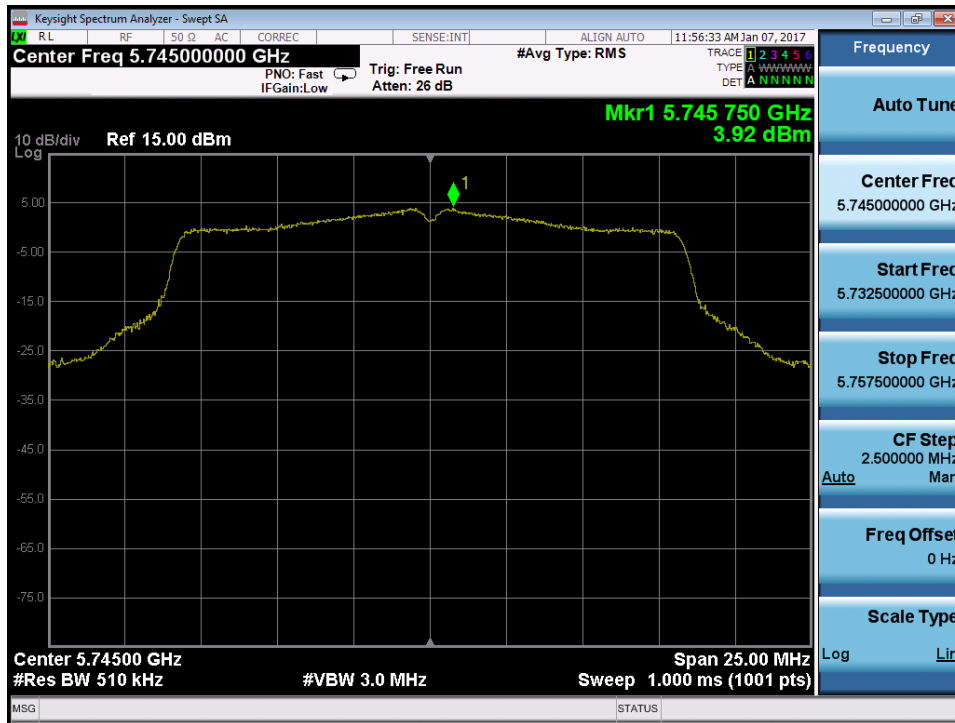


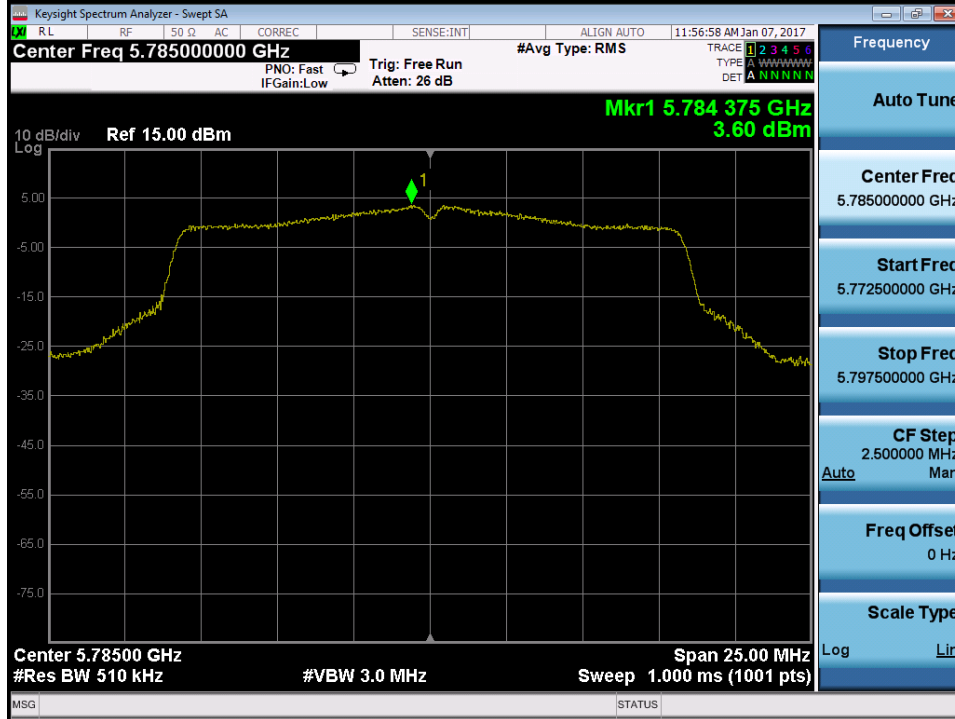
	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured Power Density [dBm]	Max Permissible Power Density [dBm/500kHz]	Margin [dB]	Pass / Fail
Band 3	5745	149	a	6	3.92	30.0	-26.08	Pass
	5785	157	a	6	3.60	30.0	-26.40	Pass
	5825	165	a	6	-0.06	30.0	-30.06	Pass
	5745	149	n (20MHz)	6.5/7.2 (MCS0)	3.82	30.0	-26.18	Pass
	5785	157	n (20MHz)	6.5/7.2 (MCS0)	3.28	30.0	-26.72	Pass
	5825	165	n (20MHz)	6.5/7.2 (MCS0)	-0.47	30.0	-30.47	Pass
	5755	151	n (40MHz)	13.5/15 (MCS0)	-2.01	30.0	-32.01	Pass
	5795	159	n (40MHz)	13.5/15 (MCS0)	-2.38	30.0	-32.38	Pass
5775	155	ac (80MHz)	29.3/32.5 (MCS0)	-6.86	30.0	-36.86	Pass	

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

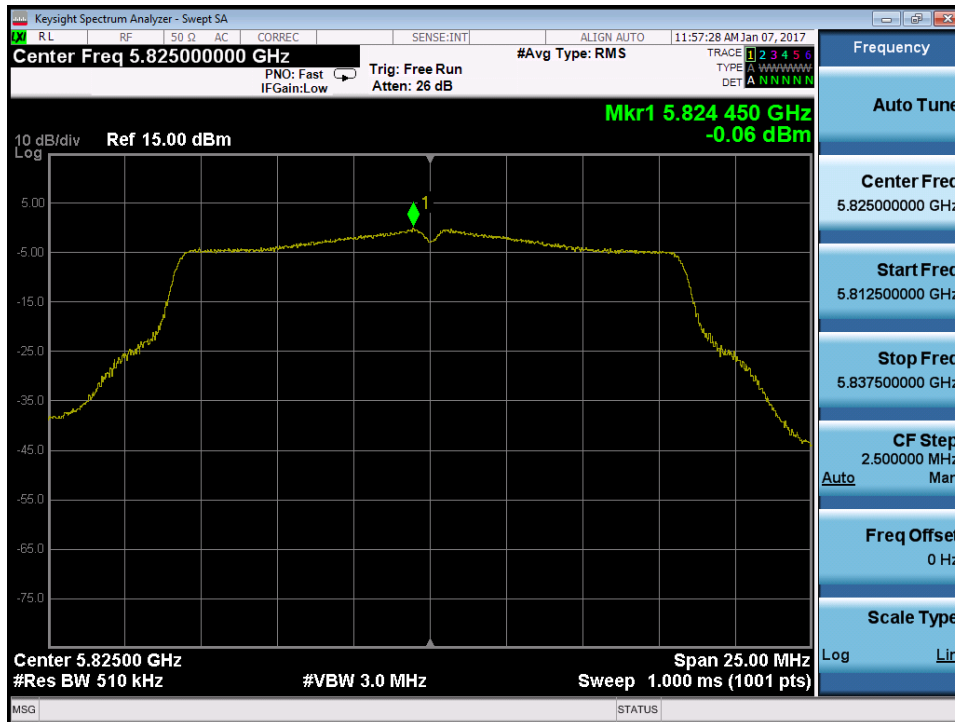


Plot 7-106. Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 149)

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 83 of 251	

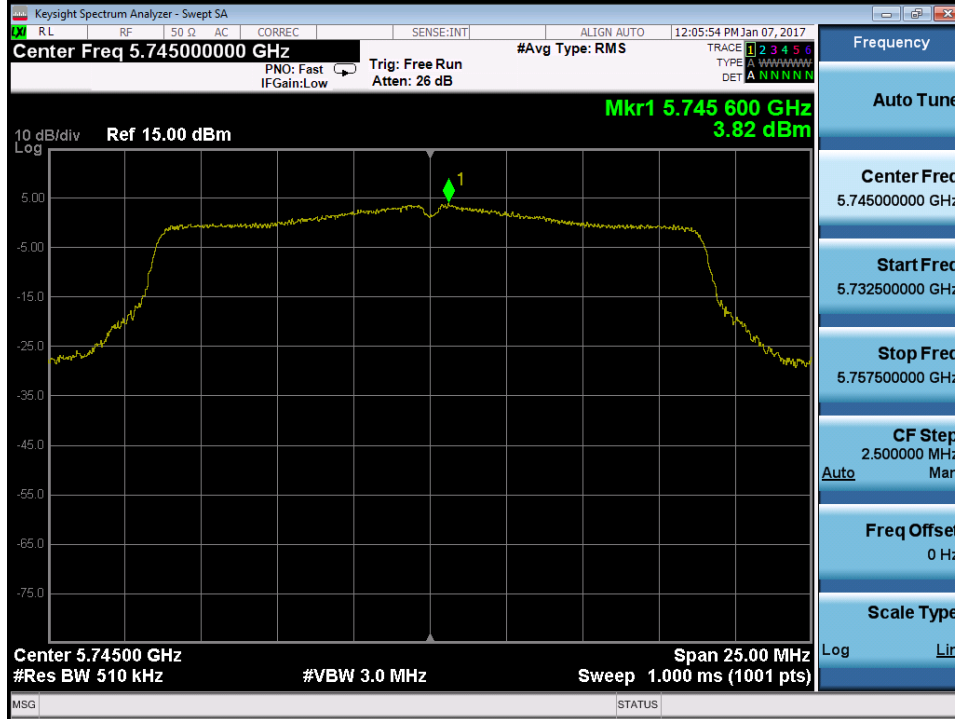


Plot 7-107. Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 157)

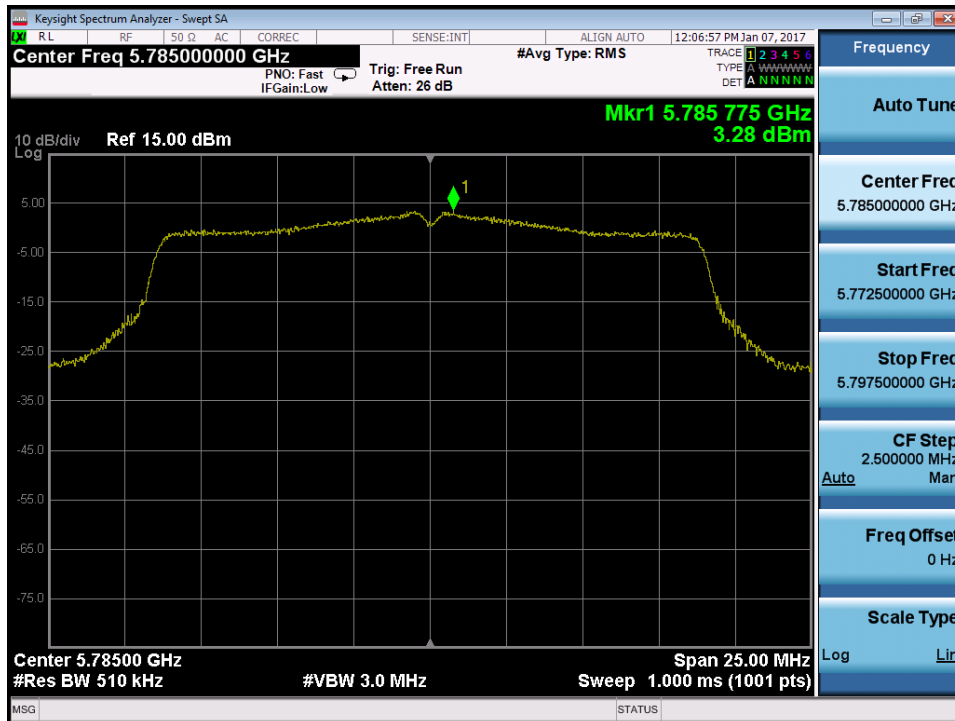


Plot 7-108. Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 165)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset		Page 84 of 251

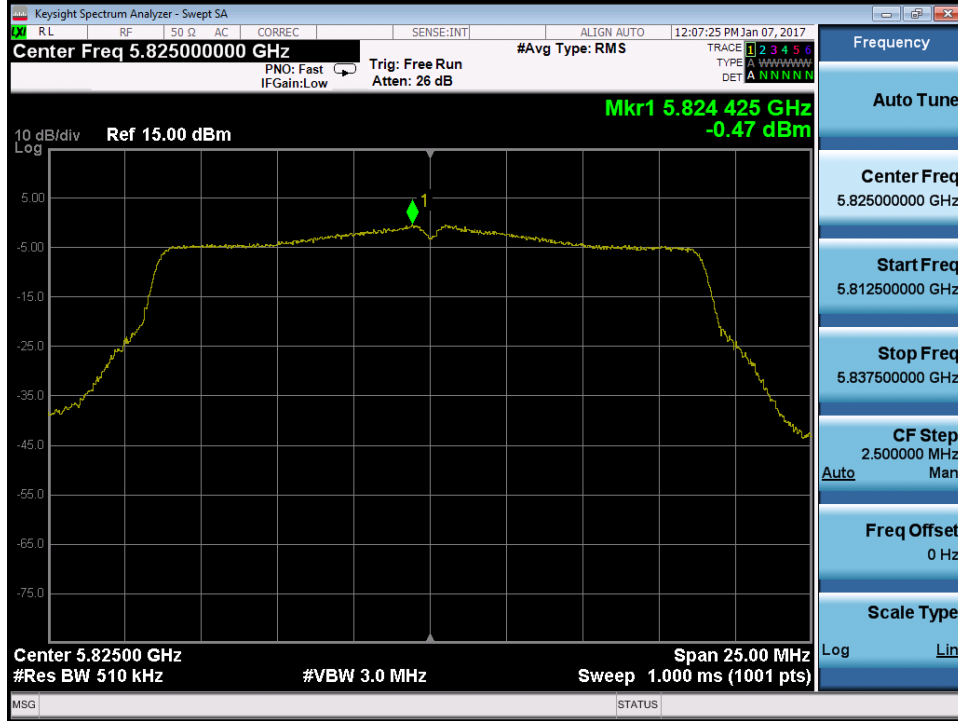


Plot 7-109. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 149)

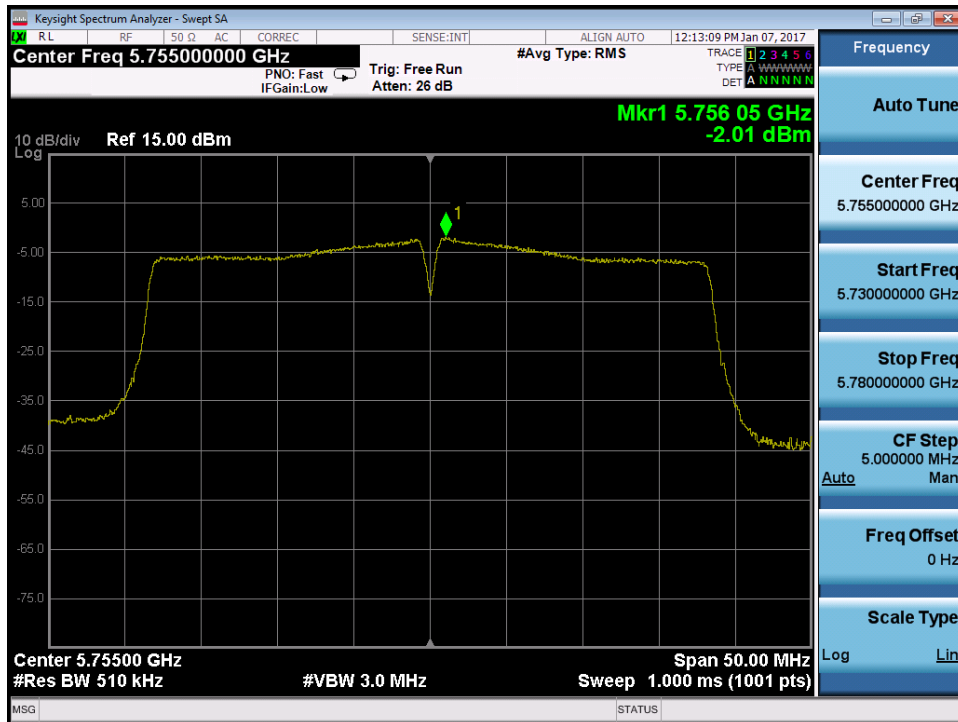


Plot 7-110. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 157)

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset		Page 85 of 251

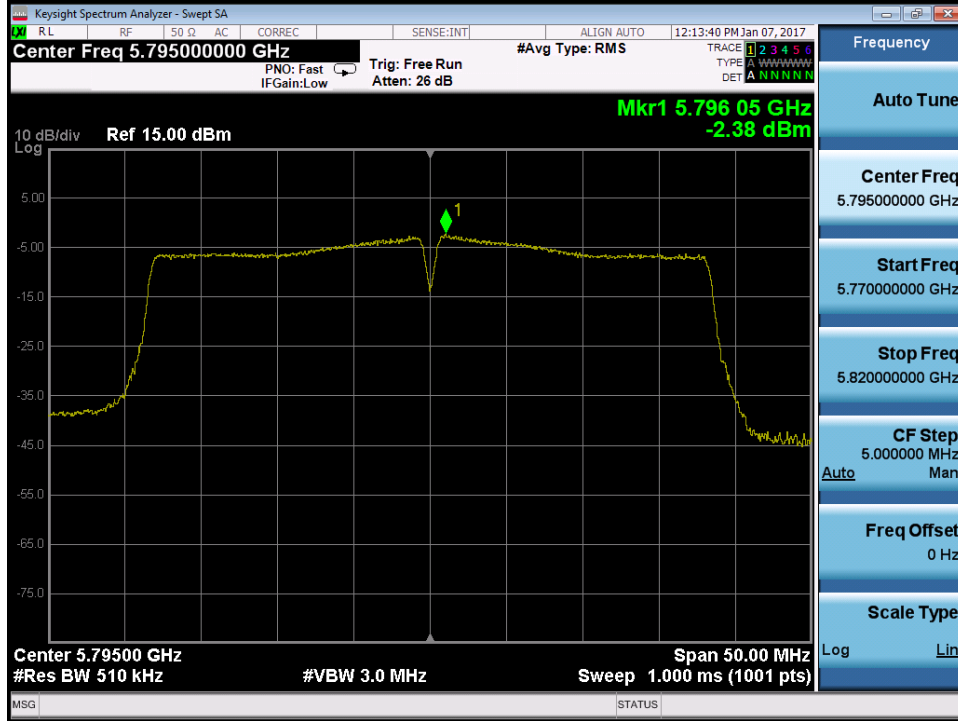


Plot 7-111. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 165)

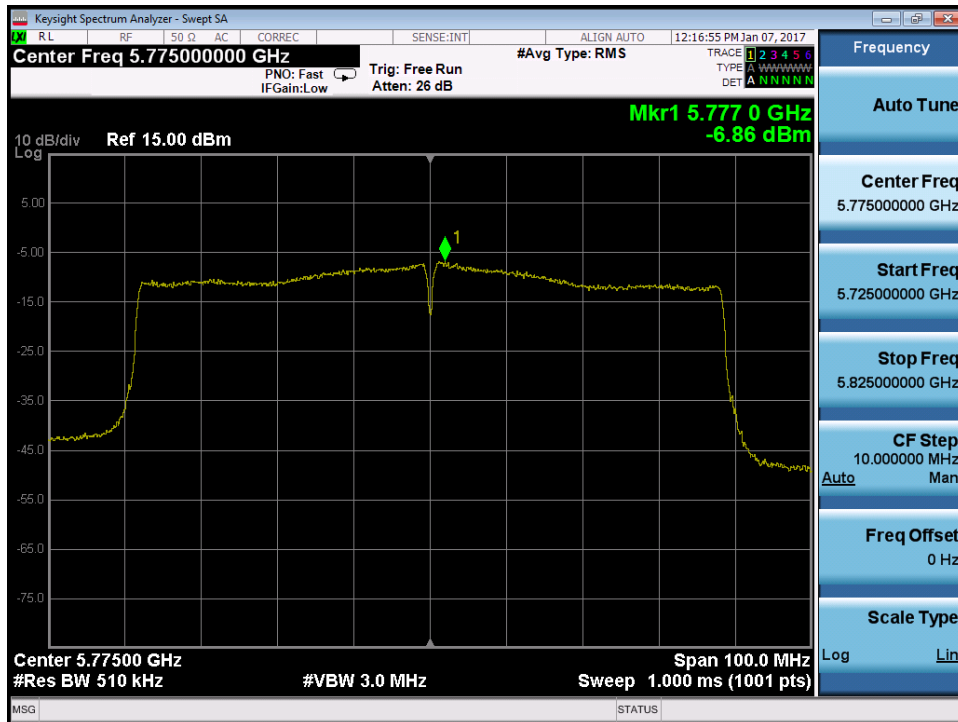


Plot 7-112. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 3) – Ch. 151)

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset		Page 86 of 251



Plot 7-113. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 3) – Ch. 159)





Plot 7-114. Power Spectral Density Plot (80MHz BW 802.11a/c (UNII Band 3) – Ch. 155)

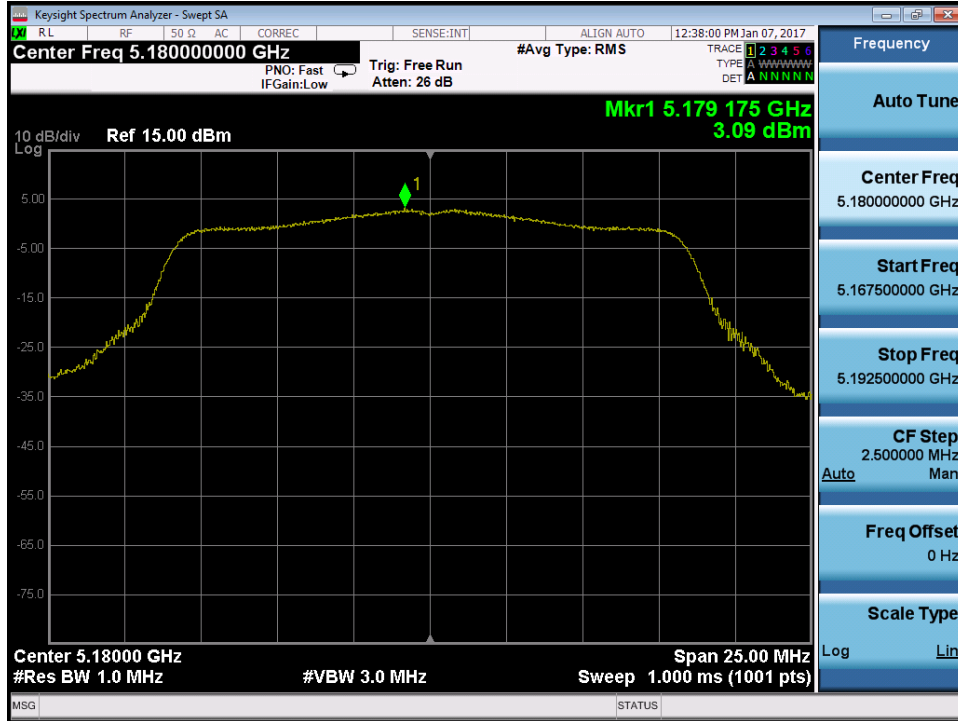
FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset		Page 87 of 251

Antenna-2 Power Spectral Density Measurements

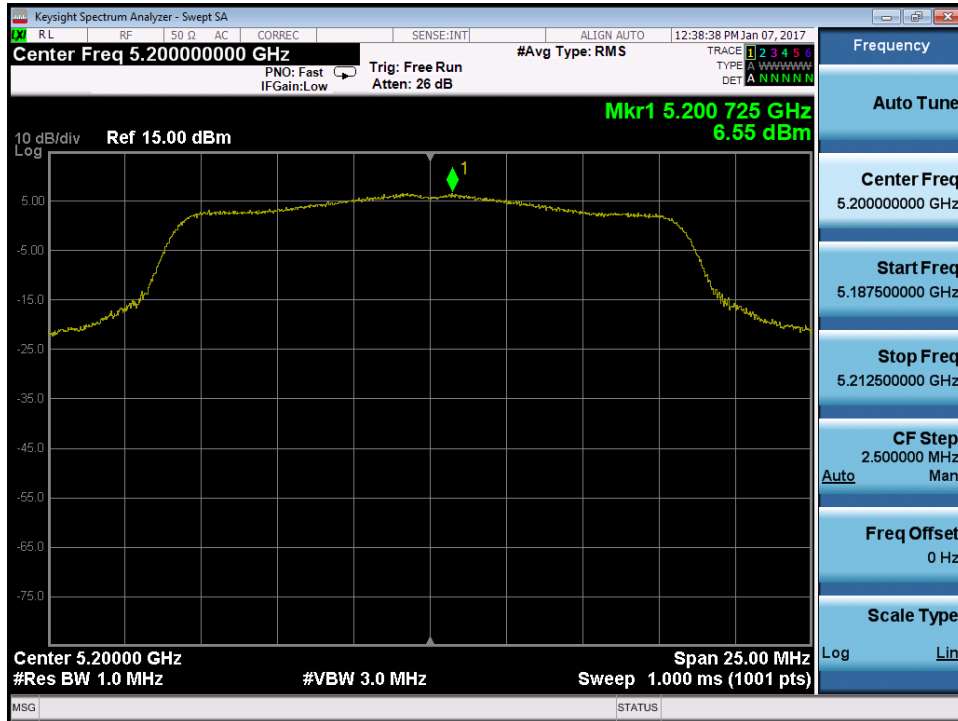
	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured Power Density [dBm]	Max Permissible Power Density [dBm/MHz]	Margin [dB]	Pass / Fail
Band 1	5180	36	a	6	3.09	11.0	-7.91	Pass
	5200	40	a	6	6.55	11.0	-4.46	Pass
	5240	48	a	6	6.58	11.0	-4.42	Pass
	5180	36	n (20MHz)	6.5/7.2 (MCS0)	2.46	11.0	-8.55	Pass
	5200	40	n (20MHz)	6.5/7.2 (MCS0)	6.11	11.0	-4.90	Pass
	5240	48	n (20MHz)	6.5/7.2 (MCS0)	6.51	11.0	-4.49	Pass
	5190	38	n (40MHz)	13.5/15 (MCS0)	-3.07	11.0	-14.07	Pass
	5230	46	n (40MHz)	13.5/15 (MCS0)	0.46	11.0	-10.54	Pass
	5210	42	ac (80MHz)	29.3/32.5 (MCS0)	-7.08	11.0	-18.08	Pass
Band 2A	5260	52	a	6	6.63	11.0	-4.38	Pass
	5280	56	a	6	6.75	11.0	-4.25	Pass
	5320	64	a	6	2.69	11.0	-8.31	Pass
	5260	52	n (20MHz)	6.5/7.2 (MCS0)	6.37	11.0	-4.63	Pass
	5280	56	n (20MHz)	6.5/7.2 (MCS0)	6.26	11.0	-4.74	Pass
	5320	64	n (20MHz)	6.5/7.2 (MCS0)	2.66	11.0	-8.34	Pass
	5270	54	n (40MHz)	13.5/15 (MCS0)	0.90	11.0	-10.10	Pass
	5310	62	n (40MHz)	13.5/15 (MCS0)	-2.99	11.0	-13.99	Pass
	5290	58	ac (80MHz)	29.3/32.5 (MCS0)	-7.07	11.0	-18.07	Pass
Band 2C	5500	100	a	6	3.56	11.0	-7.44	Pass
	5580	116	a	6	6.80	11.0	-4.20	Pass
	5720	144	a	6	6.01	11.0	-4.99	Pass
	5500	100	n (20MHz)	6.5/7.2 (MCS0)	3.16	11.0	-7.84	Pass
	5580	116	n (20MHz)	6.5/7.2 (MCS0)	6.55	11.0	-4.45	Pass
	5720	144	n (20MHz)	6.5/7.2 (MCS0)	5.66	11.0	-5.34	Pass
	5510	102	n (40MHz)	13.5/15 (MCS0)	-2.64	11.0	-13.64	Pass
	5590	118	n (40MHz)	13.5/15 (MCS0)	1.19	11.0	-9.81	Pass
	5710	142	n (40MHz)	13.5/15 (MCS0)	0.19	11.0	-10.81	Pass
	5530	106	ac (80MHz)	29.3/32.5 (MCS0)	-6.50	11.0	-17.50	Pass
5690	138	ac (80MHz)	29.3/32.5 (MCS0)	-4.39	11.0	-15.39	Pass	

Table 7-19. Conducted Power Spectral Density Measurements

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 88 of 251	

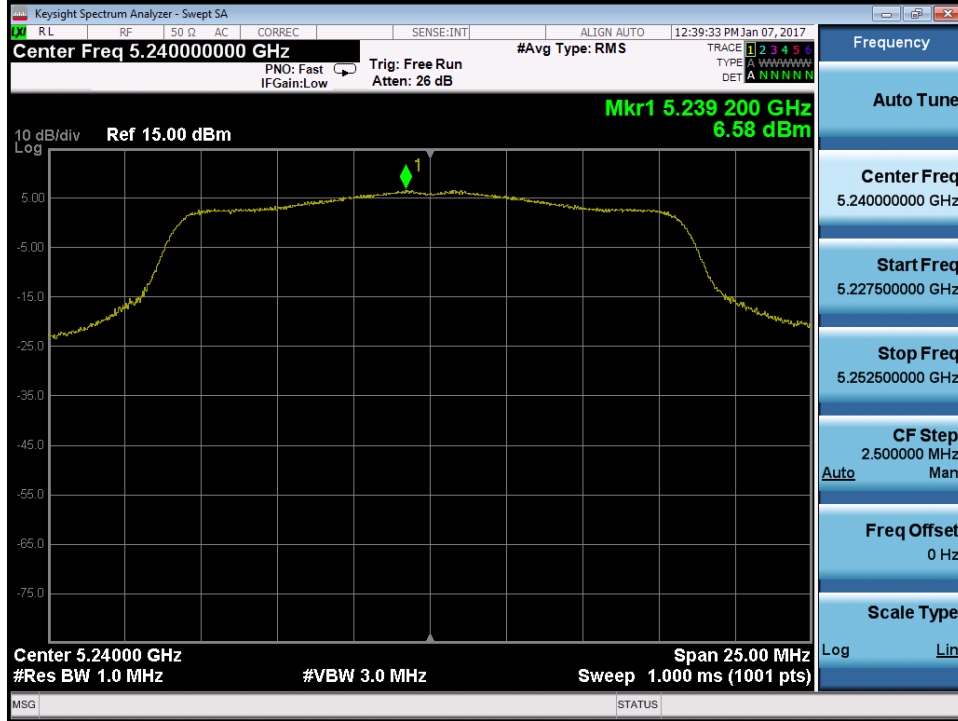


Plot 7-115. Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 36)

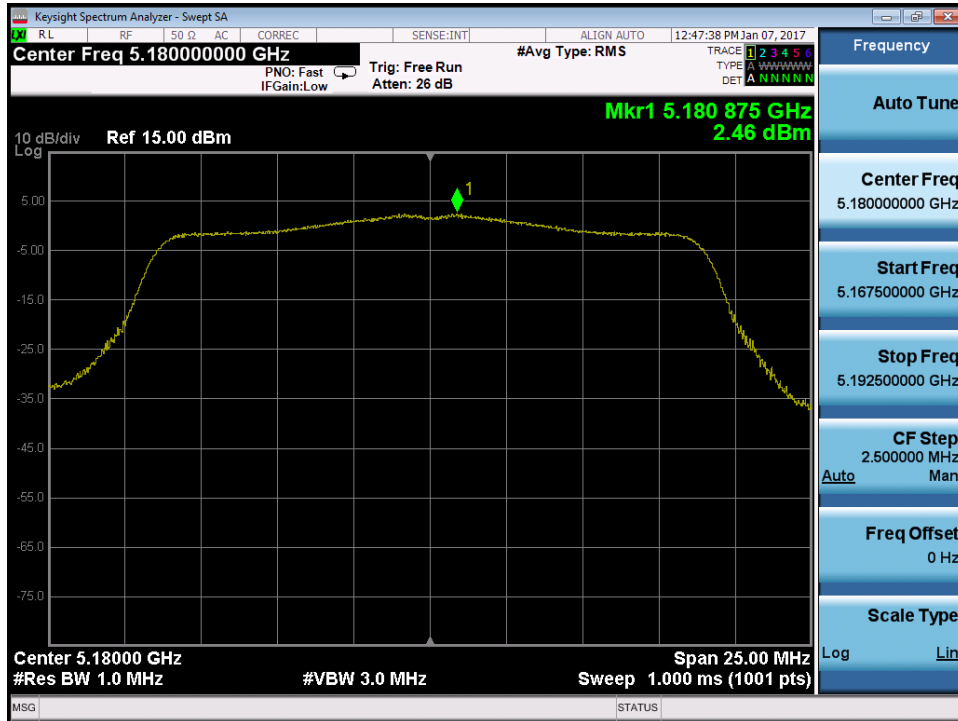


Plot 7-116. Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 40)

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset		Page 89 of 251

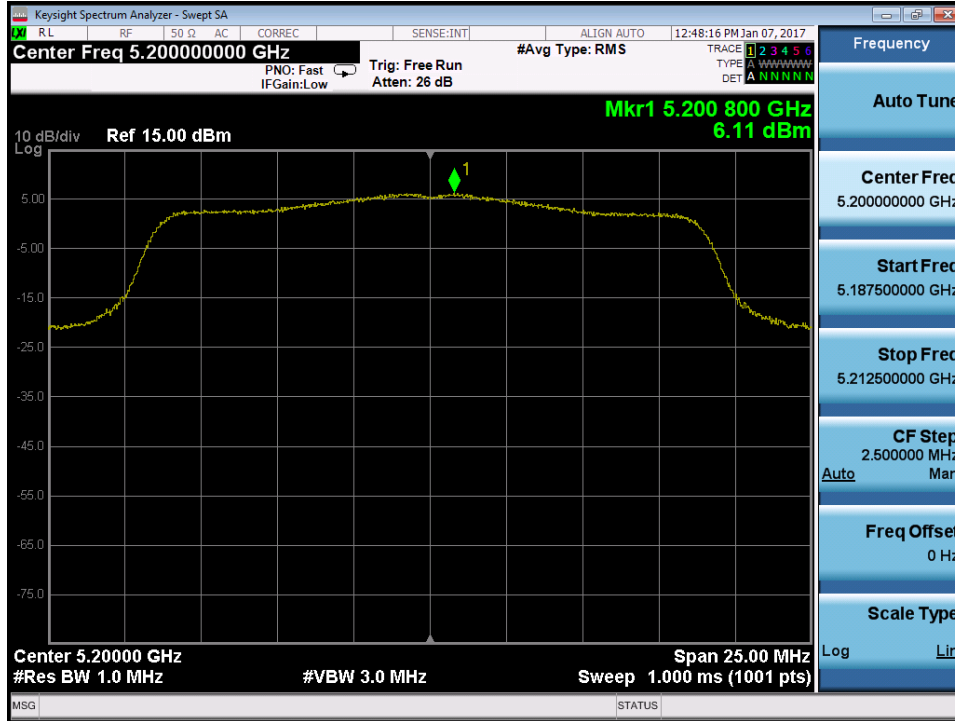


Plot 7-117. Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 48)

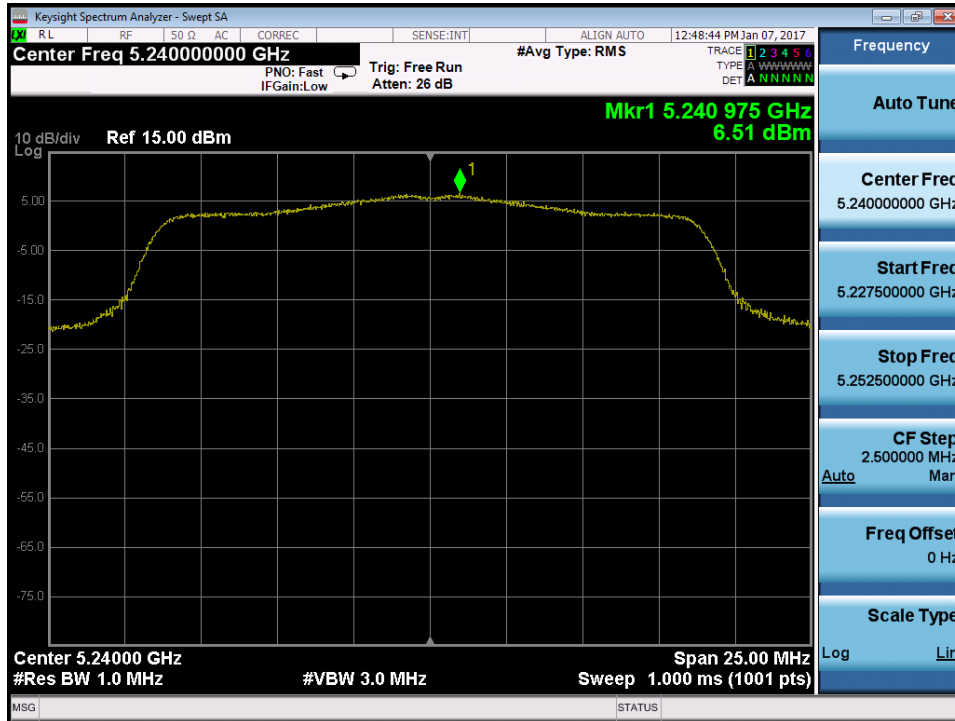


Plot 7-118. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 36)

