peak	н	-	-	-59.73	8.19	-9.54	45.92	73.98	-28.06
	28725.00	Peak	н	-	-	-45.39	-9.45	-9.54	42.62	68.20	-25.58

Table 7-40. Radiated Measurements

Worst Case Mode: Worst Case Transfer Rate: Distance of Measurements: Operating Frequency: Channel:

802.11a 6 Mbps 1 & 3 Meters 5785MHz 157

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	i Factor I	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11570.00	Average	н	-	-	-70.64	13.88	0.00	50.24	53.98	-3.74
*	11570.00	Peak	Н	-	-	-58.25	13.88	0.00	62.63	73.98	-11.35
	17355.00	Peak	н	-	-	-63.25	20.47	0.00	64.22	68.20	-3.98
	23140.00	Peak	Н	-	-	-59.34	8.47	-9.54	46.58	68.20	-21.62
	28925.00	Peak	Н	-	-	-44.99	-9.71	-9.54	42.76	68.20	-25.44

Table 7-41. Radiated Measurements

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager		
Test Report S/N:	Test Dates:	EUT Type:		Page 128 of 248		
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Worst Case Mode:	802.11a
Worst Case Transfer Rate:	6 Mbps
Distance of Measurements:	1 & 3 Meters
Operating Frequency:	5825MHz
Channel:	165

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11650.00	Average	Н	-	-	-70.35	14.22	0.00	50.87	53.98	-3.11
*	11650.00	Peak	Н	-	-	-58.95	14.22	0.00	62.27	73.98	-11.71
	17475.00	Peak	Н	-	-	-63.96	21.94	0.00	64.98	68.20	-3.22
	23300.00	Peak	Н	-	-	-59.95	8.60	-9.54	46.11	68.20	-22.09
	29125.00	Peak	н	-	-	-44.09	-9.93	-9.54	43.44	68.20	-24.76

Table 7-42. Radia	ted Measurements
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Worst Case Mode: Worst Case Transfer Rate: Distance of Measurements: Operating Frequency: Channel: 802.11a 6 Mbps 1 & 3 Meters 5825MHz 165

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11650.00	Average	Н	-	-	-70.94	14.22	0.00	50.28	53.98	-3.70
*	11650.00	Peak	Н	-	-	-58.87	14.22	0.00	62.35	73.98	-11.63
	17475.00	Peak	Н	-	-	-63.97	21.94	0.00	64.97	68.20	-3.23
*	23300.00	Average	н	-	-	-60.11	8.60	-9.54	45.95	53.98	-8.03
*	29125.00	Peak	н	-	-	-44.27	-9.93	-9.54	43.26	73.98	-30.72

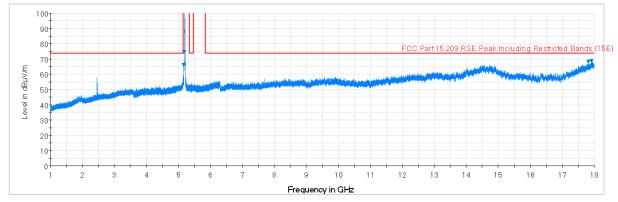
Table 7-43. Radiated Measurements with WCP

FCC ID: ZNFH871	ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 100 of 249	
1M1701180032-05-R3.ZNF	12/27/2016 - 2/15/2017	Portable Handset		Page 129 of 248	
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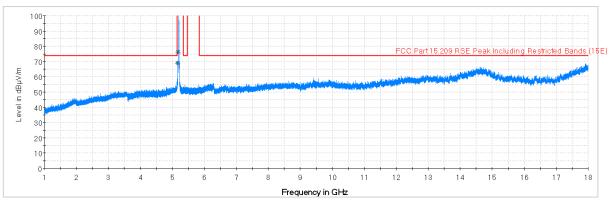
12/26/2016



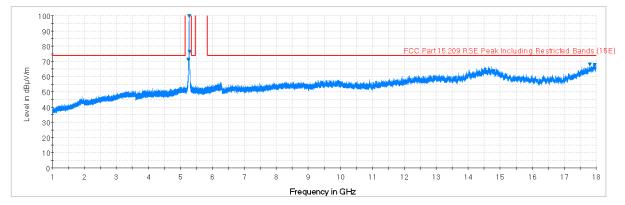




Plot 7-165. Radiated Spurious Plot above 1GHz (802.11a – U1 Ch. 40, Ant. Pol. H)



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

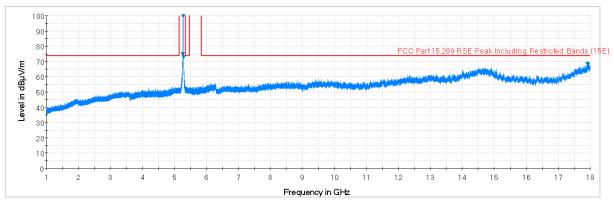


Plot 7-167. Radiated Spurious Plot above 1GHz (802.11a – U2A Ch. 56, Ant. Pol. H)

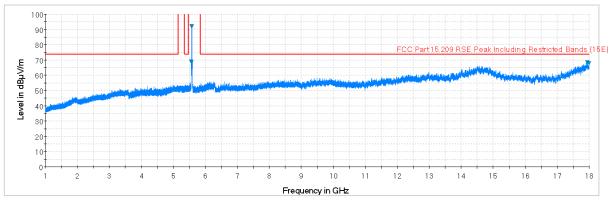
FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dega 120 of 249	
1M1701180032-05-R3.ZNF	12/27/2016 - 2/15/2017	Portable Handset		Page 130 of 248	
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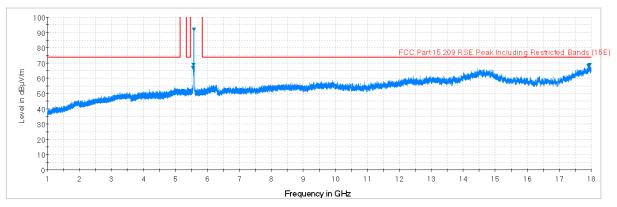




Plot 7-168. Radiated Spurious Plot above 1GHz (802.11a – U2A Ch. 56, Ant. Pol. V)



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

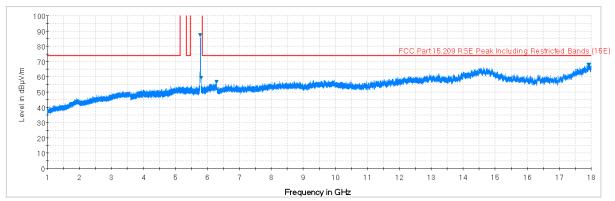


Plot 7-170. Radiated Spurious Plot above 1GHz (802.11a – U2C Ch. 116, Ant. Pol. V)

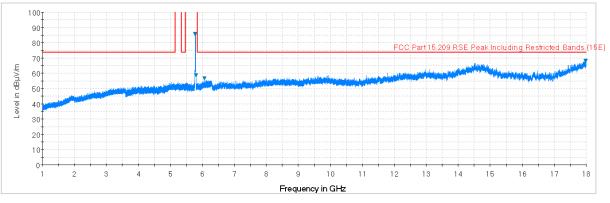
		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dega 121 of 249	
1M1701180032-05-R3.ZNF	12/27/2016 - 2/15/2017	Portable Handset		Page 131 of 248	
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Plot 7-171. Radiated Spurious Plot above 1GHz (802.11a - U3 Ch. 157, Ant. Pol. H)



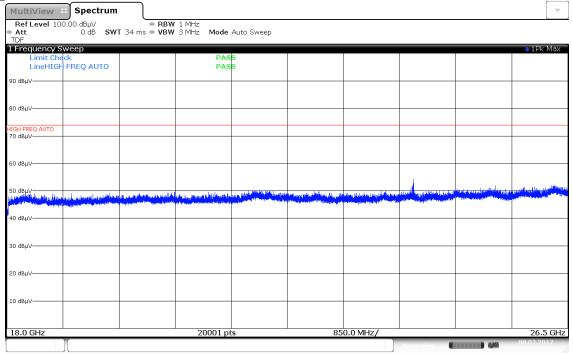
Plot 7-172. Radiated Spurious Plot above 1GHz (802.11a - U3 Ch. 157, Ant. Pol. V)

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager			
Test Report S/N:	Test Dates:	EUT Type:		Dage 122 of 249			
1M1701180032-05-R3.ZNF	12/27/2016 - 2/15/2017	Portable Handset		Page 132 of 248			
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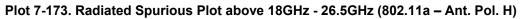
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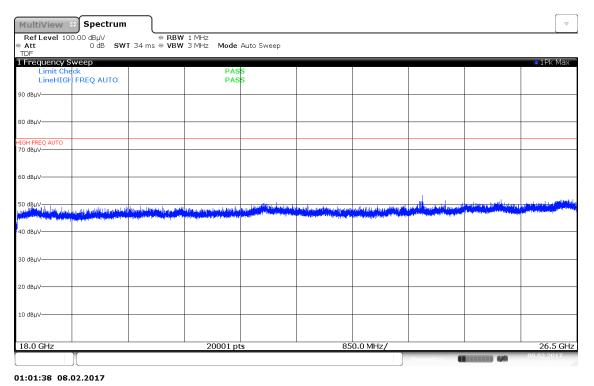


Antenna-2 Radiated Spurious Emissions Measurements (Above 18GHz)



00:59:58 08.02.2017





Plot 7-174. Radiated Spurious Plot above 18GHz - 26.5GHz (802.11a – Ant. Pol. V)

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Demo 122 of 249	
1M1701180032-05-R3.ZNF	12/27/2016 - 2/15/2017	Portable Handset		Page 133 of 248	
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12/26/2016



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

MultiView 🕀	Spectrum								∇
Ref Level 100.0 Att TDF		● RBW 54 ms ● VBW	1 MHz 3 MHz Mode	Auto Sweep					
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Limit Check			PAS						
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80 dBµV									
HIGH FREQ AUTO 70 dBµV									
60 dBµV									
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20 dBµV									
10 dBµV									
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							Measuring		08.02.2017

01:14:32 08.02.2017



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			08 02 2017

Plot 7-176. Radiated Spurious Plot above 26.5GHz - 40GHz (802.11a – Ant. Pol. V)

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Approved by: Quality Manager		
Test Report S/N:	Test Dates:	EUT Type:		Dega 124 of 249		
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Antenna-2 Radiated Spurious Emission Measurements §15.247(d) §15.205 & §15.209

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

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10360.00	Peak	Н	-	-	-58.87	12.28	0.00	60.41	68.20	-7.79
*	15540.00	Average	Н	-	-	-74.78	16.89	0.00	49.11	53.98	-4.87
*	15540.00	Peak	Н	-	-	-57.96	16.89	0.00	65.93	73.98	-8.05
*	20720.00	Average	Н	-	-	-70.96	8.13	-9.54	34.63	53.98	-19.35
*	20720.00	Peak	Н	-	-	-60.47	8.13	-9.54	45.12	73.98	-28.86
	25900.00	Peak	Н	-	-	-56.38	8.50	-9.54	49.58	68.20	-18.62

Table 7-44. Radiated Measurements

Worst Case Mode: Worst Case Transfer Rate: Distance of Measurements: Operating Frequency: Channel:

802.11a 6 Mbps 1 & 3 Meters 5200MHz 40

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10400.00	Peak	н	-	-	-58.49	12.44	0.00	60.95	68.20	-7.25
*	15600.00	Average	Н	-	-	-74.01	16.99	0.00	49.98	53.98	-4.00
*	15600.00	Peak	Н	-	-	-57.51	16.99	0.00	66.48	73.98	-7.50
*	20800.00	Average	н	-	-	-71.20	8.16	-9.54	34.41	53.98	-19.57
*	20800.00	Peak	Н	-	-	-59.20	8.16	-9.54	46.41	73.98	-27.57
	26000.00	Peak	Н	-	-	-58.44	8.52	-9.54	47.54	68.20	-20.66
				Tal	nlo 7-45 R	adiated M	loacurom	onte			

Table 7-45. Radiated Measurements

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Approved 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:	5240MHz
Channel:	48

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10480.00	Peak	Н	-	-	-59.55	13.05	0.00	60.50	68.20	-7.70
*	15720.00	Average	Н	-	-	-74.17	16.38	0.00	49.21	53.98	-4.77
*	15720.00	Peak	Н	-	-	-57.37	16.38	0.00	66.01	73.98	-7.97
*	20960.00	Average	Н	-	-	-71.64	8.12	-9.54	33.94	53.98	-20.04
*	20960.00	Peak	Н	-	-	-59.57	8.12	-9.54	46.01	73.98	-27.97
	26200.00	Peak	н	-	-	-57.67	8.62	-9.54	48.41	68.20	-19.79

Table 7-46. Radiated Measurements

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

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10480.00	Peak	н	-	-	-59.28	13.05	0.00	60.77	68.20	-7.43
*	15720.00	Average	Н	-	-	-73.80	16.38	0.00	49.58	53.98	-4.40
*	15720.00	Peak	н	-	-	-56.44	16.38	0.00	66.94	73.98	-7.04
*	20960.00	Average	Н	-	-	-71.54	8.12	-9.54	34.04	53.98	-19.94
*	20960.00	Peak	н	-	-	-59.52	8.12	-9.54	46.06	73.98	-27.92
	26200.00	Peak	н	-	-	-57.81	8.62	-9.54	48.27	68.20	-19.93

Table 7-47. Radiated Measurements with WCP

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved 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:	5260MHz
Channel:	52

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10520.00	Peak	Н	-	-	-58.21	12.46	0.00	61.25	68.20	-6.95
*	15780.00	Average	Н	-	-	-74.33	16.43	0.00	49.10	53.98	-4.88
*	15780.00	Peak	Н	-	-	-57.60	16.43	0.00	65.83	73.98	-8.15
*	21040.00	Average	Н	-	-	-70.96	8.10	-9.54	34.60	53.98	-19.38
*	21040.00	Peak	Н	-	-	-59.96	8.10	-9.54	45.60	73.98	-28.38
	26300.00	Peak	Н	-	-	-56.04	8.76	-9.54	50.18	68.20	-18.02

Table 7-48. Radiated Measurements

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

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]		Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10560.00	Peak	Н	-	-	-58.32	12.59	0.00	61.27	68.20	-6.93
*	15840.00	Average	Н	-	-	-74.02	16.07	0.00	49.05	53.98	-4.93
*	15840.00	Peak	Н	-	-	-57.50	16.07	0.00	65.57	73.98	-8.41
*	21120.00	Average	Н	-	-	-70.98	8.09	-9.54	34.56	53.98	-19.42
*	21120.00	Peak	н	-	-	-60.07	8.09	-9.54	45.47	73.98	-28.51
	26400.00	Peak	Н	-	-	-55.97	8.99	-9.54	50.48	68.20	-17.72

Table 7-49. Radiated Measurements

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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802.11a
6 Mbps
1 & 3 Meters
5320MHz
64

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	10640.00	Average	н	-	-	-70.63	12.78	0.00	49.15	53.98	-4.83
*	10640.00	Peak	Н	-	-	-58.74	12.78	0.00	61.04	73.98	-12.94
*	15960.00	Average	н	-	-	-74.35	16.21	0.00	48.86	53.98	-5.12
*	15960.00	Peak	н	-	-	-57.61	16.21	0.00	65.60	73.98	-8.38
*	21280.00	Average	н	-	-	-70.46	8.07	-9.54	35.07	53.98	-18.91
*	21280.00	Peak	н	-	-	-58.44	8.07	-9.54	47.09	73.98	-26.89
	26600.00	Peak	Н	-	-	-47.25	-8.30	-9.54	41.91	68.20	-26.29
	20000.00	1 out		Та	olo 7-50 P	-				00.20	

Table 7-50. Radiated Measurements

Worst Case Mode: Worst Case Transfer Rate: Distance of Measurements: Operating Frequency: Channel:

802.11a
6 Mbps
1 & 3 Meters
6320MHz
64

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	10640.00	Average	н	-	-	-70.43	12.78	0.00	49.35	53.98	-4.63
*	10640.00	Peak	Н	-	-	-59.04	12.78	0.00	60.74	73.98	-13.24
*	15960.00	Average	Н	-	-	-74.18	16.21	0.00	49.03	53.98	-4.95
*	15960.00	Peak	Н	-	-	-57.76	16.21	0.00	65.45	73.98	-8.53
*	21280.00	Average	Н	-	-	-70.51	8.07	-9.54	35.02	53.98	-18.96
*	21280.00	Peak	Н	-	-	-58.28	8.07	-9.54	47.25	73.98	-26.73
	26600.00	Peak	Н	-	-	-47.13	-8.30	-9.54	42.03	68.20	-26.17

Table 7-51. Radiated Measurements with WCP

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕞 LG	Approved 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:	5500MHz
Channel:	100

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	i Factor I	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11000.00	Average	Н	-	-	-70.64	12.51	0.00	48.87	53.98	-5.11
*	11000.00	Peak	Н	-	-	-57.93	12.51	0.00	61.58	73.98	-12.40
	16500.00	Peak	Н	-	-	-59.20	15.70	0.00	63.50	68.20	-4.70
	22000.00	Peak	Н	-	-	-59.72	8.35	-9.54	46.08	68.20	-22.12
	27500.00	Peak	н	-	-	-46.15	-8.93	-9.54	42.38	68.20	-25.82

Table 7-52. Radiated N	leasurements
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Worst Case Mode: Worst Case Transfer Rate: Distance of Measurements: Operating Frequency: Channel:

802.11a
6 Mbps
1 & 3 Meters
5580MHz
116

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11160.00	Average	Н	-	-	-70.61	12.68	0.00	49.07	53.98	-4.91
*	11160.00	Peak	Н	-	-	-59.50	12.68	0.00	60.18	73.98	-13.80
	16740.00	Peak	Н	-	-	-60.10	16.25	0.00	63.15	68.20	-5.05
*	22320.00	Average	Н	-	-	-70.71	8.20	-9.54	34.95	53.98	-19.03
*	22320.00	Peak	Н	-	-	-60.09	8.20	-9.54	45.57	73.98	-28.41
	27900.00	Peak	Н	-	-	-46.13	-9.24	-9.54	42.09	68.20	-26.11

Table 7-53. Radiated Measurements

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved 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:	5720MHz
Channel:	144

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11400.00	Average	Н	-	-	-70.23	13.68	0.00	50.45	53.98	-3.53
*	11400.00	Peak	Н	-	-	-58.99	13.68	0.00	61.69	73.98	-12.29
	17100.00	Peak	н	-	-	-60.74	18.22	0.00	64.48	68.20	-3.72
*	22800.00	Average	н	-	-	-70.61	8.29	-9.54	35.13	53.98	-18.85
*	22800.00	Peak	н	-	-	-60.27	8.29	-9.54	45.47	73.98	-28.51
	28500.00	Peak	н	-	-	-45.64	-9.03	-9.54	42.79	68.20	-25.41

Table 7-54. Radiated Measurements

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

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11400.00	Average	н	-	-	-70.06	13.68	0.00	50.62	53.98	-3.36
*	11400.00	Peak	Н	-	-	-58.62	13.68	0.00	62.06	73.98	-11.92
	17100.00	Peak	Н	-	-	-60.37	18.22	0.00	64.85	68.20	-3.35
*	22800.00	Average	Н	-	-	-70.70	8.29	-9.54	35.04	53.98	-18.94
*	22800.00	Peak	Н	-	-	-60.30	8.29	-9.54	45.44	73.98	-28.54
	28500.00	Peak	Н	-	-	-45.83	-9.03	-9.54	42.60	68.20	-25.60

Table 7-55. Radiated Measurements with WCP

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved 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:	5745MHz
Channel:	149

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11490.00	Average	Н	-	-	-70.53	14.14	0.00	50.61	53.98	-3.37
*	11490.00	Peak	Н	-	-	-59.48	14.14	0.00	61.66	73.98	-12.32
	17235.00	Peak	Н	-	-	-63.26	19.18	0.00	62.92	68.20	-5.28
*	22980.00	Average	Н	-	-	-71.15	8.19	-9.54	34.50	53.98	-19.48
*	22980.00	Peak	Н	-	-	-59.84	8.19	-9.54	45.81	73.98	-28.17
	28725.00	Peak	Н	-	-	-45.44	-9.45	-9.54	42.57	68.20	-25.63

Table 7-56. Radiated Measurements

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

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11570.00	Average	Н	-	-	-70.76	13.88	0.00	50.12	53.98	-3.86
*	11570.00	Peak	Н	-	-	-59.38	13.88	0.00	61.50	73.98	-12.48
	17355.00	Peak	Н	-	-	-63.71	20.47	0.00	63.76	68.20	-4.44
	23140.00	Peak	Н	-	-	-59.41	8.47	-9.54	46.51	68.20	-21.69
	28925.00	Peak	Н	-	-	-45.07	-9.71	-9.54	42.68	68.20	-25.52

Table 7-57. Radiated Measurements

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Approved 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:	5825MHz
Channel:	165

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11650.00	Average	Н	-	-	-70.87	14.22	0.00	50.35	53.98	-3.63
*	11650.00	Peak	Н	-	-	-59.52	14.22	0.00	61.70	73.98	-12.28
	17475.00	Peak	Н	-	-	-63.76	21.94	0.00	65.18	68.20	-3.02
	23300.00	Peak	Н	-	-	-59.86	8.60	-9.54	46.20	68.20	-22.00
	29125.00	Peak	н	-	-	-44.15	-9.93	-9.54	43.38	68.20	-24.82

Table	7-58.	Radiated	Measurements
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Worst Case Mode: Worst Case Transfer Rate: Distance of Measurements: Operating Frequency: Channel:

802.11a	
6 Mbps	
1 & 3 Meters	
5785MHz	
157	

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11650.00	Average	Н	-	-	-70.43	14.22	0.00	50.79	53.98	-3.19
*	11650.00	Peak	Н	-	-	-59.06	14.22	0.00	62.16	73.98	-11.82
	17475.00	Peak	н	-	-	-63.75	21.94	0.00	65.19	68.20	-3.01
	23300.00	Peak	Н	-	-	-59.88	8.60	-9.54	46.18	68.20	-22.02
	29125.00	Peak	Н	-	-	-44.33	-9.93	-9.54	43.20	68.20	-25.00

Table 7-59. Radiated Measurements with WCP

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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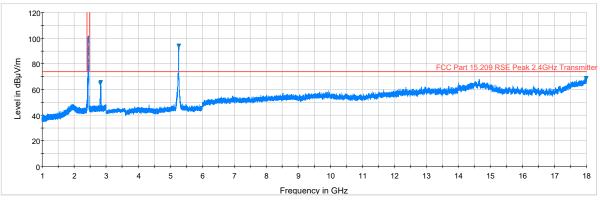
12/26/2016



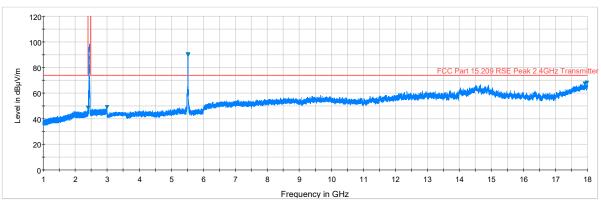
7.7.3 Simultaneous Tx Radiated Spurious Emissions Measurements §15.247(d) §15.205 & §15.209

Description	2.4 GHz Emission	5 GHz Emission
Antenna	1	2
Channel	11	52
Operating Frequency(MHz)	2462	5260
Data Rate (Mbps)	1	6
Mode	802.11b	802.11a

Table 7-60. Simultaneous Transmission Config-1



Plot 7-177. Radiated Spurious Plot above 1GHz (2.4GHz – 5GHz, Ant. Pol. H)



Plot 7-178. Radiated Spurious Plot above 1GHz (2.4GHz – 5GHz, Ant. Pol. V)

Note: The spurious emission at approximately 2480MHz in Plot 7-177 was investigated and found to be ambient noise.

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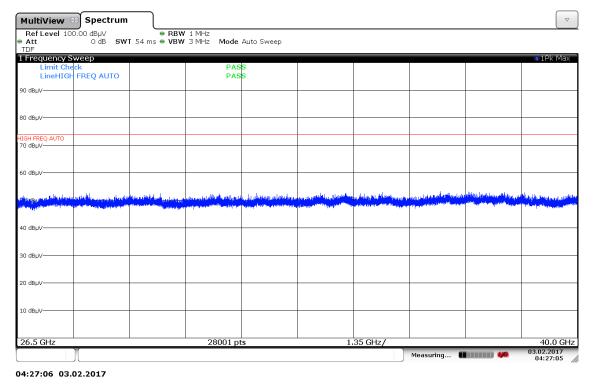
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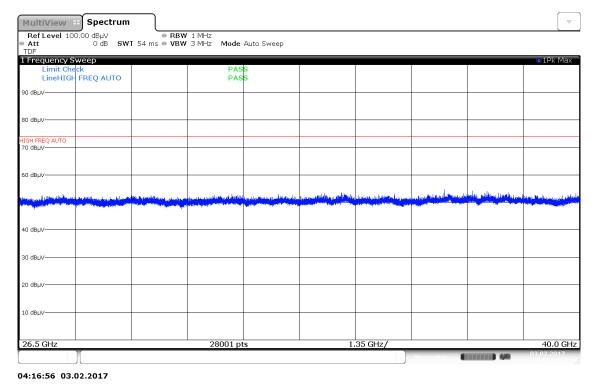
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	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	3677.00	Average	н	-	-	-69.95	-1.81	35.24	53.98	-18.74
*	3677.00	Peak	Н	-	-	-58.14	-1.81	47.05	73.98	-26.93
	6736.00	Peak	Н	-	-	-58.72	10.20	58.48	68.20	-9.72
	8559.00	Peak	Н	-	-	-59.89	12.49	59.60	68.20	-8.60
	9795.00	Peak	Н	-	-	-58.76	12.01	60.25	68.20	-7.95
*	11618.00	Average	Н	-	-	-72.47	14.27	48.80	53.98	-5.18
*	11618.00	Peak	Н	-	-	-59.49	14.27	61.78	73.98	-12.20
	14667.00	Peak	Н	-	-	-64.68	22.54	64.86	68.20	-3.34
*	17736.00	Average	н	-	-	-79.62	23.39	50.77	53.98	-3.21
*	17736.00	Peak	н	-	-	-60.37	23.39	70.02	73.98	-3.96

Table 7-61. Radiated Measurements (ANT1 2.4GHz – ANT2 5GHz)

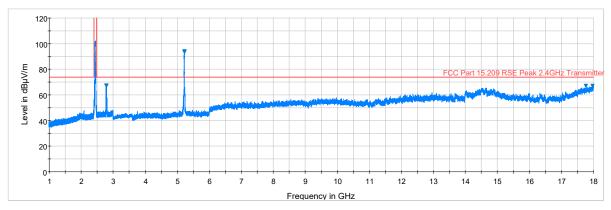
FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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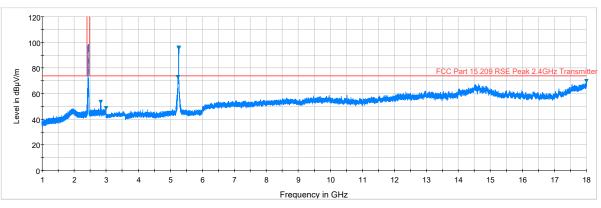


Description	5 GHz Emission	2.4 GHz Emission
Antenna	1	2
Channel	52	11
Operating Frequency(MHz)	5260	2462
Data Rate (Mbps)	6	1
Mode	802.11a	802.11b

 Table 7-62. Simultaneous Transmission Config-2



Plot 7-183. Radiated Spurious Plot above 1GHz (5GHz - 2.4 GHz, Ant. Pol. H)



Plot 7-184. Radiated Spurious Plot above 1GHz (5GHz – 2.4 GHz, Ant. Pol. V)

Note: The spurious emission at approximately 2480MHz in Plot 7-183 was investigated and found to be ambient noise.

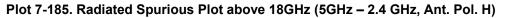
FCC ID: ZNFH871	ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Degra 147 of 249
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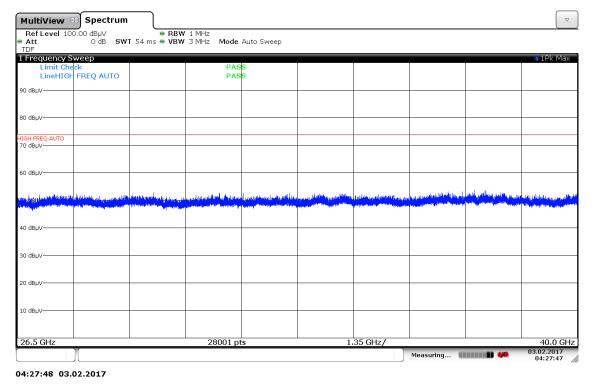
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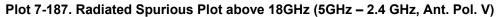
FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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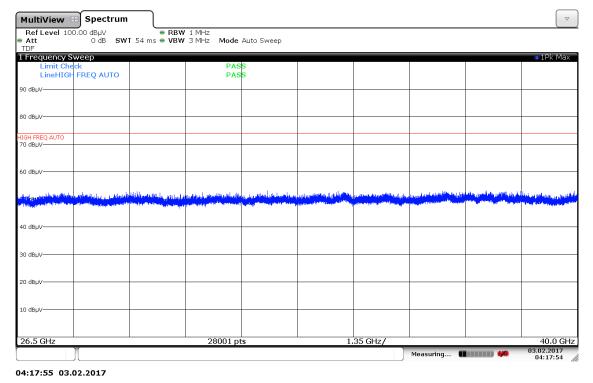
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	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	3677.00	Average	Н	-	-	-69.96	-1.81	35.23	53.98	-18.75
*	3677.00	Peak	Н	-	-	-60.60	-1.81	44.59	73.98	-29.39
	6736.00	Peak	Н	-	-	-59.94	10.20	57.26	68.20	-10.94
	8559.00	Peak	Н	-	-	-60.12	12.49	59.37	68.20	-8.83
	9795.00	Peak	Н	-	-	-58.15	12.01	60.86	68.20	-7.34
*	11618.00	Average	Н	-	-	-72.37	14.27	48.90	53.98	-5.08
*	11618.00	Peak	Н	-	-	-59.51	14.27	61.76	73.98	-12.22
	14667.00	Peak	Н	-	-	-64.96	22.54	64.58	68.20	-3.62
*	17736.00	Average	Н	-	-	-79.65	23.39	50.74	53.98	-3.24
*	17736.00	Peak	Н	-	-	-60.89	23.39	69.50	73.98	-4.48

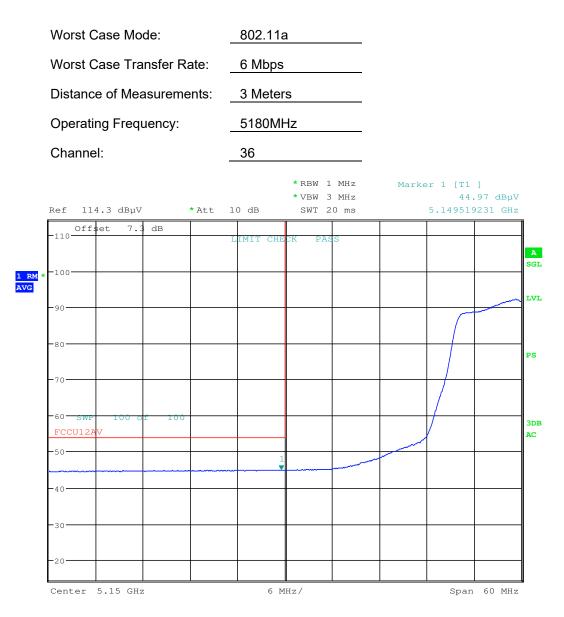
Table 7-63. Radiated Measurements (ANT1 5GHz – ANT2 2.4GHz)

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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7.7.4 Antenna-1 Radiated Band Edge Measurements (20MHz BW) §15.407(b.1)(b.2) §15.205 §15.209



Date: 25.JAN.2017 20:08:11

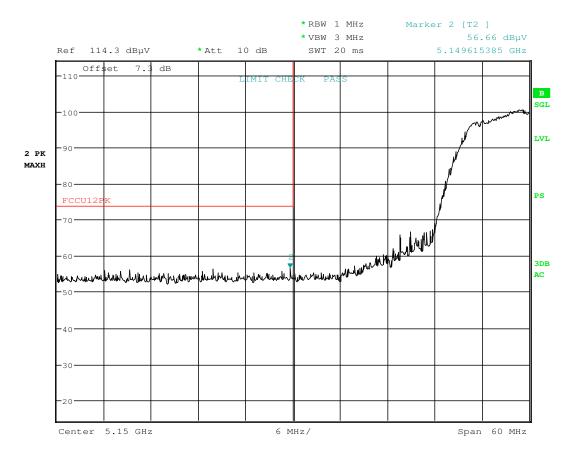
Plot 7-189. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Approved by: Quality Manager	
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Antenna-1 Radiated Band Edge Measurements (20MHz BW) §15.407(b.1)(b.2) §15.205 §15.209