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset		Page 90 of 251

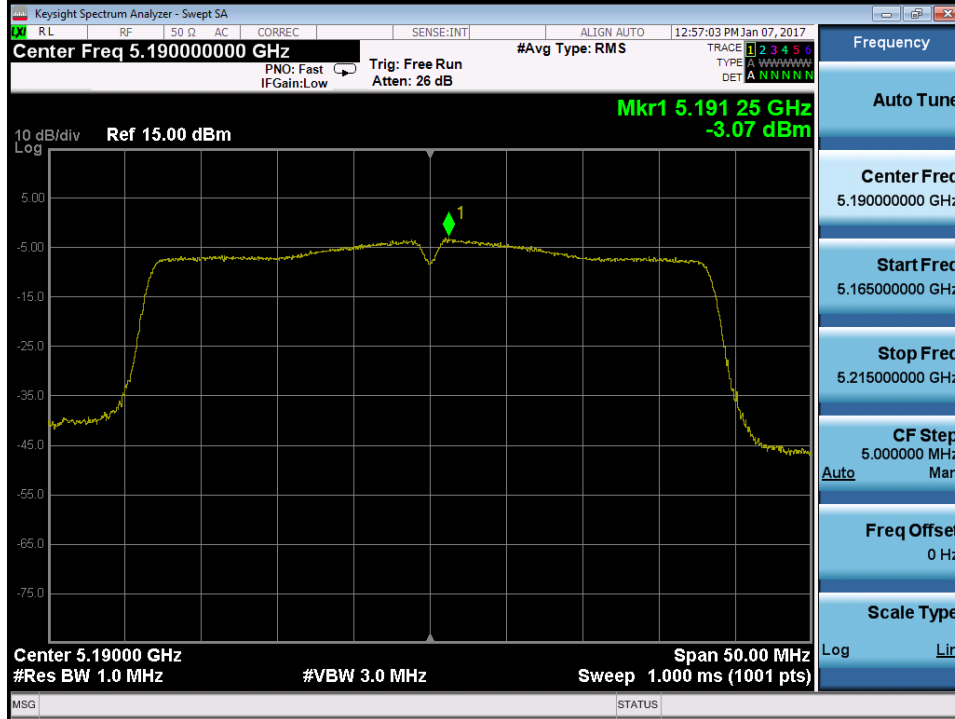


Plot 7-119. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 40)

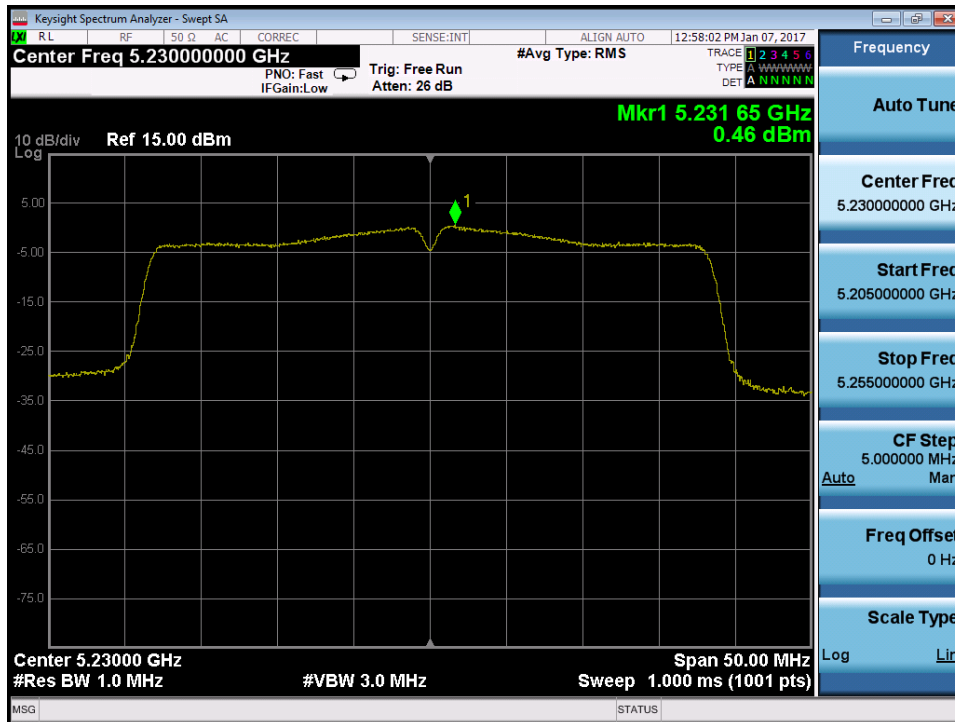


Plot 7-120. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 48)

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset		Page 91 of 251



Plot 7-121. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 1) – Ch. 38)

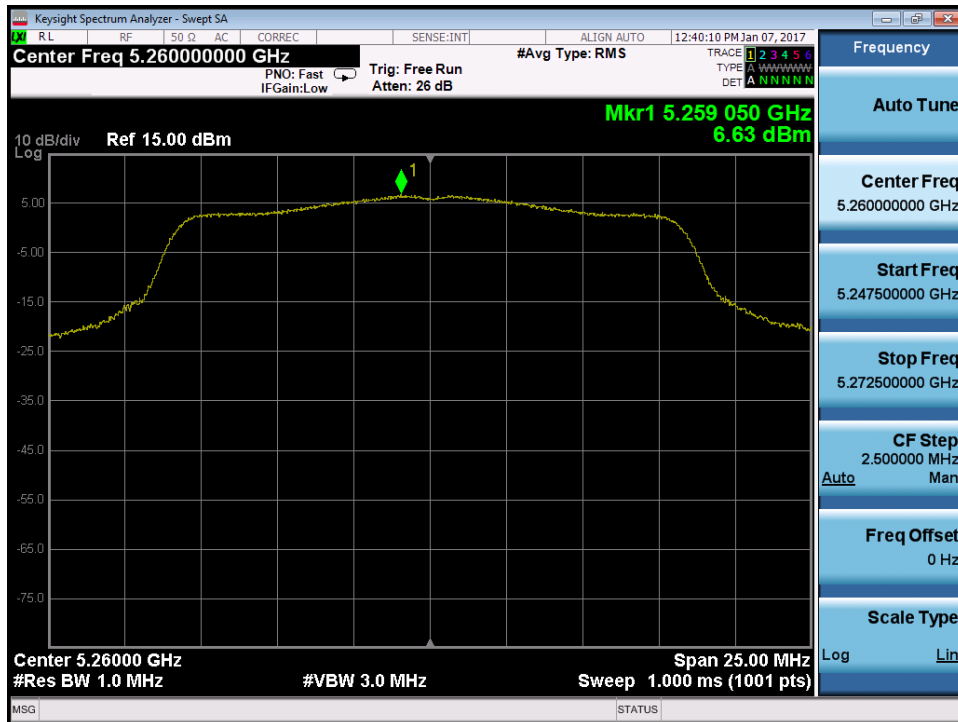


Plot 7-122. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 1) – Ch. 46)

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset		Page 92 of 251

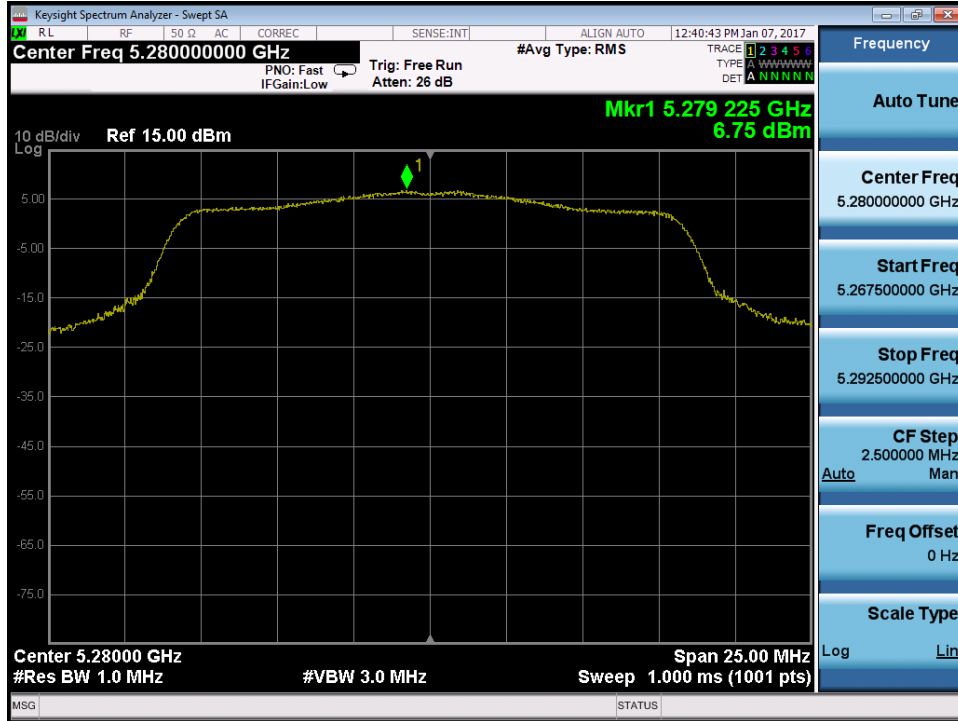


Plot 7-123. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 1) – Ch. 42)



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

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset		Page 93 of 251

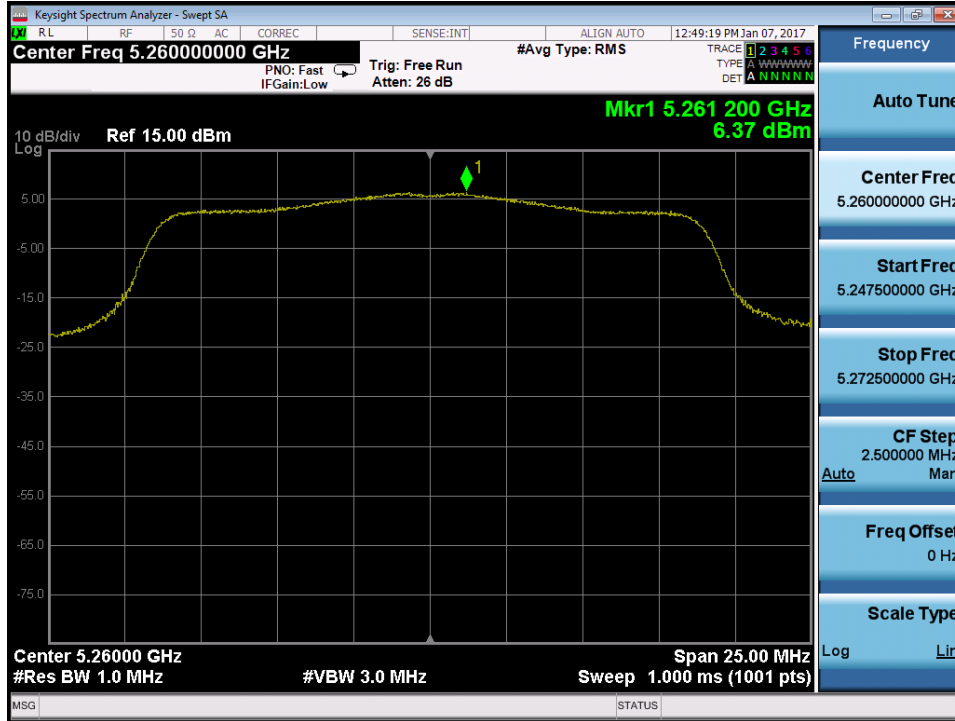


Plot 7-125. Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 56)

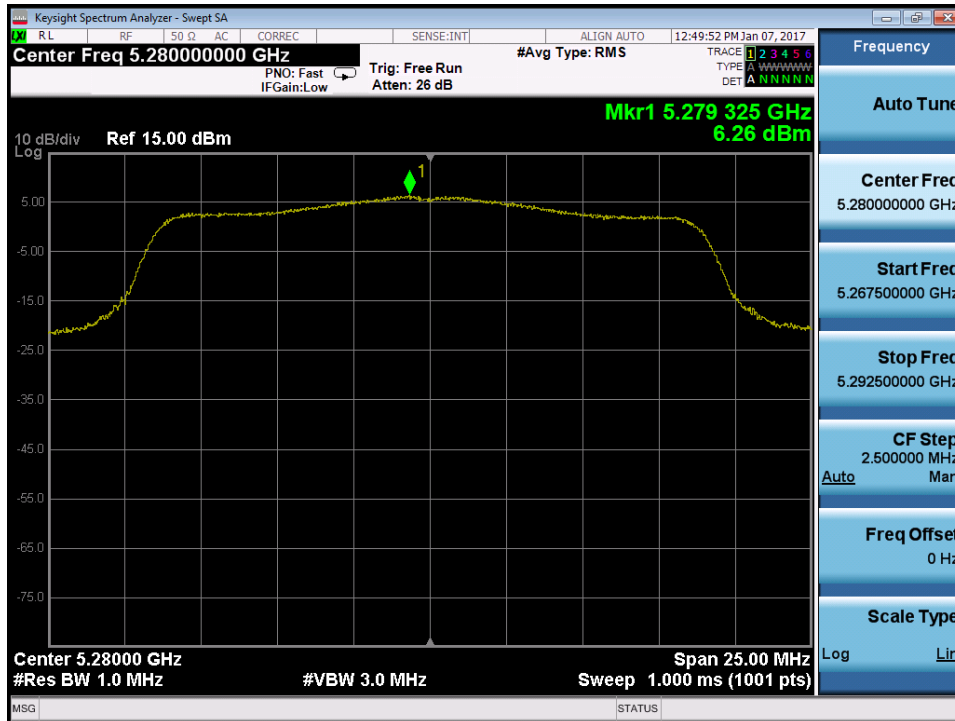


Plot 7-126. Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 64)

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset		Page 94 of 251

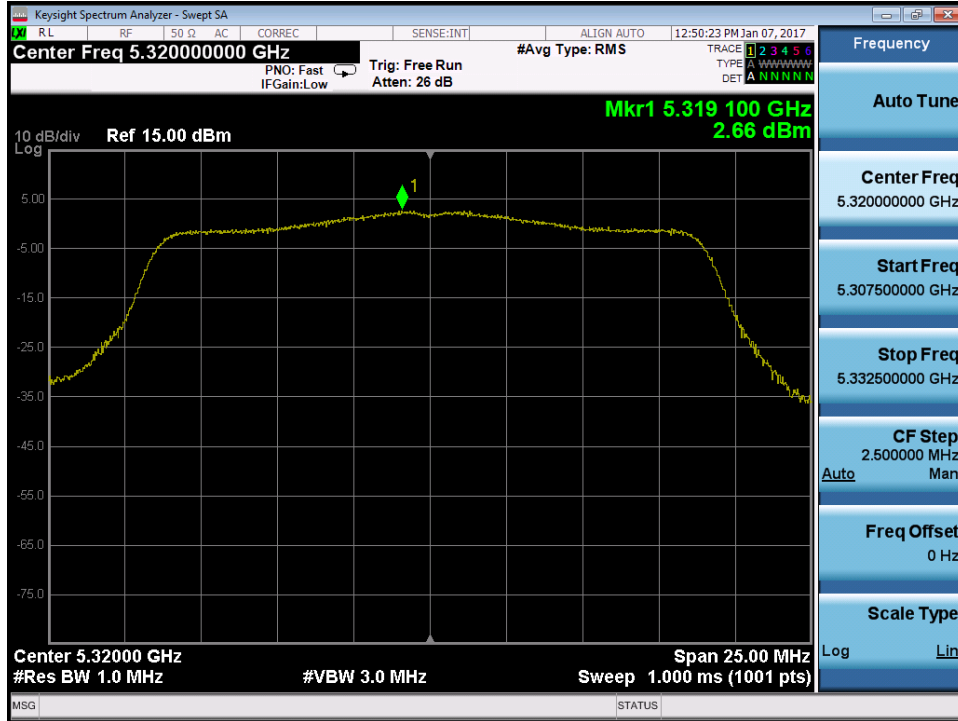


Plot 7-127. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 52)

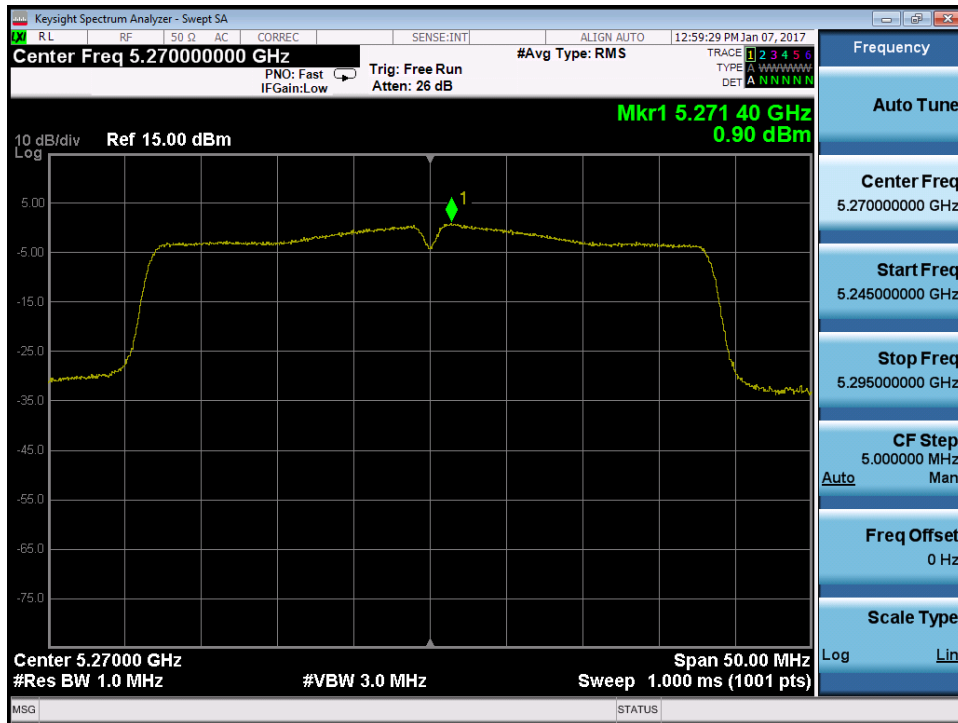


Plot 7-128. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 56)

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset		Page 95 of 251

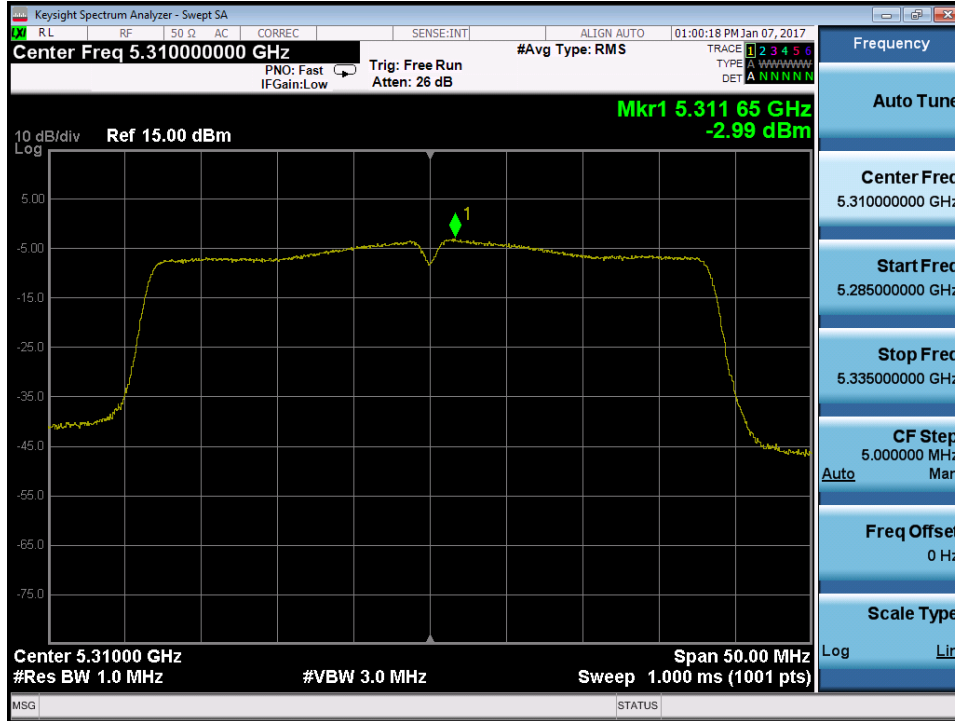


Plot 7-129. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 64)



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

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset		Page 96 of 251

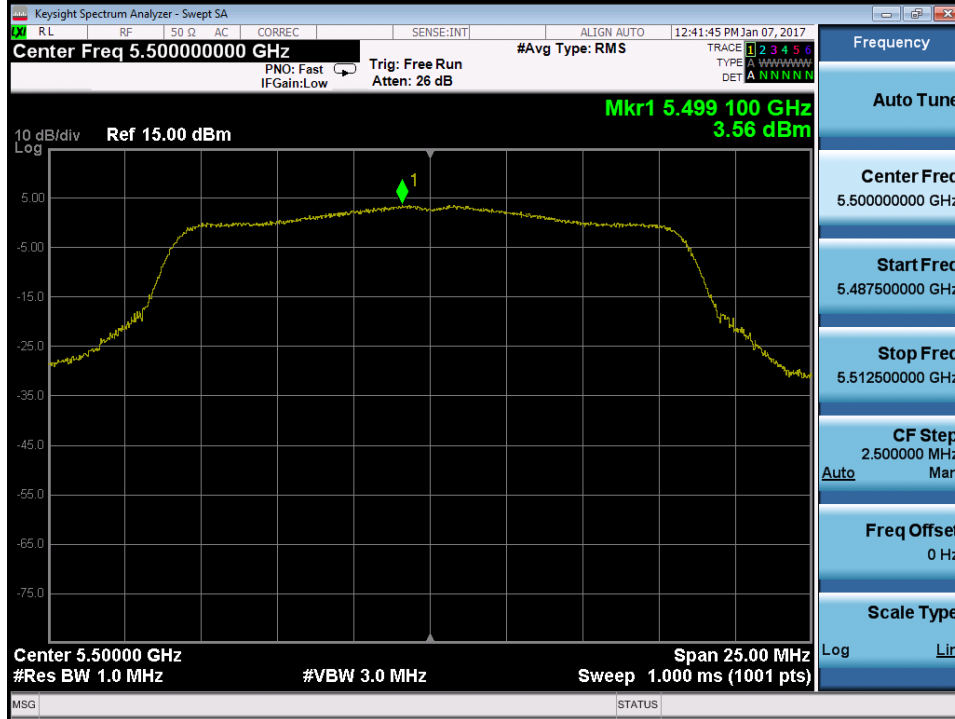


Plot 7-131. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2A) – Ch. 62)

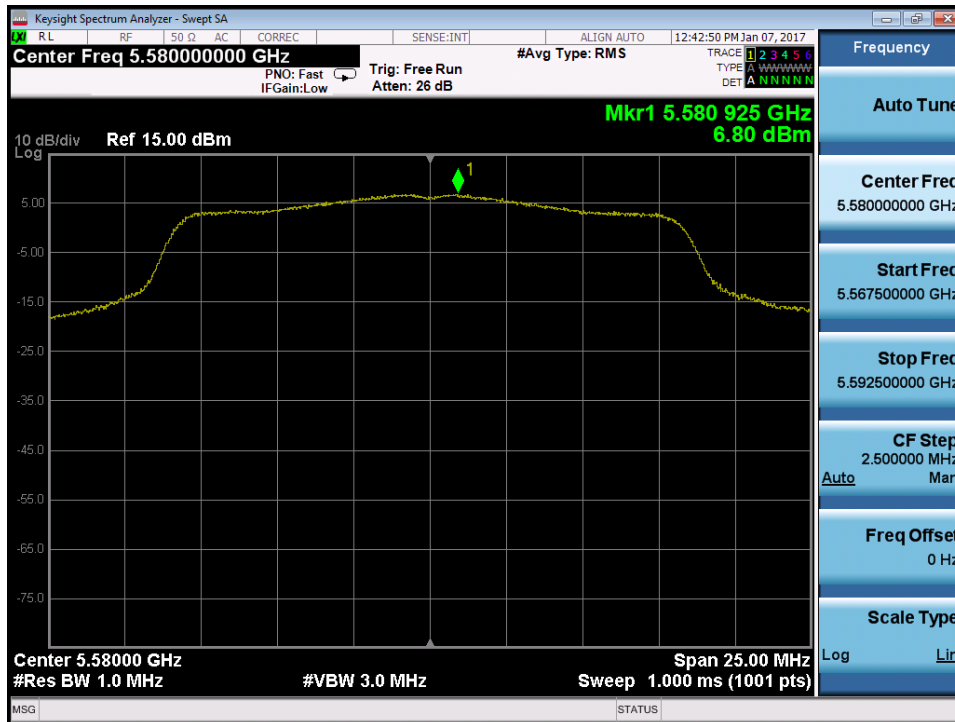


Plot 7-132. Power Spectral Density Plot (80MHz BW 802.11a/n/ac (UNII Band 2A) – Ch. 58)

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset		Page 97 of 251

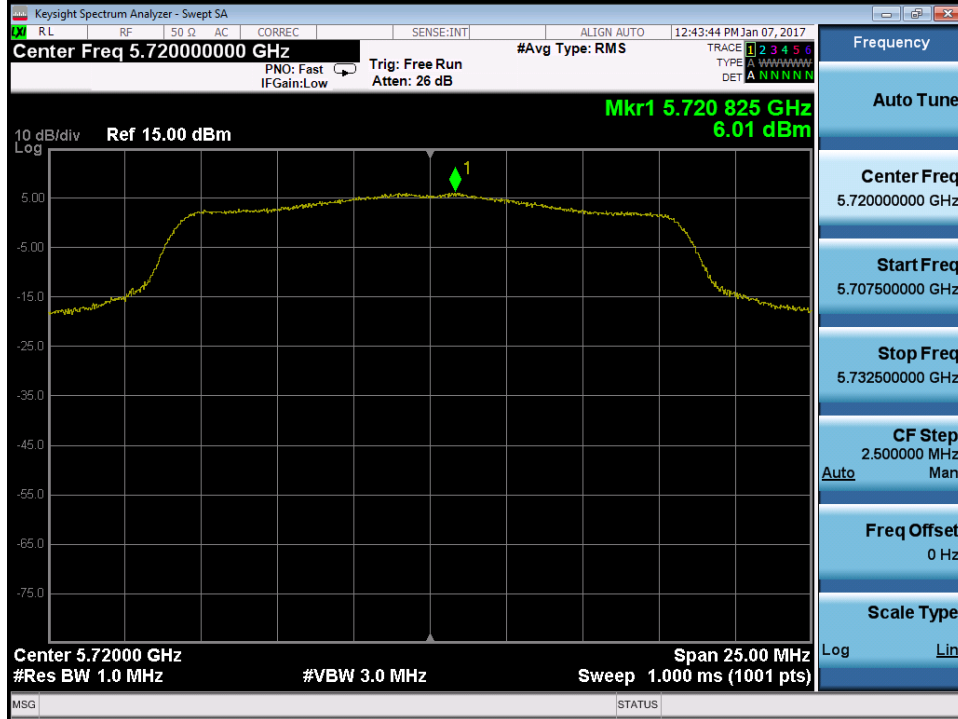


Plot 7-133. Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 100)

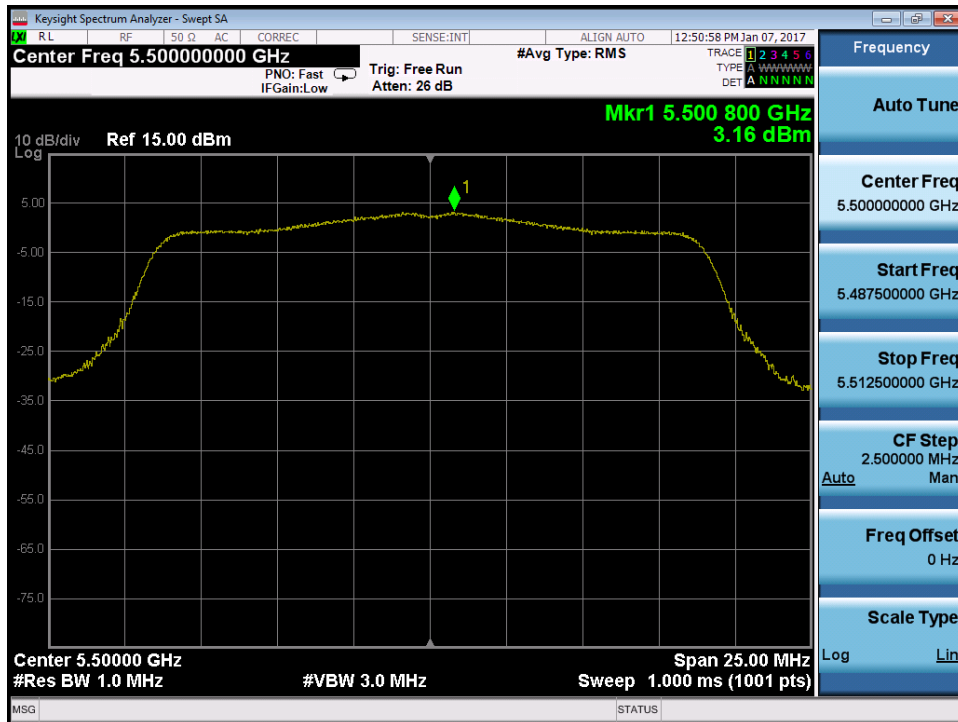


Plot 7-134. Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 116)

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset		Page 98 of 251

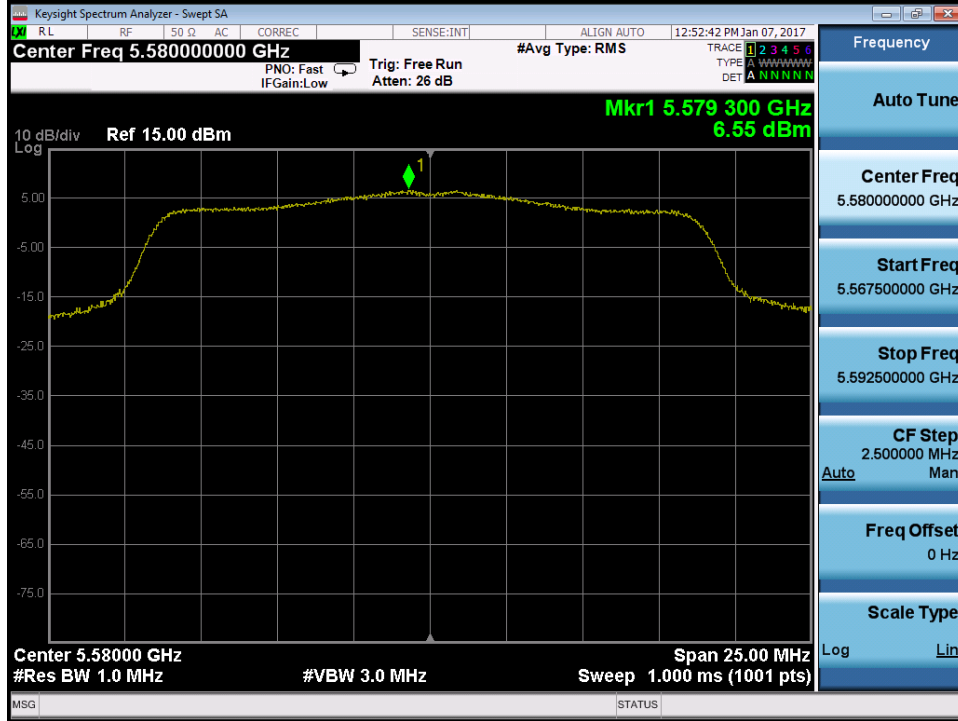


Plot 7-135. Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 144)

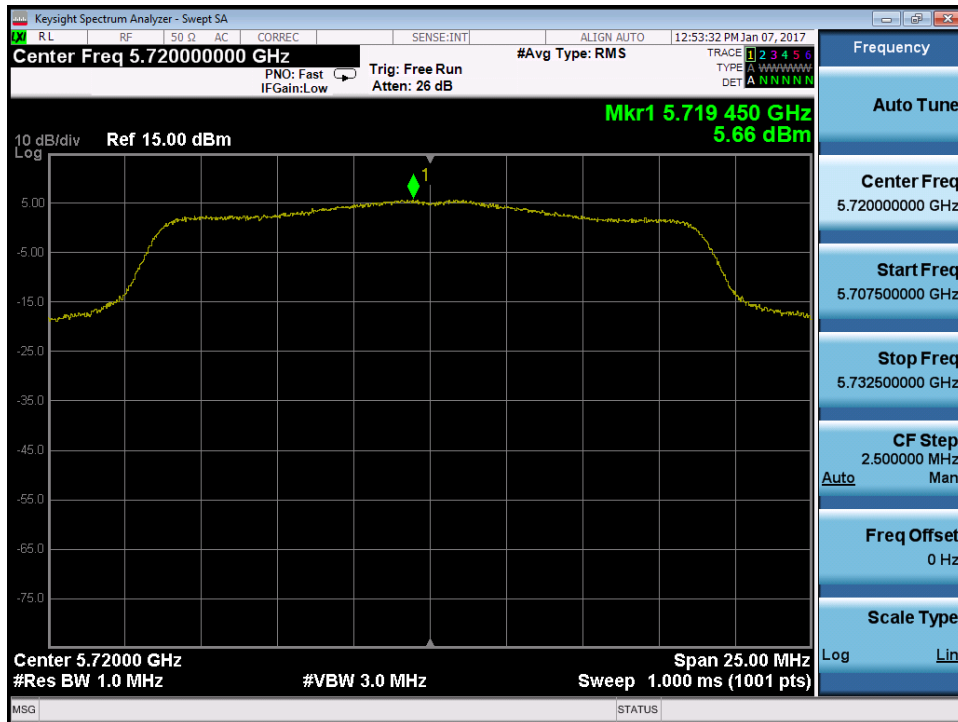


Plot 7-136. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 100)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset		Page 99 of 251

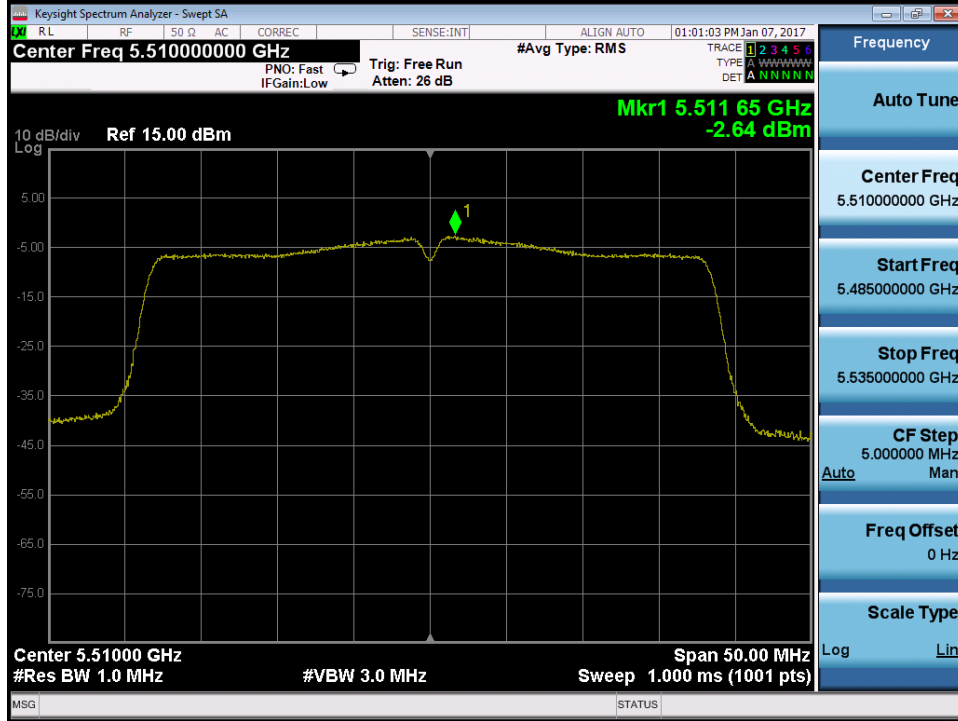


Plot 7-137. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 116)