Date: 25.JAN.2017 20:08:22

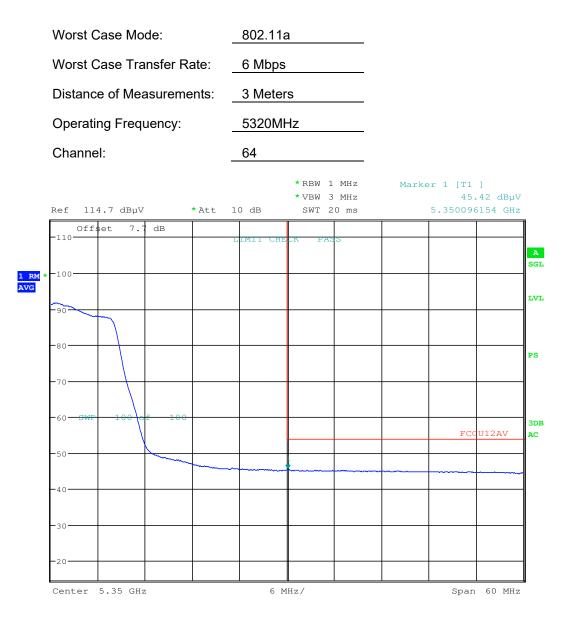
Plot 7-190. Radiated Restricted Lower Band Edge Plot (Peak - UNII Band 1)

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Approved by: Quality Manager
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Antenna-1 Radiated Band Edge Measurements (20MHz BW) §15.407(b.1)(b.2) §15.205 §15.209



Date: 25.JAN.2017 20:18:19

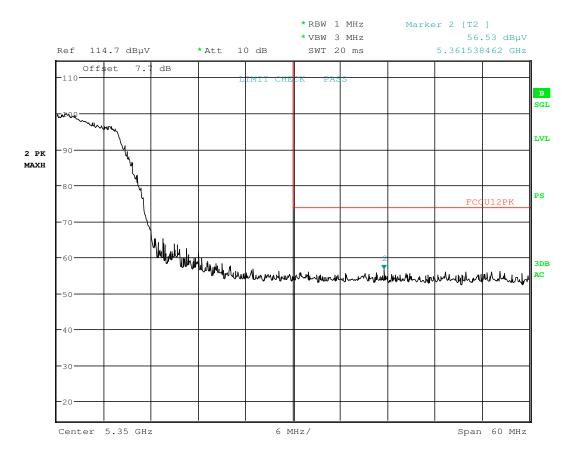
Plot 7-191. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager	
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Antenna-1 Radiated Band Edge Measurements (20MHz BW) §15.407(b.1)(b.2) §15.205 §15.209



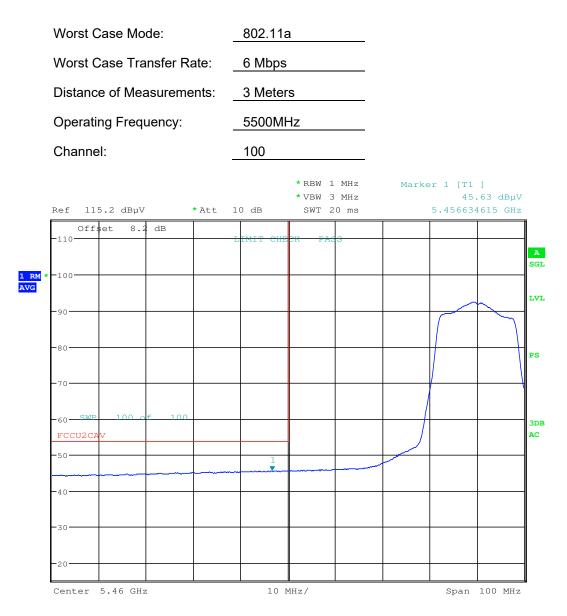
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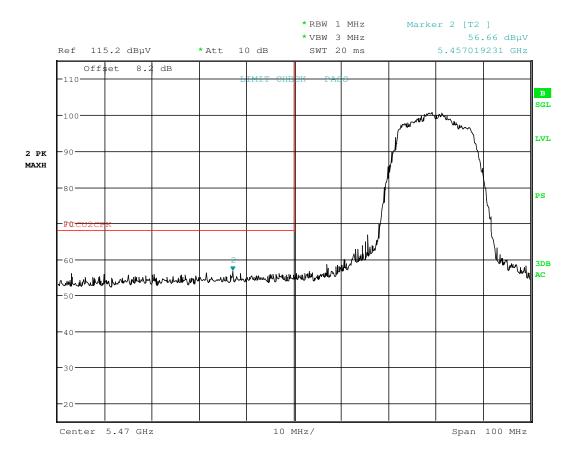
Date: 25.JAN.2017 20:40:14

Plot 7-193. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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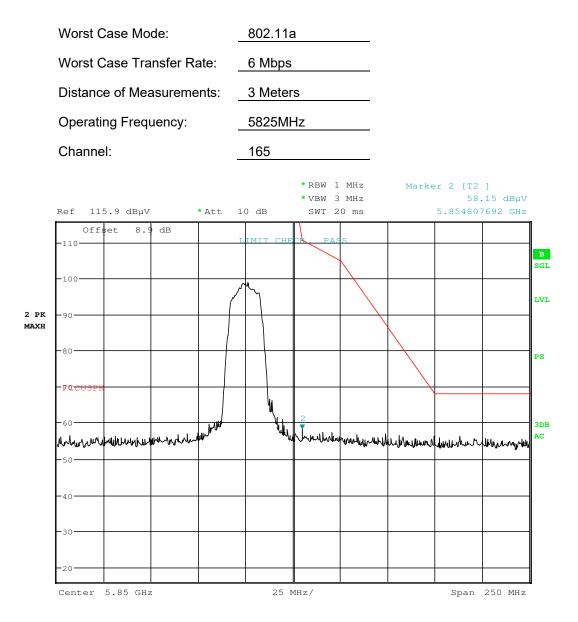
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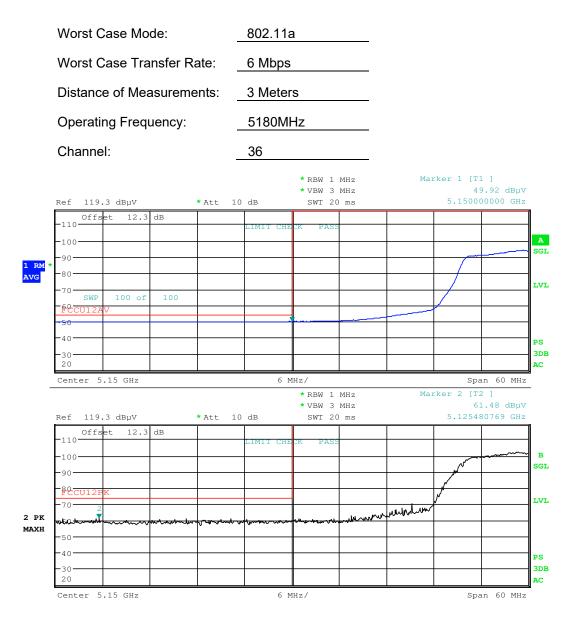
Date: 25.JAN.2017 20:51:49

Plot 7-195. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

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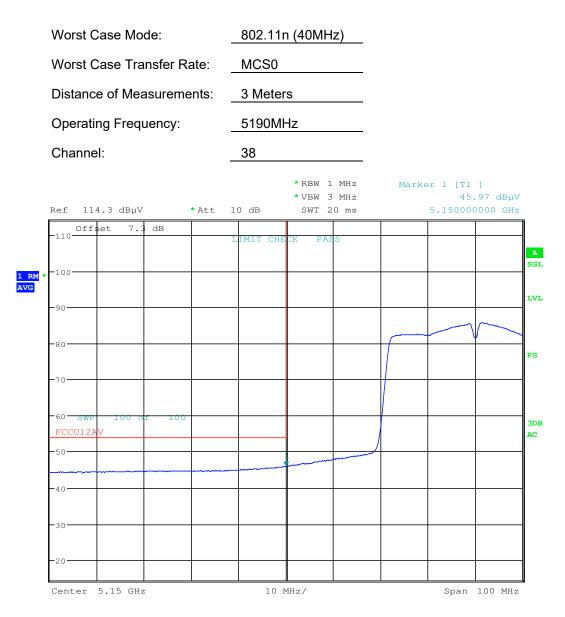
Date: 5.JAN.2017 23:46:51

Plot 7-196. Radiated Restricted Band Edge Plot with WCP (Average, Peak)

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Approved by: Quality Manager
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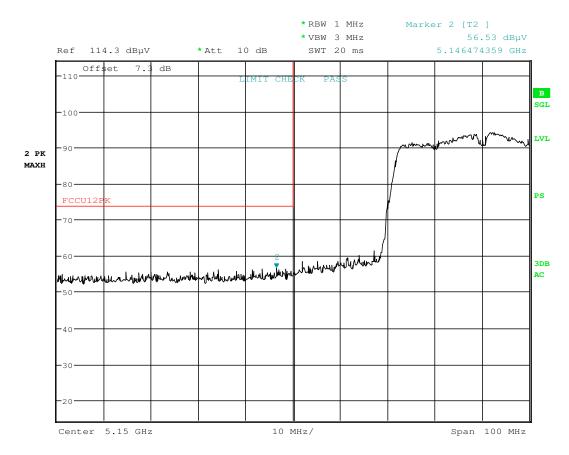
Date: 25.JAN.2017 20:10:14

Plot 7-197. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Approved by: Quality Manager
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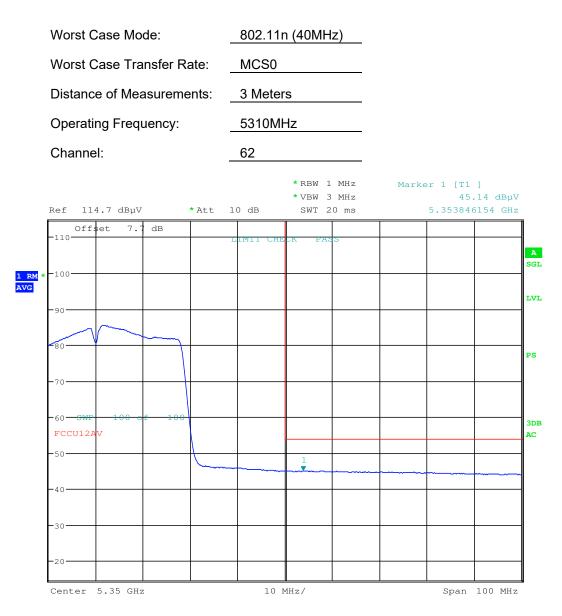
Date: 25.JAN.2017 20:09:31

Plot 7-198. Radiated Restricted Lower Band Edge Plot (Peak - UNII Band 1)

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Approved by: Quality Manager
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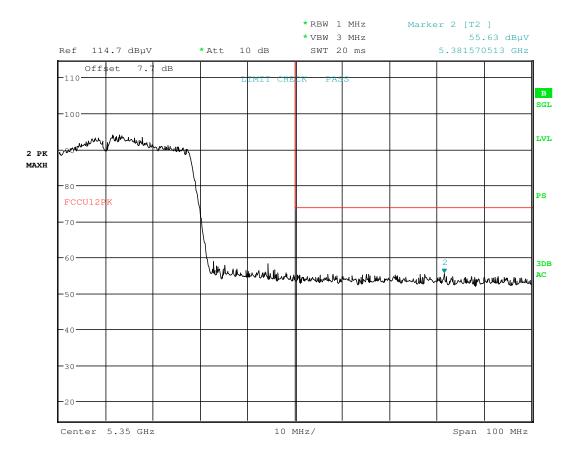
Date: 25.JAN.2017 20:20:14

Plot 7-199. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

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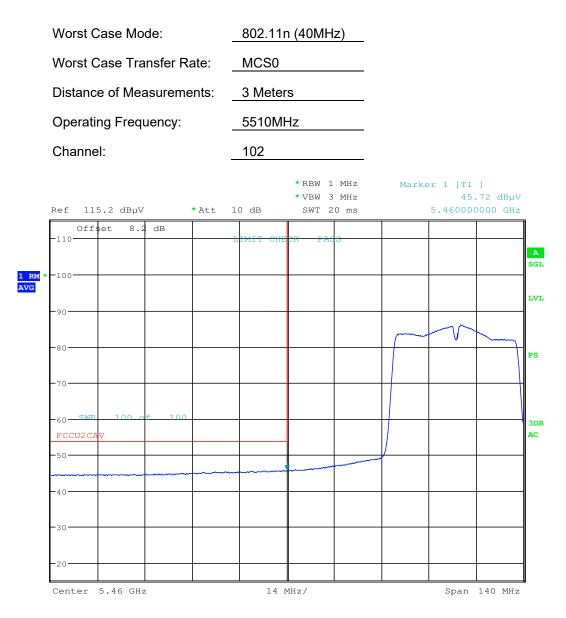
Date: 25.JAN.2017 20:19:57

Plot 7-200. Radiated Restricted Upper Band Edge Plot (Peak - UNII Band 2A)

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Approved by: Quality Manager
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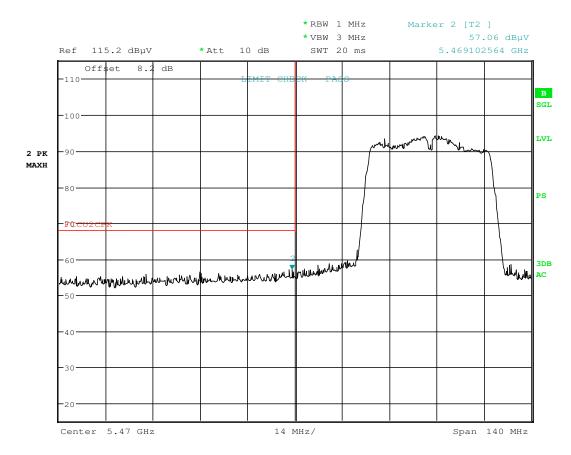
Date: 25.JAN.2017 20:41:53

Plot 7-201. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

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Date: 25.JAN.2017 20:41:41

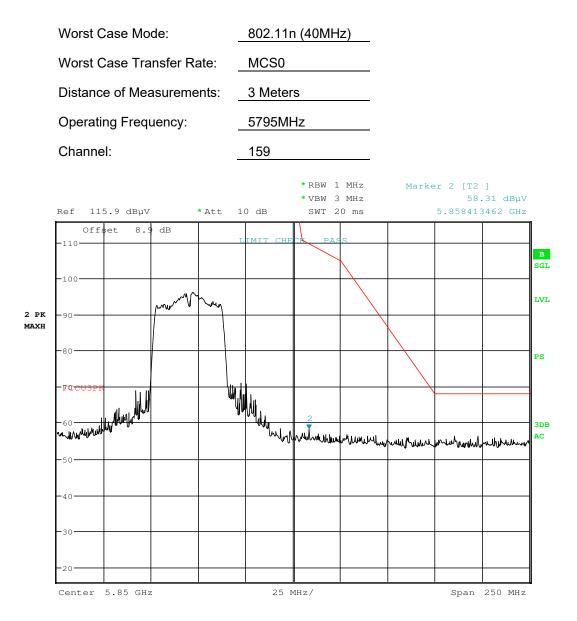
Plot 7-202. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

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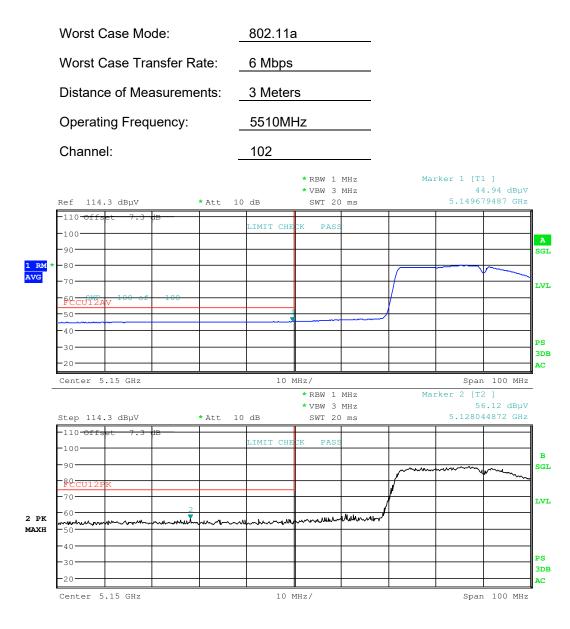
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Plot 7-203. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

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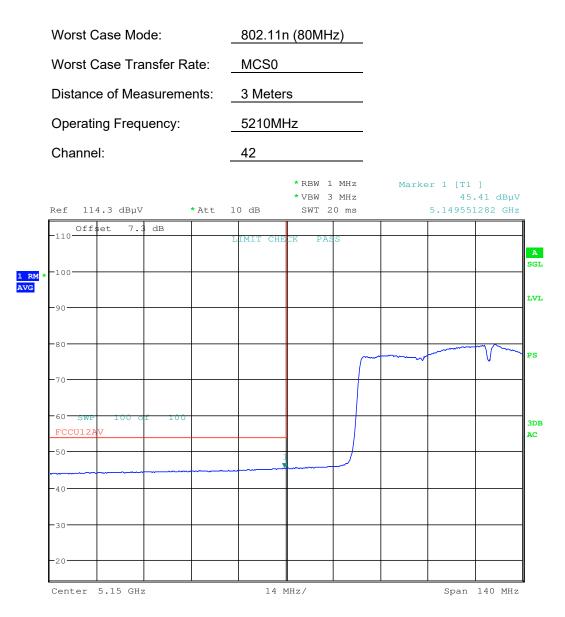
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Plot 7-204. Radiated Restricted Band Edge Plot with WCP (Average, Peak)