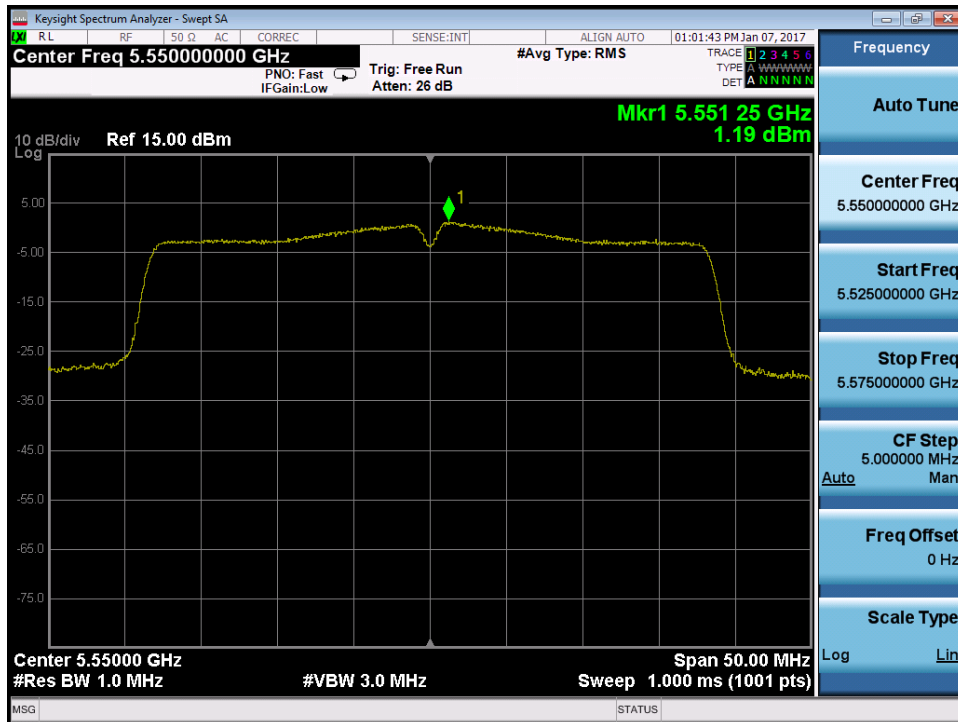


Plot 7-138. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 144)

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset		Page 100 of 251

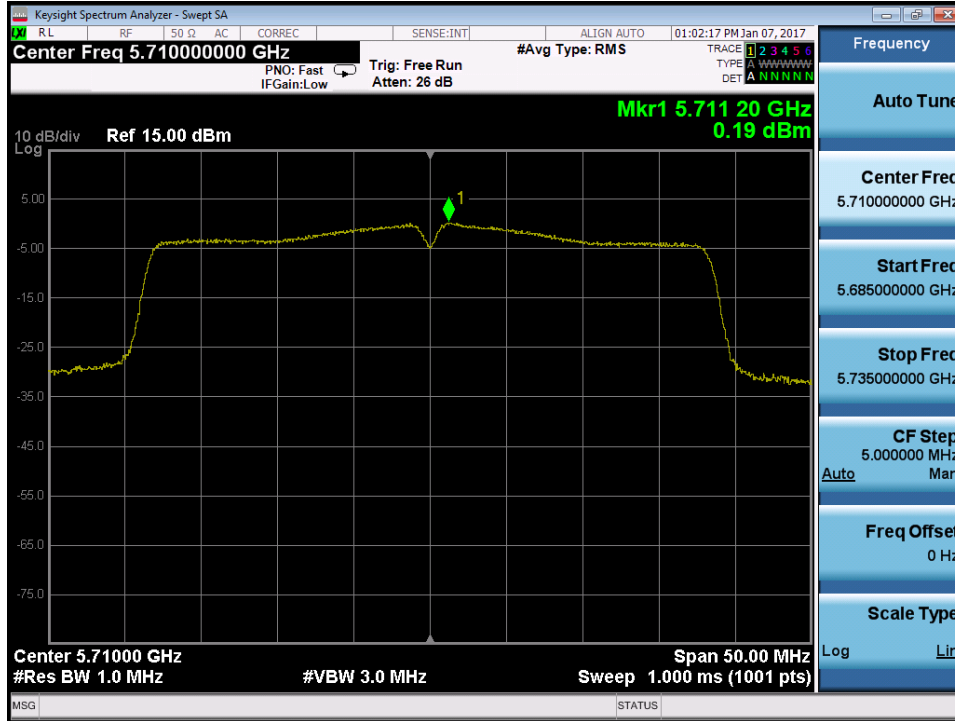


Plot 7-139. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 102)

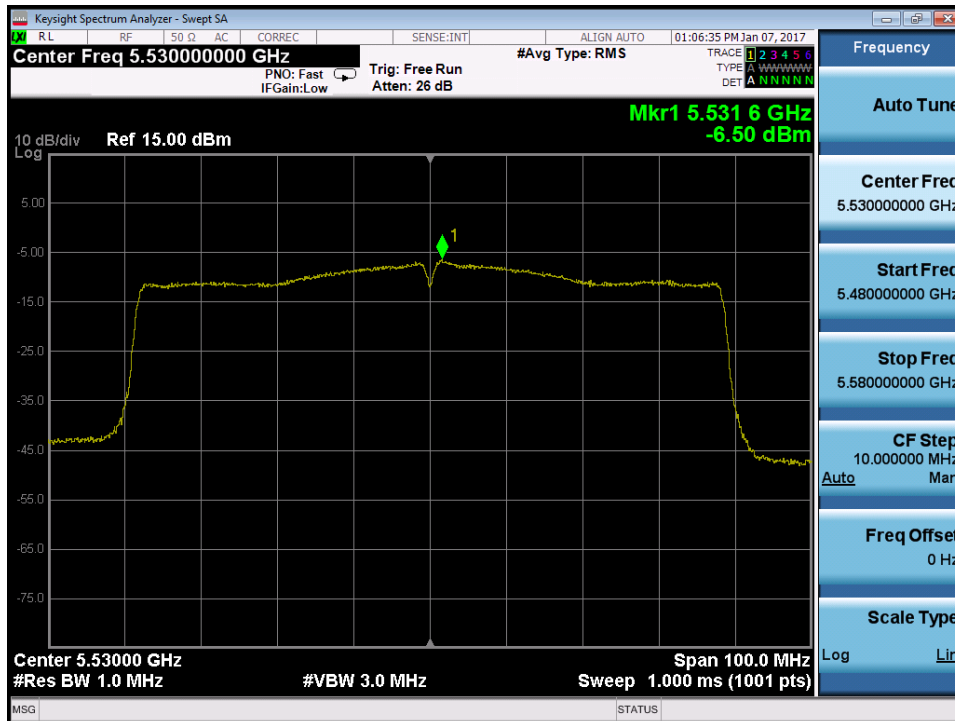


Plot 7-140. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 118)

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset		Page 101 of 251



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)

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset		Page 102 of 251

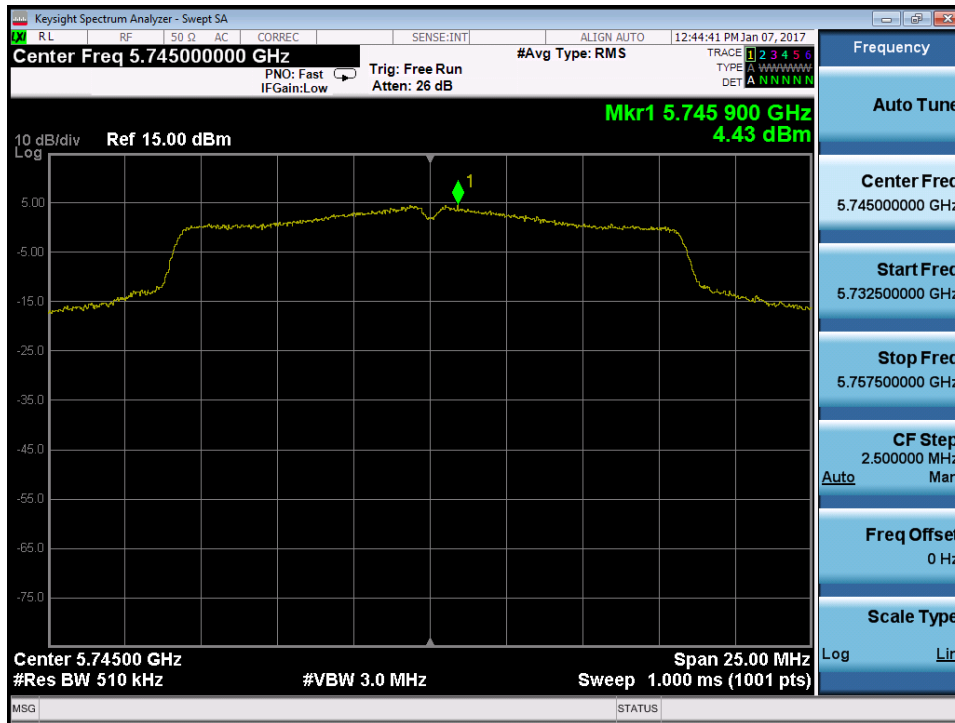


Plot 7-143. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2C) – Ch. 138)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 103 of 251	

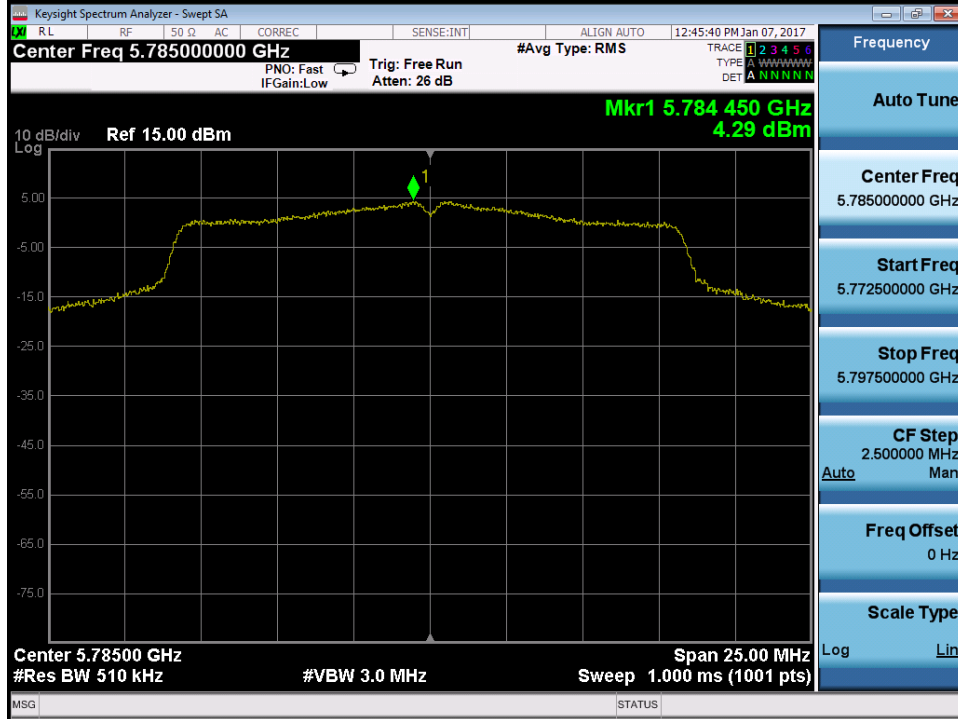
	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured Power Density [dBm]	Max Permissible Power Density [dBm/500kHz]	Margin [dB]	Pass / Fail
Band 3	5745	149	a	6	4.43	30.0	-25.57	Pass
	5785	157	a	6	4.29	30.0	-25.71	Pass
	5825	165	a	6	0.92	30.0	-29.08	Pass
	5745	149	n (20MHz)	6.5/7.2 (MCS0)	4.23	30.0	-25.77	Pass
	5785	157	n (20MHz)	6.5/7.2 (MCS0)	4.25	30.0	-25.75	Pass
	5825	165	n (20MHz)	6.5/7.2 (MCS0)	0.88	30.0	-29.12	Pass
	5755	151	n (40MHz)	13.5/15 (MCS0)	-0.70	30.0	-30.70	Pass
	5795	159	n (40MHz)	13.5/15 (MCS0)	-0.97	30.0	-30.97	Pass
5775	155	ac (80MHz)	29.3/32.5 (MCS0)	-5.54	30.0	-35.54	Pass	

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

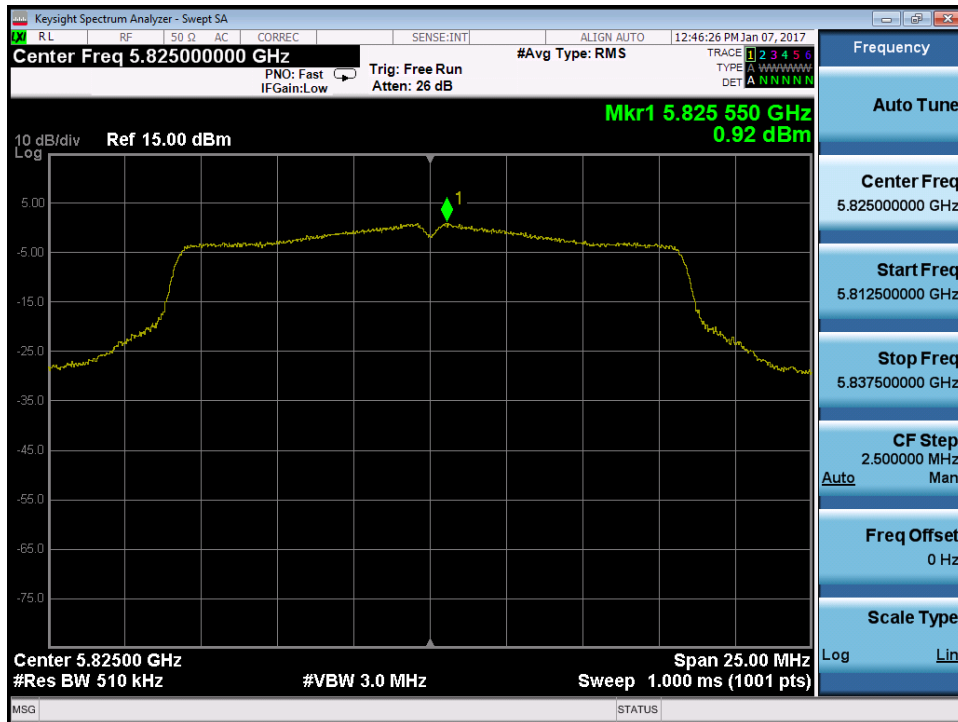


Plot 7-144. Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 149)

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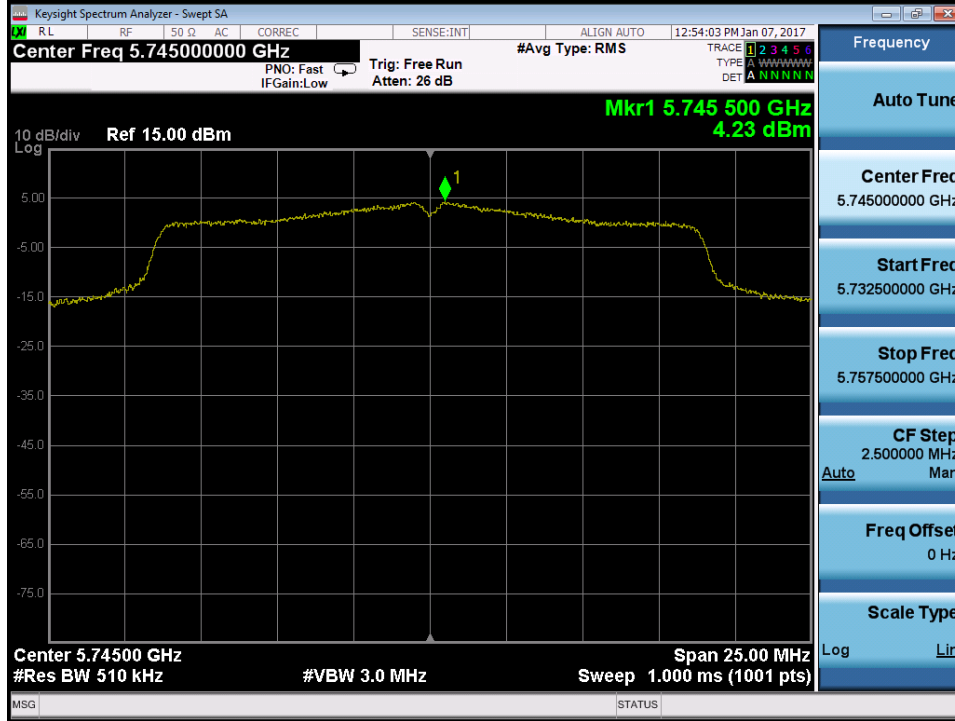


Plot 7-145. Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 157)

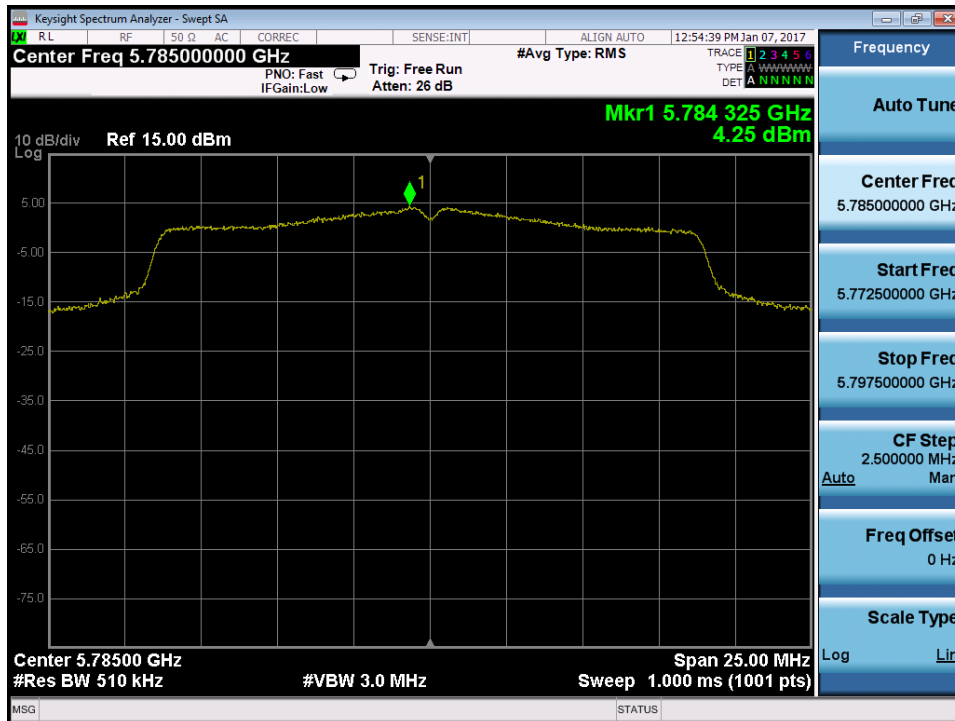


Plot 7-146. Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 165)

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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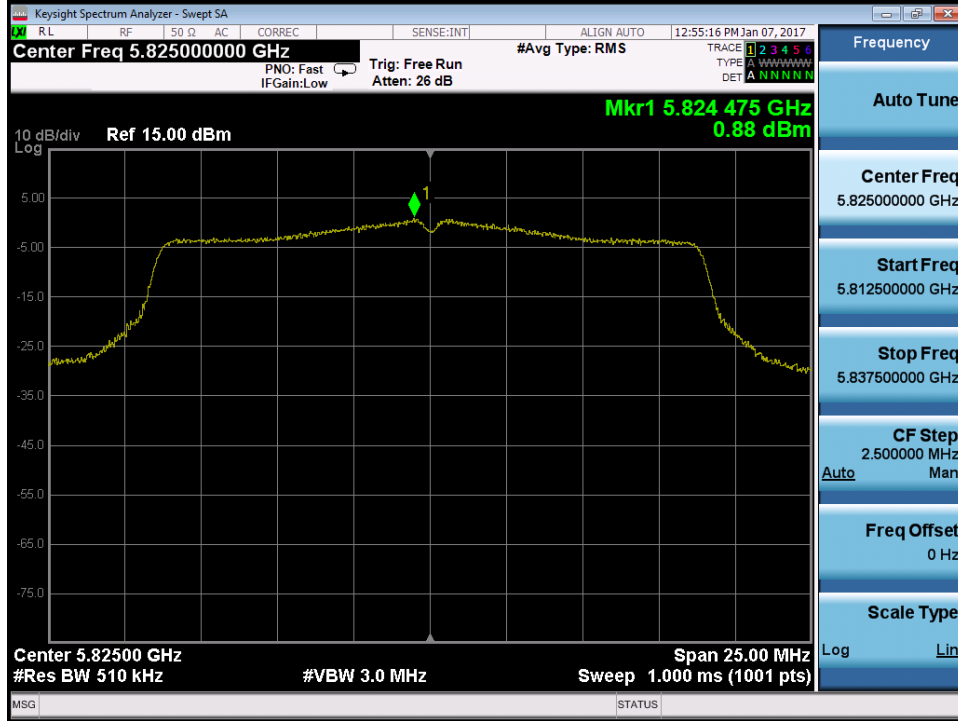


Plot 7-147. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 149)

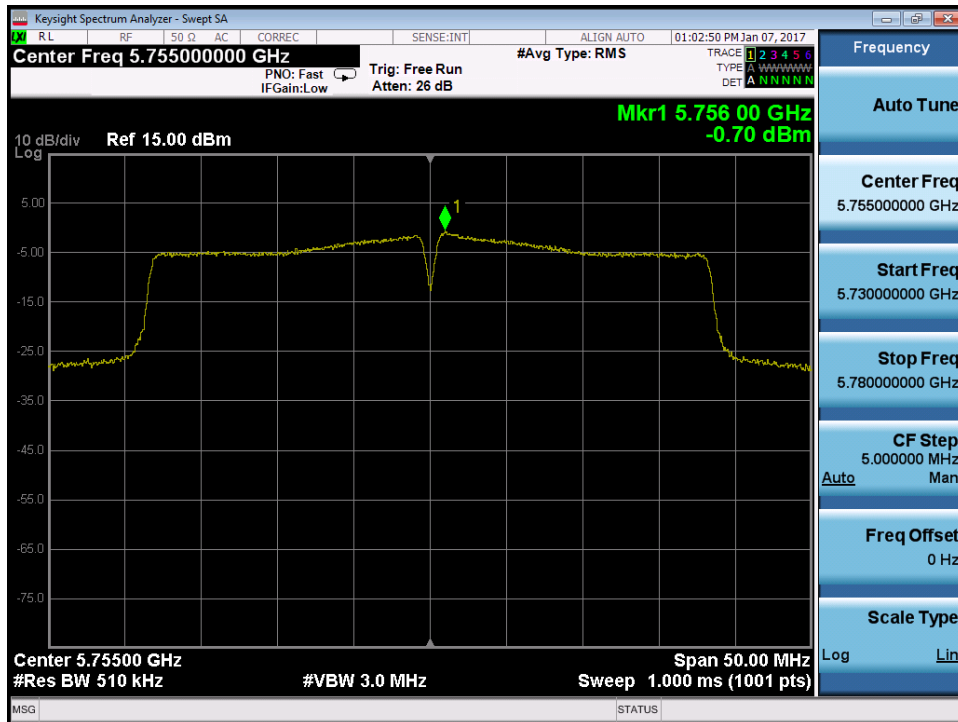


Plot 7-148. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 157)

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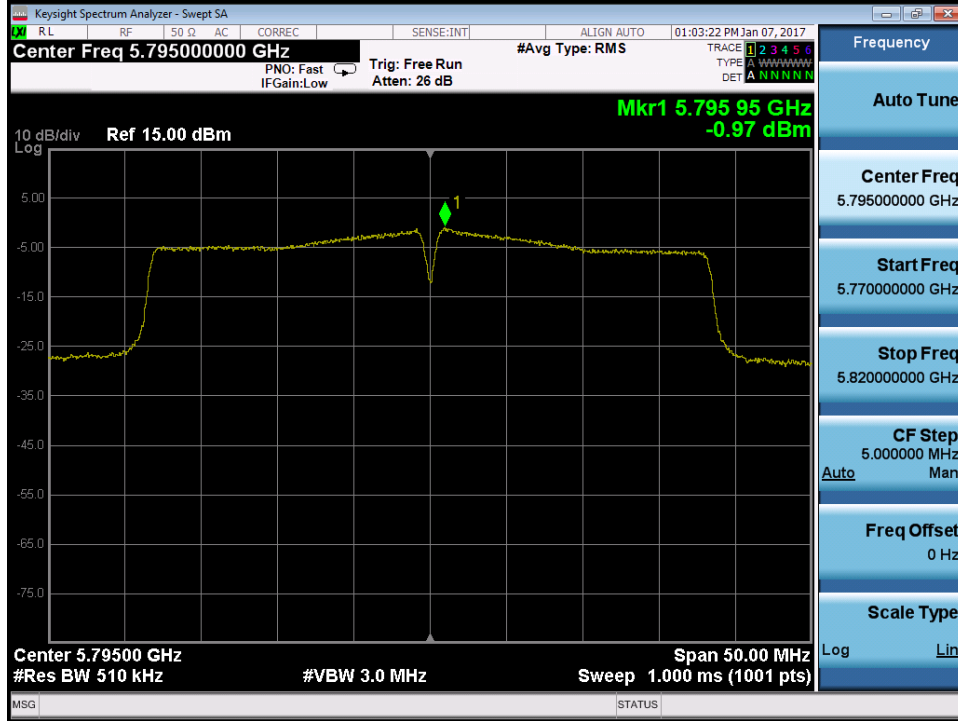


Plot 7-149. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 165)



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

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Plot 7-151. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 3) – Ch. 159)



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

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Summed MIMO Power Spectral Density Measurements

	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Antenn-1 Power Density [dBm]	Antenn-2 Power Density [dBm]	Summed MIMO Power Density [dBm]	Max Permissible Power Density [dBm/MHz]	Margin [dB]	Pass / Fail
Band 1	5180	36	n (20MHz)	6.5/7.2 (MCS0)	2.01	2.46	5.25	11.0	-5.75	Pass
	5200	40	n (20MHz)	6.5/7.2 (MCS0)	5.78	6.11	8.95	11.0	-2.05	Pass
	5240	48	n (20MHz)	6.5/7.2 (MCS0)	5.82	6.51	9.19	11.0	-1.81	Pass
	5190	38	n (40MHz)	13.5/15 (MCS0)	-4.09	-3.07	-0.54	11.0	-11.54	Pass
	5230	46	n (40MHz)	13.5/15 (MCS0)	0.12	0.46	3.30	11.0	-7.70	Pass
	5210	42	ac (80MHz)	29.3/32.5 (MCS0)	-7.11	-7.08	-4.09	11.0	-15.09	Pass
Band 2A	5260	52	n (20MHz)	6.5/7.2 (MCS0)	5.62	6.37	9.02	11.0	-1.98	Pass
	5280	56	n (20MHz)	6.5/7.2 (MCS0)	5.56	6.26	8.93	11.0	-2.07	Pass
	5320	64	n (20MHz)	6.5/7.2 (MCS0)	1.67	2.66	5.20	11.0	-5.80	Pass
	5270	54	n (40MHz)	13.5/15 (MCS0)	0.25	0.90	3.60	11.0	-7.40	Pass
	5310	62	n (40MHz)	13.5/15 (MCS0)	-3.63	-2.99	-0.28	11.0	-11.28	Pass
	5290	58	ac (80MHz)	29.3/32.5 (MCS0)	-7.15	-7.07	-4.10	11.0	-15.10	Pass
Band 2C	5500	100	n (20MHz)	6.5/7.2 (MCS0)	2.14	3.16	5.69	11.0	-5.31	Pass
	5580	116	n (20MHz)	6.5/7.2 (MCS0)	5.94	6.55	9.26	11.0	-1.74	Pass
	5720	144	n (20MHz)	6.5/7.2 (MCS0)	5.88	5.66	8.78	11.0	-2.22	Pass
	5510	102	n (40MHz)	13.5/15 (MCS0)	-3.18	-2.64	0.11	11.0	-10.89	Pass
	5550	110	n (40MHz)	13.5/15 (MCS0)	0.13	1.19	3.70	11.0	-7.30	Pass
	5590	118	n (40MHz)	13.5/15 (MCS0)	0.13	1.19	3.70	11.0	-7.30	Pass
	5710	142	n (40MHz)	13.5/15 (MCS0)	-0.37	0.19	2.93	11.0	-8.07	Pass
	5530	106	ac (80MHz)	29.3/32.5 (MCS0)	-7.65	-6.50	-4.03	11.0	-15.03	Pass
5690	138	ac (80MHz)	29.3/32.5 (MCS0)	-4.40	-4.39	-1.39	11.0	-12.39	Pass	

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]	Antenn-2 Power Density [dBm]	Summed MIMO Power Density [dBm]	Max Permissible Power Density [dBm/500kHz]	Margin [dB]	Pass / Fail
Band 3	5745	149	a	6.5/7.2 (MCS0)	3.92	4.43	7.20	30.0	-22.80	Pass
	5785	157	a	6.5/7.2 (MCS0)	3.60	4.29	6.97	30.0	-23.03	Pass
	5825	165	a	6.5/7.2 (MCS0)	-0.06	0.92	3.47	30.0	-26.53	Pass
	5745	149	n (20MHz)	6.5/7.2 (MCS0)	3.82	4.23	7.04	30.0	-22.96	Pass
	5785	157	n (20MHz)	6.5/7.2 (MCS0)	3.28	4.25	6.80	30.0	-23.20	Pass
	5825	165	n (20MHz)	6.5/7.2 (MCS0)	-0.47	0.88	3.27	30.0	-26.73	Pass
	5755	151	n (40MHz)	13.5/15 (MCS0)	-2.01	-0.70	1.70	30.0	-28.30	Pass
	5795	159	n (40MHz)	13.5/15 (MCS0)	-2.38	-0.97	1.39	30.0	-28.61	Pass
	5775	155	ac (80MHz)	29.3/32.5 (MCS0)	-6.86	-5.54	-3.14	30.0	-33.14	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 2.01 dBm for Antenna-1 and 2.46 dBm for Antenna-2.

$$\text{Antenna 1} + \text{Antenna 2} = \text{MIMO}$$

$$(2.01 \text{ dBm} + 2.46 \text{ dBm}) = (1.59 \text{ mW} + 1.76 \text{ mW}) = 3.35 \text{ mW} = 5.25 \text{ dBm}$$

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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.



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

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	5,180,000,077	77	0.00000149
100 %		- 30	5,180,000,100	100	0.00000193
100 %		- 20	5,179,999,850	-150	-0.00000290
100 %		- 10	5,179,999,988	-12	-0.00000023
100 %		0	5,179,999,993	-7	-0.00000014
100 %		+ 10	5,180,000,123	123	0.00000237
100 %		+ 20	5,179,999,877	-123	-0.00000237
100 %		+ 30	5,179,999,939	-61	-0.00000118
100 %		+ 40	5,180,000,073	73	0.00000141
100 %		+ 50	5,179,999,876	-124	-0.00000239
BATT. ENDPOINT	3.40	+ 20	5,180,000,059	59	0.00000114

Table 7-23. Frequency Stability Measurements for UNII Band 1 (Ch. 36)

Note:

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

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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)	5,260,000,059	59	0.00000112
100 %		- 30	5,260,000,028	28	0.00000053
100 %		- 20	5,260,000,096	96	0.00000183
100 %		- 10	5,259,999,957	-43	-0.00000082
100 %		0	5,260,000,083	83	0.00000158
100 %		+ 10	5,259,999,953	-47	-0.00000089
100 %		+ 20	5,260,000,062	62	0.00000118
100 %		+ 30	5,260,000,000	0	0.00000000
100 %		+ 40	5,260,000,035	35	0.00000067
100 %		+ 50	5,259,999,927	-73	-0.00000139
BATT. ENDPOINT	3.40	+ 20	5,260,000,035	35	0.00000067

Table 7-24. Frequency Stability Measurements for UNII Band 2A (Ch. 52)

Note:

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

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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)	5,499,999,896	-104	-0.00000189
100 %		- 30	5,500,000,000	0	0.00000000
100 %		- 20	5,500,000,048	48	0.00000087
100 %		- 10	5,499,999,943	-57	-0.00000104
100 %		0	5,499,999,988	-12	-0.00000022
100 %		+ 10	5,500,000,062	62	0.00000113
100 %		+ 20	5,499,999,906	-94	-0.00000171
100 %		+ 30	5,499,999,929	-71	-0.00000129
100 %		+ 40	5,500,000,033	33	0.00000060
100 %		+ 50	5,500,000,048	48	0.00000087
BATT. ENDPOINT	3.40	+ 20	5,500,000,137	137	0.00000249

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)	5,745,000,120	120	0.00000209
100 %		- 30	5,745,000,147	147	0.00000256
100 %		- 20	5,744,999,923	-77	-0.00000134
100 %		- 10	5,744,999,887	-113	-0.00000197
100 %		0	5,745,000,061	61	0.00000106
100 %		+ 10	5,744,999,981	-19	-0.00000033
100 %		+ 20	5,745,000,123	123	0.00000214
100 %		+ 30	5,745,000,035	35	0.00000061
100 %		+ 40	5,744,999,949	-51	-0.00000089
100 %		+ 50	5,745,000,024	24	0.00000042
BATT. ENDPOINT	3.40	+ 20	5,745,000,040	40	0.00000070

Table 7-26. Frequency Stability Measurements for UNII Band 3 (Ch. 149)

Note:

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

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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 increasing linearly to a level of 27 dBm/MHz at 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 [$\mu\text{V}/\text{m}$]	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 $\geq 2 \times \text{span}/\text{RBW}$)
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.

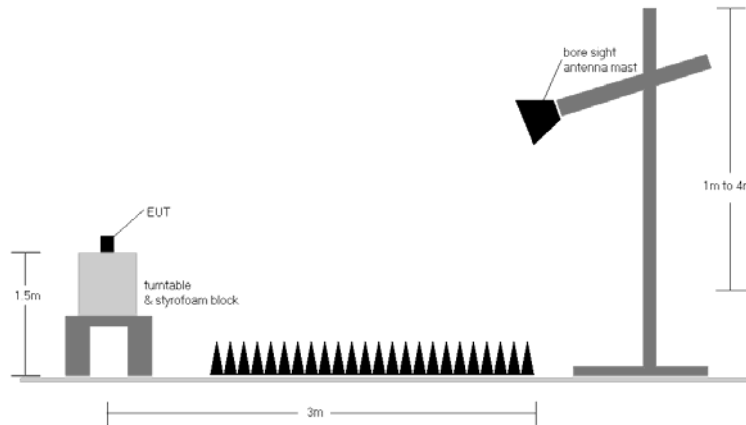



Figure 7-5. Test Instrument & Measurement Setup

Test Notes

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

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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 dB μ V/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 68.2dB μ V/m.
4. The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
5. This unit was tested with its standard battery.
6. The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter using CISPR quasi peak detector below 1GHz. Above 1 GHz, average and peak measurements were taken using linearly polarized horn antennas. The worst-case emissions are reported however emissions whose levels were not within 20dB of the respective limits were not reported.
7. Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.
8. Radiated spurious emissions were investigated while operating in MIMO mode, however, it was determined that single antenna operation produced the worst case emissions. Since the emissions produced from MIMO operation were found to be more than 20dB below the limit, the MIMO emissions are not reported.
9. The wide spectrum spurious emissions plots shown on the following pages are used only for the purpose of emission identification. Any emissions found to be within 20dB of the limit are fully investigated and the results are shown in this section. Rohde & Schwarz EMC32, Version 9.15.00 automated test software was used to perform the Radiated Spurious Emissions Pre-Scan testing.
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 $_{[dB\mu V/m]} = \text{Analyzer Level }_{[dBm]} + 107 + \text{AFCL }_{[dB/m]}$
- $\text{AFCL }_{[dB/m]} = \text{Antenna Factor }_{[dB/m]} + \text{Cable Loss }_{[dB]}$
- $\text{Margin }_{[dB]} = \text{Field Strength Level }_{[dB\mu V/m]} - \text{Limit }_{[dB\mu V/m]}$

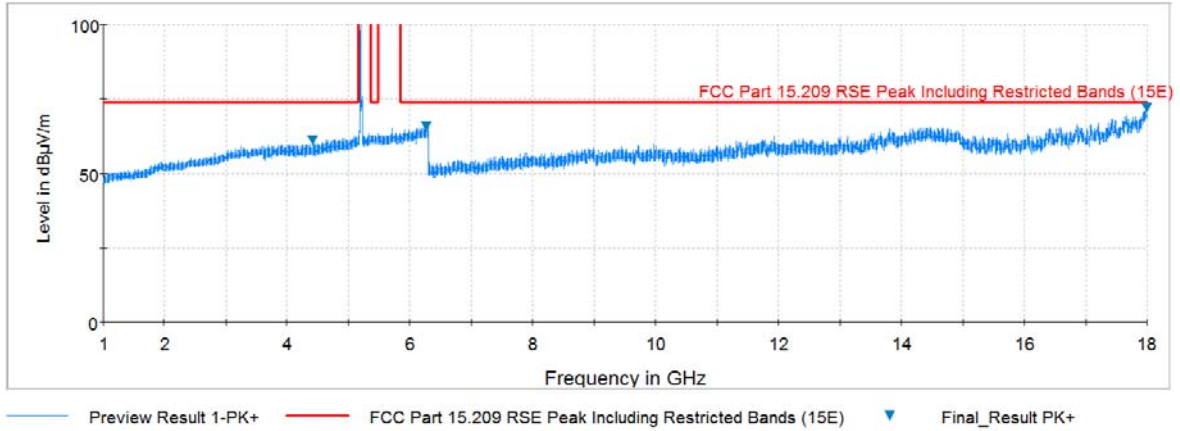
Radiated Band Edge Measurement Offset

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

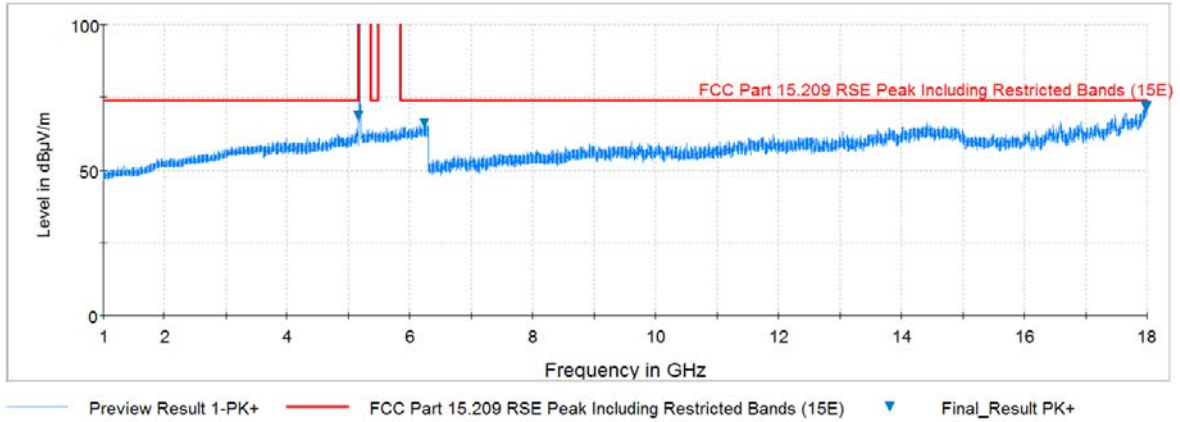
$$\text{Offset (dB)} = (\text{Antenna Factor} + \text{Cable Loss} + \text{Attenuator}) - \text{Preamplifier Gain}$$

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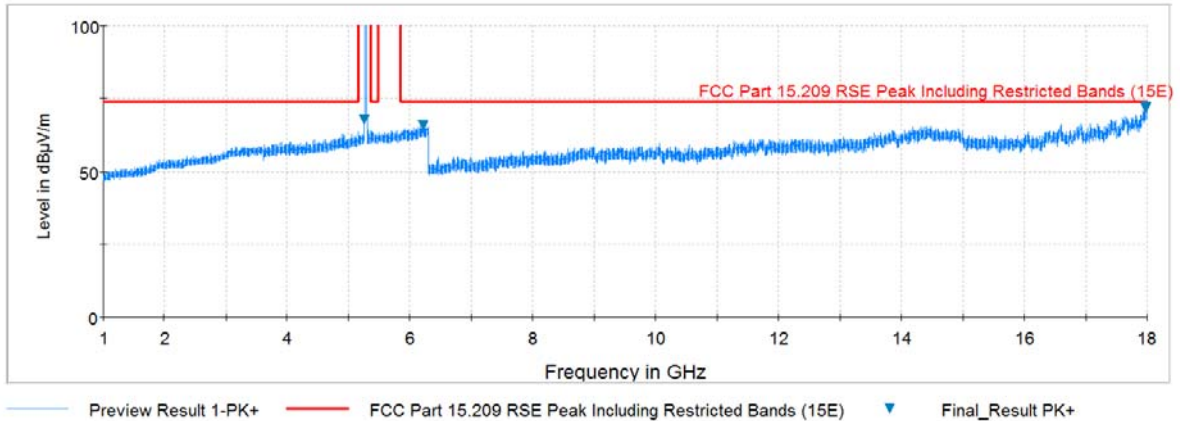
7.7.1 Antenna-1 Radiated Spurious Emission Measurements



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

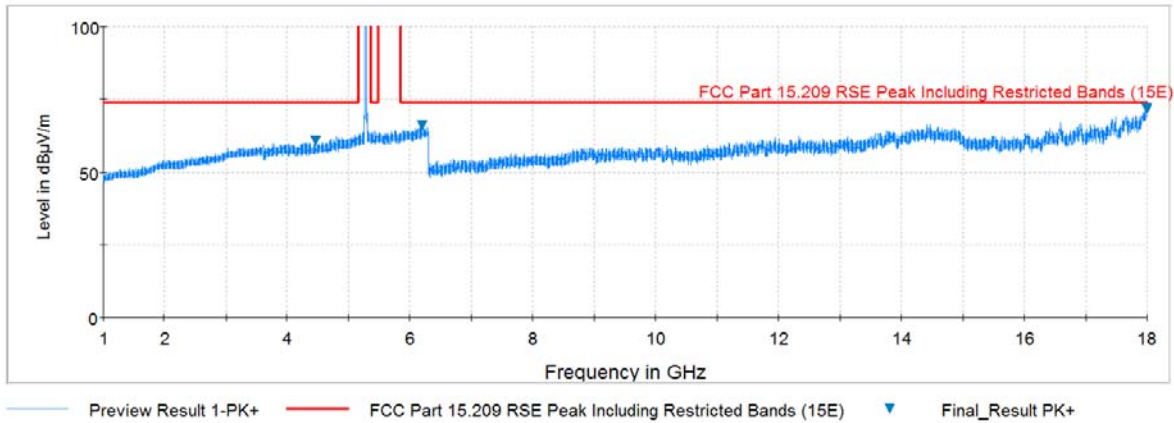


Plot 7-154. Radiated Spurious Plot above 1GHz (802.11a – U1 Ch. 40, Ant. Pol. V)

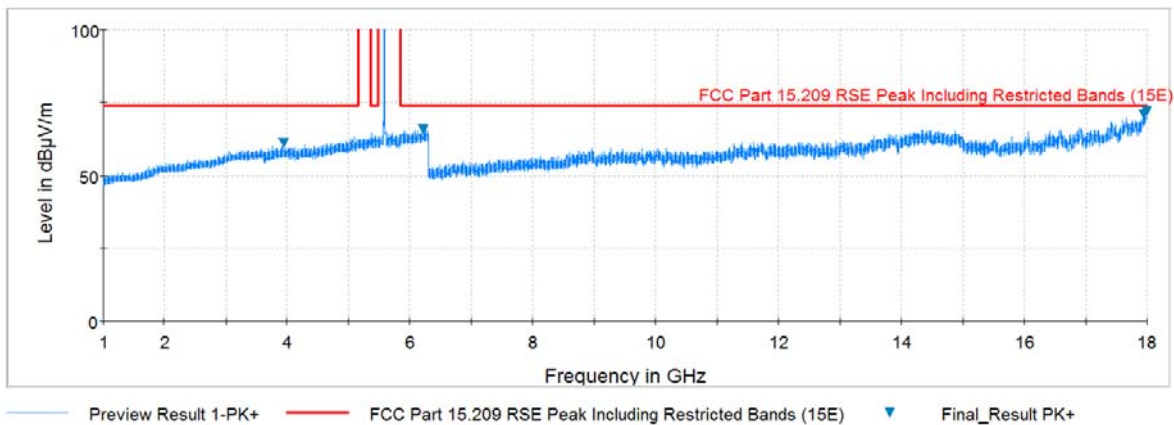


Plot 7-155. Radiated Spurious Plot above 1GHz (802.11a – U2A Ch. 56, Ant. Pol. H)

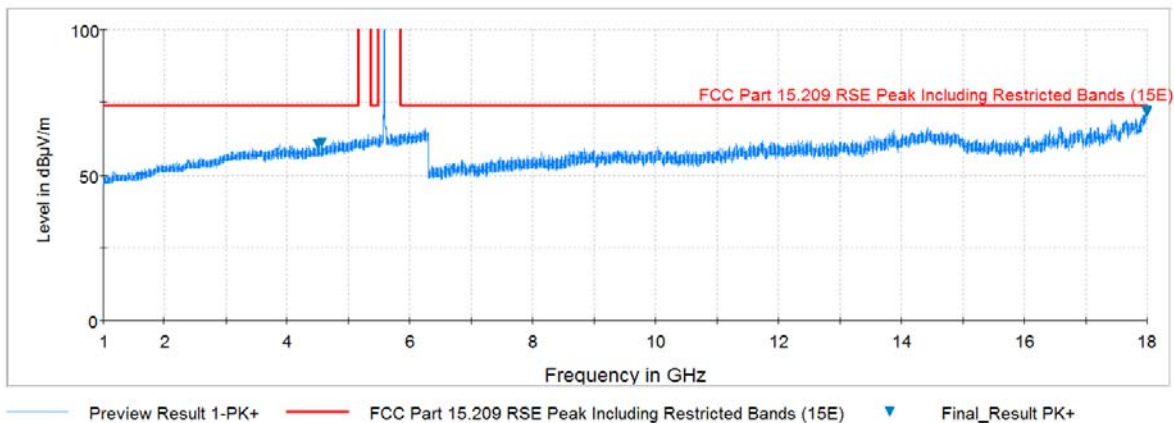
FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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Plot 7-156. Radiated Spurious Plot above 1GHz (802.11a – U2A Ch. 56, Ant. Pol. V)

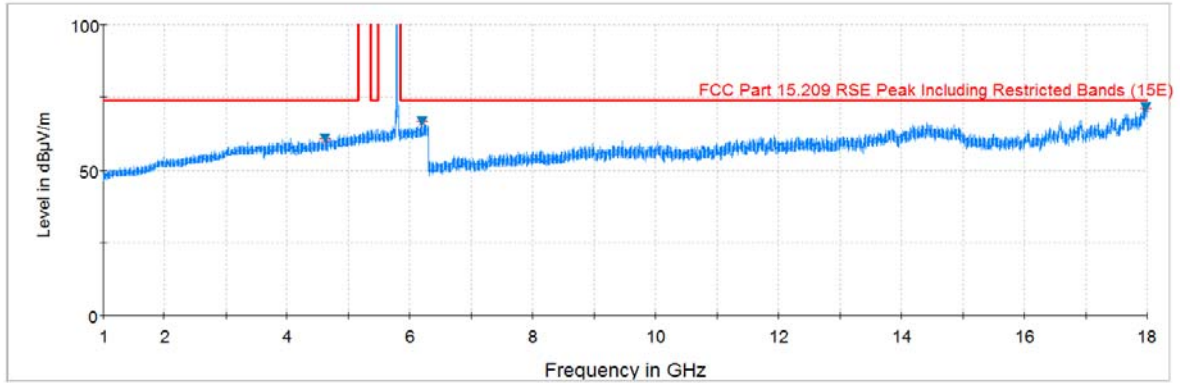


Plot 7-157. Radiated Spurious Plot above 1GHz (802.11a – U2C Ch. 116, Ant. Pol. H)



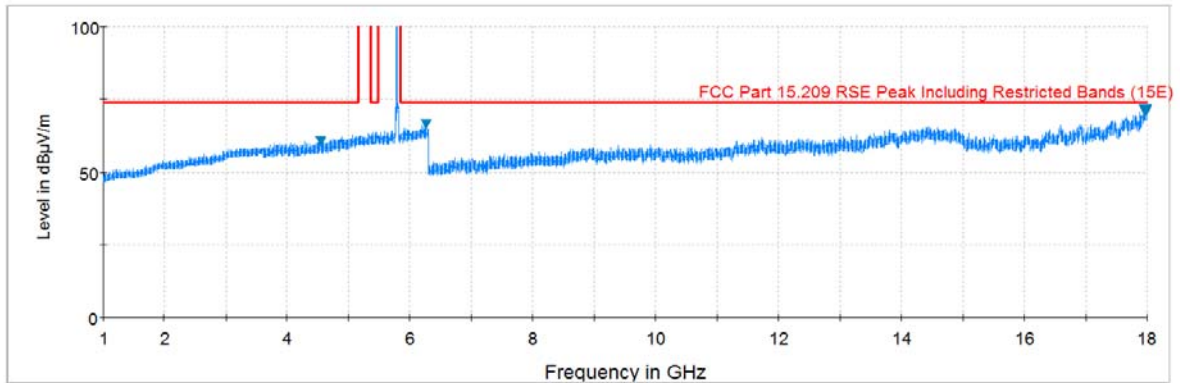
Plot 7-158. Radiated Spurious Plot above 1GHz (802.11a – U2C Ch. 116, Ant. Pol. V)

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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— Preview Result 1-PK+ * Critical_Freqs PK+
— FCC Part 15.209 RSE Peak Including Restricted Bands (15E) ▼ Final_Result PK+

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



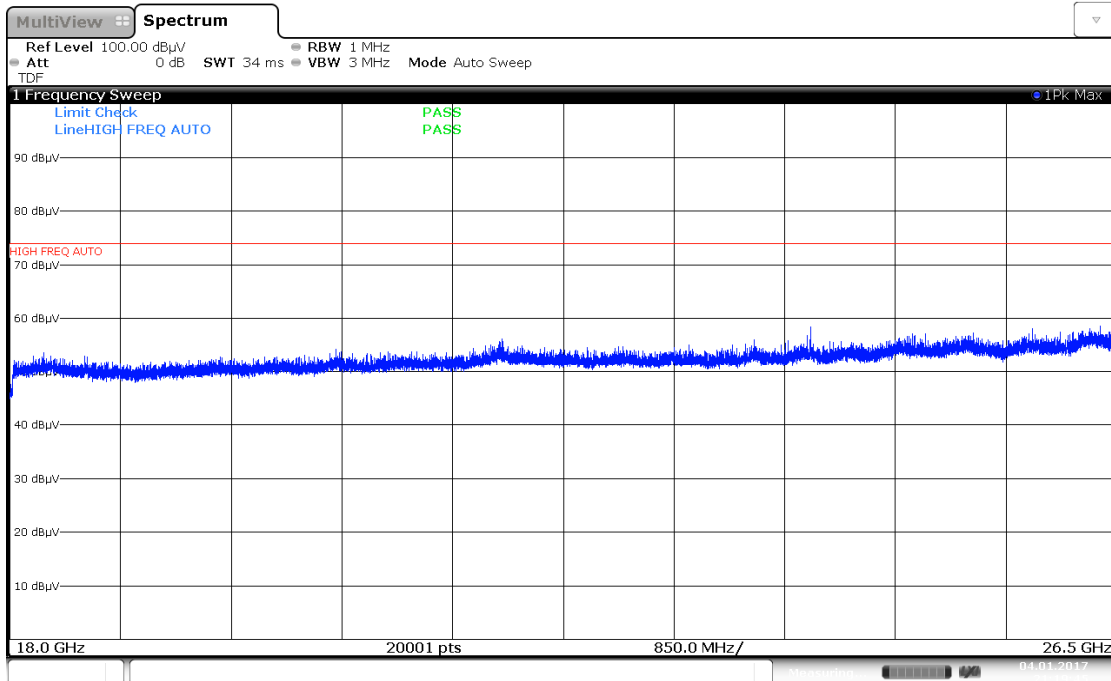
— Preview Result 1-PK+ — FCC Part 15.209 RSE Peak Including Restricted Bands (15E) ▼ Final_Result PK+

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

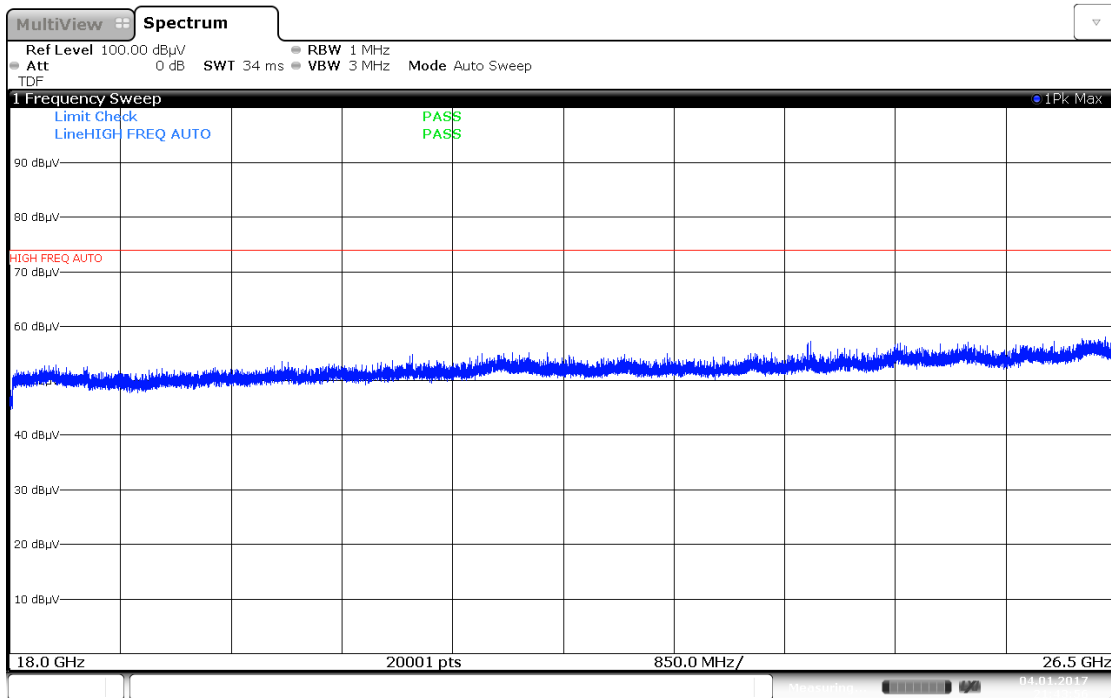
FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 119 of 251	

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

§15.209



Plot 7-161. Radiated Spurious Plot 18GHz - 26.5GHz (802.11a – Ant. Pol. H)

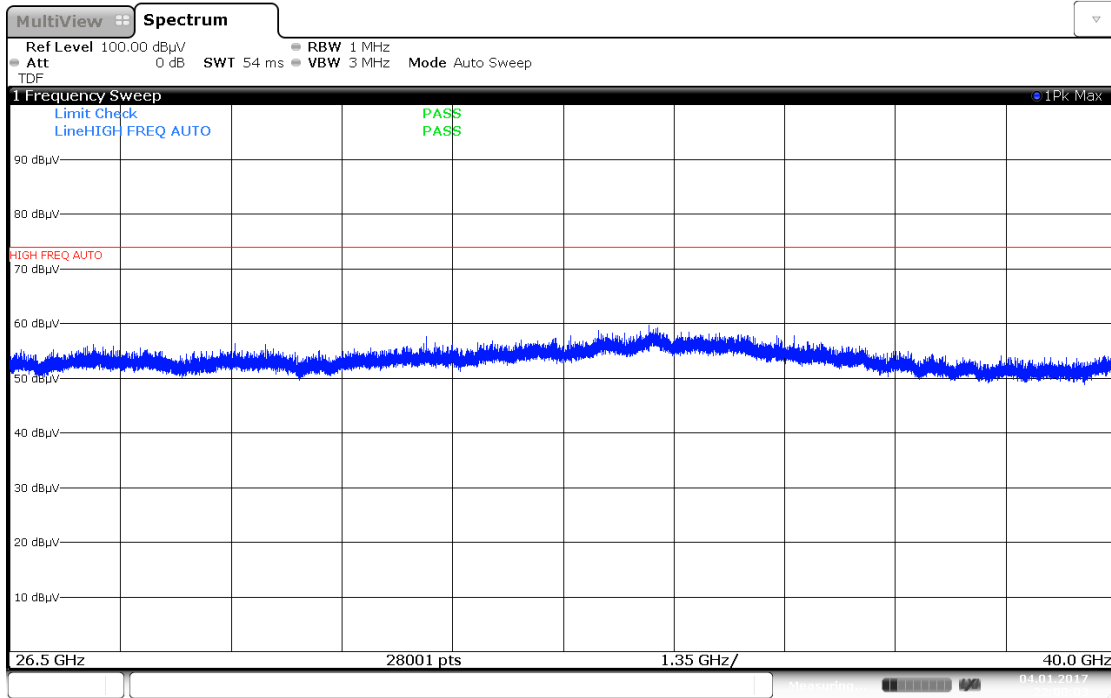


Plot 7-162. Radiated Spurious Plot above 18GHz - 26.5GHz (802.11a – Ant. Pol. V)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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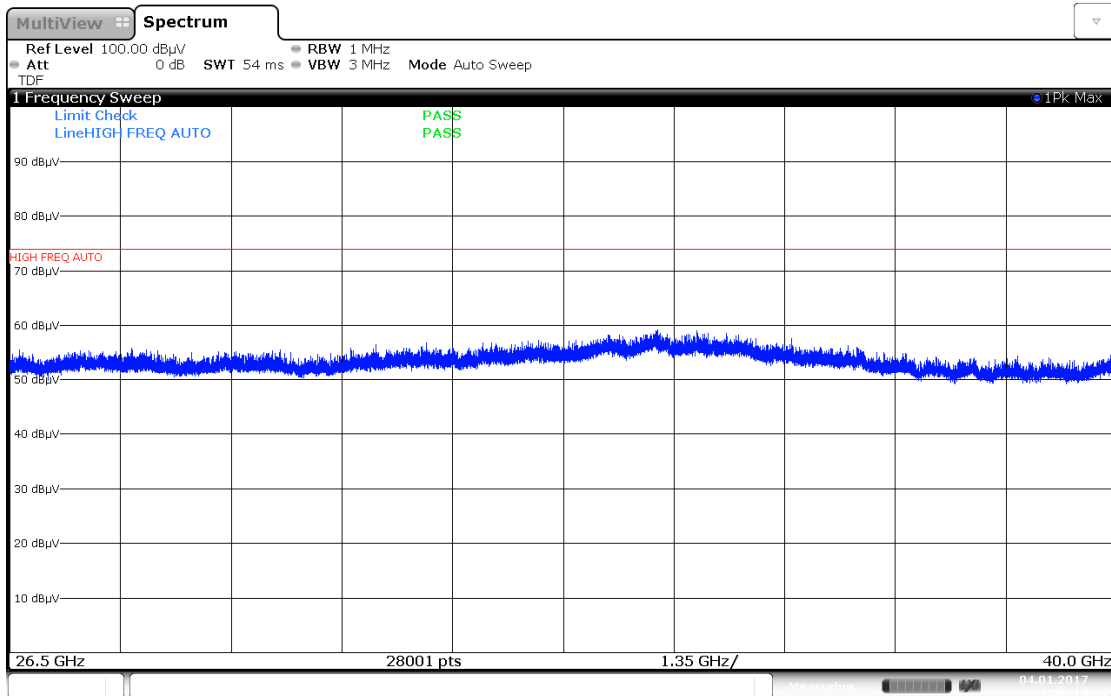
Antenna-1 Radiated Spurious Emissions Measurements (Above 18GHz)

§15.209



22:00:04 04.01.2017

Plot 7-163. Radiated Spurious Plot 26.5GHz - 40GHz (802.11a – Ant. Pol. H)



21:55:19 04.01.2017

Plot 7-164. Radiated Spurious Plot above 26.5GHz - 40GHz (802.11a – Ant. Pol. V)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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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	H	100	119	-57.89	9.88	-9.54	49.45	68.20	-18.75
* 15540.00	Average	H	-	-	-75.09	12.76	-9.54	35.12	53.98	-18.86
* 15540.00	Peak	H	-	-	-63.49	12.76	-9.54	46.72	73.98	-27.26
* 20720.00	Average	H	-	-	-73.21	8.13	-9.54	32.38	53.98	-21.60
* 20720.00	Peak	H	-	-	-62.84	8.13	-9.54	42.75	73.98	-31.23
25900.00	Peak	H	-	-	-59.35	8.50	-9.54	46.61	68.20	-21.59

Table 7-28. Radiated Measurements

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

Frequency [MHz]	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	H	100	109	-57.76	9.89	-9.54	49.59	68.20	-18.61
* 15600.00	Average	H	-	-	-75.12	13.12	-9.54	35.46	53.98	-18.52
* 15600.00	Peak	H	-	-	-63.61	13.12	-9.54	46.97	73.98	-27.01
* 20800.00	Average	H	-	-	-72.29	8.16	-9.54	33.32	53.98	-20.66
* 20800.00	Peak	H	-	-	-60.36	8.16	-9.54	45.25	73.98	-28.73
26000.00	Peak	H	-	-	-58.23	8.52	-9.54	47.75	68.20	-20.45

Table 7-29. Radiated Measurements

FCC ID: ZNFLS993			FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		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	H	100	109	-57.18	10.24	-9.54	50.52	68.20	-17.68
* 15720.00	Average	H	-	-	-75.19	13.45	-9.54	35.72	53.98	-18.26
* 15720.00	Peak	H	-	-	-62.85	13.45	-9.54	48.06	73.98	-25.92
* 20960.00	Average	H	-	-	-72.49	8.12	-9.54	33.09	53.98	-20.89
* 20960.00	Peak	H	-	-	-60.92	8.12	-9.54	44.66	73.98	-29.32
26200.00	Peak	H	-	-	-57.42	8.62	-9.54	48.66	68.20	-19.54

Table 7-30. Radiated Measurements

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

Frequency [MHz]	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	H	100	3	-62.20	10.24	-9.54	45.50	68.20	-22.70
* 15720.00	Average	H	-	-	-75.77	13.45	-9.54	35.14	53.98	-18.84
* 15720.00	Peak	H	-	-	-62.97	13.45	-9.54	47.94	73.98	-26.04
* 20960.00	Average	H	-	-	-72.06	8.12	-9.54	33.52	53.98	-20.46
* 20960.00	Peak	H	-	-	-61.22	8.12	-9.54	44.36	73.98	-29.62
26200.00	Peak	H	-	-	-57.76	8.62	-9.54	48.32	68.20	-19.88

Table 7-31. Radiated Measurements with WCP

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		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	H	100	118	-57.18	10.21	-9.54	50.49	68.20	-17.71
* 15780.00	Average	H	-	-	-75.22	13.34	-9.54	35.58	53.98	-18.40
* 15780.00	Peak	H	-	-	-63.18	13.34	-9.54	47.62	73.98	-26.36
* 21040.00	Average	H	-	-	-72.13	8.10	-9.54	33.43	53.98	-20.55
* 21040.00	Peak	H	-	-	-60.70	8.10	-9.54	44.86	73.98	-29.12
26300.00	Peak	H	-	-	-56.96	8.76	-9.54	49.26	68.20	-18.94

Table 7-32. Radiated Measurements

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

Frequency [MHz]	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	H	100	116	-56.84	9.92	-9.54	50.53	68.20	-17.67
* 15840.00	Average	H	-	-	-74.88	12.96	-9.54	35.54	53.98	-18.44
* 15840.00	Peak	H	-	-	-62.44	12.96	-9.54	47.98	73.98	-26.00
* 21120.00	Average	H	-	-	-71.88	8.09	-9.54	33.66	53.98	-20.32
* 21120.00	Peak	H	-	-	-59.20	8.09	-9.54	46.34	73.98	-27.64
26400.00	Peak	H	-	-	-56.74	8.99	-9.54	49.71	68.20	-18.49

Table 7-33. Radiated Measurements

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		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: 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	H	100	121	-59.71	9.65	-9.54	47.39	53.98	-6.59
* 10640.00	Peak	H	100	121	-56.61	9.65	-9.54	50.49	73.98	-23.49
* 15960.00	Average	H	-	-	-74.56	12.55	-9.54	35.45	53.98	-18.53
* 15960.00	Peak	H	-	-	-62.00	12.55	0.00	57.55	73.98	-16.43
* 21280.00	Average	H	-	-	-71.30	8.07	-9.54	34.23	53.98	-19.75
* 21280.00	Peak	H	-	-	-60.56	8.07	-9.54	44.97	73.98	-29.01
26600.00	Peak	H	-	-	-47.18	-8.30	-9.54	41.98	68.20	-26.22

Table 7-34. Radiated Measurements

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

Frequency [MHz]	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	H	100	168	-63.30	9.92	-9.54	44.07	68.20	-24.13
* 15840.00	Average	H	-	-	-74.74	12.96	-9.54	35.68	53.98	-18.30
* 15840.00	Peak	H	-	-	-62.56	12.96	-9.54	47.86	73.98	-26.12
* 21120.00	Average	H	-	-	-71.49	8.09	-9.54	34.06	53.98	-19.92
* 21120.00	Peak	H	-	-	-59.29	8.09	-9.54	46.25	73.98	-27.73
26400.00	Peak	H	-	-	-56.81	8.99	-9.54	49.64	68.20	-18.56

Table 7-35. Radiated Measurements with WCP

FCC ID: ZNFLS993	 FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)			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]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 11000.00	Average	H	100	113	-59.60	9.94	-9.54	47.80	53.98	-6.18
* 11000.00	Peak	H	100	113	-56.20	9.94	-9.54	51.20	73.98	-22.78
16500.00	Peak	H	-	-	-64.21	12.86	-9.54	46.11	68.20	-22.09
22000.00	Peak	H	-	-	-58.41	8.35	-9.54	47.39	68.20	-20.81
27500.00	Peak	H	-	-	-45.75	-8.93	-9.54	42.78	68.20	-25.42

Table 7-36. Radiated Measurements

Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps
 Distance of Measurements: 1 & 3 Meters
 Operating Frequency: 5580MHz
 Channel: 116

Frequency [MHz]	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	H	100	110	-58.98	10.56	-9.54	49.04	53.98	-4.94
* 11160.00	Peak	H	100	110	-54.21	10.56	-9.54	53.81	73.98	-20.17
16740.00	Peak	H	-	-	-62.73	11.52	-9.54	46.25	68.20	-21.95
* 22320.00	Average	H	-	-	-71.48	8.20	-9.54	34.18	53.98	-19.80
* 22320.00	Peak	H	-	-	-58.95	8.20	-9.54	46.71	73.98	-27.27
27900.00	Peak	H	-	-	-45.88	-9.24	-9.54	42.34	68.20	-25.86

Table 7-37. Radiated Measurements

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)			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	H	100	110	-57.97	11.10	-9.54	50.59	53.98	-3.39
* 11400.00	Peak	H	100	110	-52.78	11.10	-9.54	55.78	73.98	-18.20
17100.00	Peak	H	-	-	-61.25	13.22	-9.54	49.43	68.20	-18.77
* 22800.00	Average	H	-	-	-71.00	8.29	-9.54	34.74	53.98	-19.24
* 22800.00	Peak	H	-	-	-59.45	8.29	-9.54	46.29	73.98	-27.69
28500.00	Peak	H	-	-	-44.67	-9.03	-9.54	43.76	68.20	-24.44


Table 7-38. Radiated Measurements

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

Frequency [MHz]	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	H	100	342	-67.26	11.10	-9.54	41.30	53.98	-12.68
* 11400.00	Peak	H	100	342	-58.51	11.10	-9.54	50.05	73.98	-23.93
17100.00	Peak	H	-	-	-61.85	13.22	-9.54	48.83	68.20	-19.37
* 22800.00	Average	H	-	-	-71.82	8.29	-9.54	33.92	53.98	-20.06
* 22800.00	Peak	H	-	-	-60.46	8.29	-9.54	45.28	73.98	-28.70
28500.00	Peak	H	-	-	-44.85	-9.03	-9.54	43.58	68.20	-24.62

Table 7-39. Radiated Measurements with WCP

Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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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	H	100	112	-58.11	11.06	-9.54	50.41	53.98	-3.57
* 11490.00	Peak	H	100	112	-51.37	11.06	-9.54	57.15	73.98	-16.83
17235.00	Peak	H	-	-	-62.35	17.22	-9.54	52.33	68.20	-15.87
* 22980.00	Average	H	-	-	-71.34	8.19	-9.54	34.31	53.98	-19.67
* 22980.00	Peak	H	-	-	-60.61	8.19	-9.54	45.04	73.98	-28.94
28725.00	Peak	H	-	-	-44.15	-9.45	-9.54	43.86	68.20	-24.34

Table 7-40. Radiated Measurements

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

Frequency [MHz]	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	H	100	24	-66.20	10.88	-9.54	42.14	53.98	-11.84
* 11570.00	Peak	H	100	24	-58.65	10.88	-9.54	49.69	73.98	-24.29
17355.00	Peak	H	-	-	-69.77	16.71	-9.54	44.40	68.20	-23.80
23140.00	Peak	H	-	-	-60.90	8.47	-9.54	45.02	68.20	-23.18
28925.00	Peak	H	-	-	-45.21	-9.71	-9.54	42.54	68.20	-25.66

Table 7-41. Radiated Measurements

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 128 of 251	

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	H	100	157	-58.65	10.92	-9.54	49.73	53.98	-4.25
* 11650.00	Peak	H	100	157	-55.84	10.92	-9.54	52.54	73.98	-21.44
17475.00	Peak	H	-	-	-61.01	15.81	-9.54	52.26	68.20	-15.94
23300.00	Peak	H	-	-	-59.83	8.60	-9.54	46.23	68.20	-21.97
29125.00	Peak	H	-	-	-44.22	-9.93	-9.54	43.31	68.20	-24.89

Table 7-42. Radiated Measurements

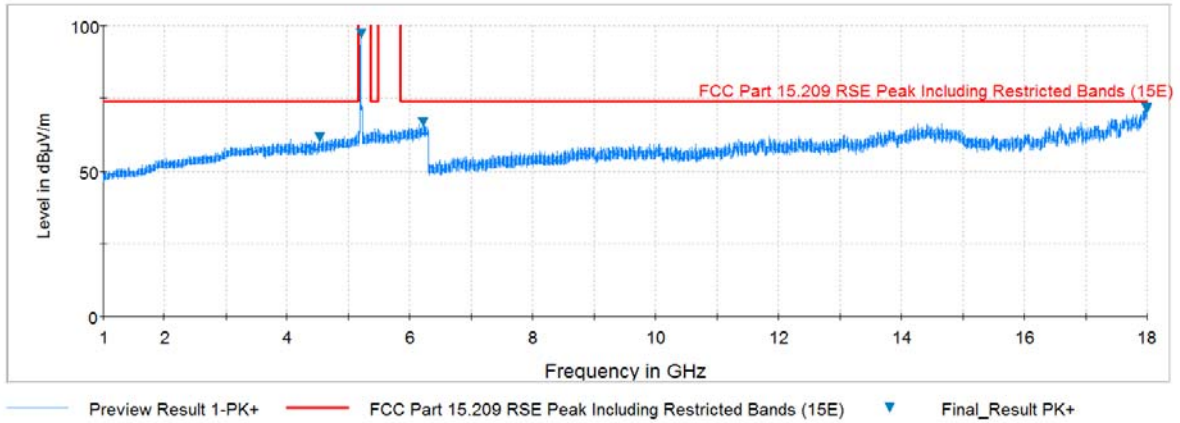
Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps
 Distance of Measurements: 1 & 3 Meters
 Operating Frequency: 5825MHz
 Channel: 165

Frequency [MHz]	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	H	-	-	-68.02	10.92	-9.54	40.36	53.98	-13.62
* 11650.00	Peak	H	-	-	-62.32	10.92	-9.54	46.06	73.98	-27.92
17475.00	Peak	H	-	-	-60.63	15.81	-9.54	52.64	68.20	-15.56
23300.00	Peak	H	-	-	-60.47	8.60	-9.54	45.59	68.20	-22.61
29125.00	Peak	H	-	-	-44.30	-9.93	-9.54	43.23	68.20	-24.97

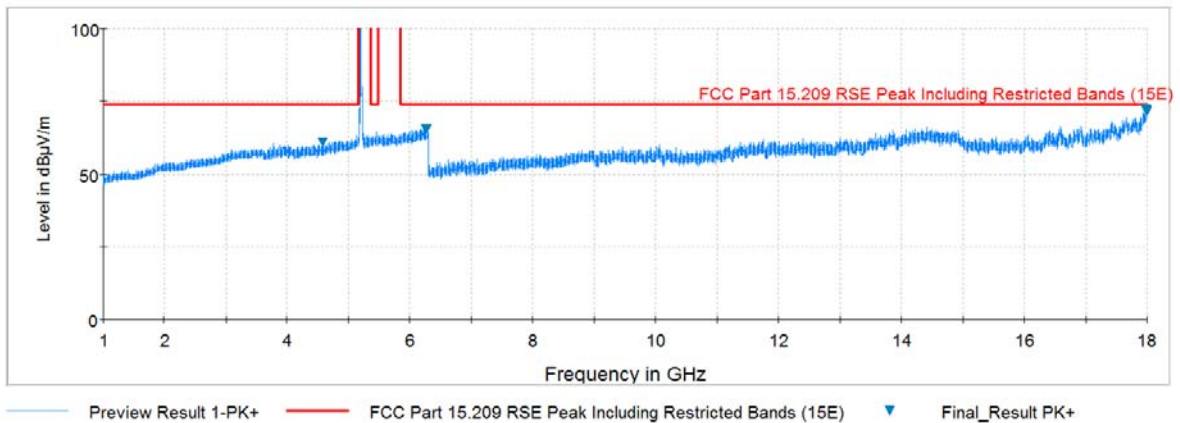
Table 7-43. Radiated Measurements with WCP

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 129 of 251	

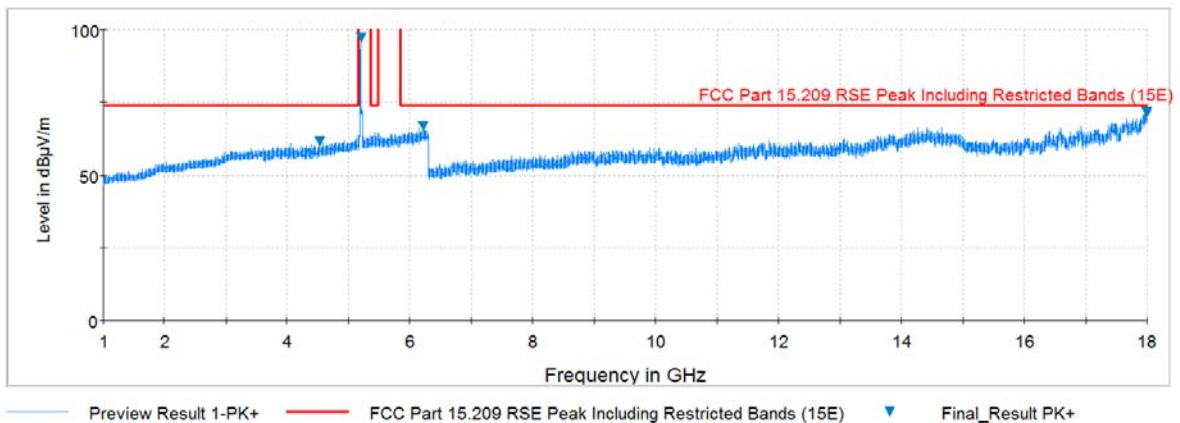
7.7.2 Antenna-2 Radiated Spurious Emission Measurements