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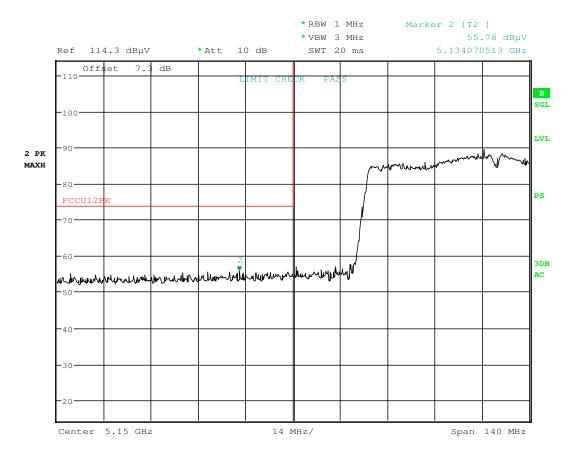
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Plot 7-205. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

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Test Report S/N:	Test Dates:	EUT Type:		Dega 167 of 249
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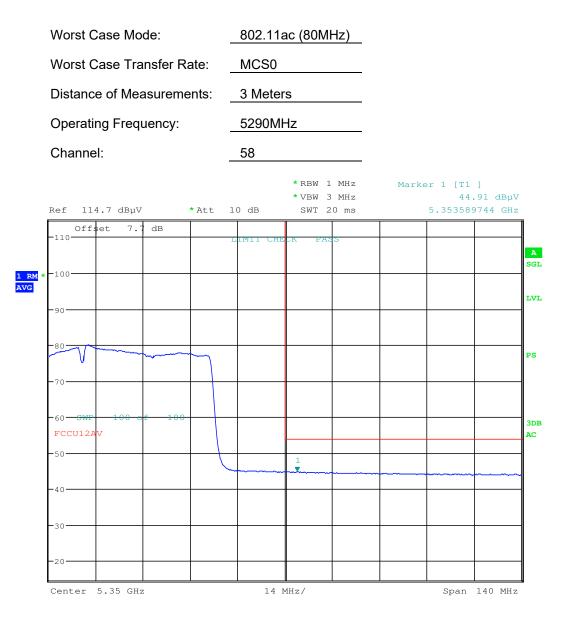
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Plot 7-206. Radiated Restricted Lower Band Edge Plot (Peak - UNII Band 1)

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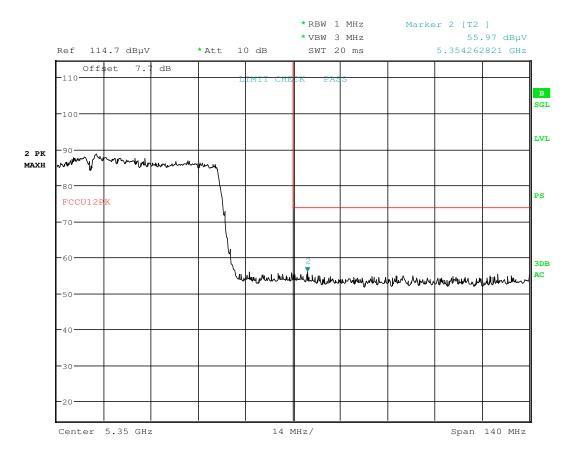
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Plot 7-207. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

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Test Report S/N:	Test Dates:	EUT Type:		Degra 160 of 249
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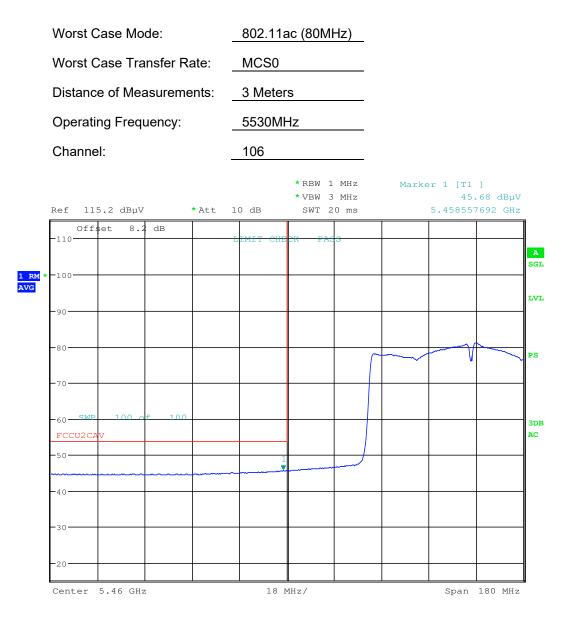
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Plot 7-208. Radiated Restricted Upper Band Edge Plot (Peak - UNII Band 2A)

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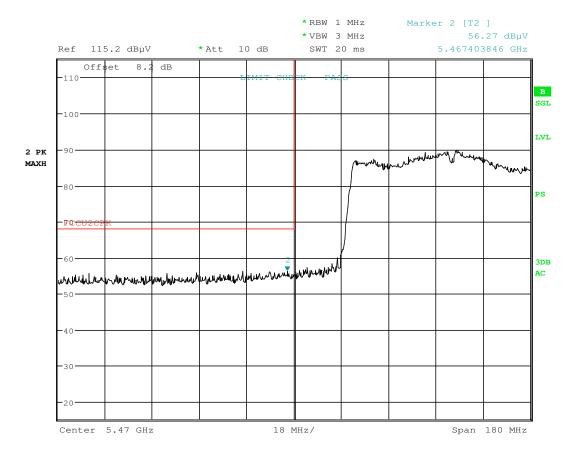
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Plot 7-209. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

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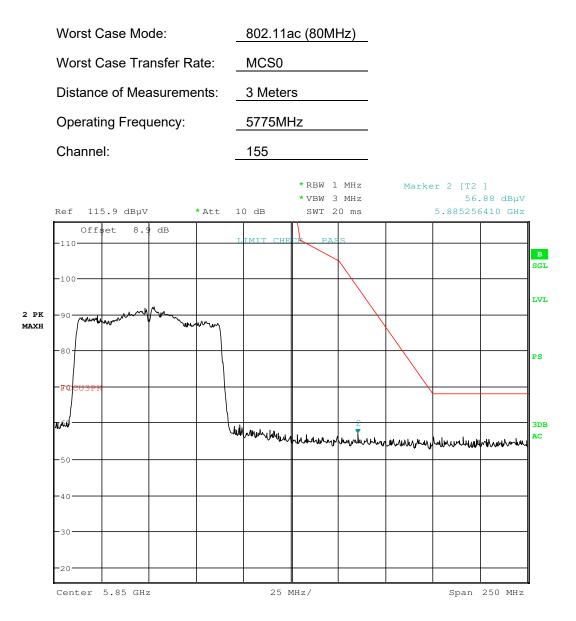
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Plot 7-210. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

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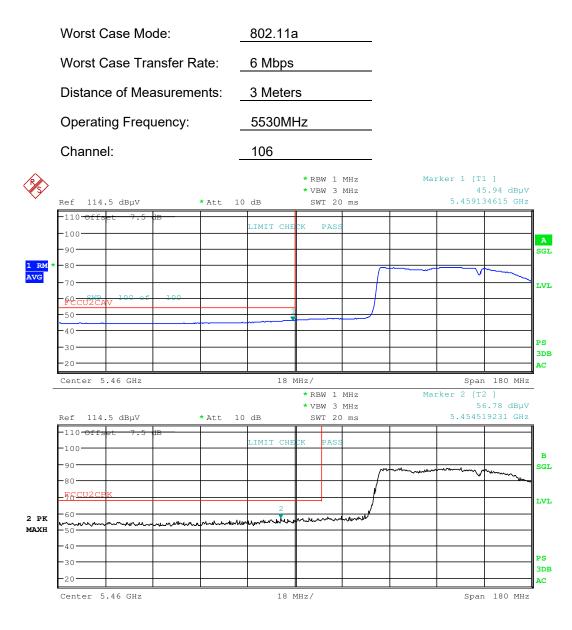
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Plot 7-211. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

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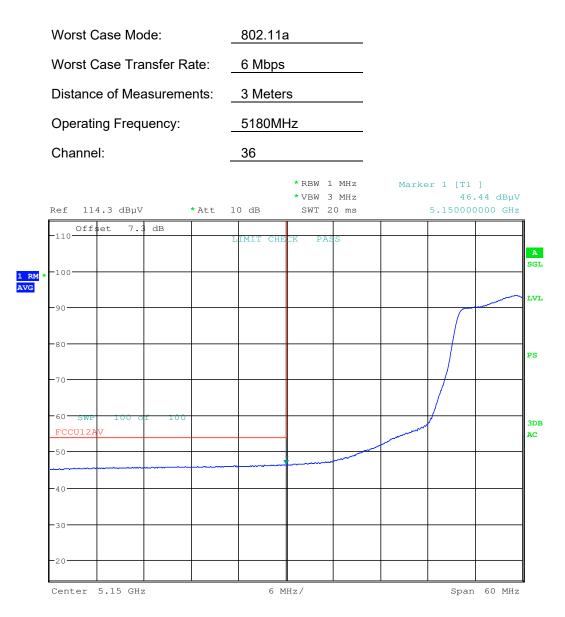
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Plot 7-212. Radiated Restricted Band Edge Plot with WCP (Average, Peak)

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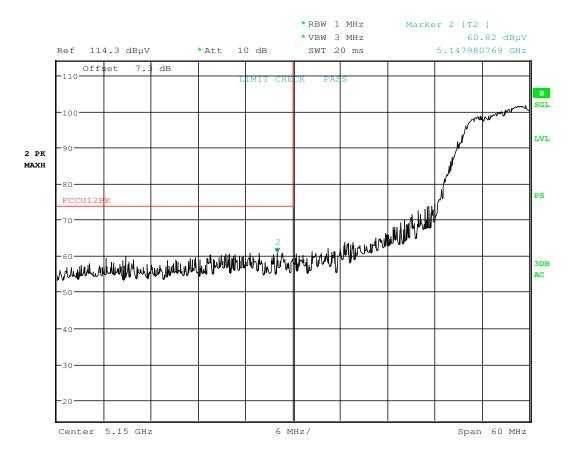
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Plot 7-213. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

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Date: 25.JAN.2017 21:04:28

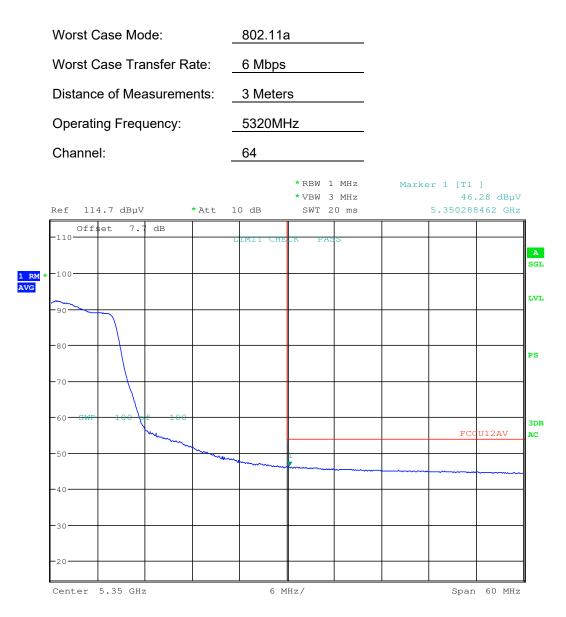


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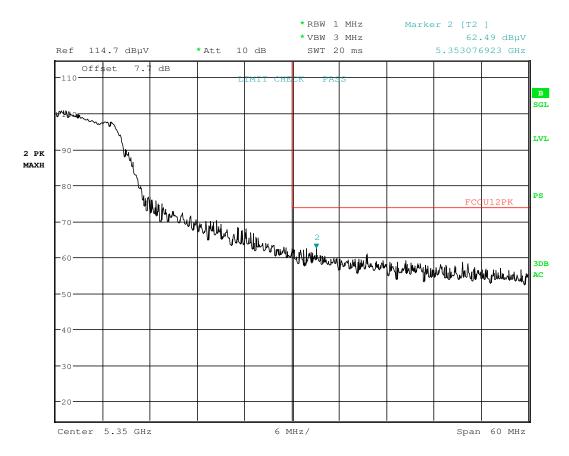
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Plot 7-215. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

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Date: 25.JAN.2017 21:20:00

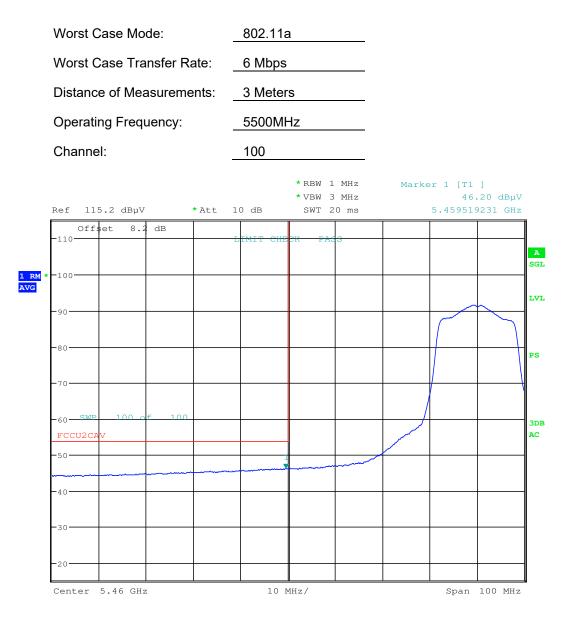


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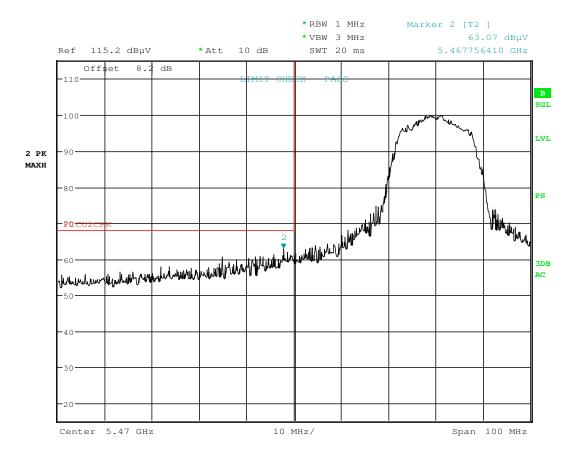
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Plot 7-217. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

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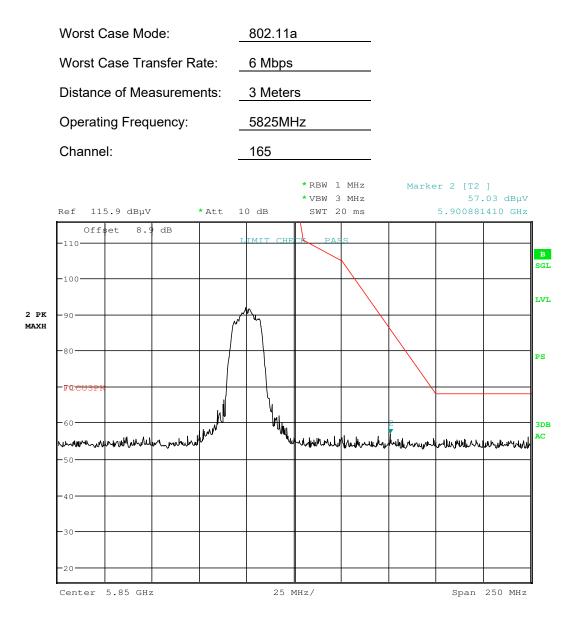
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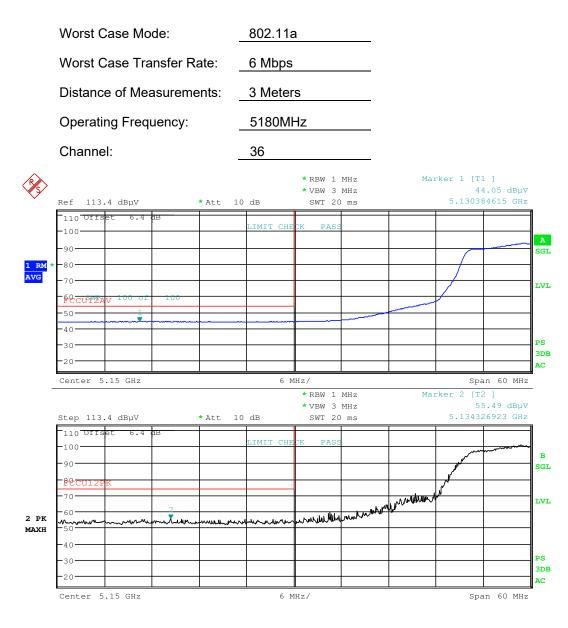
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Plot 7-219. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