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

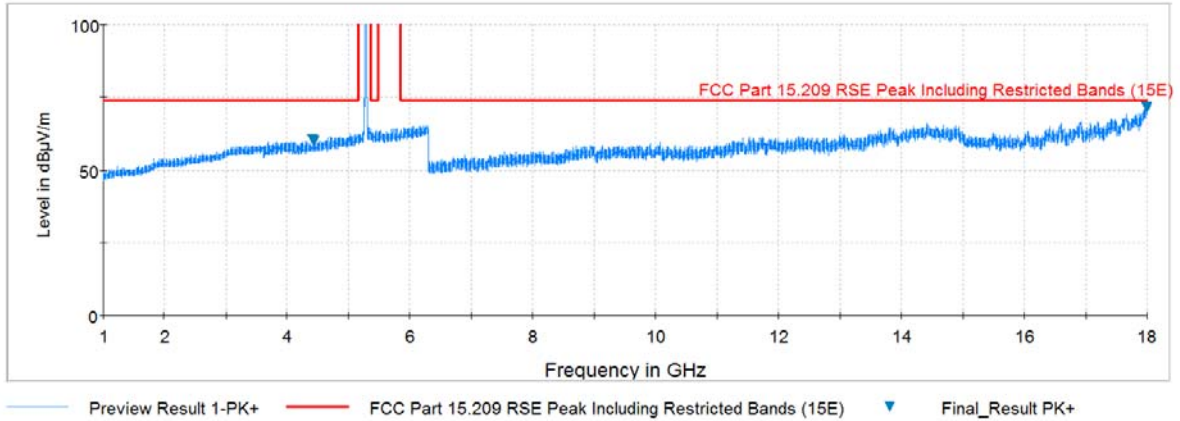


Plot 7-166. Radiated Spurious Plot above 1GHz (802.11a – U1 Ch. 40, Ant. Pol. V)

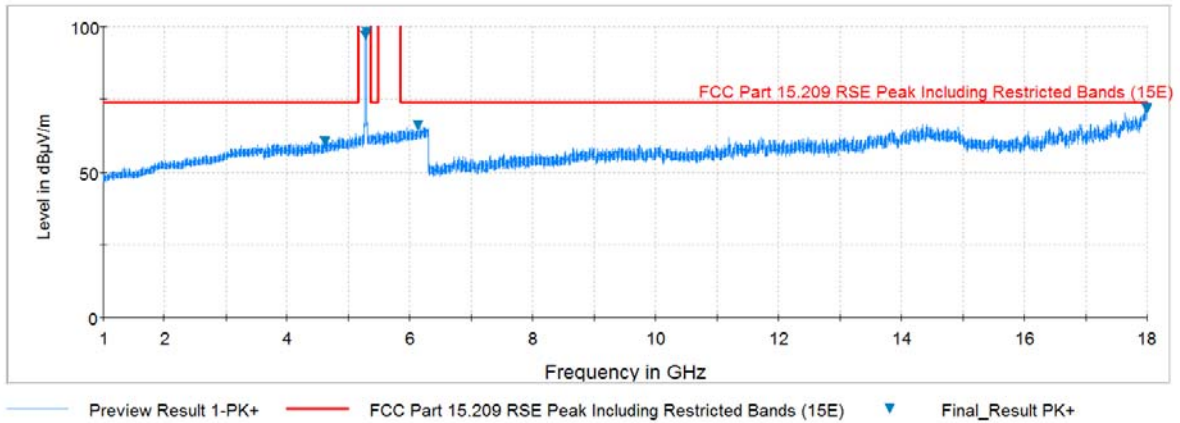


Plot 7-167. Radiated Spurious Plot above 1GHz (802.11a – U2A Ch. 56, Ant. Pol. H)

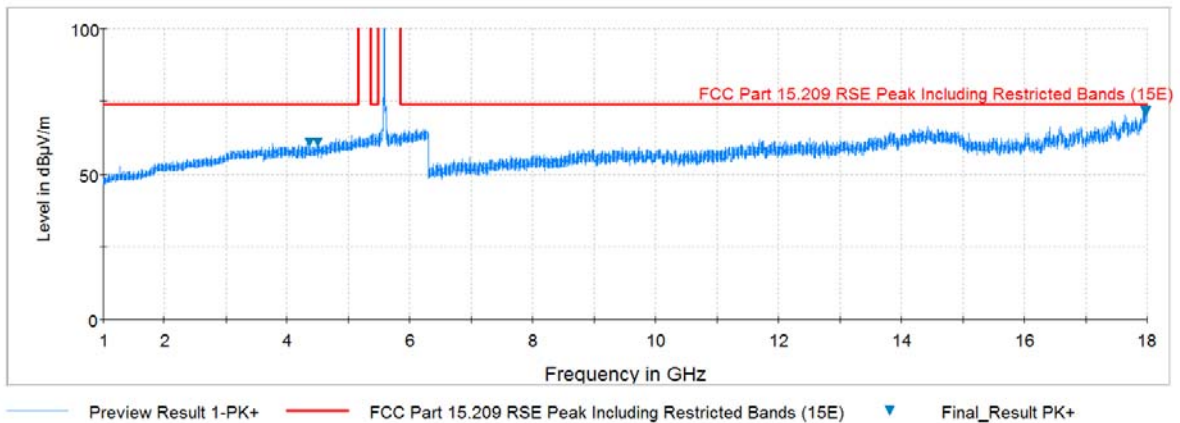
FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset		Page 130 of 251





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

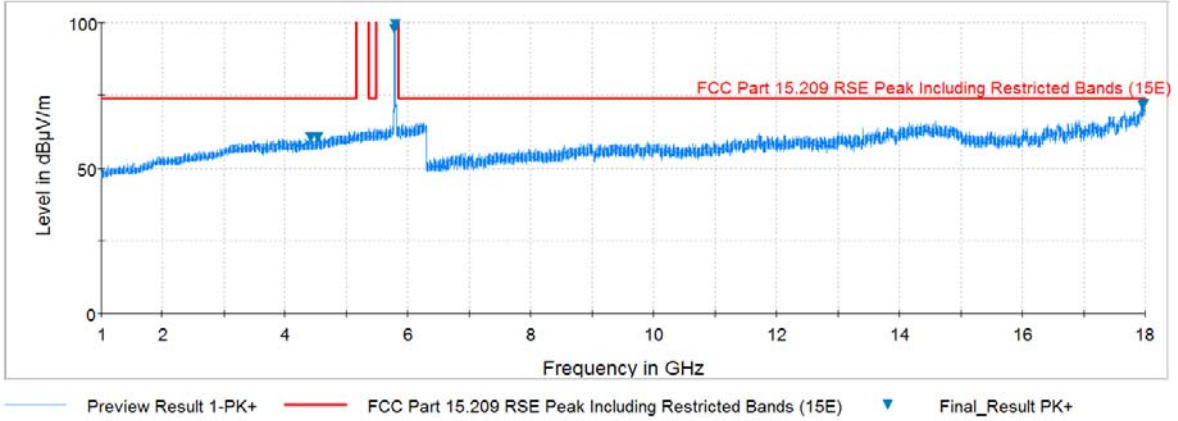


Plot 7-169. Radiated Spurious Plot above 1GHz (802.11a – U2C Ch. 116, Ant. Pol. H)

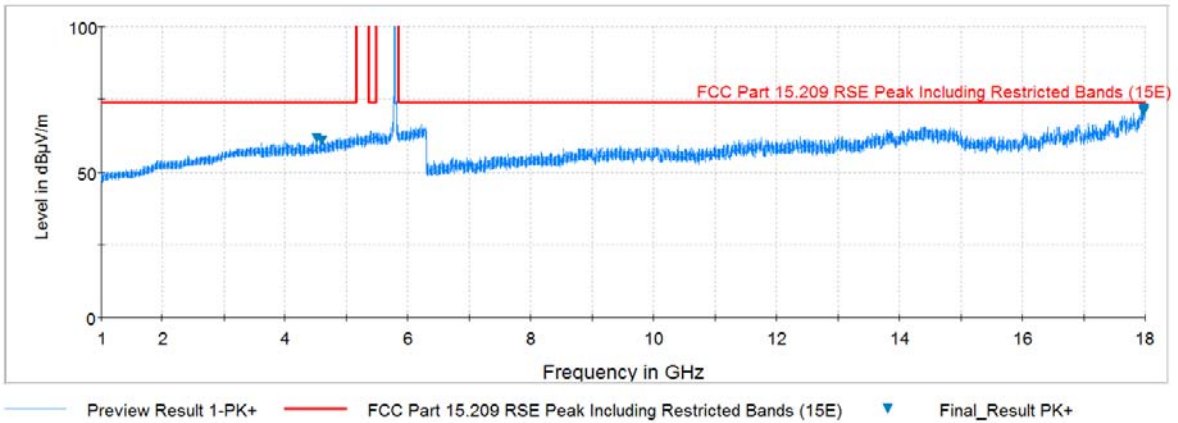


Plot 7-170. Radiated Spurious Plot above 1GHz (802.11a – U2C Ch. 116, Ant. Pol. V)



FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 131 of 251	



Plot 7-171. Radiated Spurious Plot above 1GHz (802.11a – U3 Ch. 157, Ant. Pol. H)

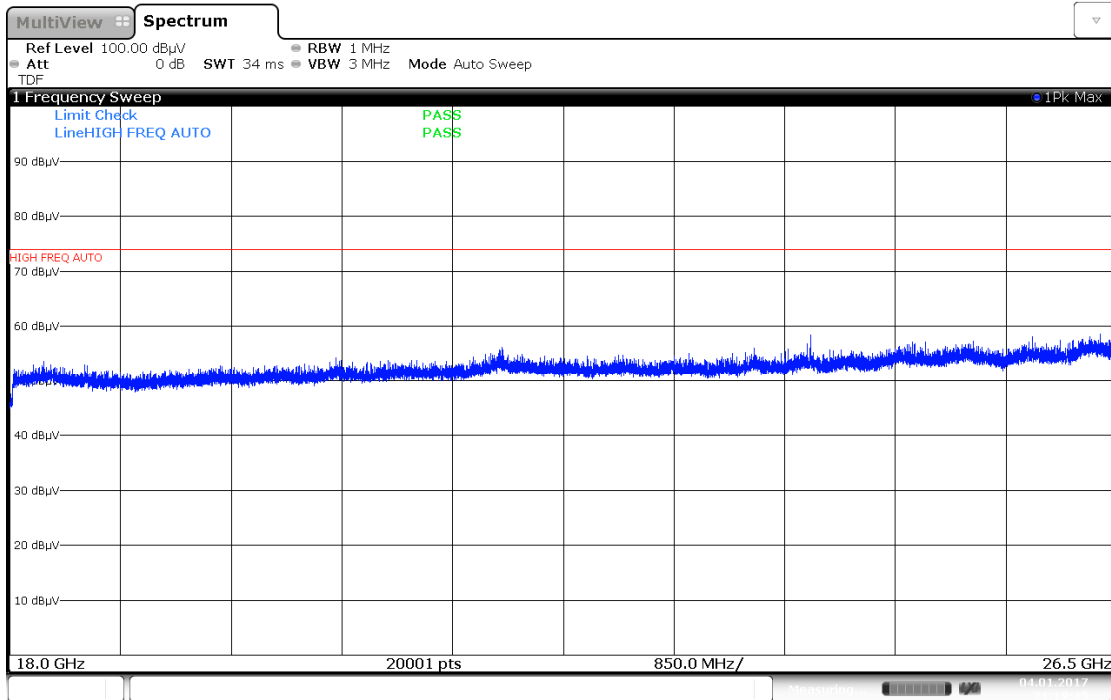


Plot 7-172. Radiated Spurious Plot above 1GHz (802.11a – U3 Ch. 157, Ant. Pol. V)

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 132 of 251	

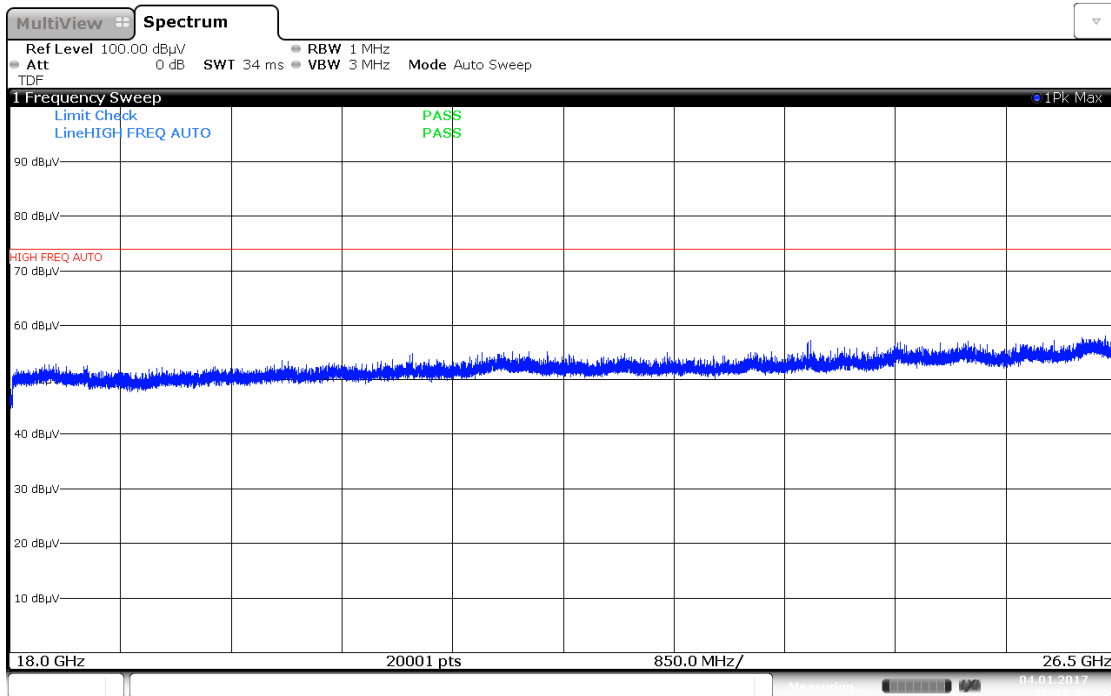
Antenna-2 Radiated Spurious Emissions Measurements (Above 18GHz)

§15.209



21:19:45 04.01.2017

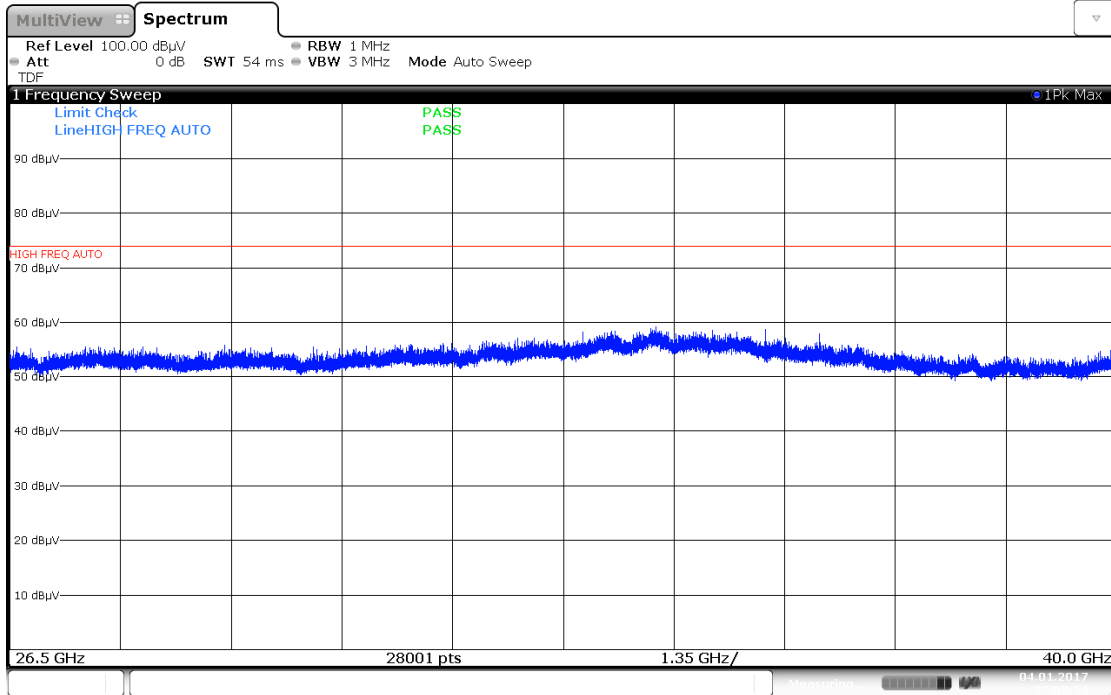
Plot 7-173. Radiated Spurious Plot 18GHz - 26.5GHz (802.11a – Ant. Pol. H)



21:43:56 04.01.2017

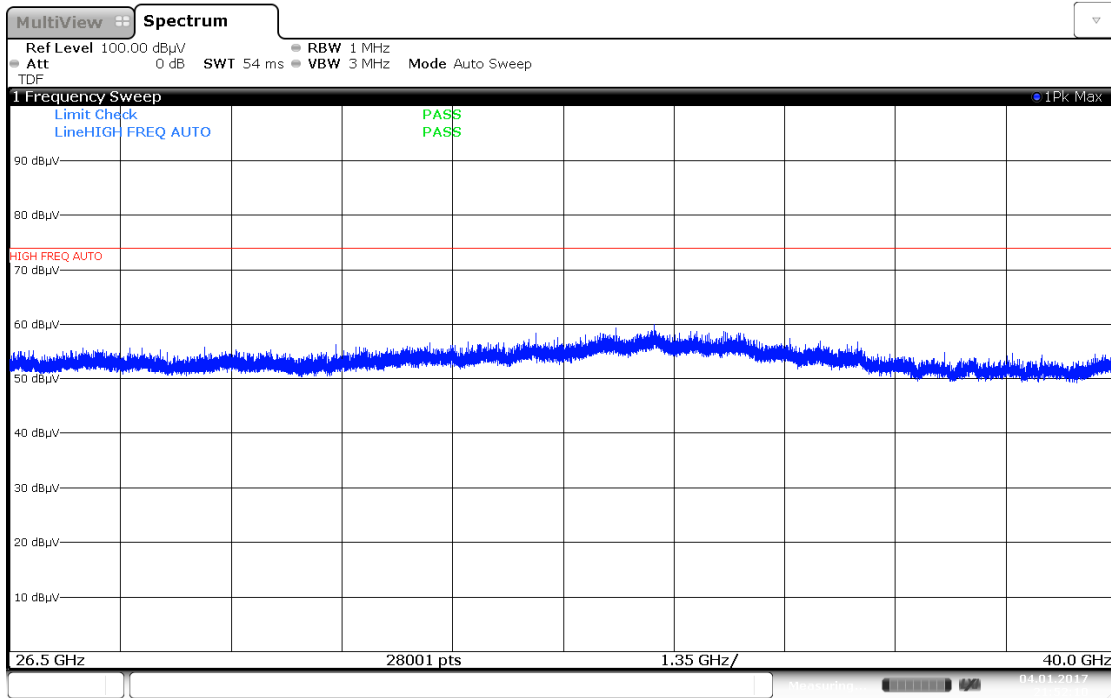
Plot 7-174. Radiated Spurious Plot above 18GHz - 26.5GHz (802.11a – Ant. Pol. V)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 133 of 251	



22:03:25 04.01.2017

Plot 7-175. Radiated Spurious Plot above 26.5GHz - 40GHz (802.11a – Ant. Pol. H)



21:52:10 04.01.2017

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

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset		Page 134 of 251

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	H	100	288	-55.42	9.88	-9.54	51.92	68.20	-16.28
* 15540.00	Average	H	-	-	-74.02	12.76	-9.54	36.19	53.98	-17.79
* 15540.00	Peak	H	-	-	-62.95	12.76	-9.54	47.26	73.98	-26.72
* 20720.00	Average	H	-	-	-73.54	8.13	-9.54	32.05	53.98	-21.93
* 20720.00	Peak	H	-	-	-62.87	8.13	-9.54	42.72	73.98	-31.26
25900.00	Peak	H	-	-	-59.43	8.50	-9.54	46.53	68.20	-21.67

Table 7-44. Radiated Measurements

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

Frequency [MHz]	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	H	100	289	-57.22	9.89	-9.54	50.13	68.20	-18.07
* 15600.00	Average	H	-	-	-75.30	13.12	-9.54	35.28	53.98	-18.70
* 15600.00	Peak	H	-	-	-63.95	13.12	-9.54	46.63	73.98	-27.35
* 20800.00	Average	H	-	-	-72.34	8.16	-9.54	33.27	53.98	-20.71
* 20800.00	Peak	H	-	-	-60.64	8.16	-9.54	44.97	73.98	-29.01
26000.00	Peak	H	-	-	-58.06	8.52	-9.54	47.92	68.20	-20.28

Table 7-45. Radiated Measurements

FCC ID: ZNFLS993			FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset		Page 135 of 251	

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	H	100	288	-56.37	10.24	-9.54	51.33	68.20	-16.87
* 15720.00	Average	H	-	-	-75.13	13.45	-9.54	35.78	53.98	-18.20
* 15720.00	Peak	H	-	-	-63.59	13.45	-9.54	47.32	73.98	-26.66
* 20960.00	Average	H	-	-	-72.33	8.12	-9.54	33.25	53.98	-20.73
* 20960.00	Peak	H	-	-	-61.44	8.12	-9.54	44.14	73.98	-29.84
26200.00	Peak	H	-	-	-58.43	8.62	-9.54	47.65	68.20	-20.55

Table 7-46. Radiated Measurements

Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps
 Distance of Measurements: 1 & 3 Meters
 Operating Frequency: 5180MHz
 Channel: 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	H	100	69	-63.32	9.89	-9.54	44.03	68.20	-24.17
* 15600.00	Average	H	-	-	-76.15	13.12	-9.54	34.43	53.98	-19.55
* 15600.00	Peak	H	-	-	-63.33	13.12	-9.54	47.25	73.98	-26.73
* 20800.00	Average	H	-	-	-72.19	8.16	-9.54	33.42	53.98	-20.56
* 20800.00	Peak	H	-	-	-59.64	8.16	-9.54	45.97	73.98	-28.01
26000.00	Peak	H	-	-	-57.65	8.52	-9.54	48.33	68.20	-19.87

Table 7-47. Radiated Measurements with WCP

FCC ID: ZNFLS993	 FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset		Page 136 of 251

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	H	100	293	-57.11	10.21	-9.54	50.56	68.20	-17.64
* 15780.00	Average	H	-	-	-75.02	13.34	-9.54	35.78	53.98	-18.19
* 15780.00	Peak	H	-	-	-63.30	13.34	-9.54	47.50	73.98	-26.47
* 21040.00	Average	H	-	-	-72.14	8.10	-9.54	33.42	53.98	-20.56
* 21040.00	Peak	H	-	-	-60.14	8.10	-9.54	45.42	73.98	-28.56
26300.00	Peak	H	-	-	-55.87	8.76	-9.54	50.35	68.20	-17.85

Table 7-48. Radiated Measurements

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

Frequency [MHz]	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	H	100	288	-56.15	9.92	-9.54	51.23	68.20	-16.97
* 15840.00	Average	H	-	-	-75.02	12.96	-9.54	35.40	53.98	-18.58
* 15840.00	Peak	H	-	-	-62.73	12.96	-9.54	47.69	73.98	-26.29
* 21120.00	Average	H	-	-	-72.13	8.09	-9.54	33.41	53.98	-20.57
* 21120.00	Peak	H	-	-	-59.64	8.09	-9.54	45.90	73.98	-28.08
26400.00	Peak	H	-	-	-55.75	8.99	-9.54	50.70	68.20	-17.50

Table 7-49. Radiated Measurements

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 137 of 251	

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	H	100	288	-59.99	9.65	-9.54	47.12	53.98	-6.86
* 10640.00	Peak	H	100	288	-56.53	9.65	-9.54	50.58	73.98	-23.40
* 15960.00	Average	H	-	-	-74.74	12.55	-9.54	35.27	53.98	-18.71
* 15960.00	Peak	H	-	-	-61.99	12.55	-9.54	48.02	73.98	-25.96
* 21280.00	Average	H	-	-	-71.31	8.07	-9.54	34.22	53.98	-19.76
* 21280.00	Peak	H	-	-	-58.53	8.07	-9.54	47.00	73.98	-26.98
26600.00	Peak	H	-	-	-46.39	-8.30	-9.54	42.77	68.20	-25.43

Table 7-50. Radiated Measurements

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [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	H	100	289	-62.55	9.92	-9.54	44.83	68.20	-23.37
* 15840.00	Average	H	-	-	-75.06	12.96	-9.54	35.36	53.98	-18.62
* 15840.00	Peak	H	-	-	-63.45	12.96	-9.54	46.97	73.98	-27.01
* 21120.00	Average	H	-	-	-71.81	8.09	-9.54	33.73	53.98	-20.25
* 21120.00	Peak	H	-	-	-59.72	8.09	-9.54	45.82	73.98	-28.16
26400.00	Peak	H	-	-	-57.15	8.99	-9.54	49.30	68.20	-18.90

Table 7-51. Radiated Measurements with WCP

FCC ID: ZNFLS993			FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset		Page 138 of 251	

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]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 11000.00	Average	H	100	114	-59.97	9.94	-9.54	47.43	53.98	-6.55
* 11000.00	Peak	H	100	114	-55.81	9.94	-9.54	51.59	73.98	-22.39
16500.00	Peak	H	-	-	-61.51	12.86	-9.54	48.81	68.20	-19.39
22000.00	Peak	H	-	-	-59.04	8.35	-9.54	46.76	68.20	-21.44
27500.00	Peak	H	-	-	-45.16	-8.93	-9.54	43.37	68.20	-24.83

Table 7-52. Radiated Measurements

Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps
 Distance of Measurements: 1 & 3 Meters
 Operating Frequency: 5580MHz
 Channel: 116

Frequency [MHz]	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	H	100	114	-59.18	10.09	-9.54	48.37	53.98	-5.61
* 11160.00	Peak	H	100	114	-54.22	10.09	-9.54	53.33	73.98	-20.65
16740.00	Peak	H	-	-	-61.86	16.33	-9.54	51.92	68.20	-16.28
* 22320.00	Average	H	-	-	-71.42	8.20	-9.54	34.24	53.98	-19.74
* 22320.00	Peak	H	-	-	-58.49	8.20	-9.54	47.17	73.98	-26.81
27900.00	Peak	H	-	-	-45.29	-9.24	-9.54	42.93	68.20	-25.27

Table 7-53. Radiated Measurements

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 139 of 251	

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	H	100	107	-58.01	10.88	-9.54	50.33	53.98	-3.65
* 11400.00	Peak	H	100	107	-52.27	10.88	-9.54	56.07	73.98	-17.91
17100.00	Peak	H	-	-	-61.32	16.69	-9.54	52.82	68.20	-15.38
* 22800.00	Average	H	-	-	-71.61	8.29	-9.54	34.13	53.98	-19.85
* 22800.00	Peak	H	-	-	-60.08	8.29	-9.54	45.66	73.98	-28.32
28500.00	Peak	H	-	-	-45.45	-9.03	-9.54	42.98	68.20	-25.22



Table 7-54. Radiated Measurements

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

Frequency [MHz]	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	H	100	354	-70.59	10.09	-9.54	36.96	53.98	-17.02
* 11160.00	Peak	H	100	354	-63.24	10.09	-9.54	44.31	73.98	-29.67
16740.00	Peak	H	-	-	-62.20	16.33	-9.54	51.58	68.20	-16.62
* 22320.00	Average	H	-	-	-71.10	8.20	-9.54	34.56	53.98	-19.42
* 22320.00	Peak	H	-	-	-58.34	8.20	-9.54	47.32	73.98	-26.66
27900.00	Peak	H	-	-	-45.31	-9.24	-9.54	42.91	68.20	-25.29

Table 7-55. Radiated Measurements with WCP

Worst Case Mode: 802.11a

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 140 of 251	

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	H	100	105	-58.75	11.06	-9.54	49.77	53.98	-4.21
* 11490.00	Peak	H	100	105	-52.10	11.06	-9.54	56.42	73.98	-17.56
17235.00	Peak	H	-	-	-61.97	17.22	-9.54	52.71	68.20	-15.49
* 22980.00	Average	H	-	-	-72.24	8.19	-9.54	33.41	53.98	-20.57
* 22980.00	Peak	H	-	-	-60.90	8.19	-9.54	44.75	73.98	-29.23
28725.00	Peak	H	-	-	-45.60	-9.45	-9.54	42.41	68.20	-25.79

Table 7-56. Radiated Measurements

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

Frequency [MHz]	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	H	100	156	-59.61	10.88	-9.54	48.73	53.98	-5.25
* 11570.00	Peak	H	100	156	-56.43	10.88	-9.54	51.91	73.98	-22.07
17355.00	Peak	H	-	-	-62.14	16.71	-9.54	52.03	68.20	-16.17
23140.00	Peak	H	-	-	-58.97	8.47	-9.54	46.95	68.20	-21.25
28925.00	Peak	H	-	-	-44.60	-9.71	-9.54	43.15	68.20	-25.05

Table 7-57. Radiated Measurements

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 141 of 251	

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	H	100	160	-59.68	10.92	-9.54	48.70	53.98	-5.28
* 11650.00	Peak	H	100	160	-55.17	10.92	-9.54	53.21	73.98	-20.77
17475.00	Peak	H	-	-	-60.50	15.81	-9.54	52.77	68.20	-15.43
23300.00	Peak	H	-	-	-60.26	8.60	-9.54	45.80	68.20	-22.40
29125.00	Peak	H	-	-	-43.97	-9.93	-9.54	43.56	68.20	-24.64

Table 7-58. Radiated Measurements

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

Frequency [MHz]	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	H	100	237	-62.22	11.06	-9.54	46.30	53.98	-7.68
* 11490.00	Peak	H	100	237	-55.14	11.06	-9.54	53.38	73.98	-20.60
17235.00	Peak	H	-	-	-61.77	17.22	-9.54	52.91	68.20	-15.29
* 22980.00	Average	H	-	-	-72.54	8.19	-9.54	33.11	53.98	-20.87
* 22980.00	Peak	H	-	-	-61.34	8.19	-9.54	44.31	73.98	-29.67
28725.00	Peak	H	-	-	-45.56	-9.45	-9.54	42.45	68.20	-25.75

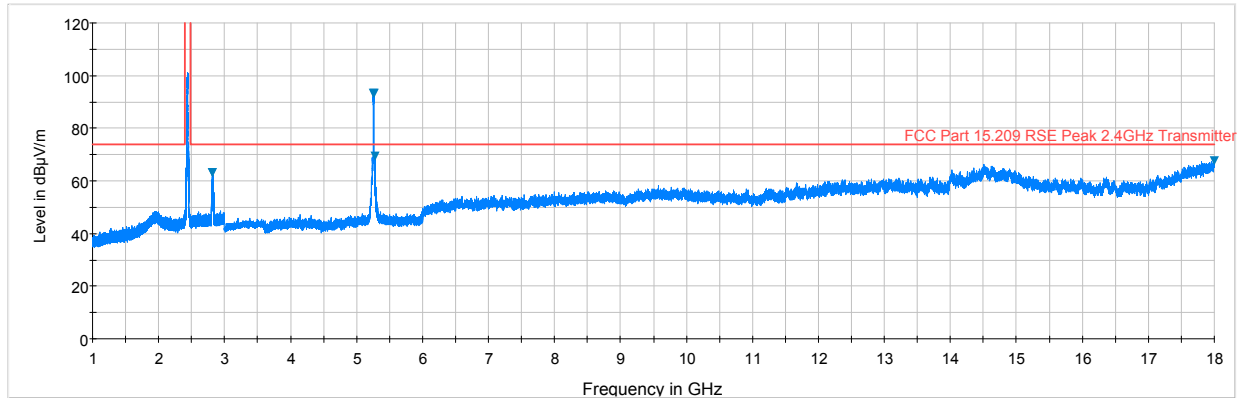
Table 7-59. Radiated Measurements with WCP

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 142 of 251	

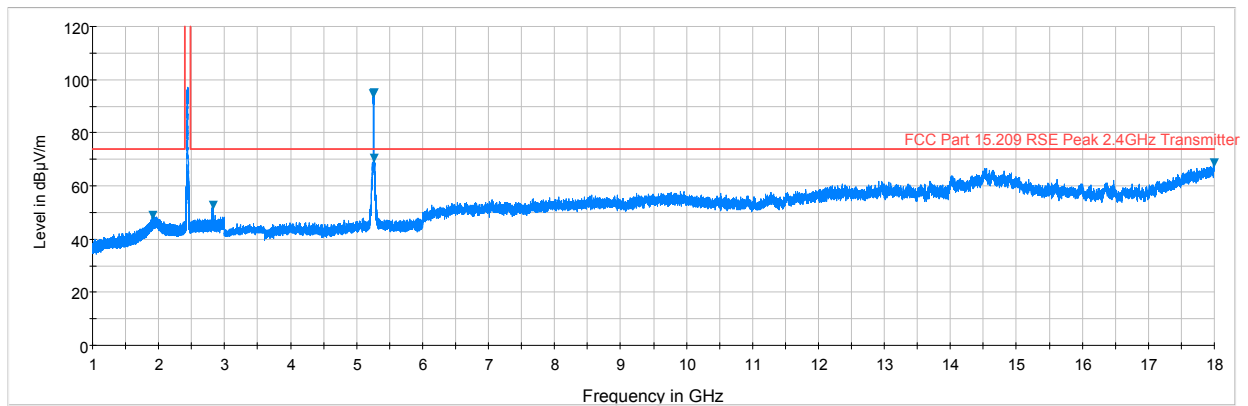
7.7.3 Simultaneous Tx Radiated Spurious Emissions Measurements §15.247(d) §15.205 & §15.209

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)

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 143 of 251	

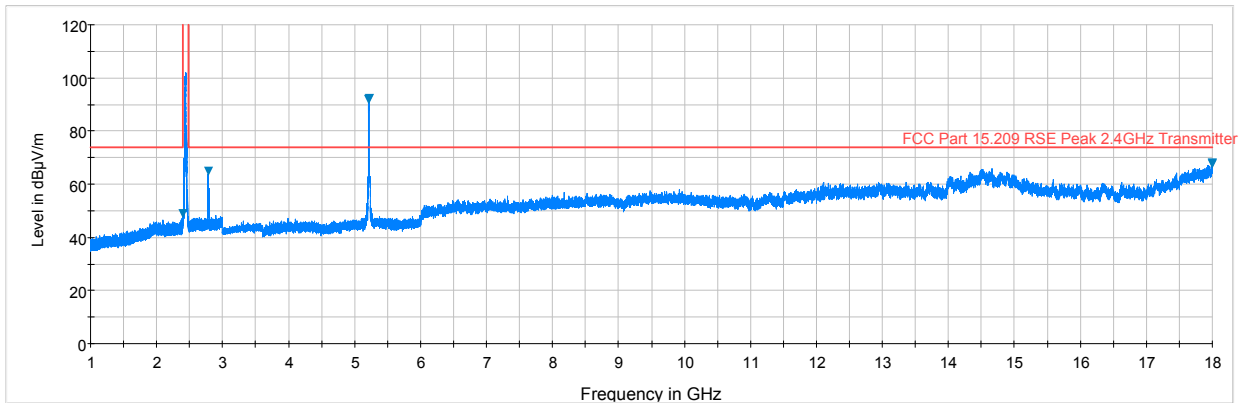
	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	3677.00	Average	H	-	-	-71.94	-1.81	33.25	53.98	-20.73
*	3677.00	Peak	H	-	-	-58.49	-1.81	46.70	73.98	-27.28
	6736.00	Peak	H	-	-	-60.22	10.20	56.98	68.20	-11.22
	8559.00	Peak	H	-	-	-59.87	12.49	59.62	68.20	-8.58
	9795.00	Peak	H	-	-	-59.17	12.01	59.84	68.20	-8.36
*	11618.00	Average	H	-	-	-72.13	14.27	49.14	53.98	-4.84
*	11618.00	Peak	H	-	-	-59.63	14.27	61.64	73.98	-12.34
	14667.00	Peak	H	-	-	-64.95	22.54	64.59	68.20	-3.61
*	17736.00	Average	H	-	-	-79.60	23.39	50.79	53.98	-3.19
*	17736.00	Peak	H	-	-	-59.69	23.39	70.70	73.98	-3.28