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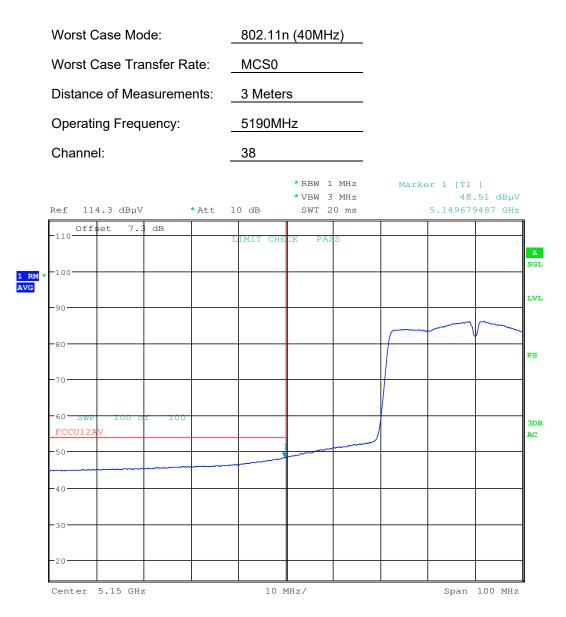
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Plot 7-220. Radiated Restricted Band Edge Plot with WCP (Average, Peak)

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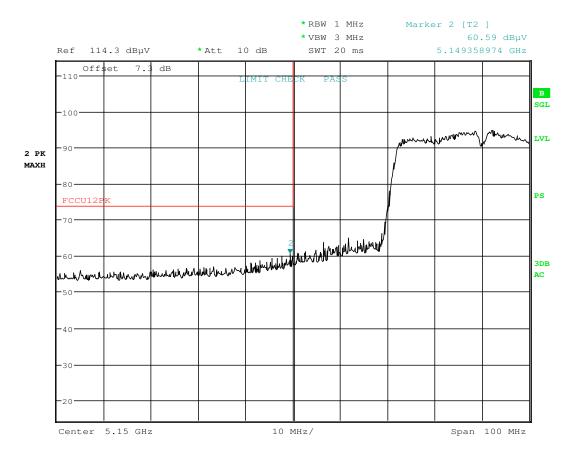
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Plot 7-221. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

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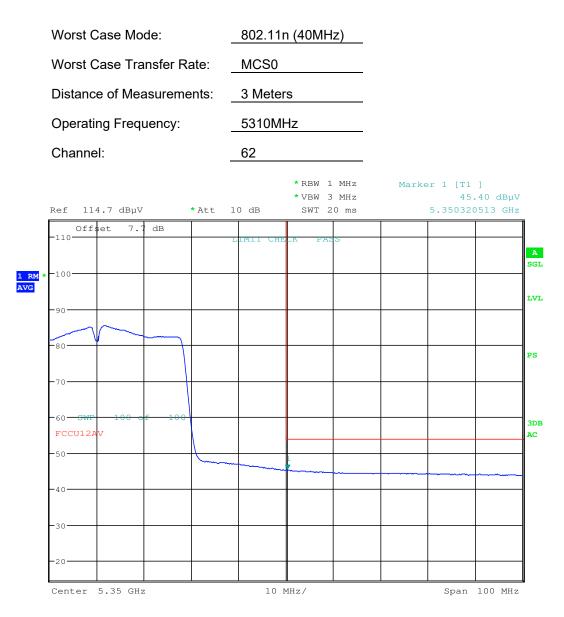
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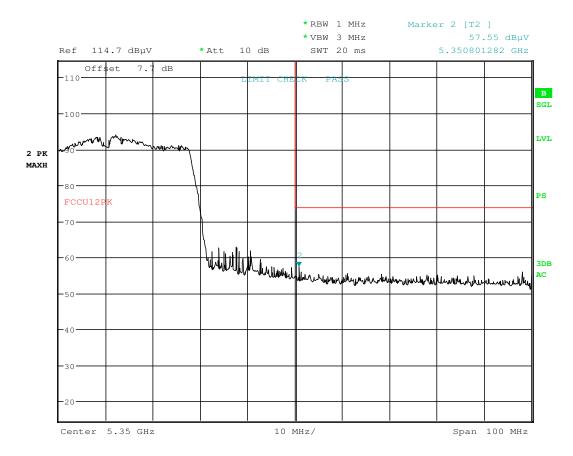
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Plot 7-223. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

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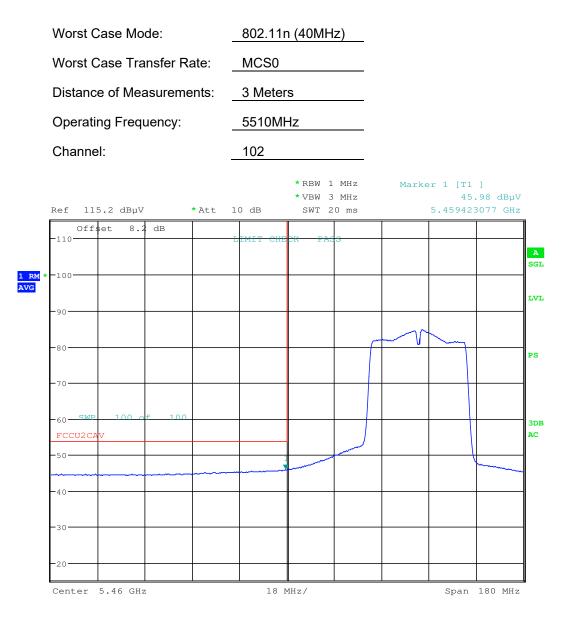
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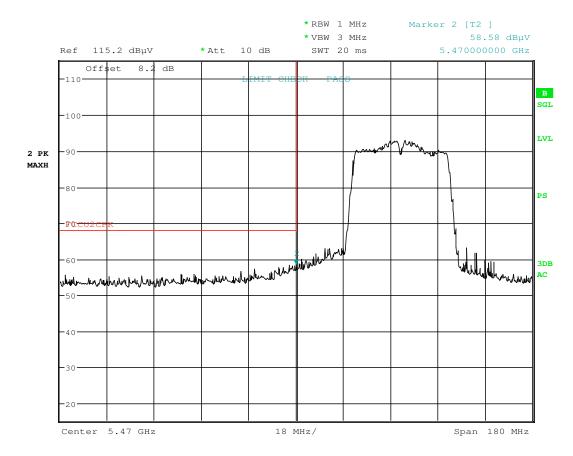
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Plot 7-225. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

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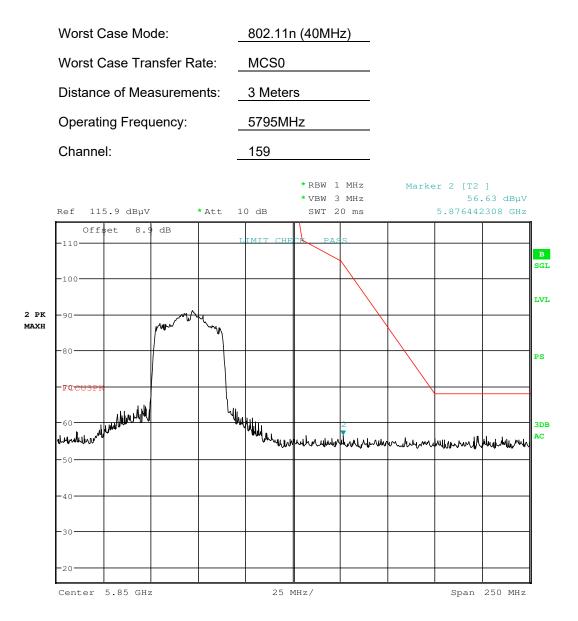
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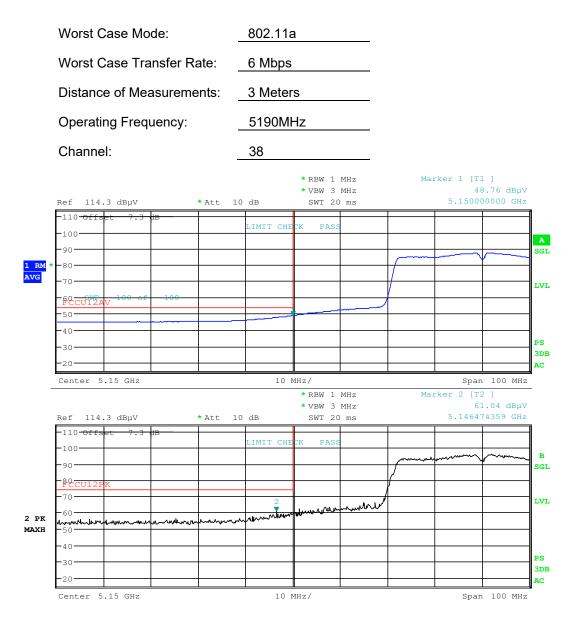
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Plot 7-227. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

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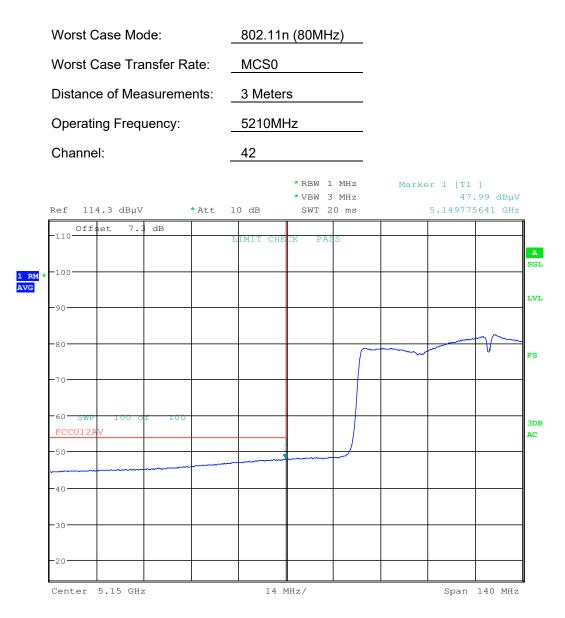
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Plot 7-228. Radiated Restricted Band Edge Plot with WCP (Average, Peak)

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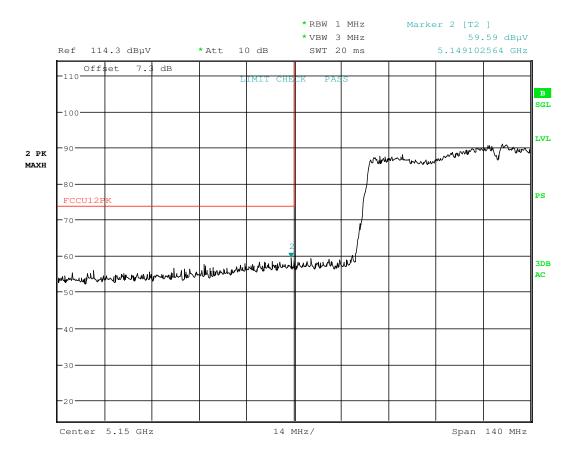
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Plot 7-229. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

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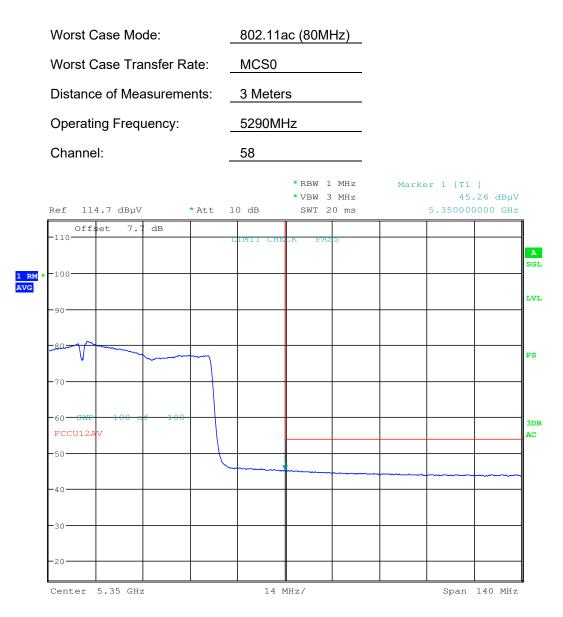
Date: 25.JAN.2017 21:13:52

Plot 7-230. Radiated Restricted Lower Band Edge Plot (Peak - UNII Band 1)

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Demo 102 of 249
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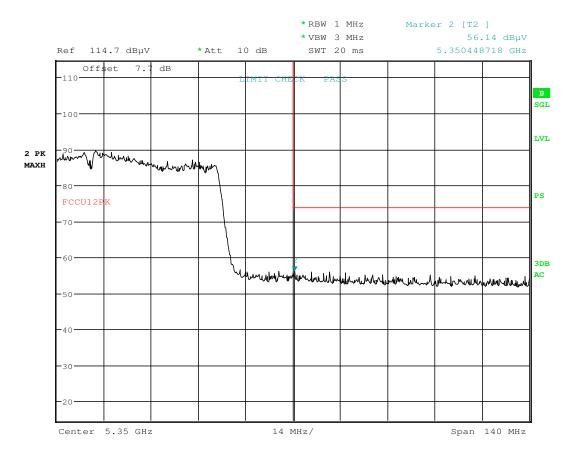
Date: 25.JAN.2017 21:26:35

Plot 7-231. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Degra 102 of 249
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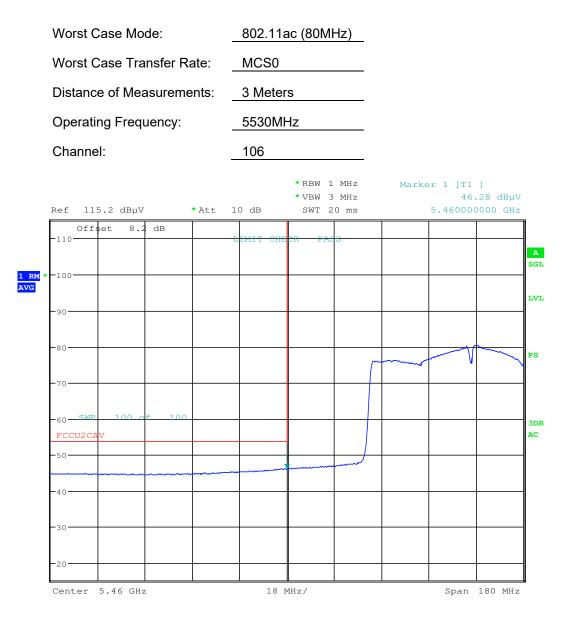
Date: 25.JAN.2017 21:26:46



FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 104 of 249
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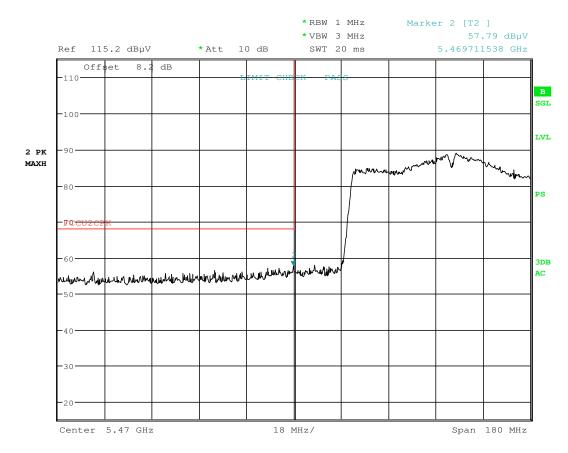
Date: 25.JAN.2017 21:39:00

Plot 7-233. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Degre 105 of 249
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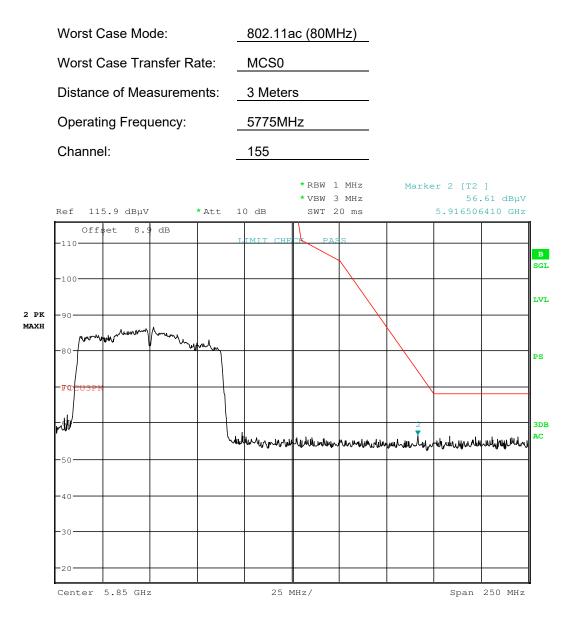
Date: 25.JAN.2017 21:39:17