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

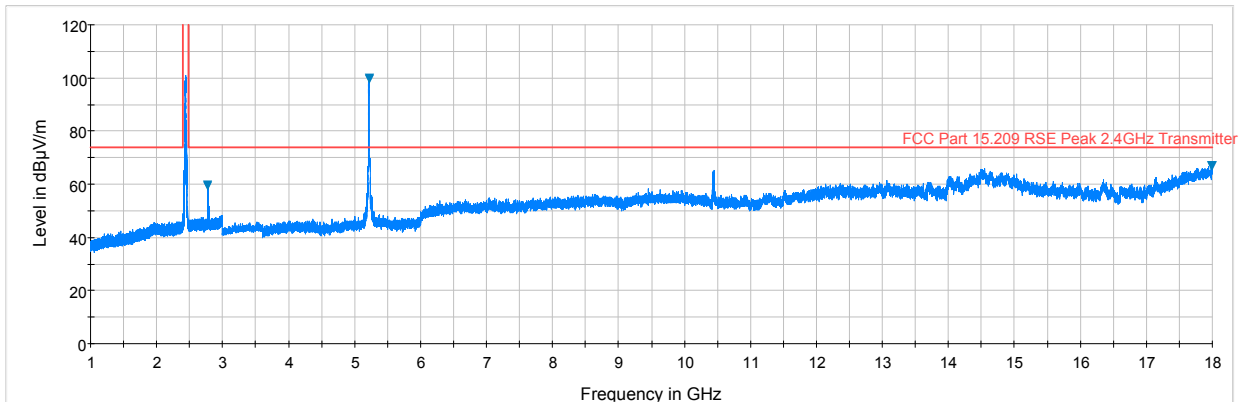
FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset			Page 144 of 251

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 7-179. Radiated Spurious Plot above 1GHz (5GHz – 2.4 GHz, Ant. Pol. H)





Plot 7-180. Radiated Spurious Plot above 1GHz (5GHz – 2.4 GHz, Ant. Pol. V)

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 145 of 251	

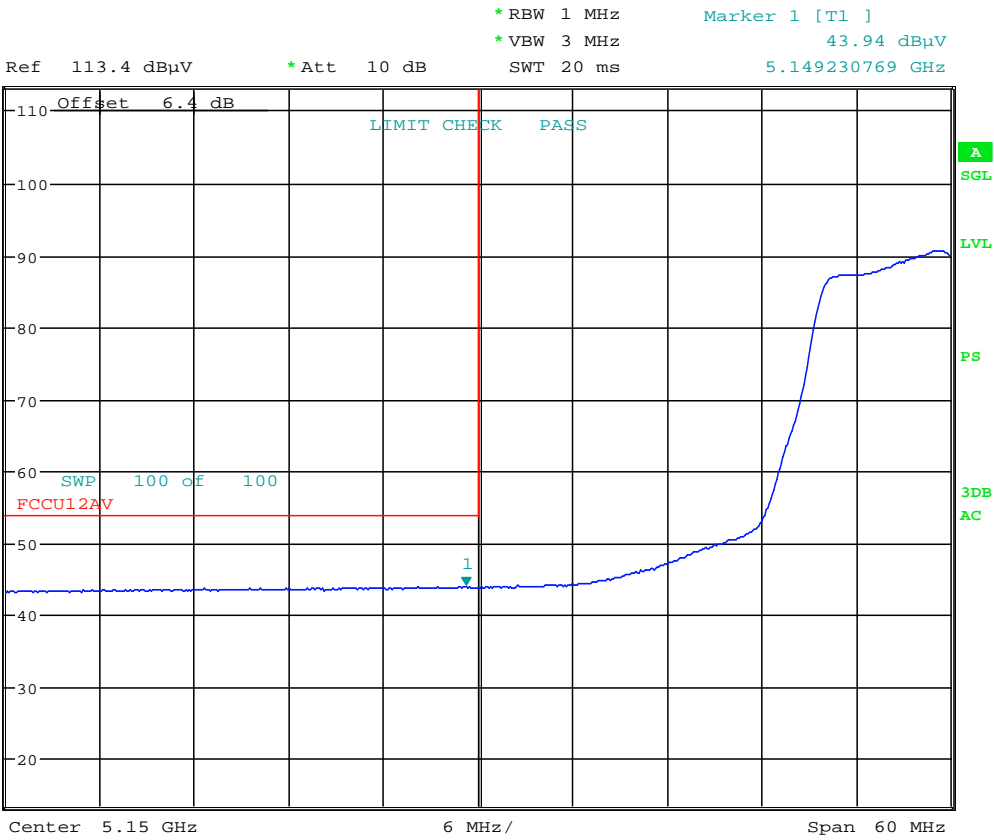
	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	3677.00	Average	H	-	-	-71.97	-1.81	33.22	53.98	-20.76
*	3677.00	Peak	H	-	-	-57.43	-1.81	47.76	73.98	-26.22
	6736.00	Peak	H	-	-	-60.19	10.20	57.01	68.20	-11.19
	8559.00	Peak	H	-	-	-59.70	12.49	59.79	68.20	-8.41
	9795.00	Peak	H	-	-	-58.98	12.01	60.03	68.20	-8.17
*	11618.00	Average	H	-	-	-72.51	14.27	48.76	53.98	-5.22
*	11618.00	Peak	H	-	-	-58.31	14.27	62.96	73.98	-11.02
	14667.00	Peak	H	-	-	-64.77	22.54	64.77	68.20	-3.43
*	17736.00	Average	H	-	-	-79.60	23.39	50.79	53.98	-3.19
*	17736.00	Peak	H	-	-	-59.57	23.39	70.82	73.98	-3.16

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

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset			Page 146 of 251

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

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

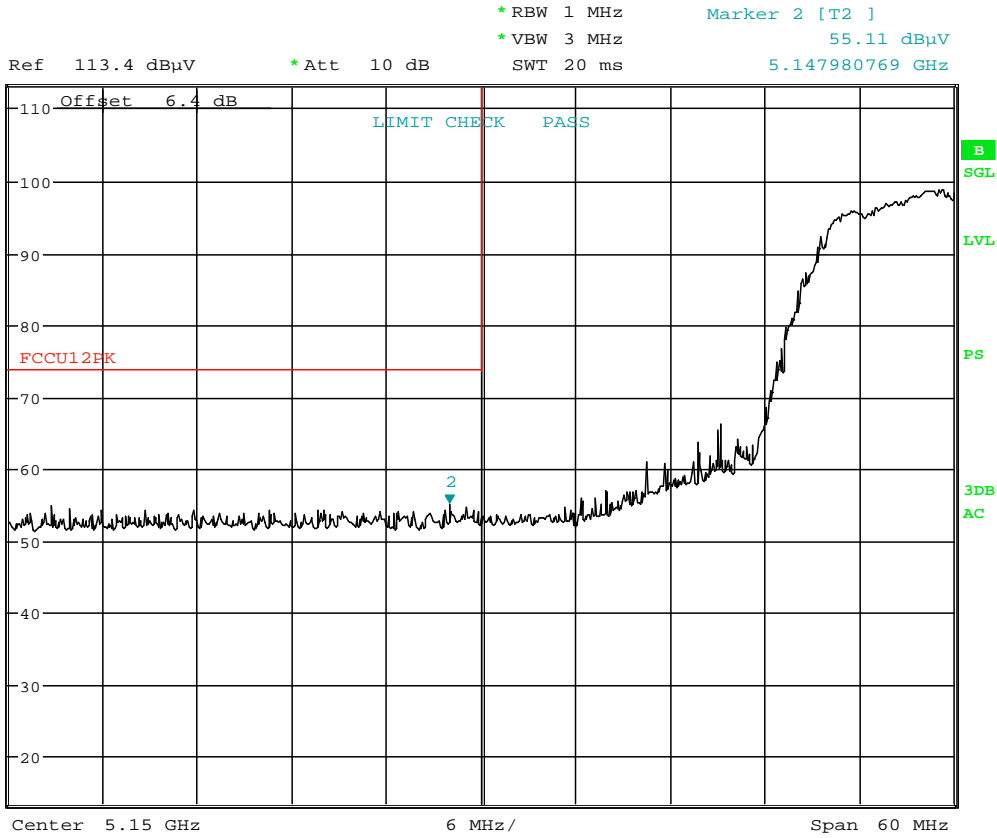


Date: 22.JAN.2017 22:13:32

Plot 7-181. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 147 of 251	

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



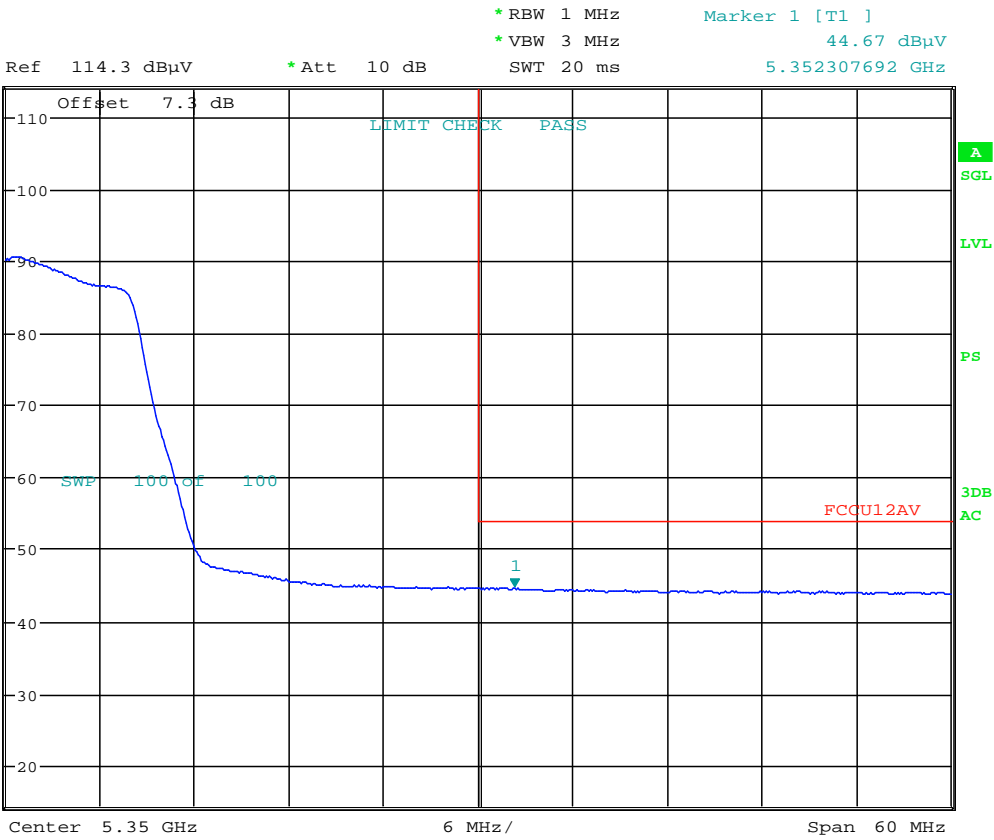
Date: 22.JAN.2017 22:13:20

Plot 7-182. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 148 of 251	

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

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

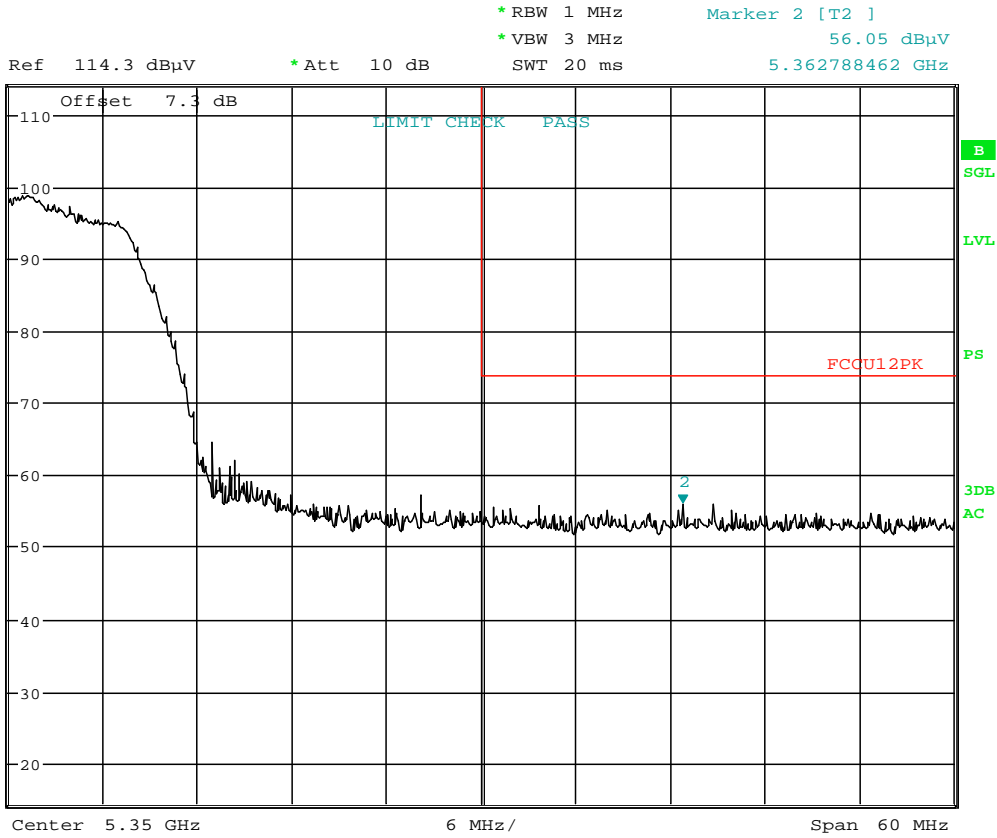


Date: 22.JAN.2017 22:22:31

Plot 7-183. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 149 of 251	

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



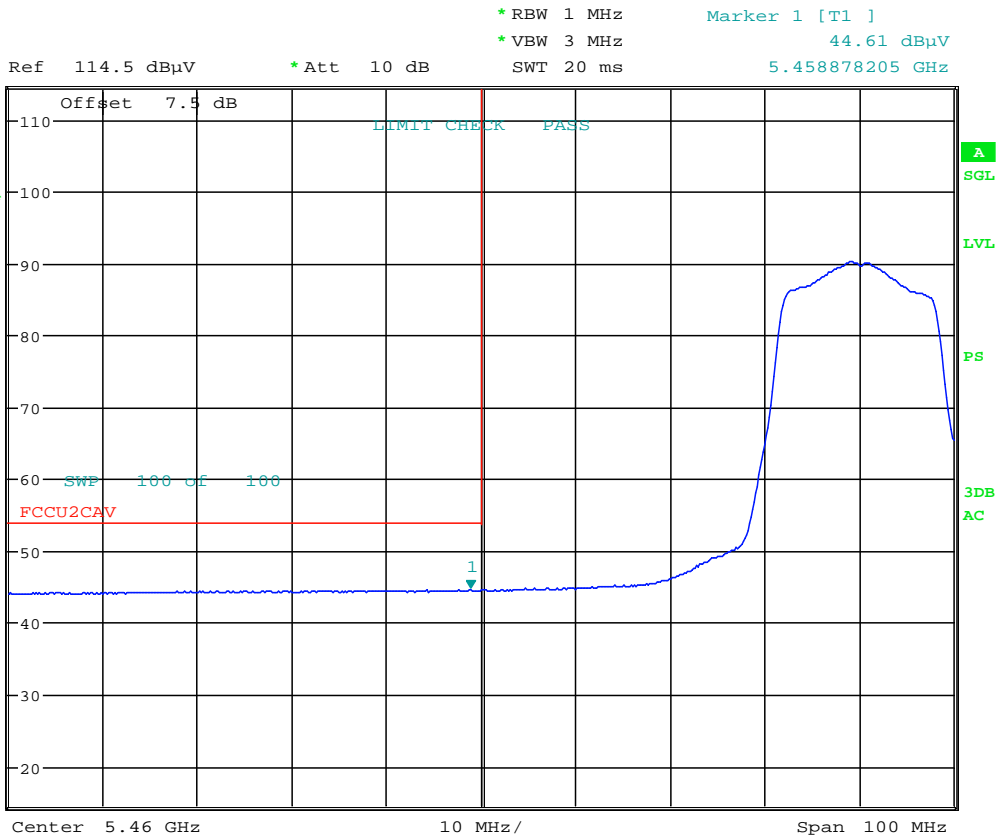
Date: 22.JAN.2017 22:22:46

Plot 7-184. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 150 of 251	

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

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

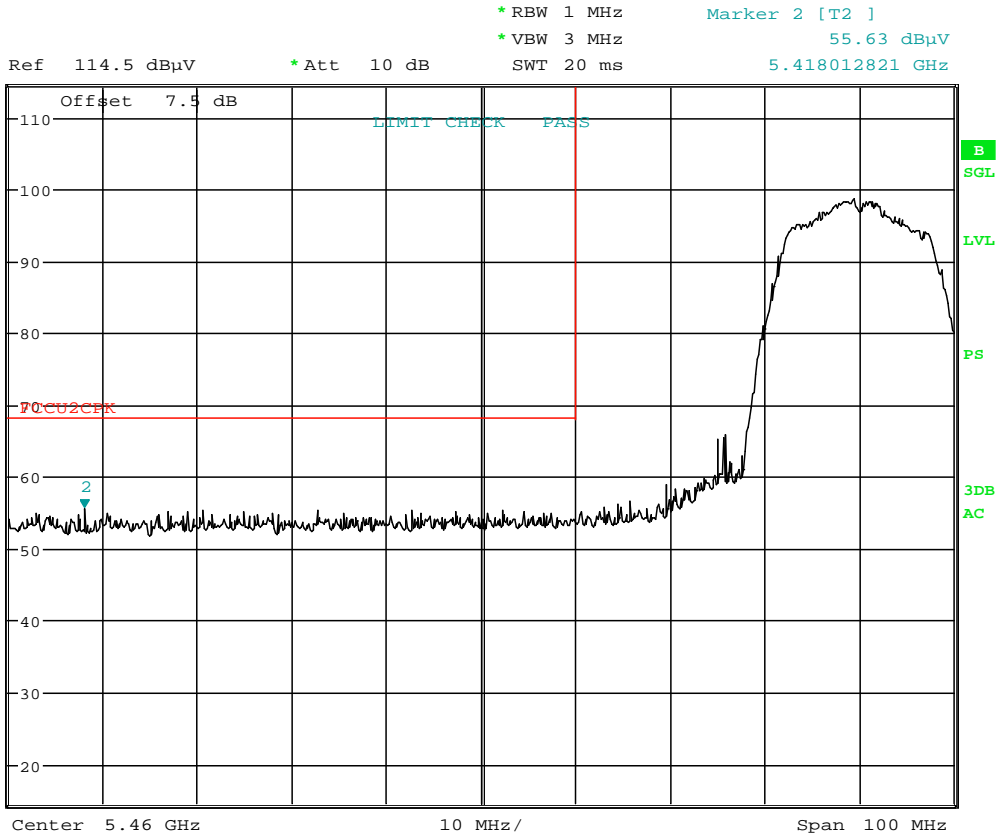


Date: 22.JAN.2017 22:31:38

Plot 7-185. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 151 of 251	

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



Date: 22.JAN.2017 22:31:50

Plot 7-186. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

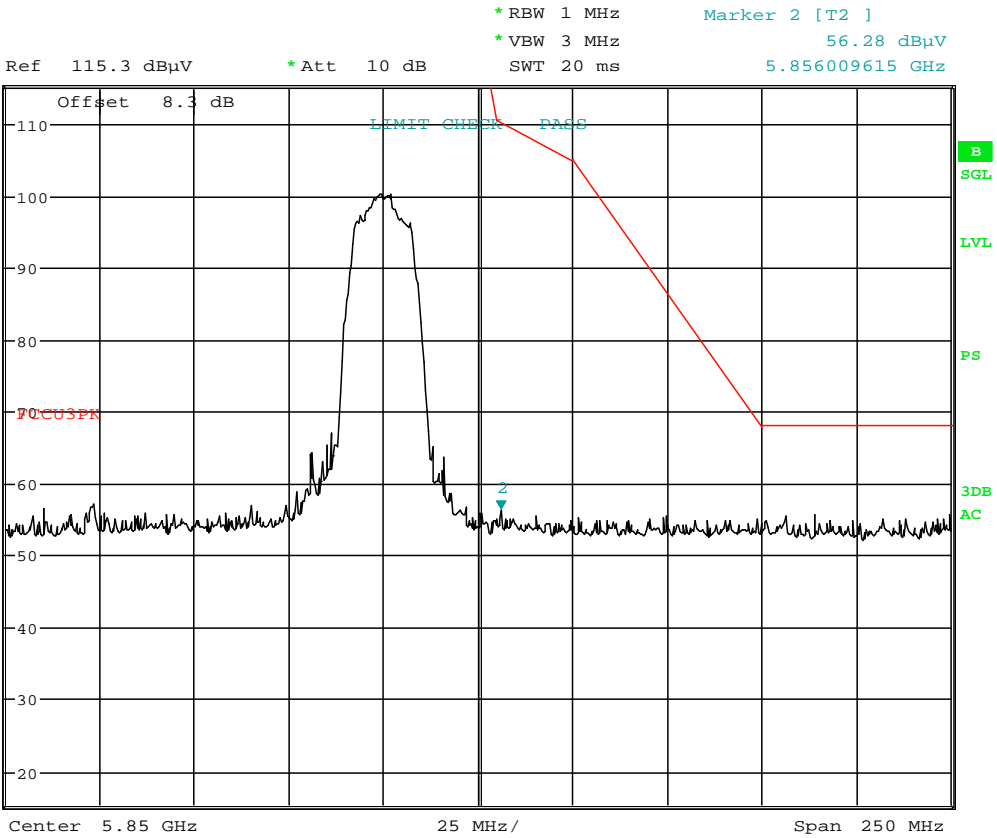
FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 152 of 251	

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V 6.2
01/09/2016

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

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



Date: 22.JAN.2017 22:47:16

Plot 7-187. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 153 of 251	

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

§15.407(b.1)(b.2) §15.205 §15.209

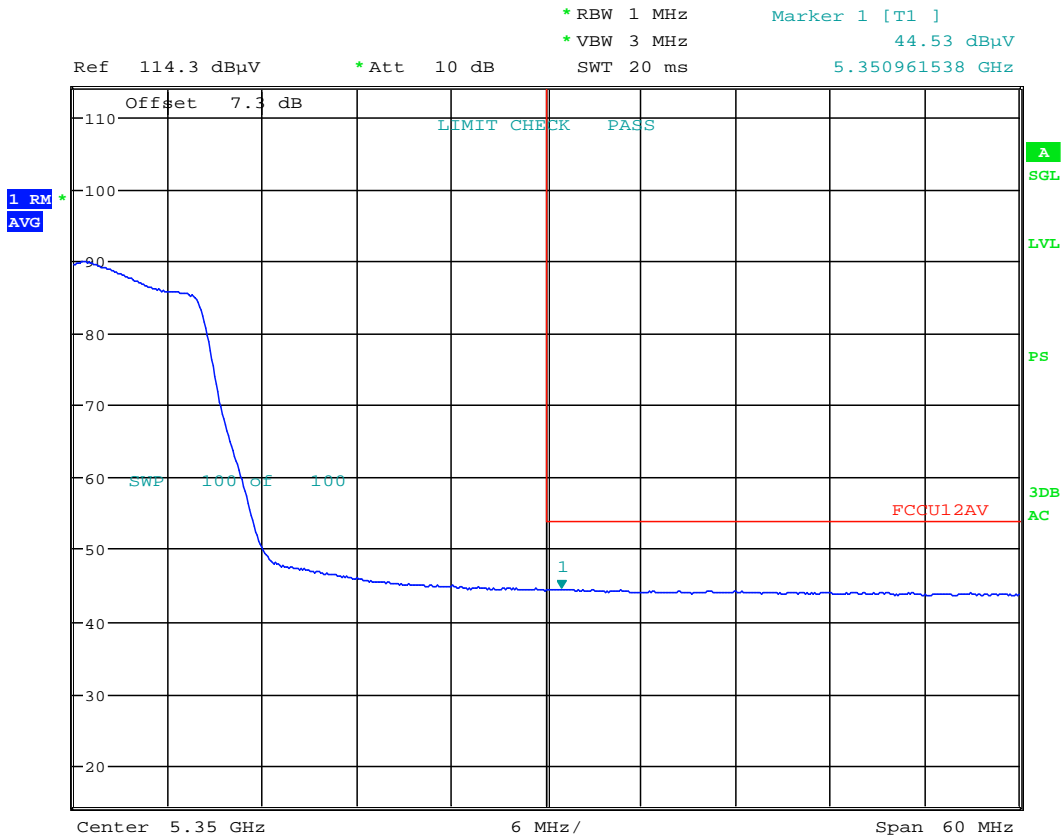
Worst Case Mode: 802.11a

Worst Case Transfer Rate: 6 Mbps

Distance of Measurements: 3 Meters

Operating Frequency: 5320MHz

Channel: 64

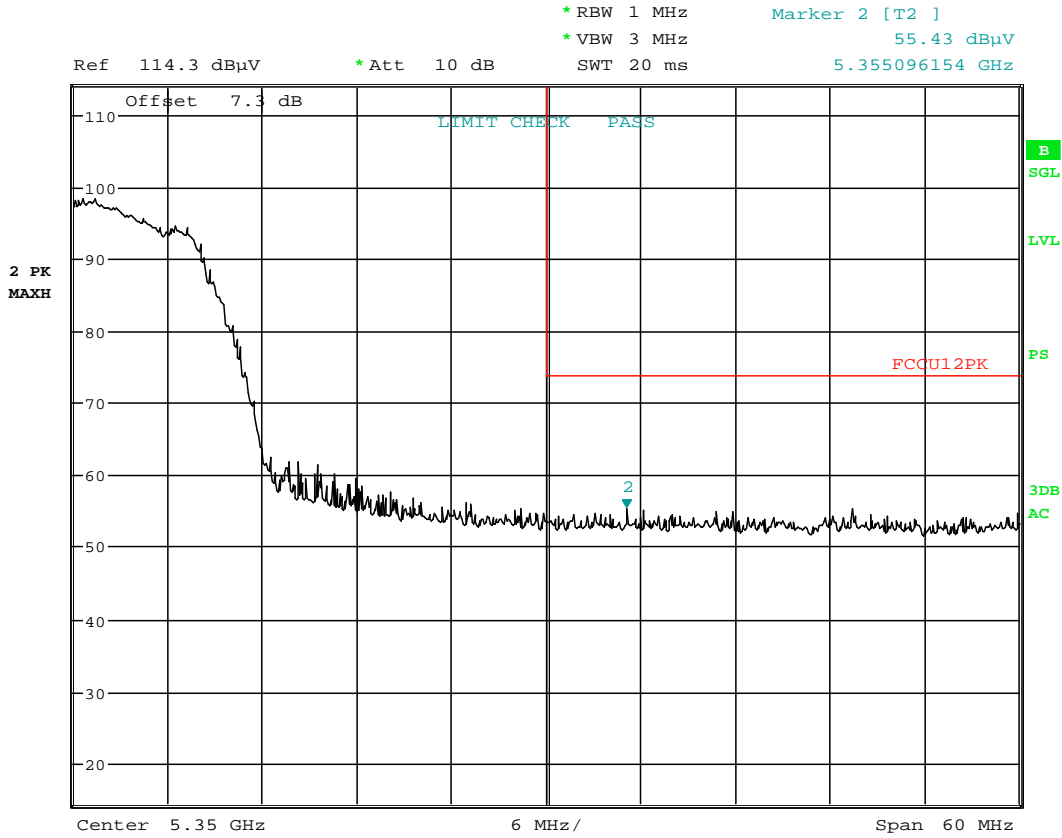


Date: 1.FEB.2017 11:12:49

Plot 7-188. Radiated Restricted Band Edge Plot with WCP

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 154 of 251	

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



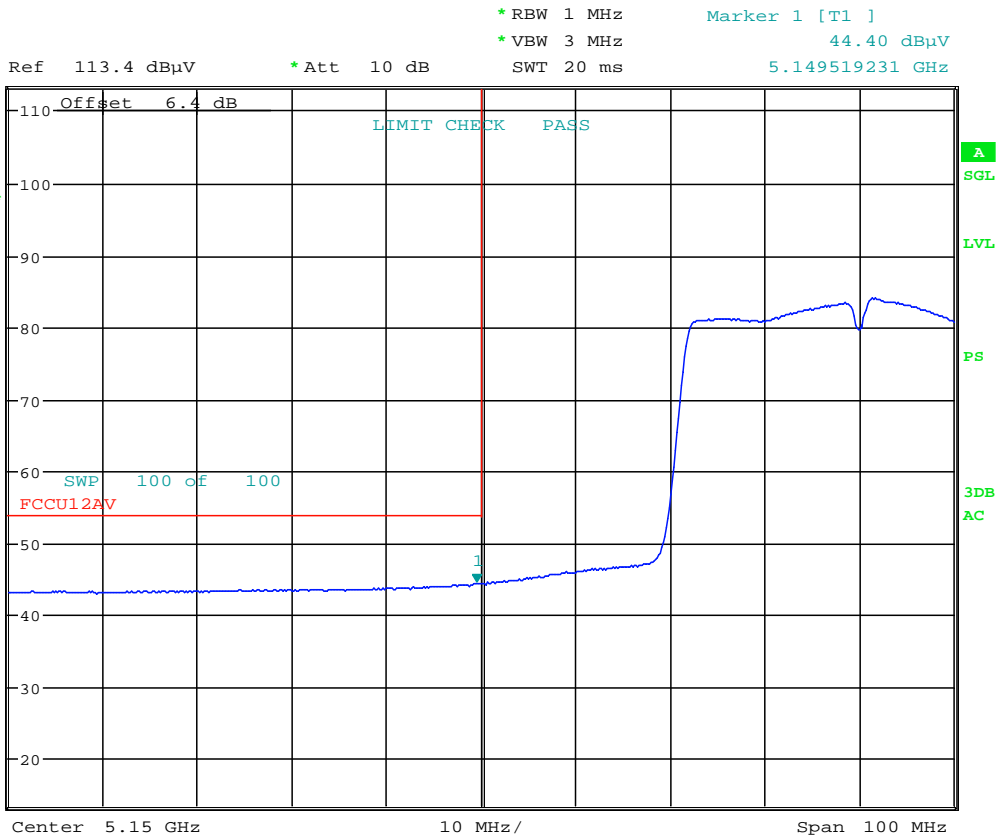
Date: 1.FEB.2017 11:12:59

Plot 7-189. Radiated Restricted Band Edge Plot with WCP

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 155 of 251	

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

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

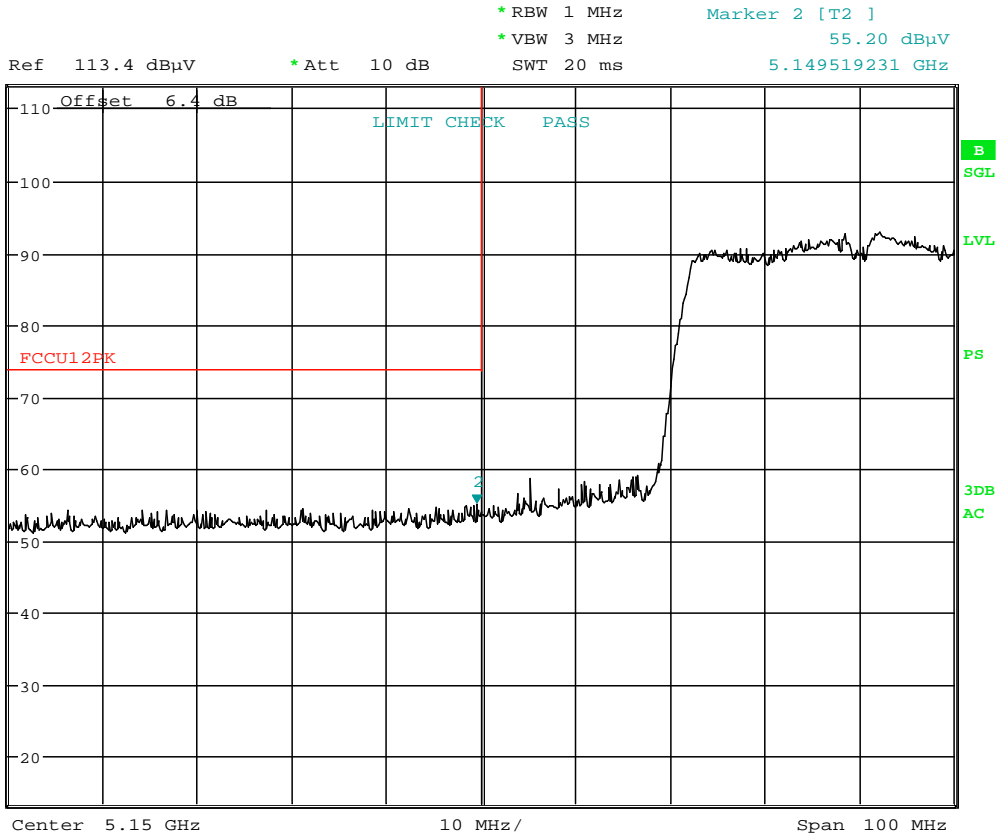


Date: 22.JAN.2017 22:16:24

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

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	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 (40MHz BW) §15.407(b.1)(b.2) §15.205 §15.209