Plot 7-234. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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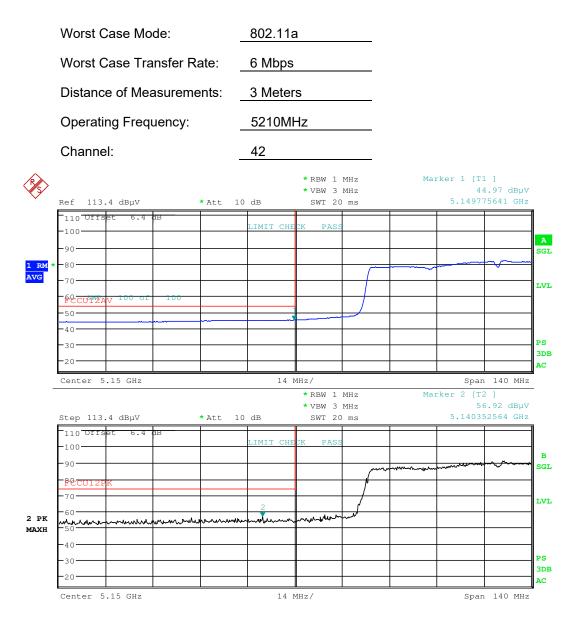
Date: 8.FEB.2017 15:23:14

Plot 7-235. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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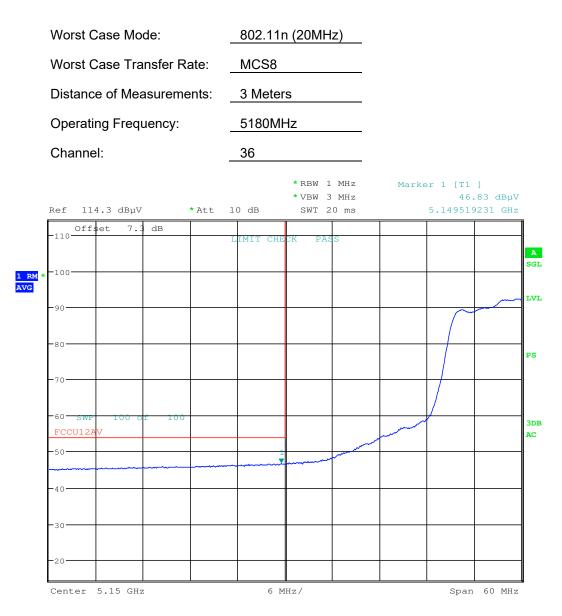
Date: 6.FEB.2017 23:27:34

Plot 7-236. Radiated Restricted Band Edge Plot with WCP (Average, Peak)

		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 100 of 240
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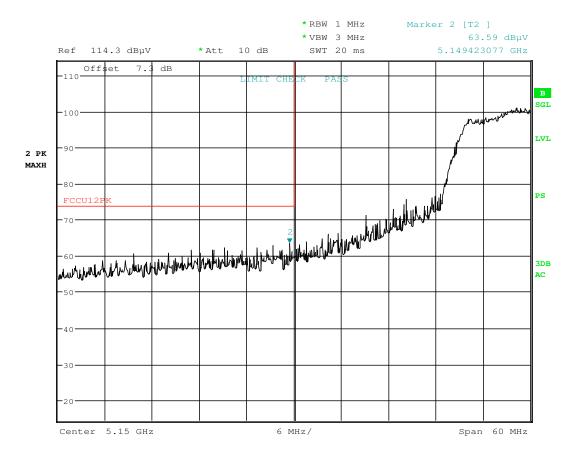
Date: 25.JAN.2017 22:35:04

Plot 7-237. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Degra 100 of 249
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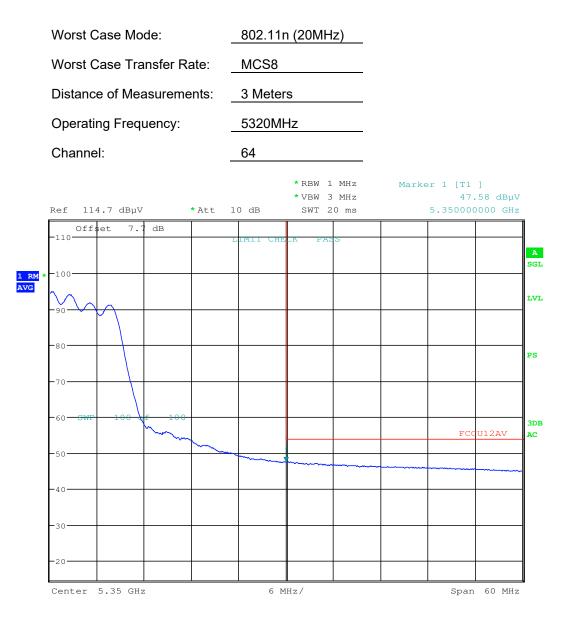
Date: 25.JAN.2017 22:35:14

Plot 7-238. Radiated Restricted Lower Band Edge Plot (Peak - UNII Band 1)

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Degra 200 of 249
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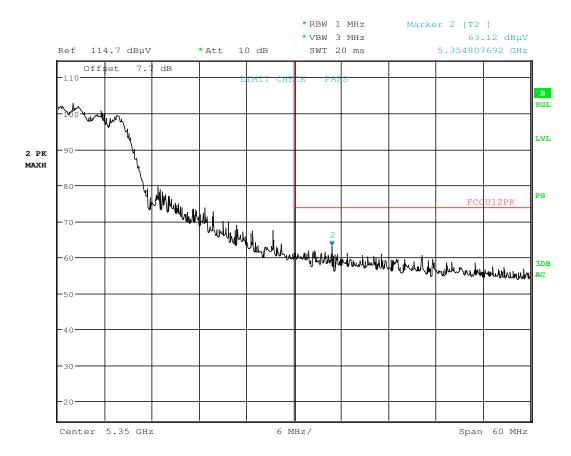
Date: 25.JAN.2017 22:46:03

Plot 7-239. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 201 of 249
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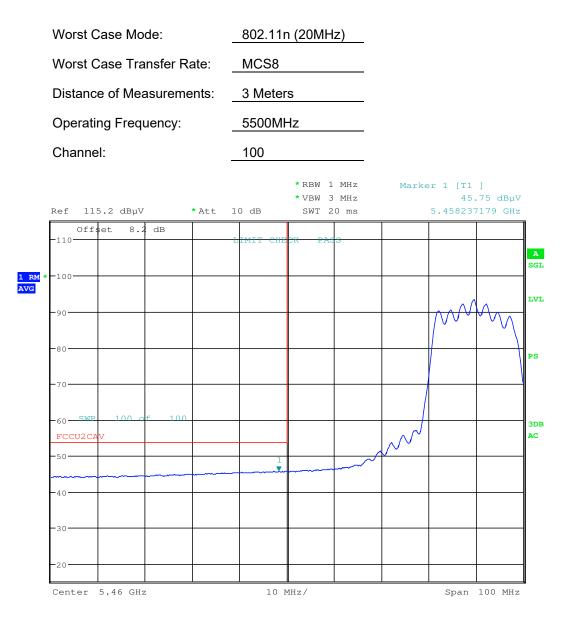
Date: 25.JAN.2017 22:46:57



FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Approved by: Quality Manager
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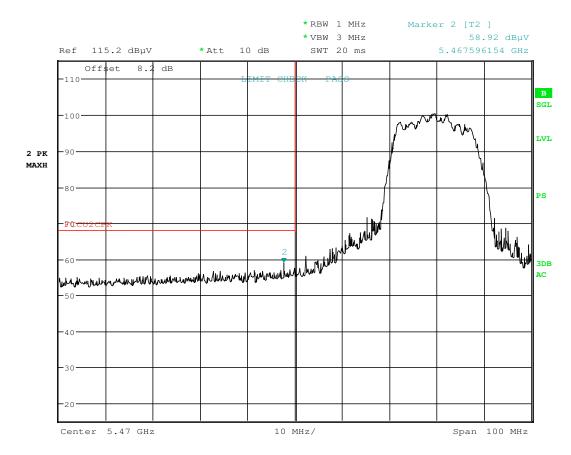
Date: 25.JAN.2017 23:13:21

Plot 7-241. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Degra 202 of 249
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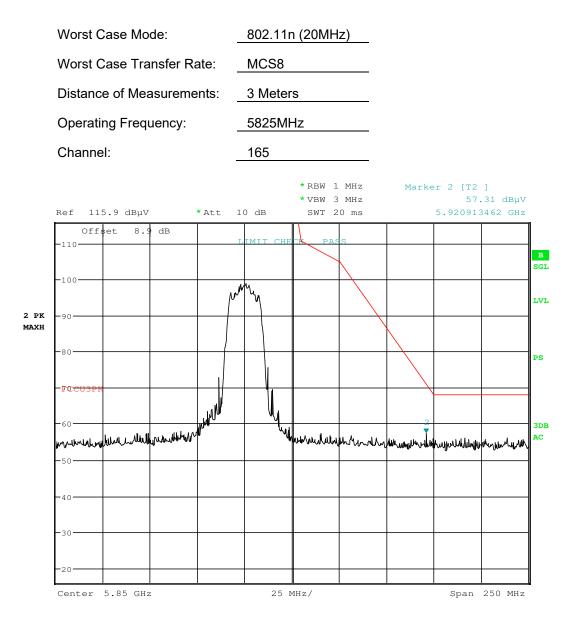
Date: 25.JAN.2017 23:13:38



FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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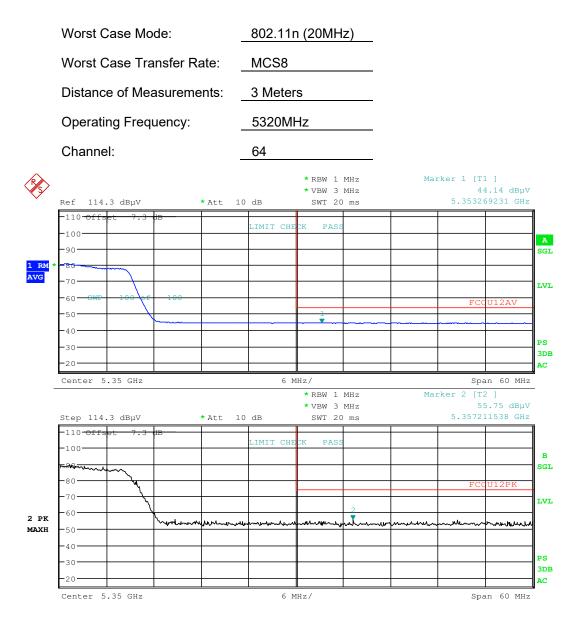
Date: 25.JAN.2017 23:27:45

Plot 7-243. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

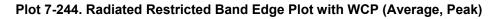
FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Degre 205 of 249
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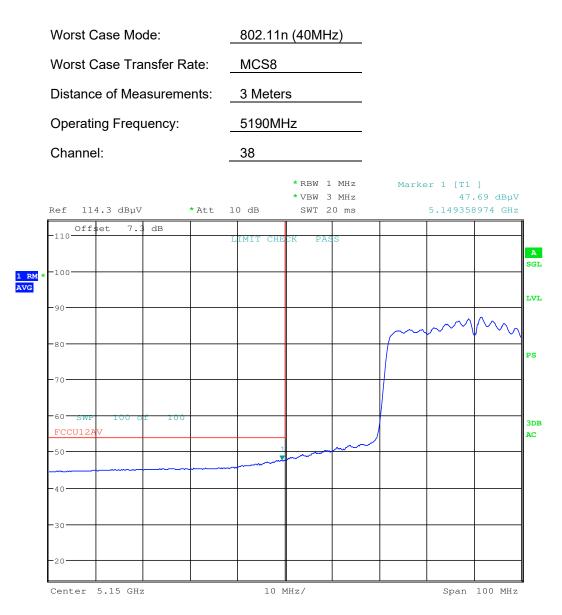
Date: 6.FEB.2017 23:37:28



FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 206 of 249
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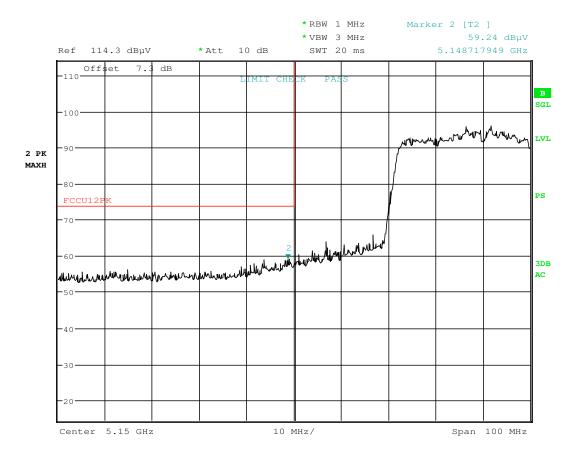
Date: 25.JAN.2017 22:36:15

Plot 7-245. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Approved by: Quality Manager
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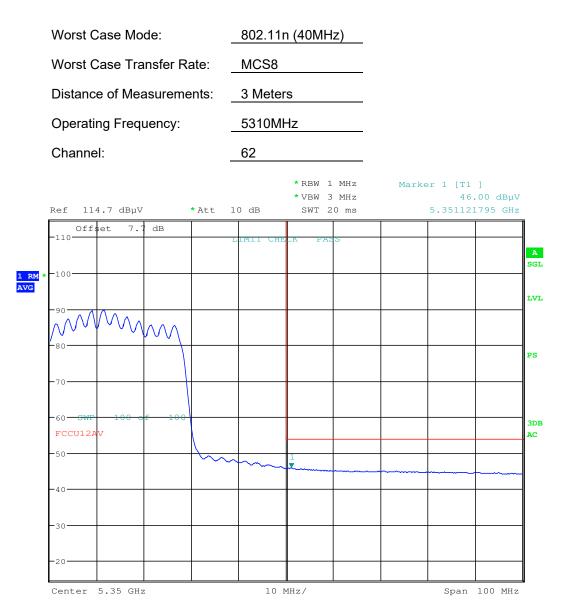
Date: 25.JAN.2017 22:36:04

Plot 7-246. Radiated Restricted Lower Band Edge Plot (Peak - UNII Band 1)

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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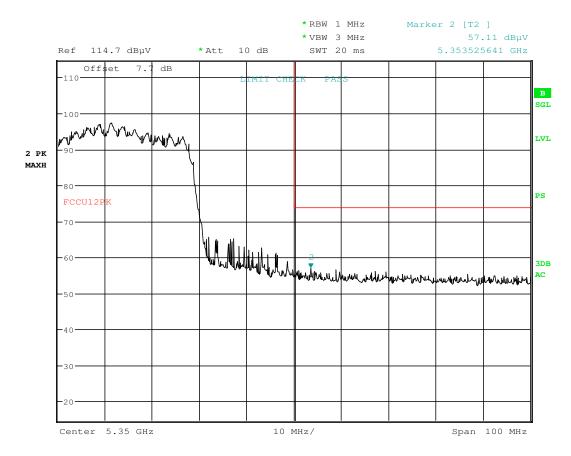
Date: 25.JAN.2017 22:54:58

Plot 7-247. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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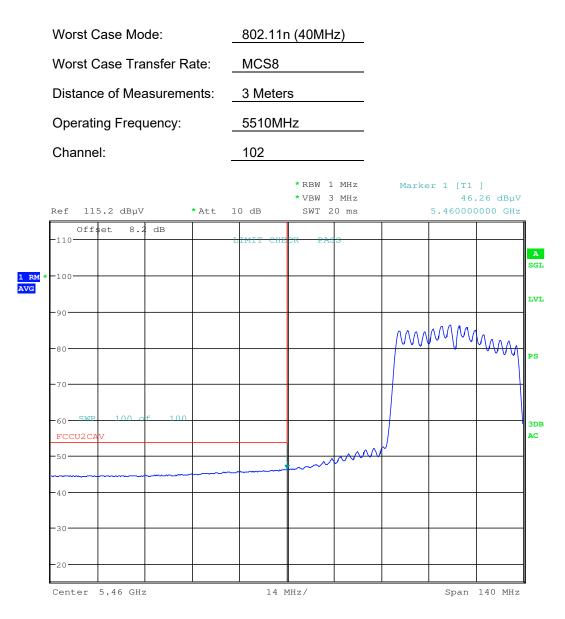
Date: 25.JAN.2017 22:54:47



FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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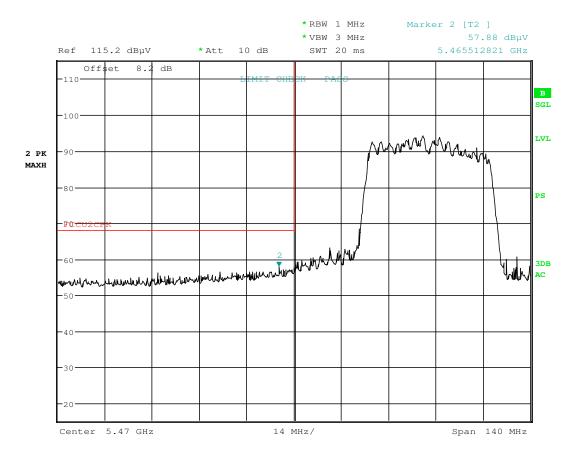
Date: 25.JAN.2017 23:17:05

Plot 7-249. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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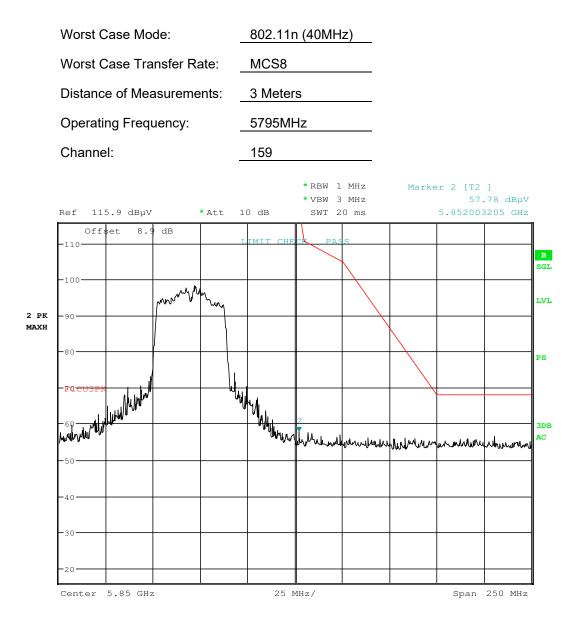
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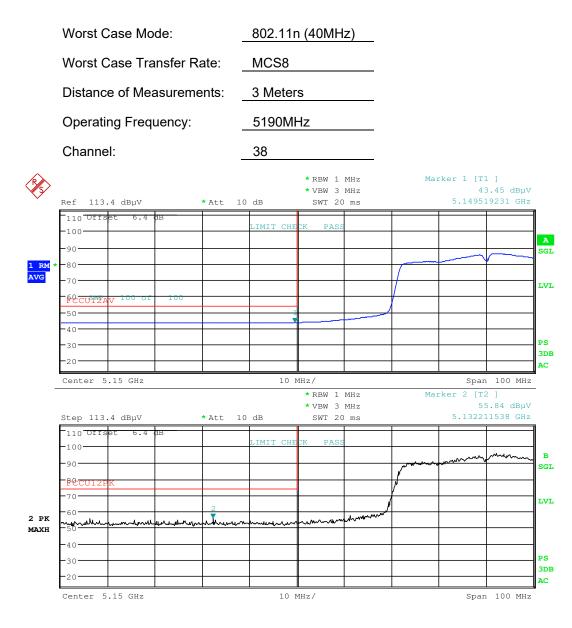
Date: 25.JAN.2017 23:28:54

Plot 7-251. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Approved by: Quality Manager
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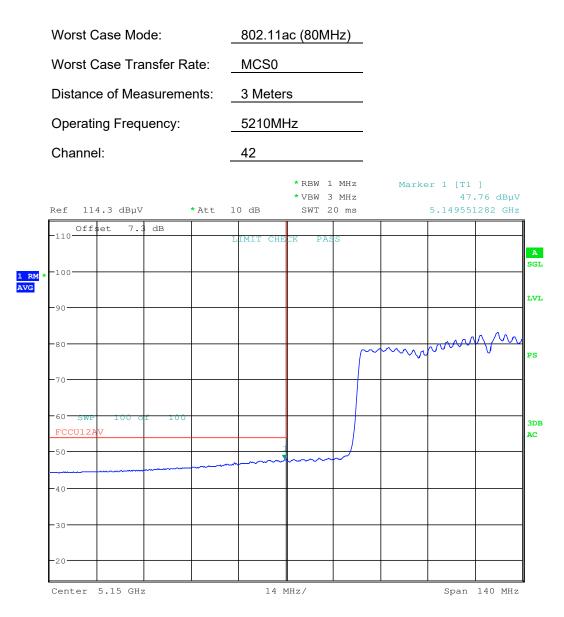
Date: 6.FEB.2017 23:39:59

Plot 7-252. Radiated Restricted Band Edge Plot with WCP (Average, Peak)

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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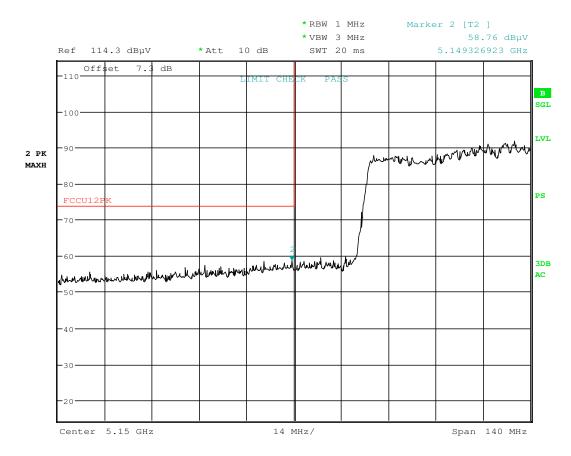
Date: 25.JAN.2017 22:37:20

Plot 7-253. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Approved by: Quality Manager
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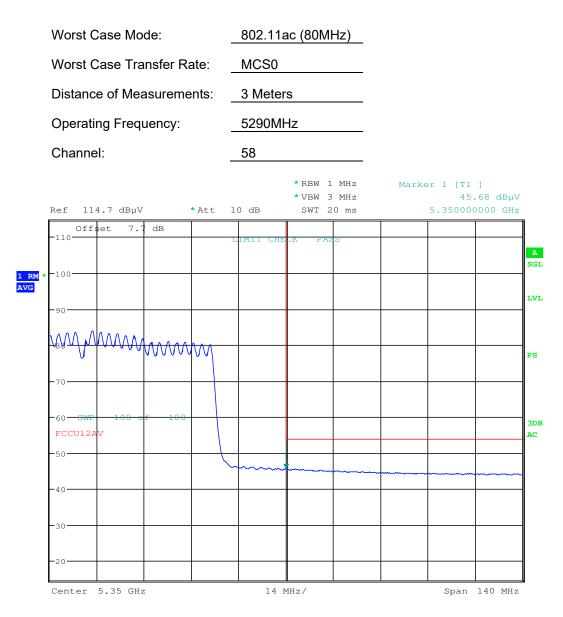
Date: 25.JAN.2017 22:37:30

Plot 7-254. Radiated Restricted Lower Band Edge Plot (Peak - UNII Band 1)

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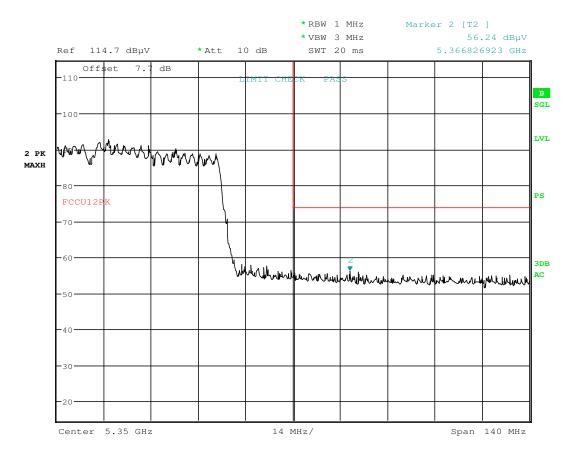
Date: 25.JAN.2017 22:57:39

Plot 7-255. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

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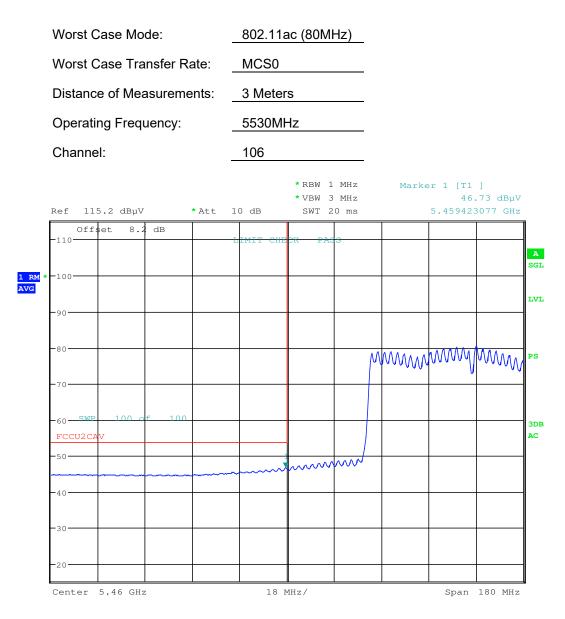
Date: 25.JAN.2017 22:57:49



FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Approved by: Quality Manager
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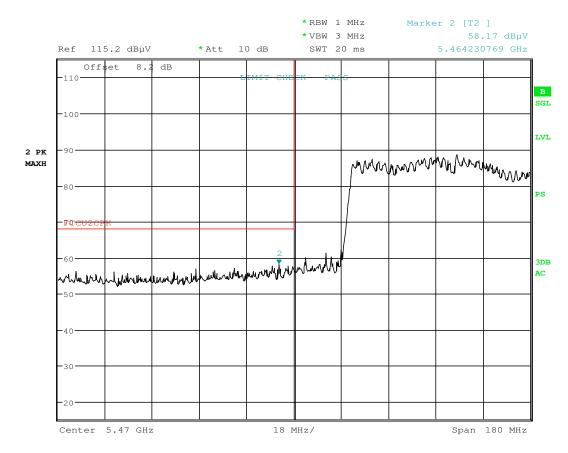
Date: 25.JAN.2017 23:18:47

Plot 7-257. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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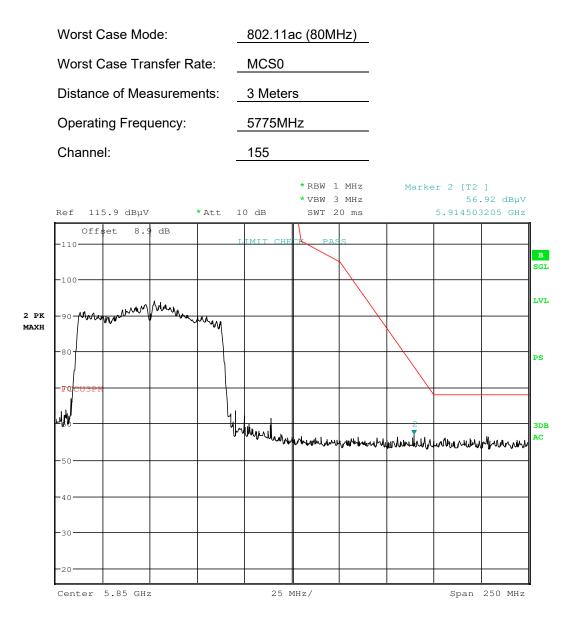
Date: 25.JAN.2017 23:19:11

Plot 7-258. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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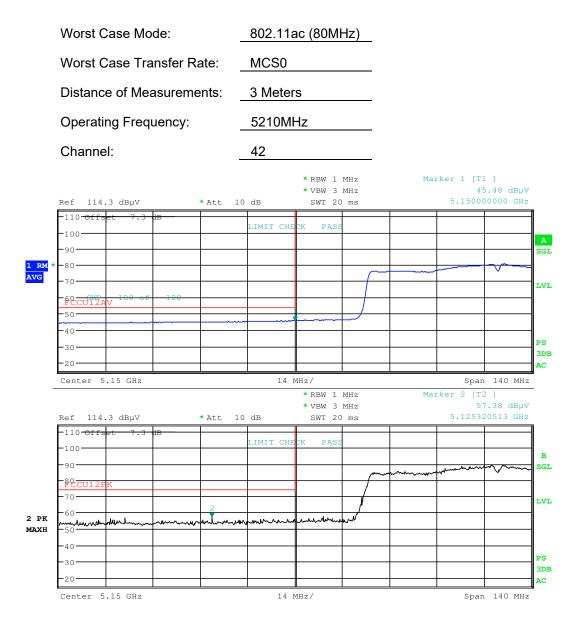
Date: 25.JAN.2017 23:29:58

Plot 7-259. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Approved by: Quality Manager
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Date: 30.JAN.2017 22:51:14

Plot 7-260. Radiated Restricted Band Edge Plot with WCP

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Approved by: Quality Manager
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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 7-64 per Section 15.209.

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

Table 7-64. Radiated Limits

Test Procedures Used

ANSI C63.10-2013

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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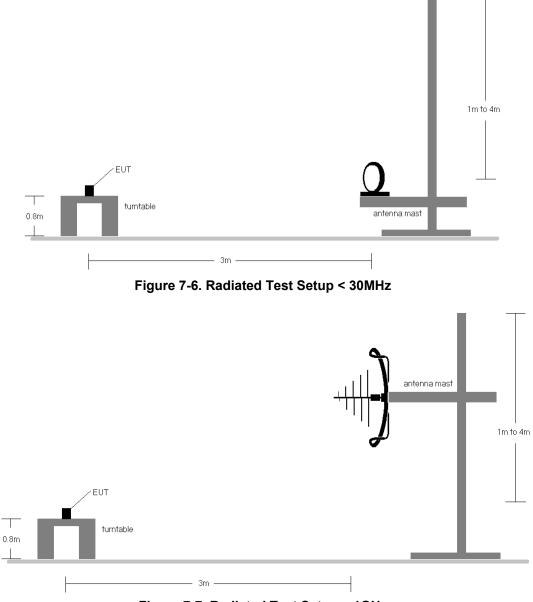
12/26/2016

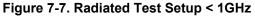
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Test Setup

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





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Test Notes

- 1. All emissions lying in restricted bands specified in §15.205 are below the limit shown in Table 7-64.
- 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.
- 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.

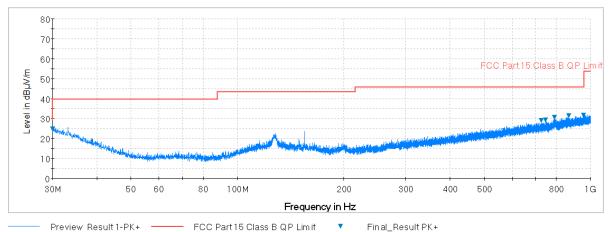
FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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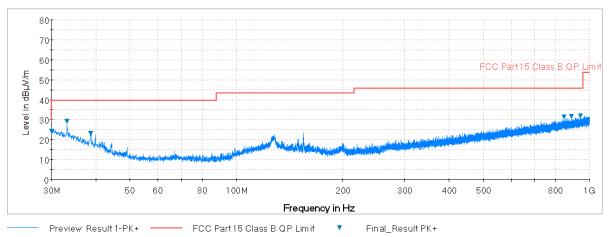
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Antenna-1 Radiated Spurious Emissions Measurements (Below 1GHz) §15.209



Plot 7-261. Radiated Spurious Plot below 1GHz (802.11a – U3 Ch. 157, Ant. Pol. H)



Plot 7-262. Radiated Spurious Plot below 1GHz (802.11a - U3 Ch. 157, Ant. Pol. V)

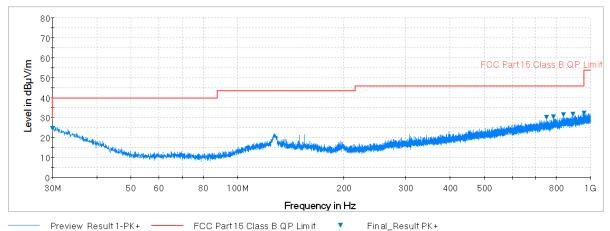
FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Approved by: Quality Manager
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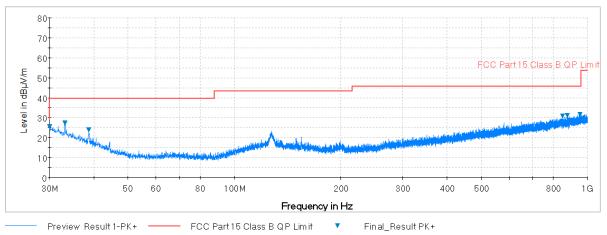
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Antenna-2 Radiated Spurious Emissions Measurements (Below 1GHz) §15.209







Plot 7-264. Radiated Spurious Plot below 1GHz (802.11a - U3 Ch. 157, Ant. Pol. V)

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

Table 7-65. 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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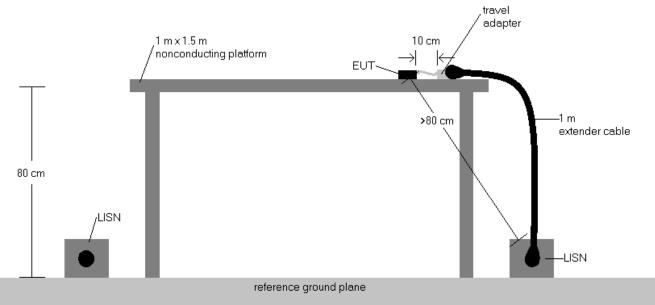
12/26/2016