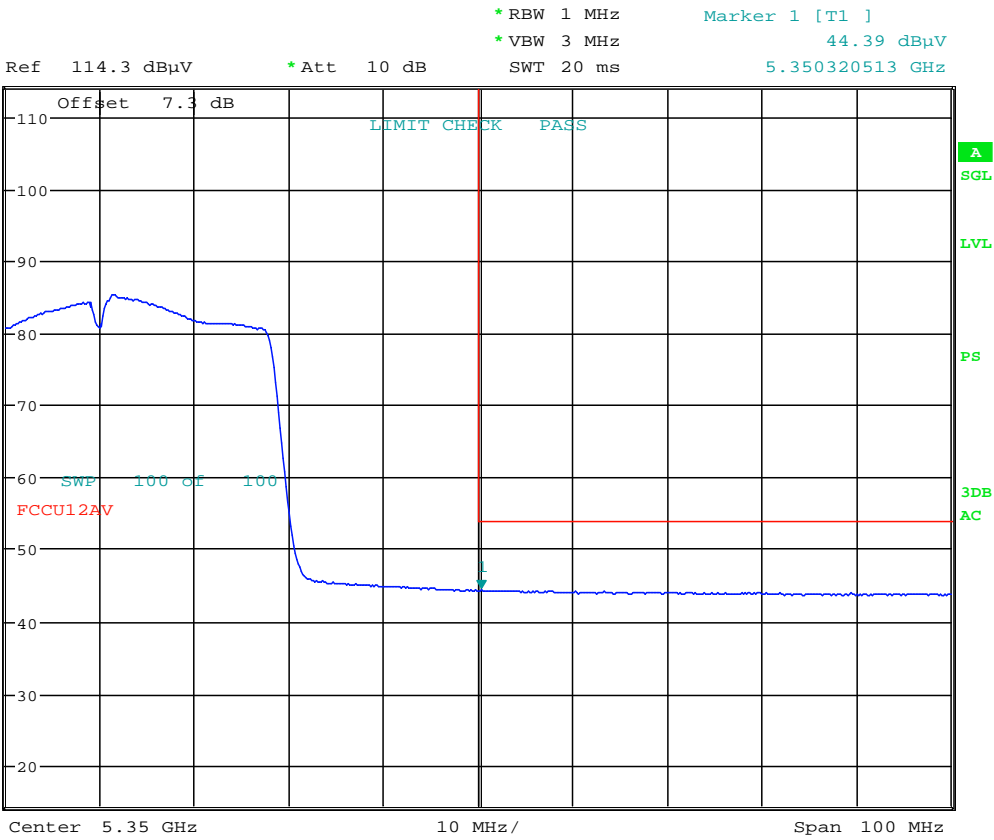
Date: 22.JAN.2017 22:16:36

Plot 7-191. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 157 of 251	

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

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

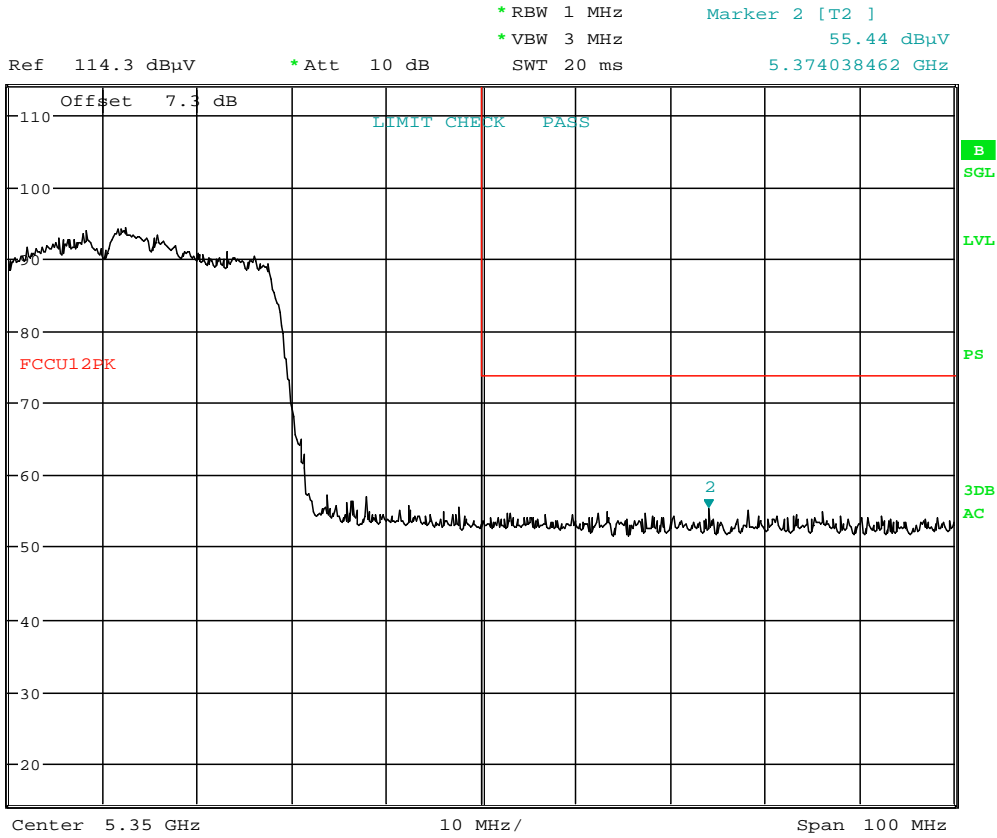


Date: 22.JAN.2017 22:24:19

Plot 7-192. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 158 of 251	

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



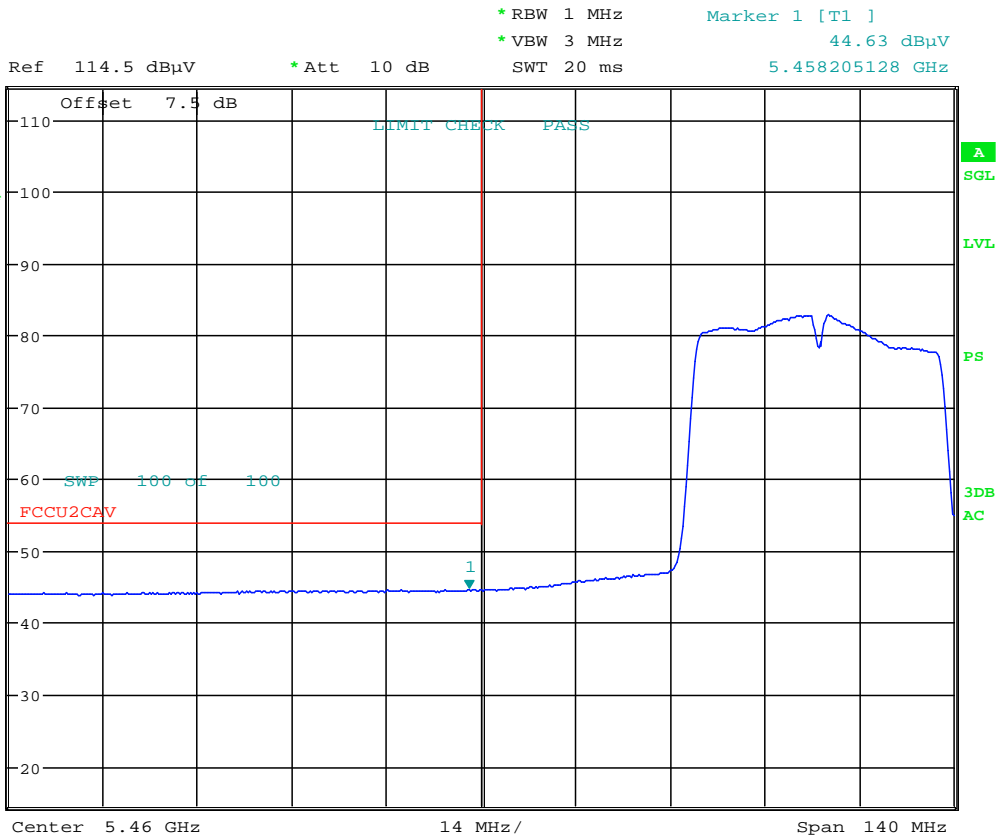
Date: 22.JAN.2017 22:24:31

Plot 7-193. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 159 of 251	

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

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

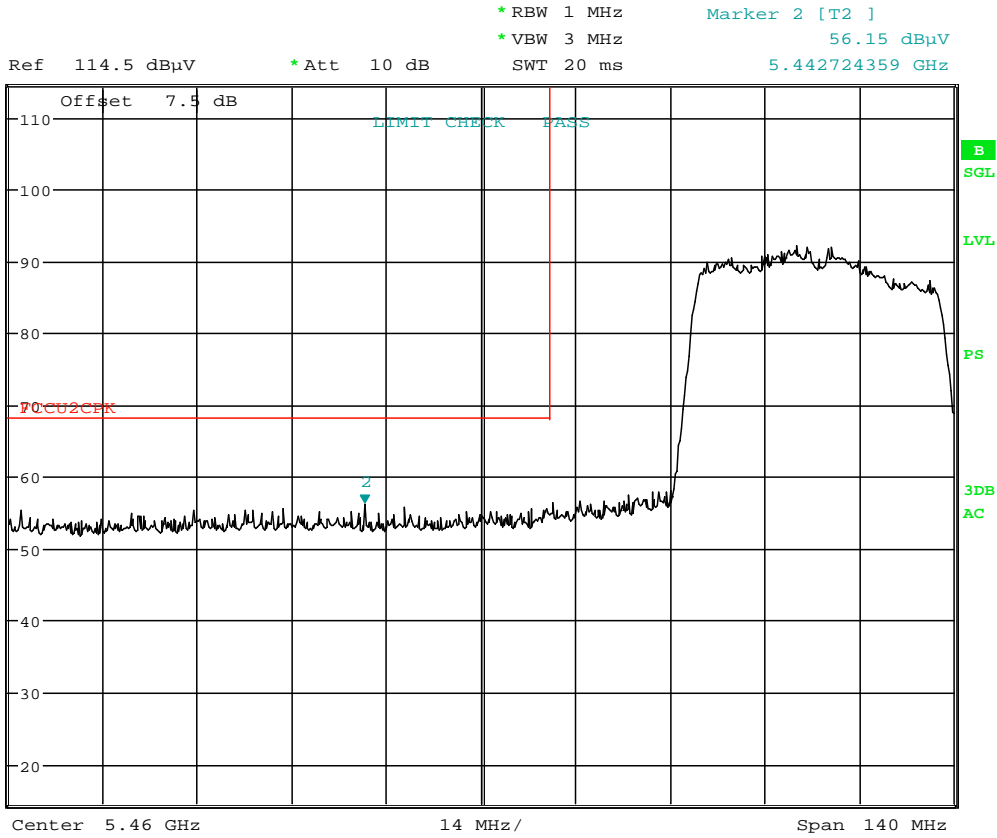


Date: 22.JAN.2017 22:33:29

Plot 7-194. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 160 of 251	

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



Date: 22.JAN.2017 22:33:47

Plot 7-195. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 161 of 251	

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

§15.407(b.1)(b.2) §15.205 §15.209

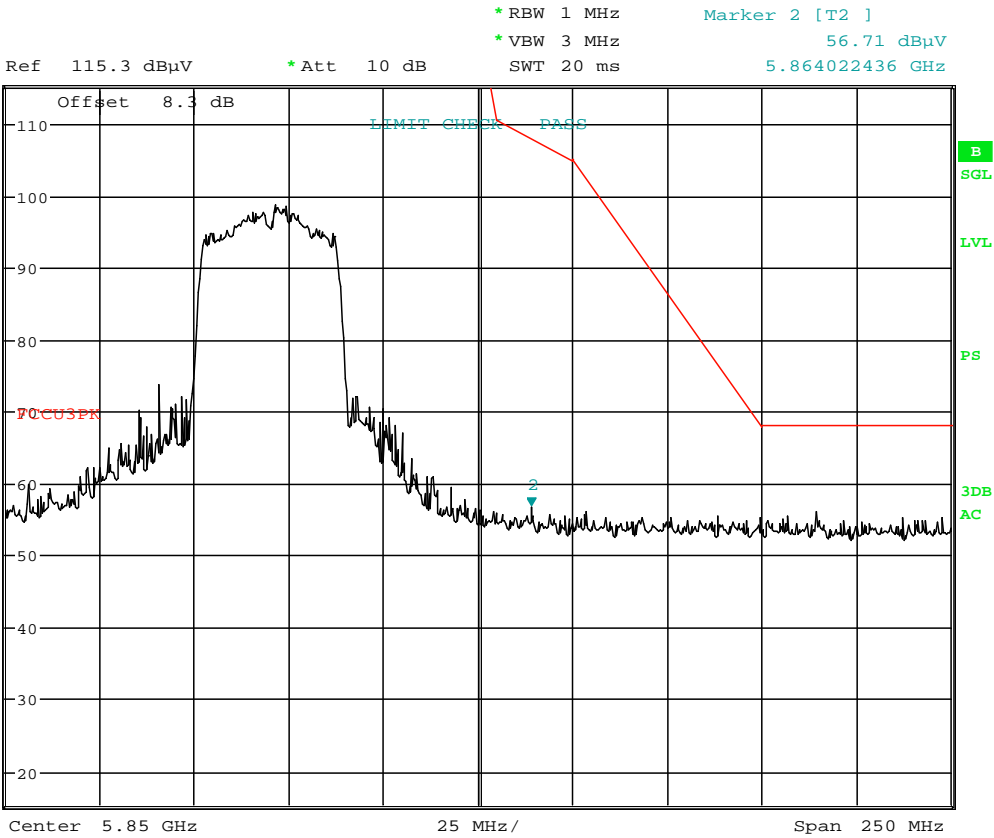
Worst Case Mode: 802.11n (40MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5795MHz

Channel: 159



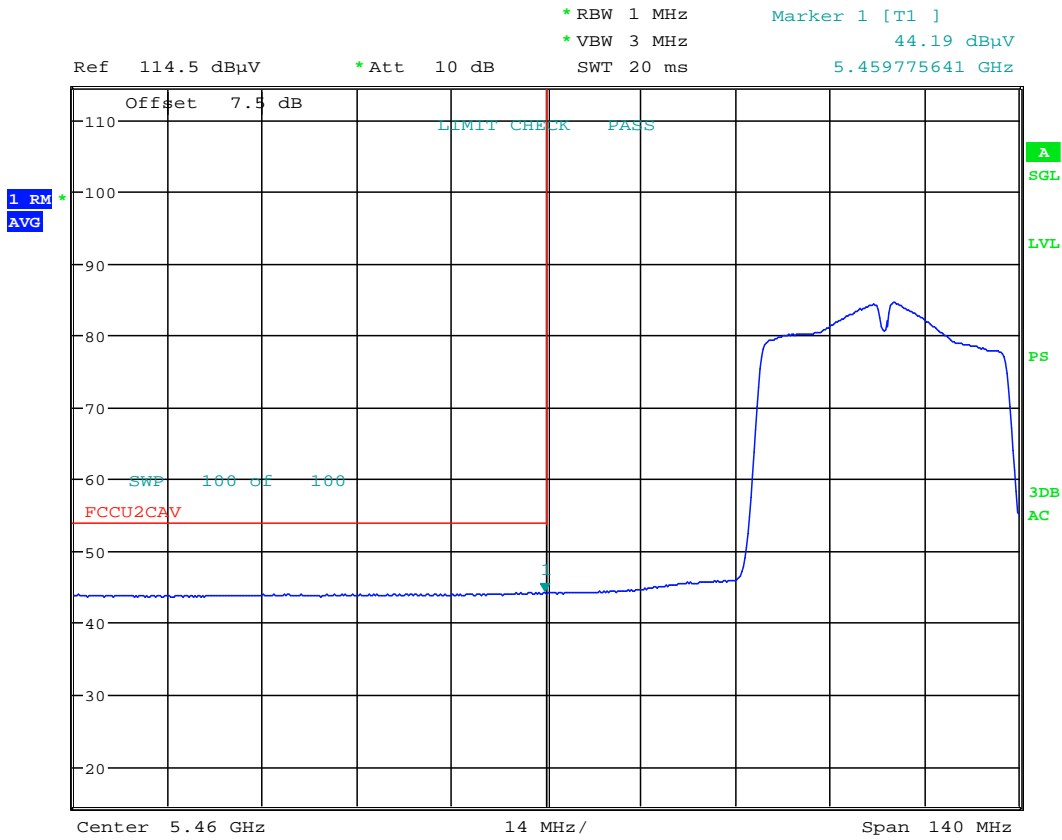
Date: 22.JAN.2017 22:48:40

Plot 7-196. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset		Page 162 of 251

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

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

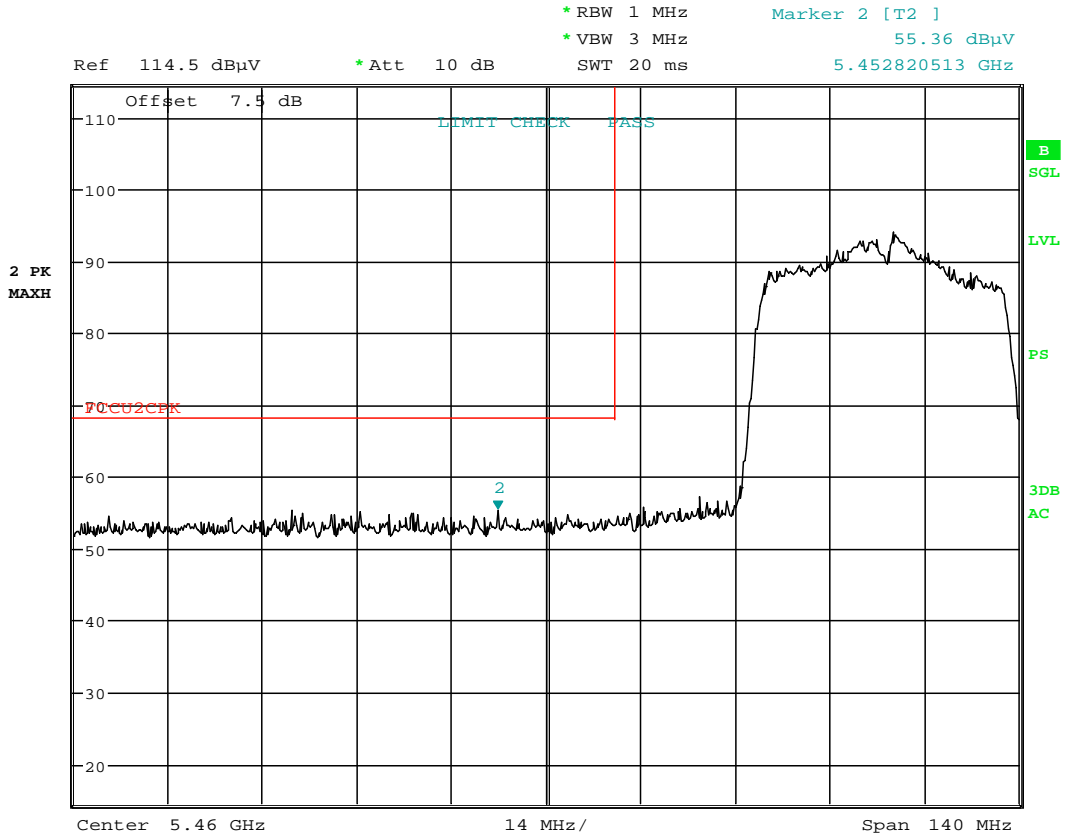


Date: 1.FEB.2017 11:03:32

Plot 7-197. Radiated Restricted Band Edge Plot with WCP

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset		Page 163 of 251

Antenna-1 WCP Radiated Band Edge Measurements (40MHz BW)
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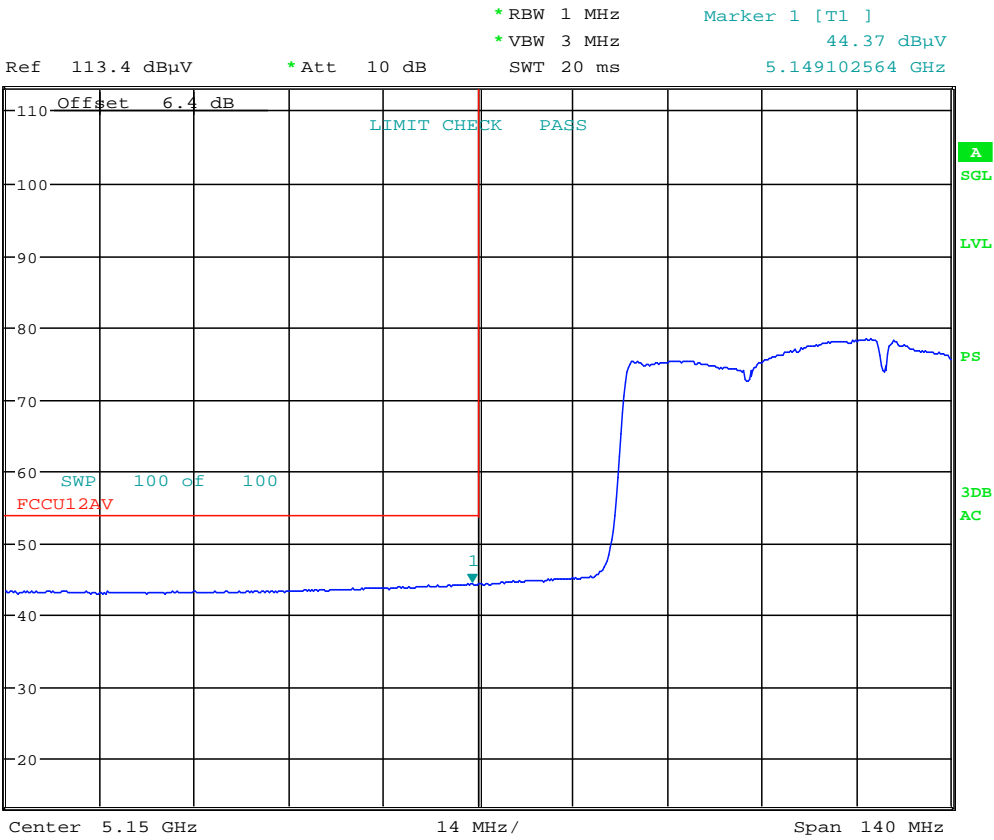
Date: 1.FEB.2017 11:03:46

Plot 7-198. Radiated Restricted Band Edge Plot with WCP

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 164 of 251	

7.7.6 Antenna-1 Radiated Band Edge Measurements (80MHz BW)
§15.407(b.1)(b.2) §15.205 §15.209

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

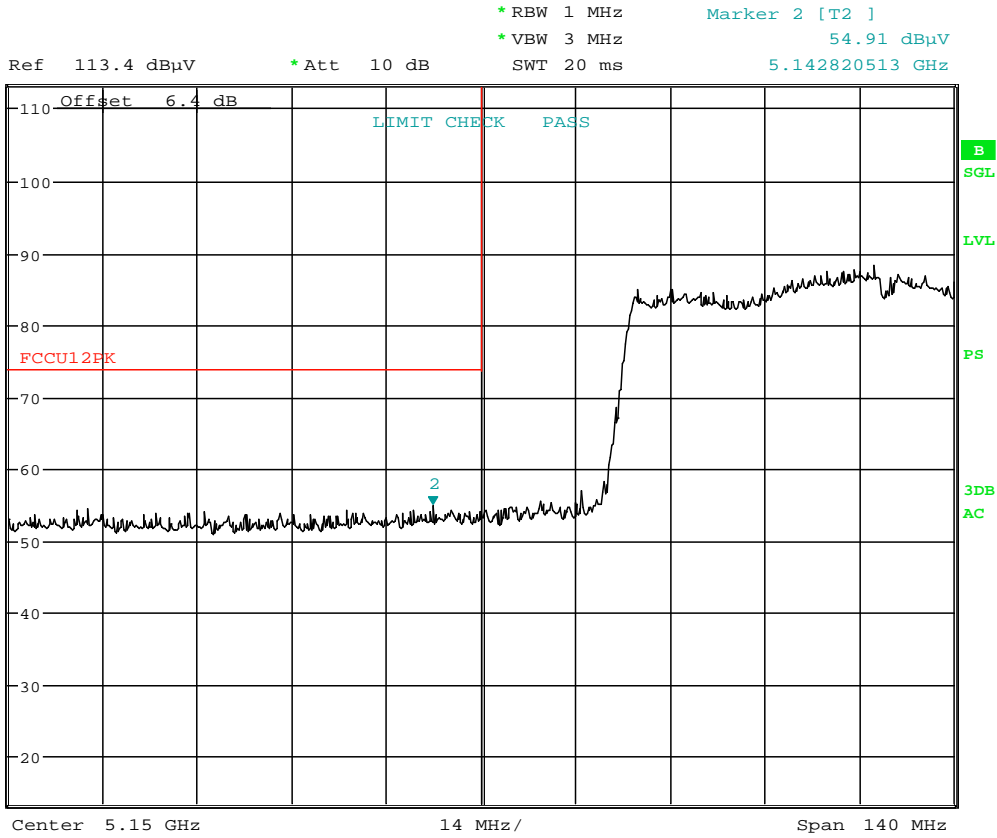


Date: 22.JAN.2017 22:18:28

Plot 7-199. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 165 of 251	

Antenna-1 Radiated Band Edge Measurements (80MHz BW)
§15.407(b.1)(b.2) §15.205 §15.209



Date: 22.JAN.2017 22:18:44

Plot 7-200. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)

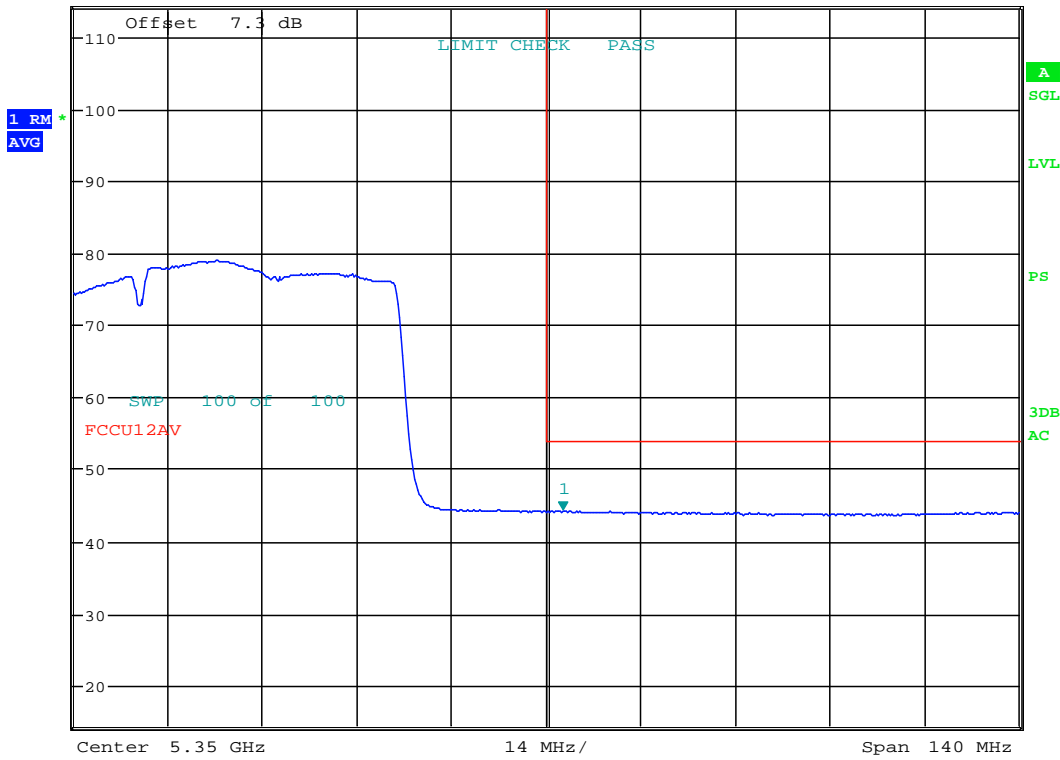
FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 166 of 251	

Antenna-1 Radiated Band Edge Measurements (80MHz BW)
§15.407(b.1)(b.2) §15.205 §15.209

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



* RBW 1 MHz Marker 1 [T1]
 * VBW 3 MHz 44.32 dBµV
 * Att 10 dB SWT 20 ms 5.352467949 GHz
 Ref 114.3 dBµV Offset 7.3 dB

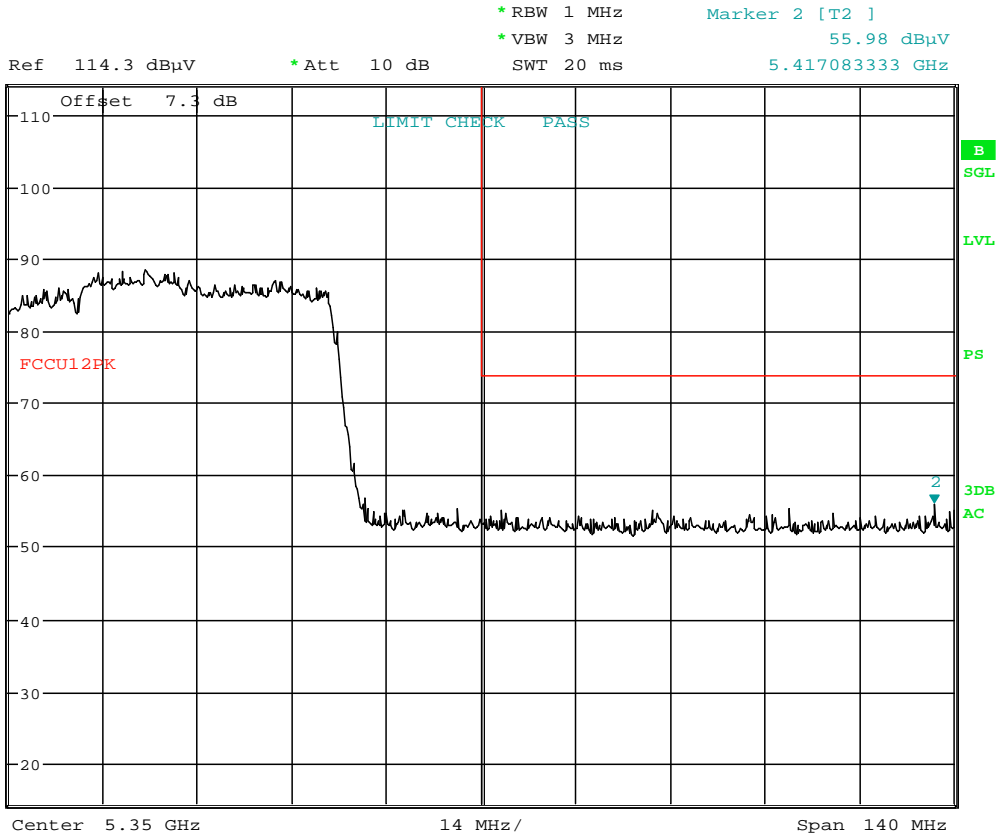


Date: 22.JAN.2017 22:26:25

Plot 7-201. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 167 of 251	

Antenna-1 Radiated Band Edge Measurements (80MHz BW)
§15.407(b.1)(b.2) §15.205 §15.209



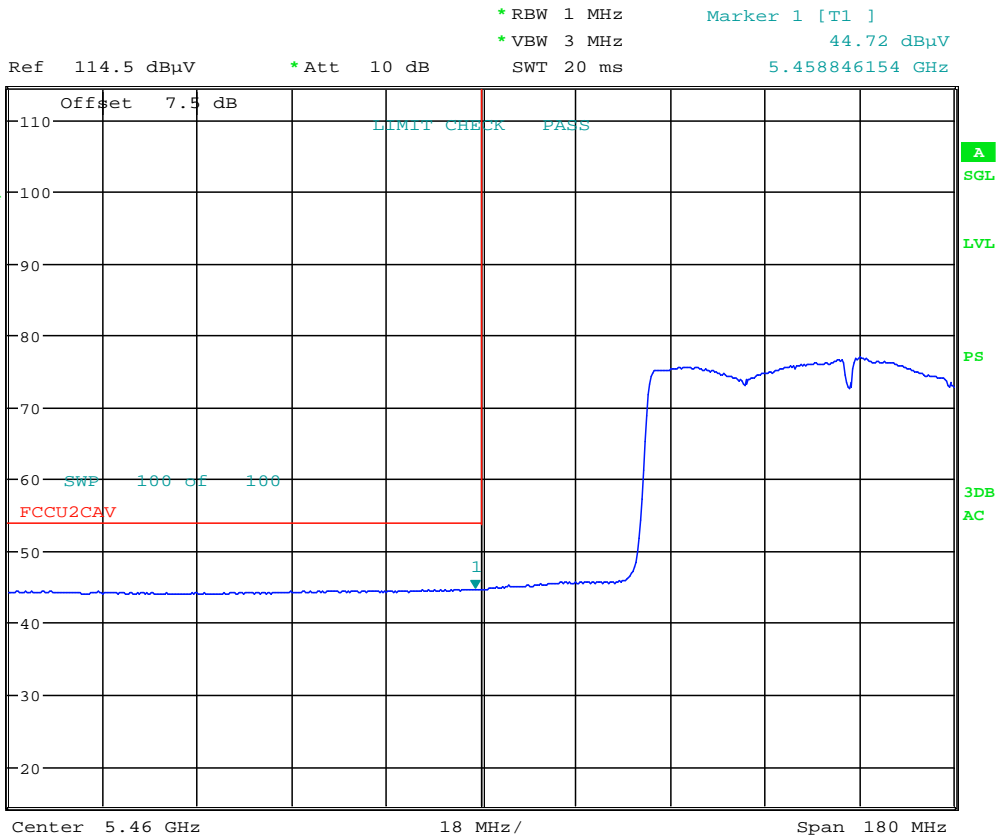
Date: 22.JAN.2017 22:26:48

Plot 7-202. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 168 of 251	

Antenna-1 Radiated Band Edge Measurements (80MHz BW)
§15.407(b.1)(b.2) §15.205 §15.209

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



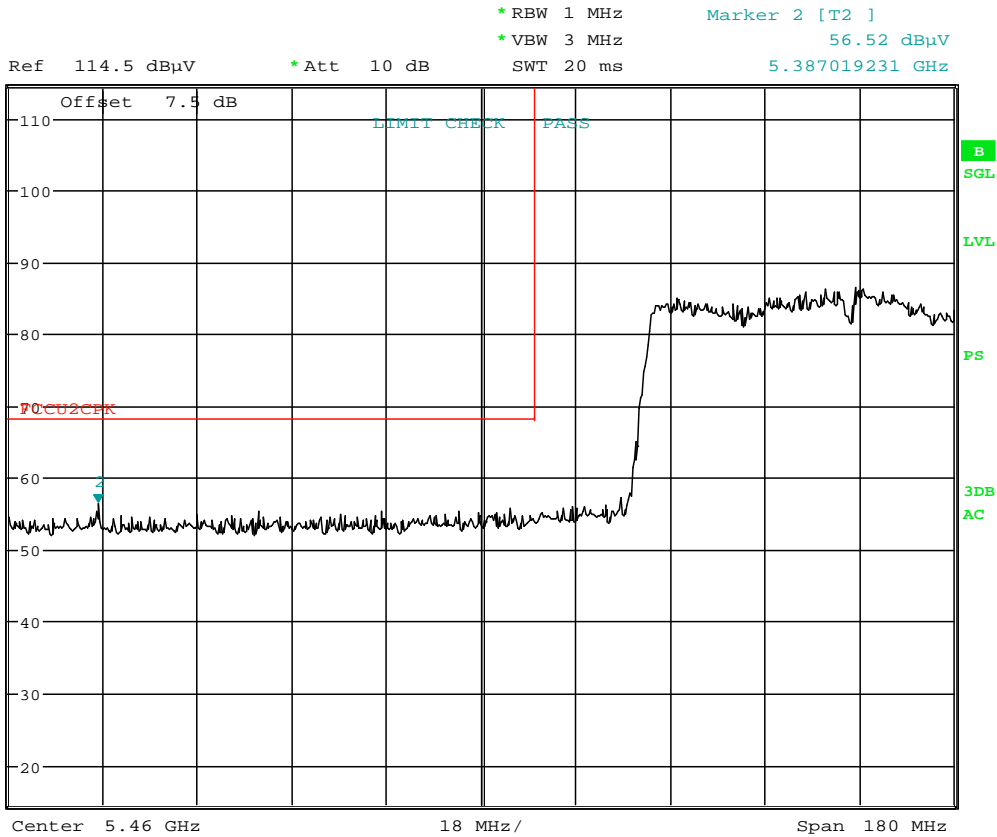
Date: 22.JAN.2017 22:35:27

Plot 7-203. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 169 of 251	



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

§15.407(b.1)(b.2) §15.205 §15.209



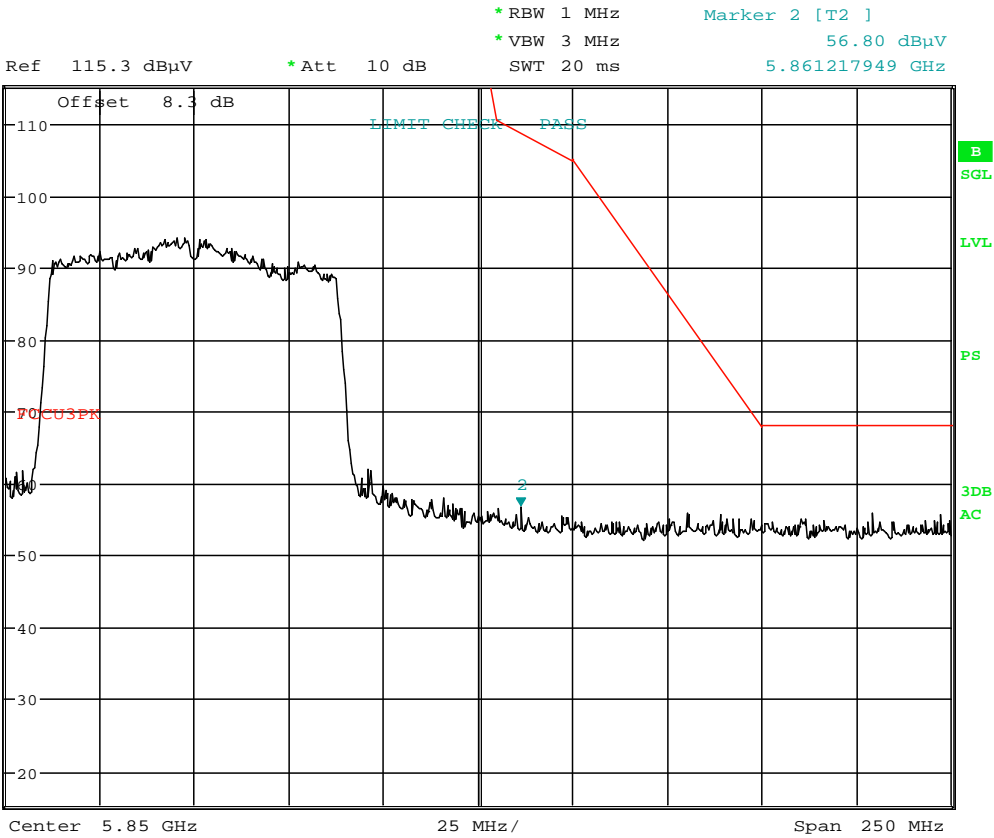
Date: 22.JAN.2017 22:35:50

Plot 7-204. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 170 of 251	

Antenna-1 Radiated Band Edge Measurements (80MHz BW)
§15.407(b.1)(b.2) §15.205 §15.209