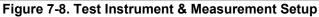
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Test Setup

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





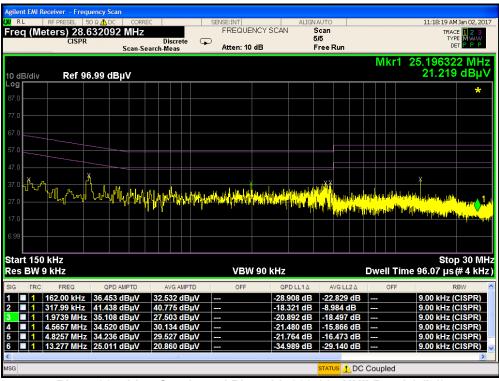
Test Notes

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

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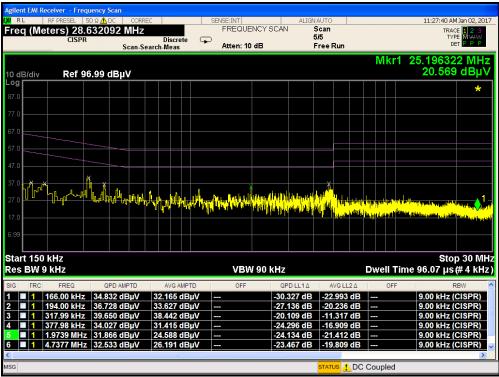


Plot 7-265. Line Conducted Plot with 802.11a UNII Band 1 (L1)

FCC ID: ZNFH871	ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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Plot 7-266. Line Conducted Plot with 802.11a UNII Band 1 (N)

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Agilent EMI Re	ceiver - Fred	uency S	Scan																							
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Plot 7-267. Line Conducted Plot with 802.11a UNII Band 2A (L1)

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Agilent EMI Receiv	er - Frequency	Scan												
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3 1 4.56	97 MHz 33.		29.14 27.23					951 dB 569 dB	-16.8	59 dB 65 dB			9.00 kHz 9.00 kHz	(CISPR)
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Plot 7-268. Line Conducted Plot with 802.11a UNII Band 2A (N)

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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Agilent EMI Red	ceiver - Frea	uency S	can																									
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Plot 7-269. Line Conducted Plot with 802.11a UNII Band 2C (L1)

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Agilent EMI Re	ceiver - Frequ	Jency S	can																							
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Plot 7-270. Line Conducted Plot with 802.11a UNII Band 2C (N)

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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Agile	ent EMI F	Receiver - Free	quency	Scan																						
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	urt 15(s BW											VBV	N 90	kHz					D	wei	 Ti	me	96.0		p 30 Mi (# 4 kH;	
SIG	TRC	FREQ	0	PD AMP	PTD	1	AV	'G AM	IPTD	- 1		OFF		Q	PD LL1 A		AVG	LL2 Δ			OFF				RBW	^
1	1	154.00 kHz	35.1	04 dE	υV	3	2.16	51 d	Bu\	/				-30	678 dE	3 -2	3.62	20 dE	3 -				9.00	kHz (CISPR)	
2		313.99 kHz		35 dB					Bµ\						330 dE			24 dE							CISPR)	
3	1	3.2858 MHz	z 35.3	62 dB	βµV	2	9.02	28 d	Βµ\	/				-20	.638 dE	3 -1	6.97	<mark>/2 d</mark> E	3 -						CISPR)	1
4	1	4.2177 MHz		87 dE					Bµ\					-23	.913 dE			l1 dE							CISPR)	
5	1	4.5777 MHz							Bμ\						.177 dE)5 dE							CISPR)	ŀ
6	1	4.7457 MHz	z 32.2	41 dB	βµV	2	7.29	99 d	Bμ\	/				-23	.759 dE	3 -1	8.70)1 dE	3 -				9.00	kHz	CISPR)	~
<			_		_	_		111	_	_	_		_			_		_	_	_	_	_	_	_	>	J
MSG																STA	TUS	🔔 D	C Co	pupl	ed					
																	_									

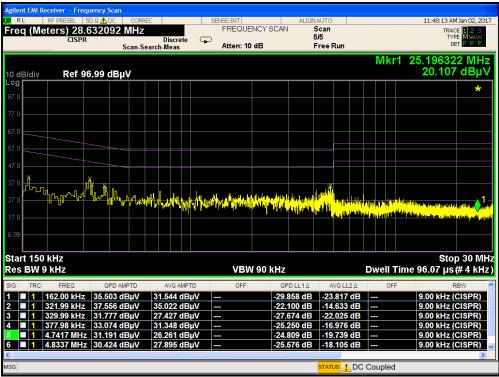
Plot 7-271. Line Conducted Plot with 802.11a UNII Band 3 (L1)

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Line-Conducted Test Data <u>§15.407</u>



Plot 7-272. Line Conducted Plot with 802.11a UNII Band 3 (N)

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8.0 CONCLUSION

The data collected relate only the item(s) tested and show that the LG Portable Handset FCC ID: ZNFH871 is in compliance with Part 15E of the FCC Rules.

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APPENDIX A. 802.11A DUAL TX

A.1 Summary

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

Notes:

1) This device employs dual transmission in 802.11a and 802.11g modes using Cyclic Delay Diversity. For all

1) This device employs dual transmission in 802.11a and 802.11g modes using Cyclic Delay Diversity. For all test cases, the device was set to transmit from both antennas simultaneously. The data in this section demonstrates compliance to the dual-transmission requirements specified in KDB 662911 v02r01.

Table A.1-1. Summary of Test Results

- 2) All data found in this section is compiled from plots found in the main body of this test report.
- Since this device is able to transmit the same data through both of its antennas in a given symbol period, then, by the definition specified in KDB 662911 v02r01 Section F)1), the transmission symbols are correlated.
- 4) Since two antennas are supported in this device and a minimum of N_{ss} = 1 antenna can operate at any given time, the maximum array gain for two correlated signals is 10log₁₀(N_{ant}/N_{ss}) = 3dB, where N_{ss} is the number of spatial streams and N_{ant} is the total number of antennas.
- 5) For conducted spurious emissions, per KDB 662911 v02r01 Section E)3)b), the emissions on each individual output complied with its corresponding relative limit for that output, so additional testing was not required for dual transmission operation.

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A.2 Output Power Measurement §15.247(b.3)

Test Overview

Using the "Measure and Sum" technique, the measured conducted power values were summed in linear power units then converted back to dBm. Original measured values are found in Section 7.4 of this report.

			5GHz (20MHz) Conducted	Power [dBm]
Freq [MHz]	Channel	Detector	IEEE 1	Fransmission	Mode
			ANT1	ANT2	CDD
5180	36	AVG	12.37	12.21	15.30
5200	40	AVG	16.18	15.96	19.08
5220	44	AVG	16.11	15.85	18.99
5240	48	AVG	16.04	15.97	19.02
5260	52	AVG	16.01	15.71	18.87
5280	56	AVG	15.89	15.76	18.84
5300	60	AVG	16.05	15.71	18.89
5320	64	AVG	12.02	11.88	14.96
5500	100	AVG	12.25	12.33	15.30
5580	116	AVG	15.86	15.85	18.87
5660	132	AVG	15.83	16.10	18.98
5720	144	AVG	15.76	15.63	18.71
5745	149	AVG	16.36	16.44	19.41
5785	157	AVG	15.95	16.06	19.02
5825	165	AVG	12.27	11.51	14.92

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

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A.3 Power Spectral Density §15.247(e)

Test Overview

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

	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Antenn-1 Power Density [dBm]			Max Permissible Power Density [dBm/MHz]	Margin [dB]	Pass / Fail
-	5180	36	а	6	1.40	1.15	4.29	11.0	-6.71	Pass
Band	5200	40	а	6	5.16	5.42	8.30	11.0	-2.70	Pass
ä	5240	48	а	6	5.19	5.29	8.25	11.0	-2.75	Pass
2A	5260	52	а	6	5.03	4.71	7.89	11.0	-3.11	Pass
Band	5280	56	а	6	4.89	4.98	7.95	11.0	-3.05	Pass
Ba	5320	64	а	6	1.47	1.22	4.36	11.0	-6.64	Pass
2C	5500	100	а	6	1.62	1.84	4.74	11.0	-6.26	Pass
Band	5580	116	а	6	5.30	5.81	8.57	11.0	-2.43	Pass
Ba	5720	144	а	6	5.30	4.49	7.93	11.0	-3.07	Pass

Table A3-1.802.11a Dual Tx Conducted Power Density Measurements

	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Antenn-1 Power Density [dBm]			Max Permissible Power Density [dBm/500kHz]	Margin [dB]	Pass / Fail
с	5745	149	а	6	3.10	2.11	5.64	30.0	-24.36	Pass
pue	5785	157	а	6	3.35	2.23	5.84	30.0	-24.16	Pass
ä	5825	165	а	6	-0.70	-1.40	1.97	30.0	-28.03	Pass

Table A3-2.802.11a Dual Tx Conducted Power Density Measurements

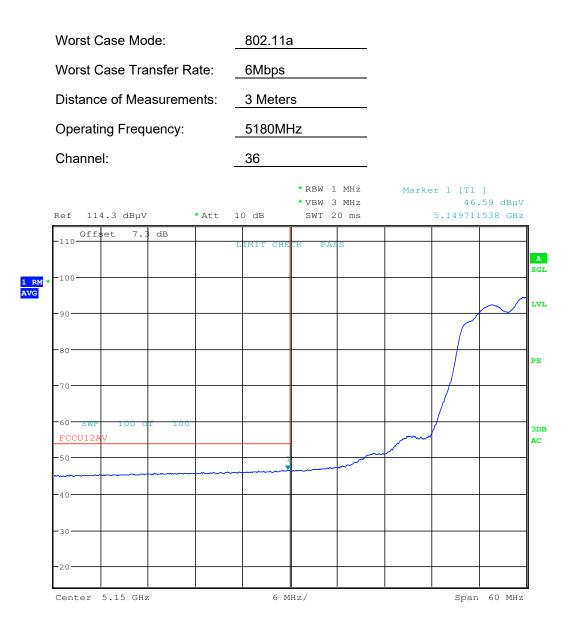
FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Approved by: Quality Manager
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A.4 Dual Tx Radiated Restricted Band Edge Measurements §15.205 §15.209

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



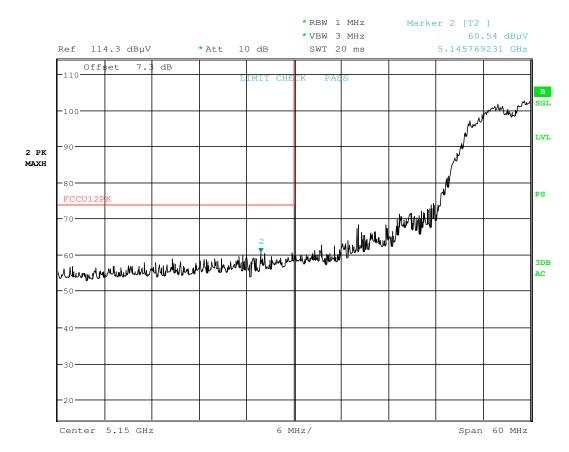
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FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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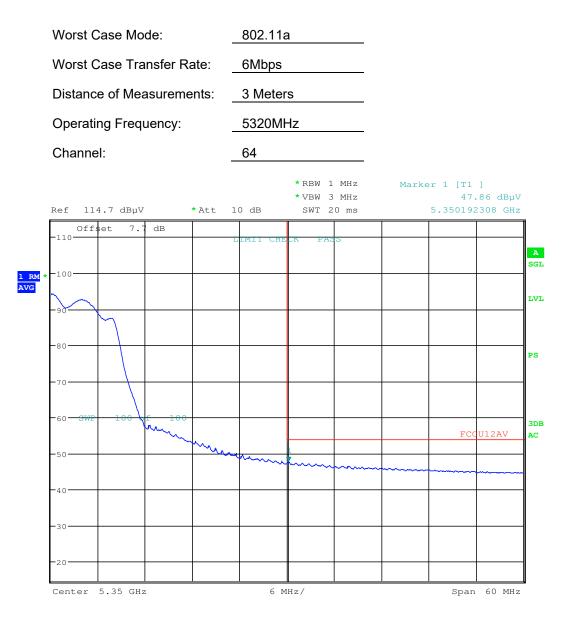
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Plot A.2-2. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

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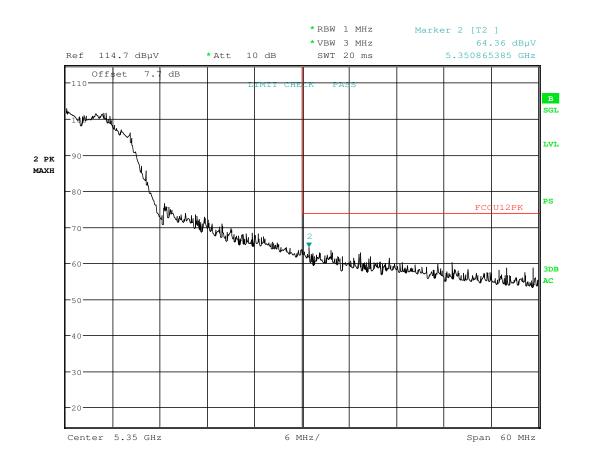
Date: 31.JAN.2017 14:43:29

Plot A.2-3. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Approved by: Quality Manager
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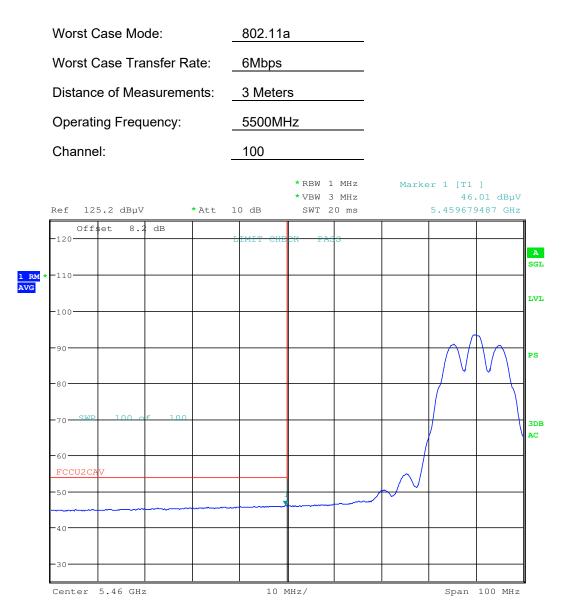
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FCC ID: ZNFH871		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Approved by: Quality Manager
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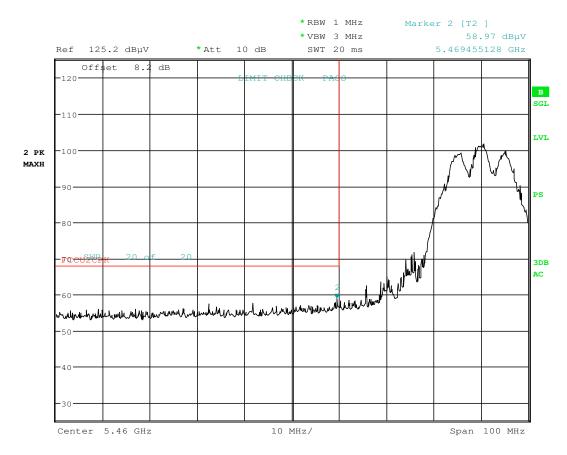
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Plot A.2-5. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

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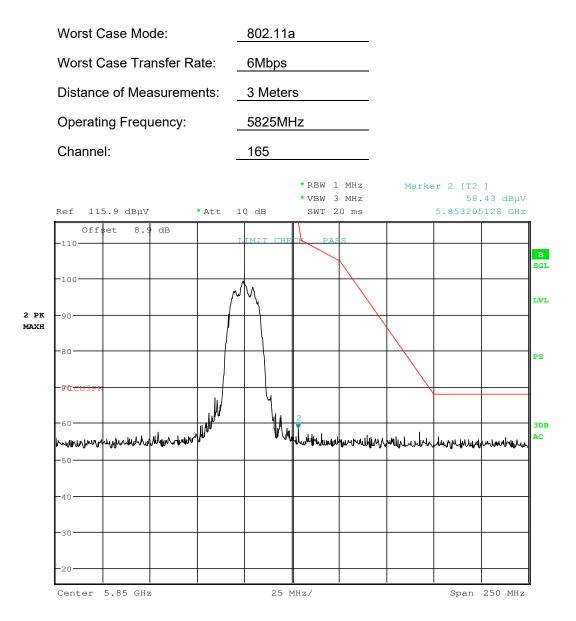
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Plot A.2-7. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

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