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



Date: 22.JAN.2017 22:50:24

Plot 7-205. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 171 of 251	

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

§15.407(b.1)(b.2) §15.205 §15.209

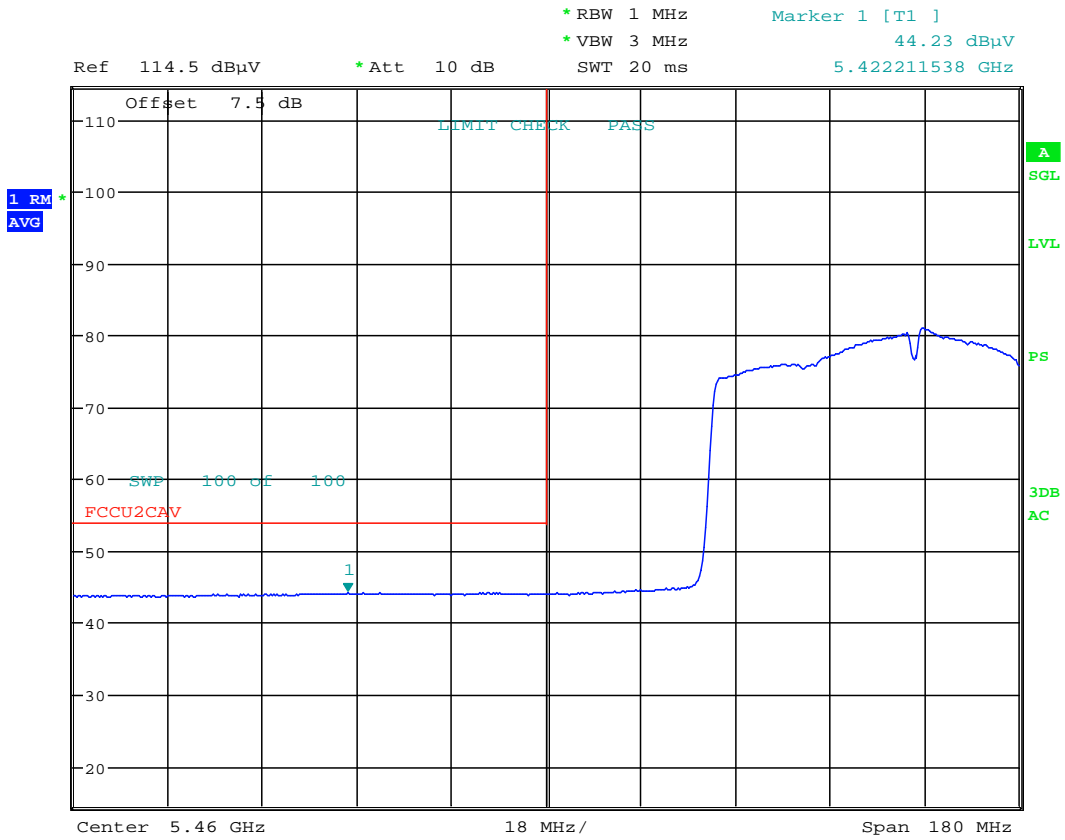
Worst Case Mode: 802.11ac

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5210MHz

Channel: 42

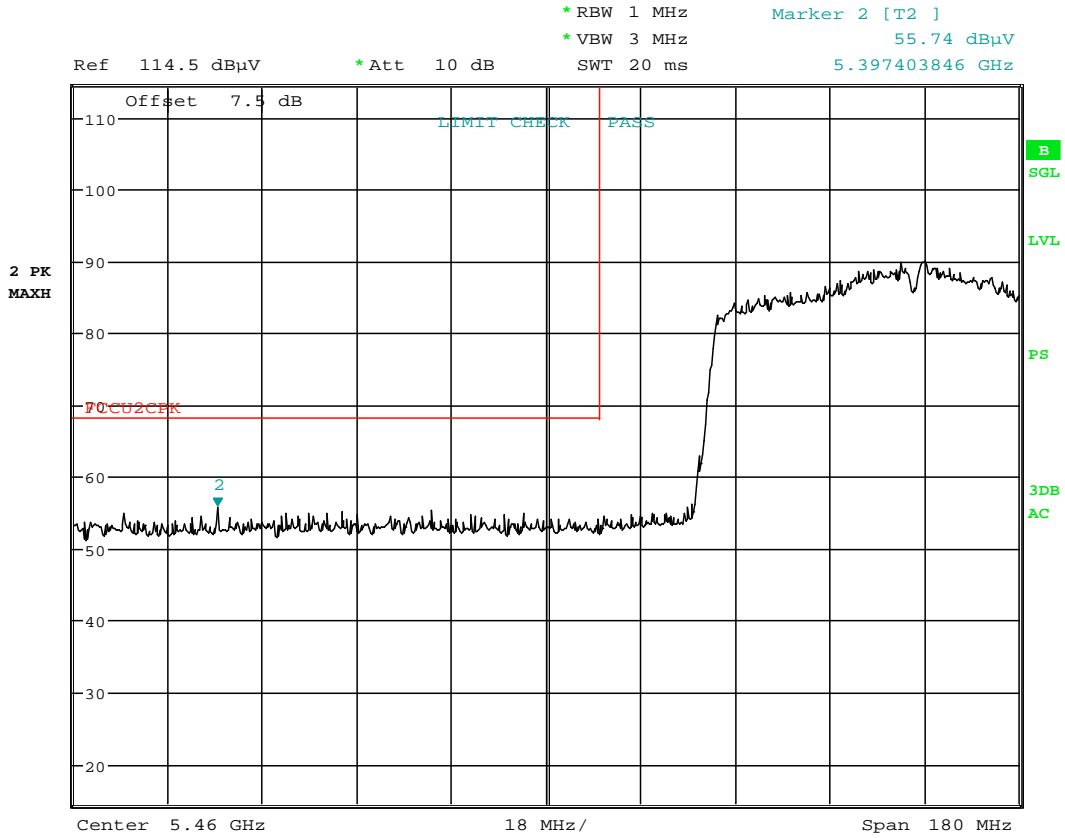


Date: 1.FEB.2017 11:19:58

Plot 7-206. Radiated Restricted Band Edge Plot with WCP



FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 172 of 251	

Antenna-1 WCP Radiated Band Edge Measurements (80MHz BW) §15.407(b.1)(b.2) §15.205 §15.209



Date: 1.FEB.2017 11:20:11

Plot 7-207. Radiated Restricted Band Edge Plot with WCP

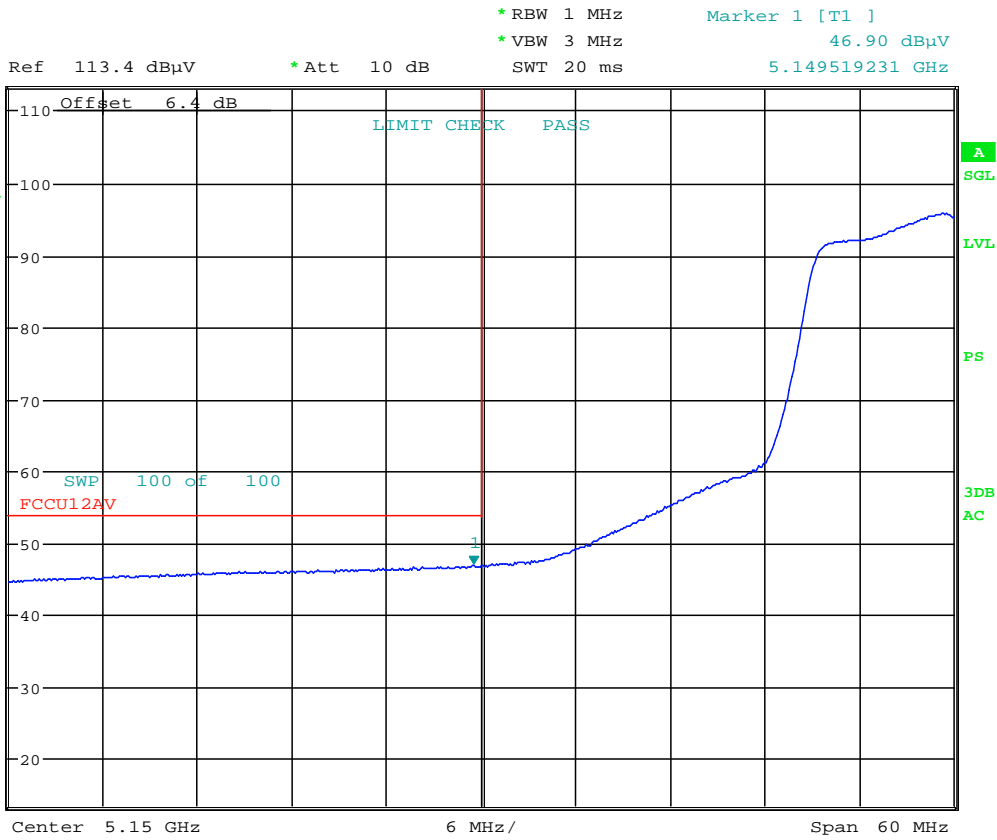
FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 173 of 251	

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

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

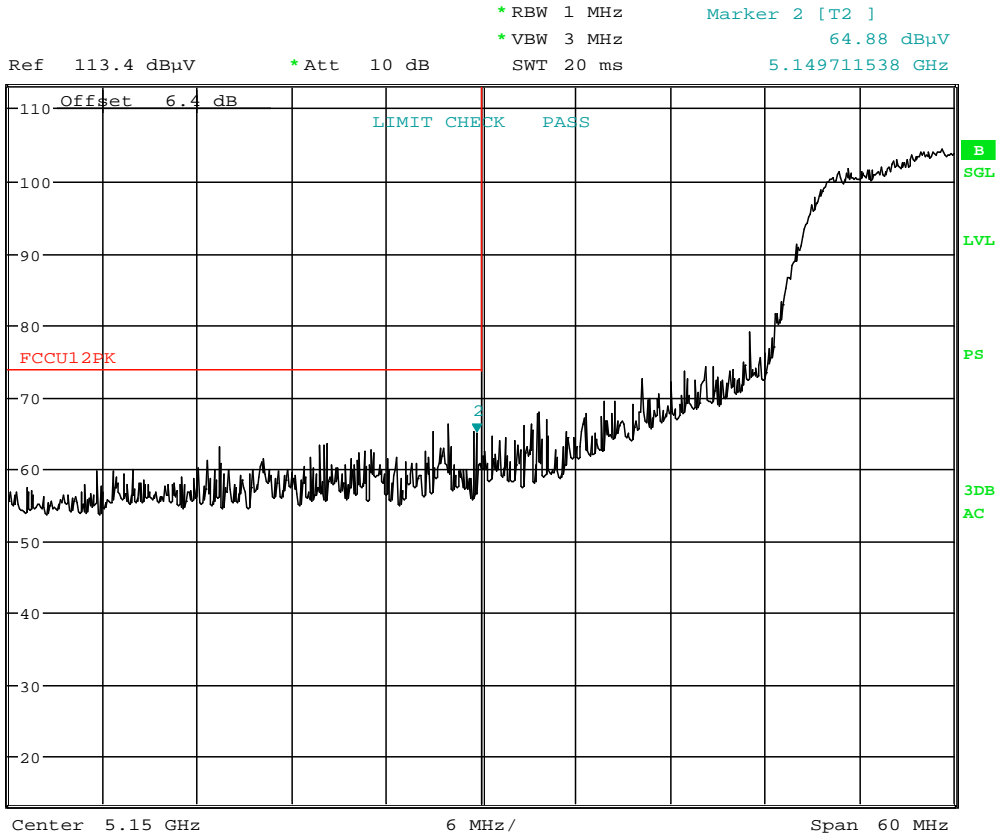


Date: 22.JAN.2017 23:21:38

Plot 7-208. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 174 of 251	

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



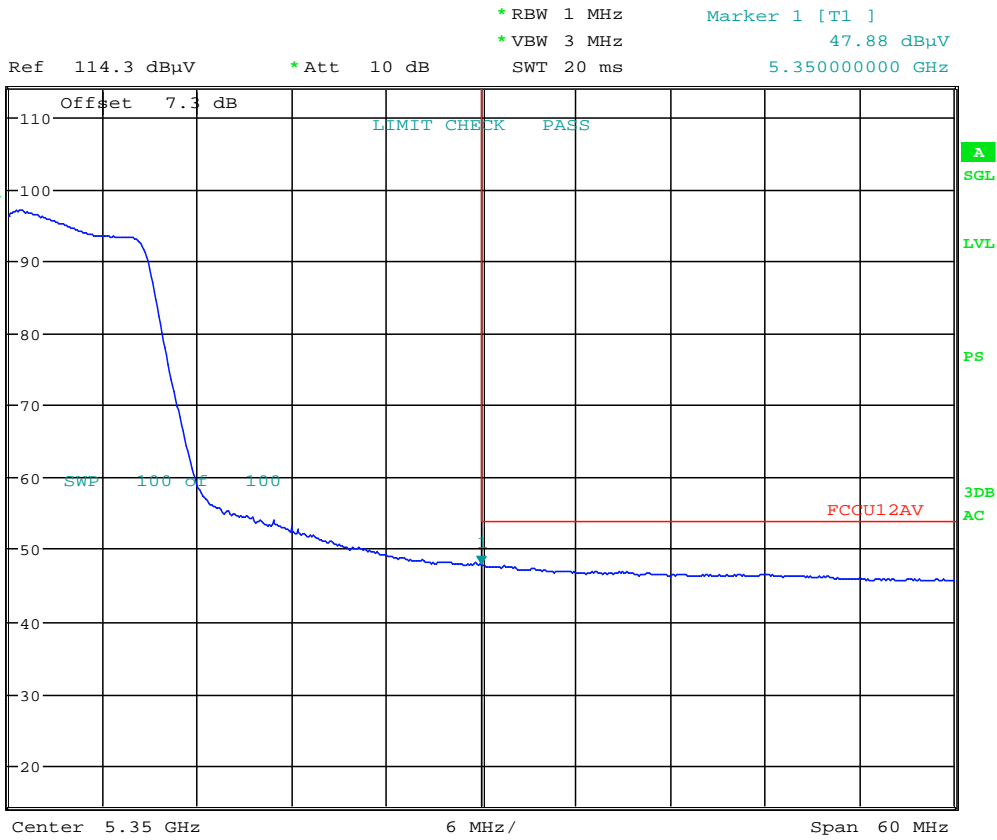
Date: 22.JAN.2017 23:21:50

Plot 7-209. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 175 of 251	

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

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

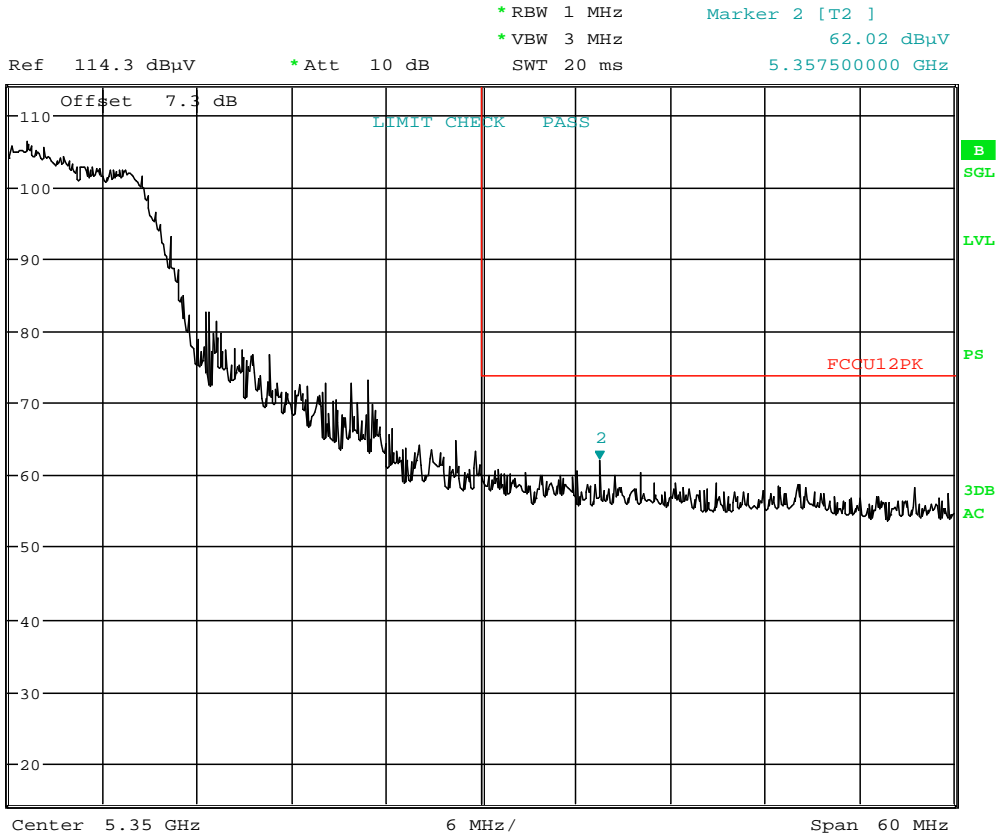


Date: 22.JAN.2017 23:34:59

Plot 7-210. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 176 of 251	

Antenna-2 Radiated Band Edge Measurements (20MHz BW)
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Date: 22.JAN.2017 23:35:12

Plot 7-211. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

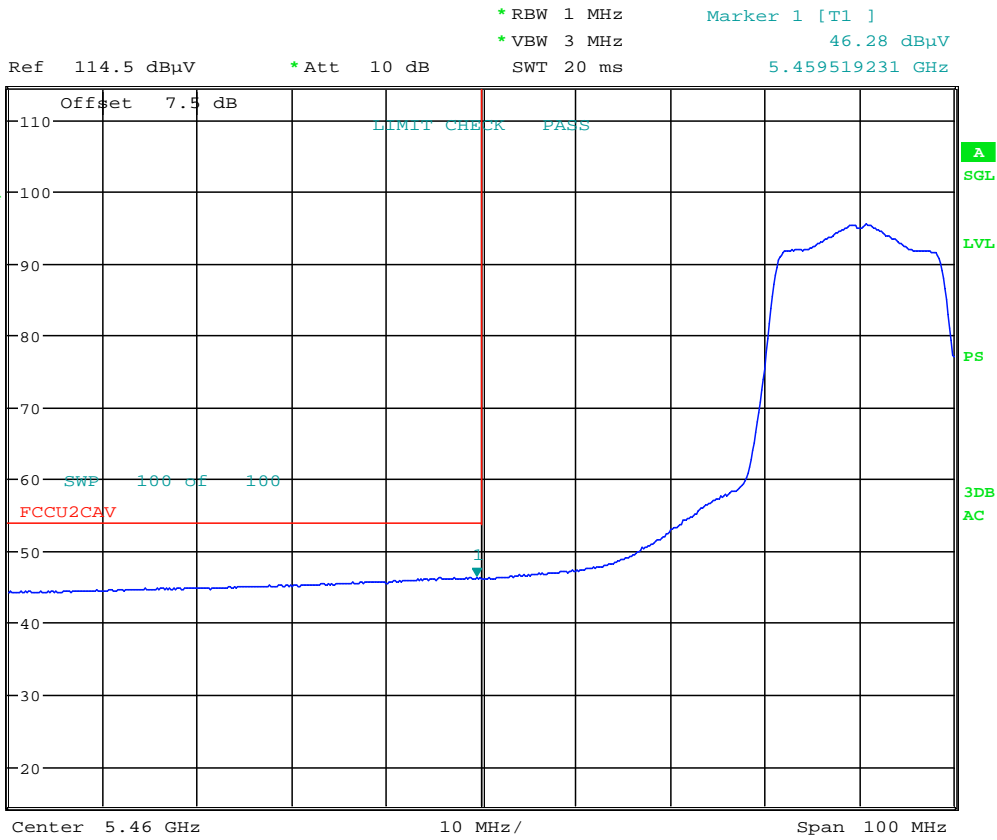
FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 177 of 251	

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Antenna-2 Radiated Band Edge Measurements (20MHz BW)
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Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps
 Distance of Measurements: 3 Meters
 Operating Frequency: 5500MHz
 Channel: 100

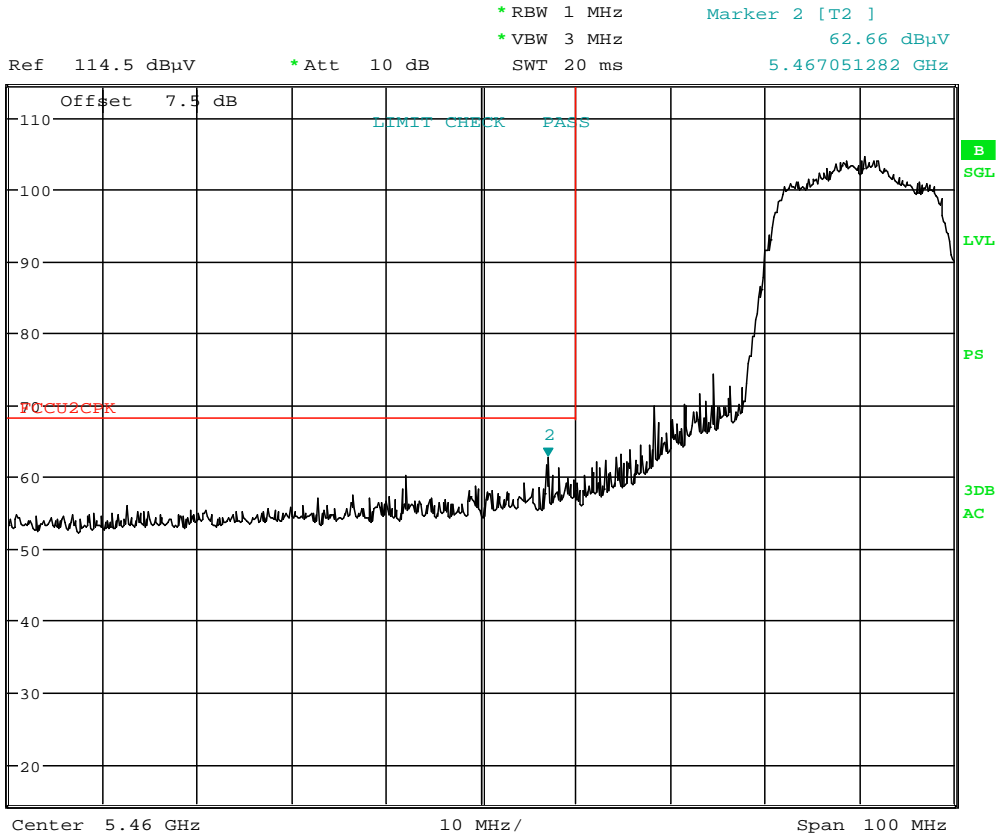


Date: 22.JAN.2017 23:43:53

Plot 7-212. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 178 of 251	

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



Date: 22.JAN.2017 23:44:14

Plot 7-213. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

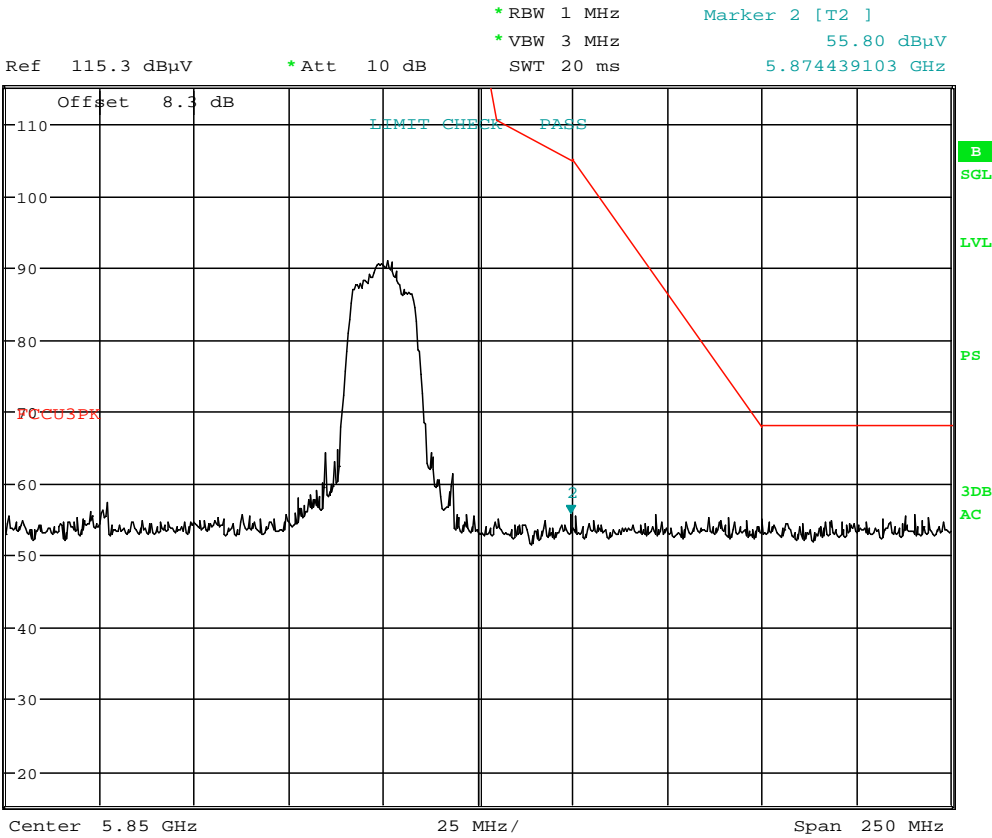
FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 179 of 251	

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Antenna-2 Radiated Band Edge Measurements (20MHz BW)
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Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps
 Distance of Measurements: 3 Meters
 Operating Frequency: 5825MHz
 Channel: 165



Date: 22.JAN.2017 23:53:49

Plot 7-214. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 180 of 251	

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

§15.407(b.1)(b.2) §15.205 §15.209

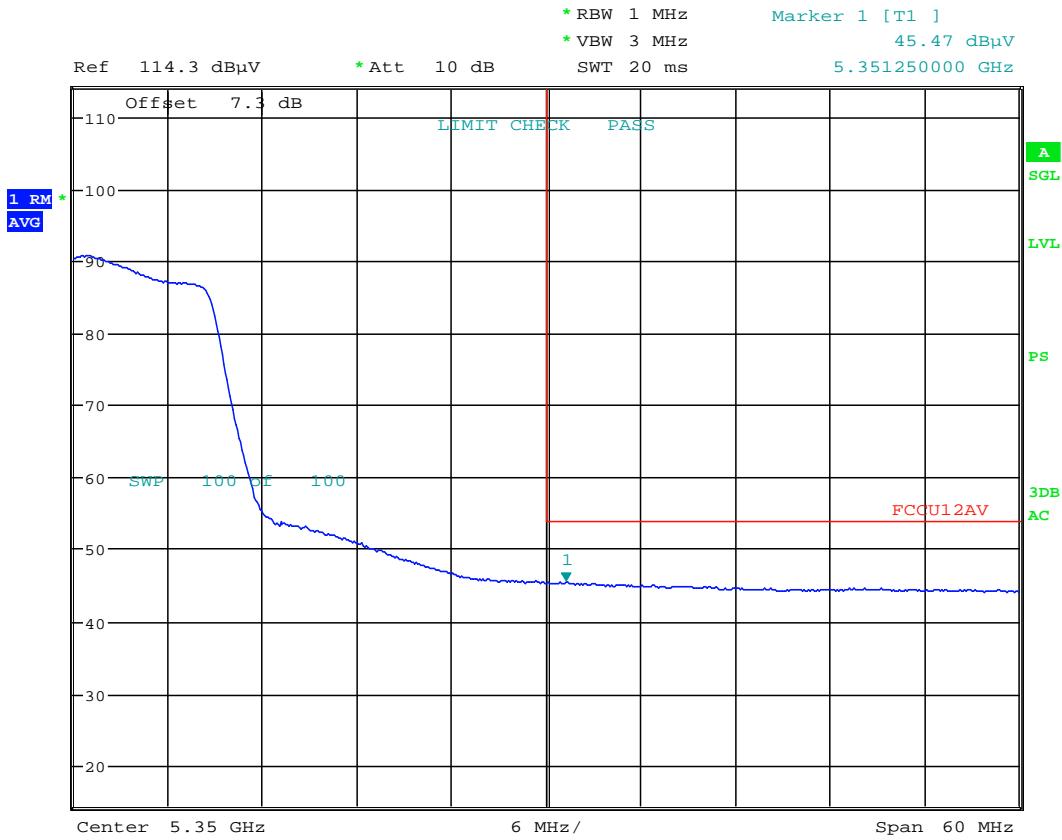
Worst Case Mode: 802.11a

Worst Case Transfer Rate: 6 Mbps

Distance of Measurements: 3 Meters

Operating Frequency: 5320MHz

Channel: 64

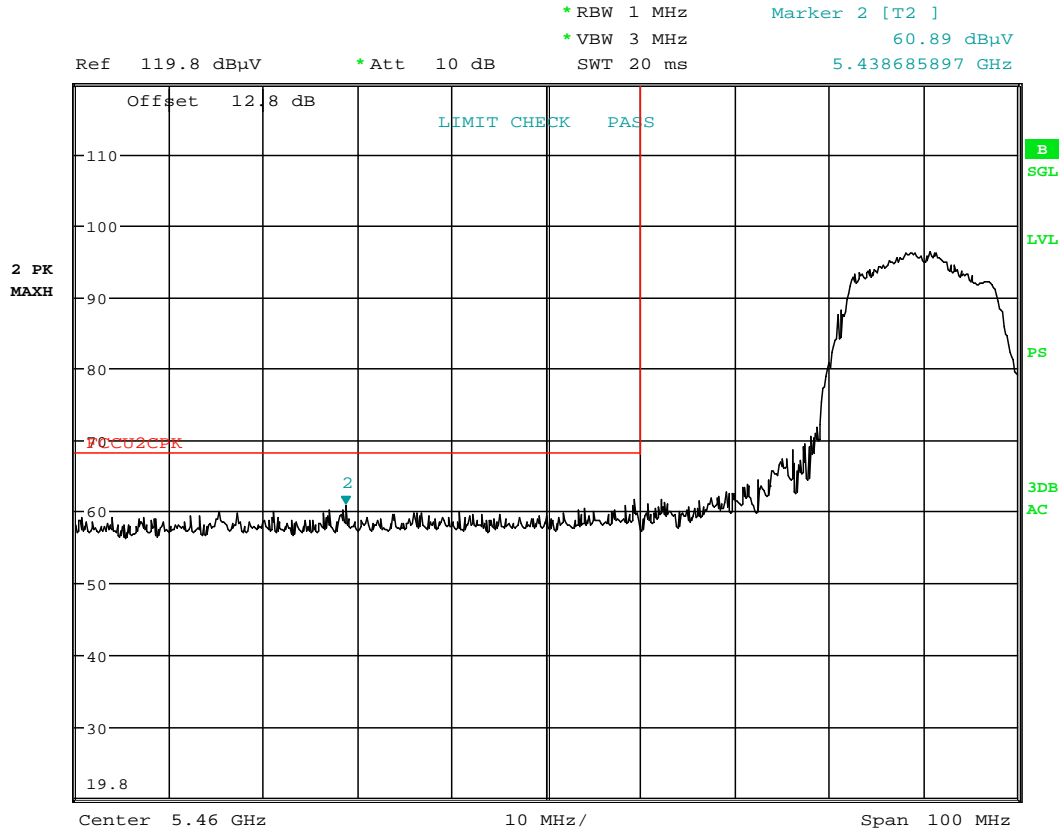


Date: 1.FEB.2017 11:26:16

Plot 7-215. Radiated Restricted Band Edge Plot with WCP



FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 181 of 251	

Antenna-2 WCP Radiated Band Edge Measurements (20MHz BW) \$15.407(b.1)(b.2) \$15.205 \$15.209



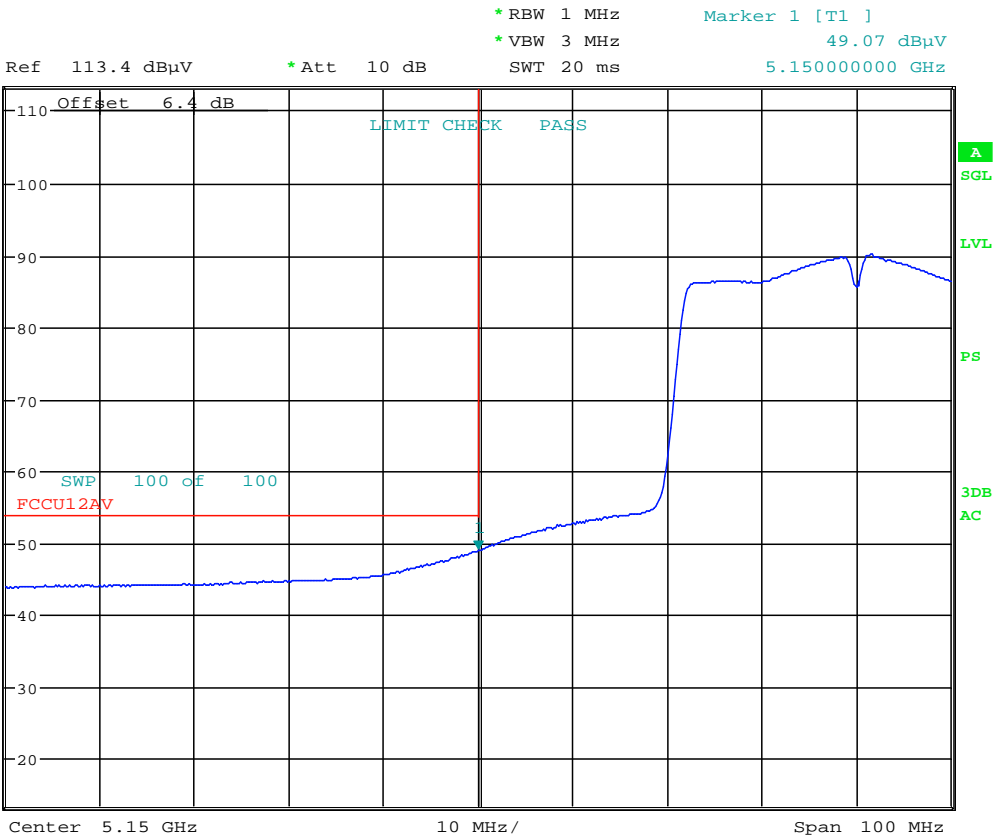
Date: 4.JAN.2017 09:33:45

Plot 7-216. Radiated Restricted Band Edge Plot with WCP

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 182 of 251	

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

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

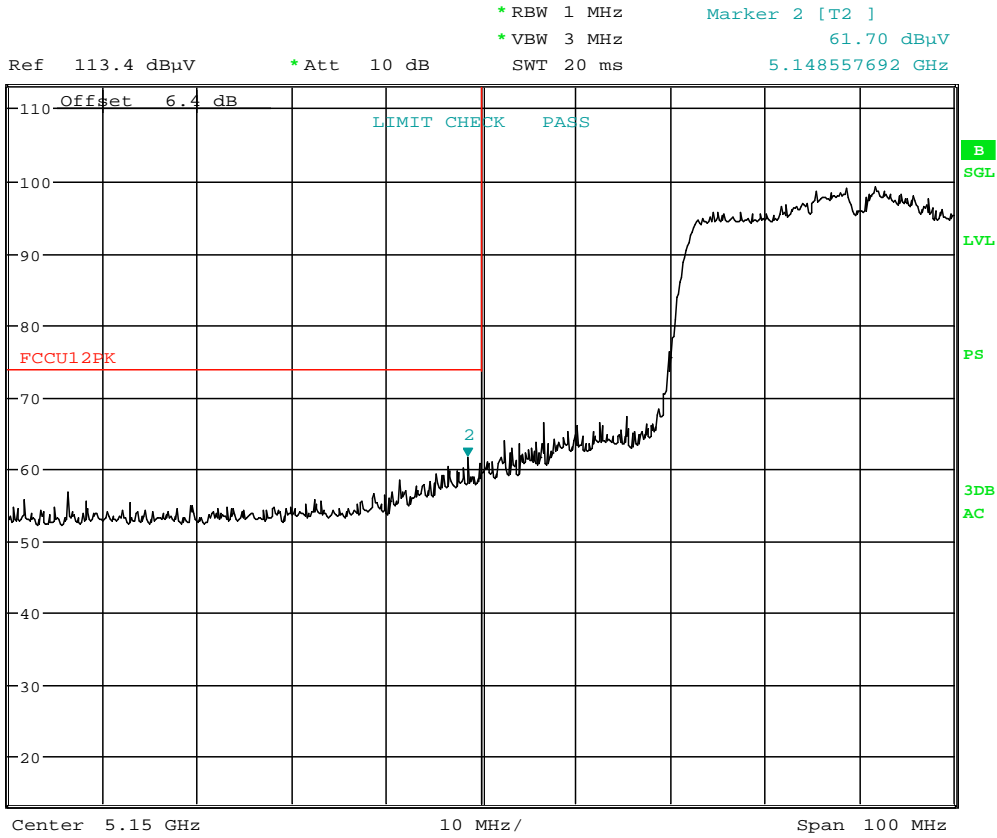


Date: 22.JAN.2017 23:23:27

Plot 7-217. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 183 of 251	

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



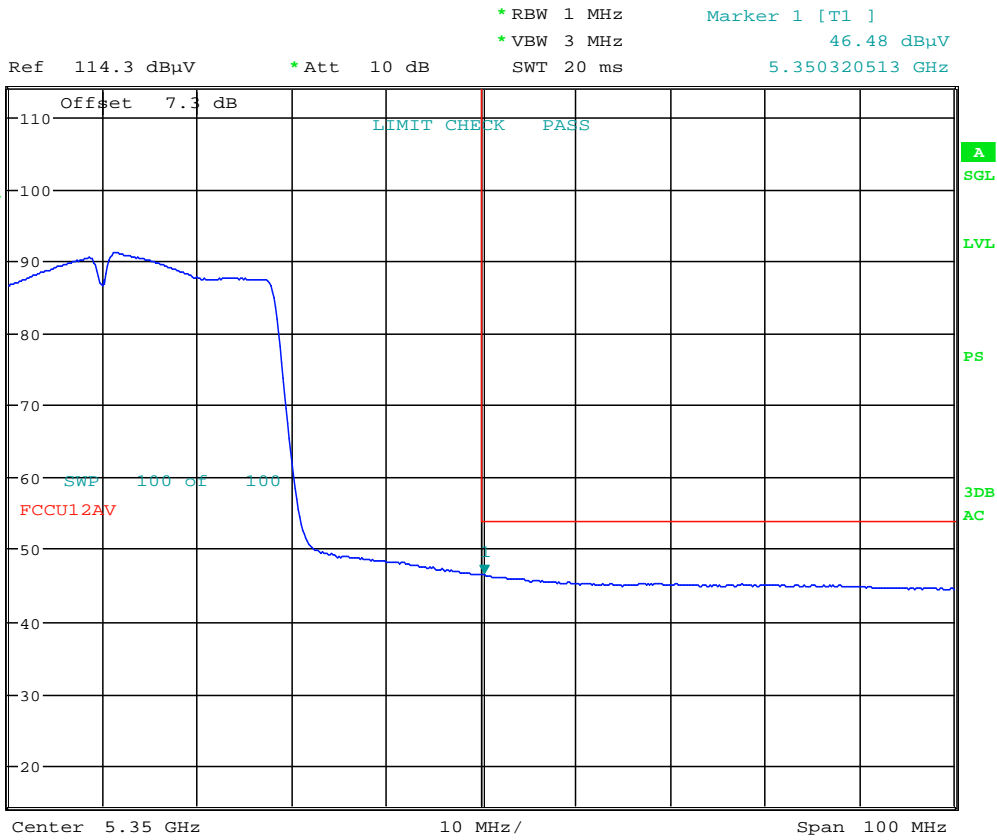
Date: 22.JAN.2017 23:23:38

Plot 7-218. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 184 of 251	

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

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

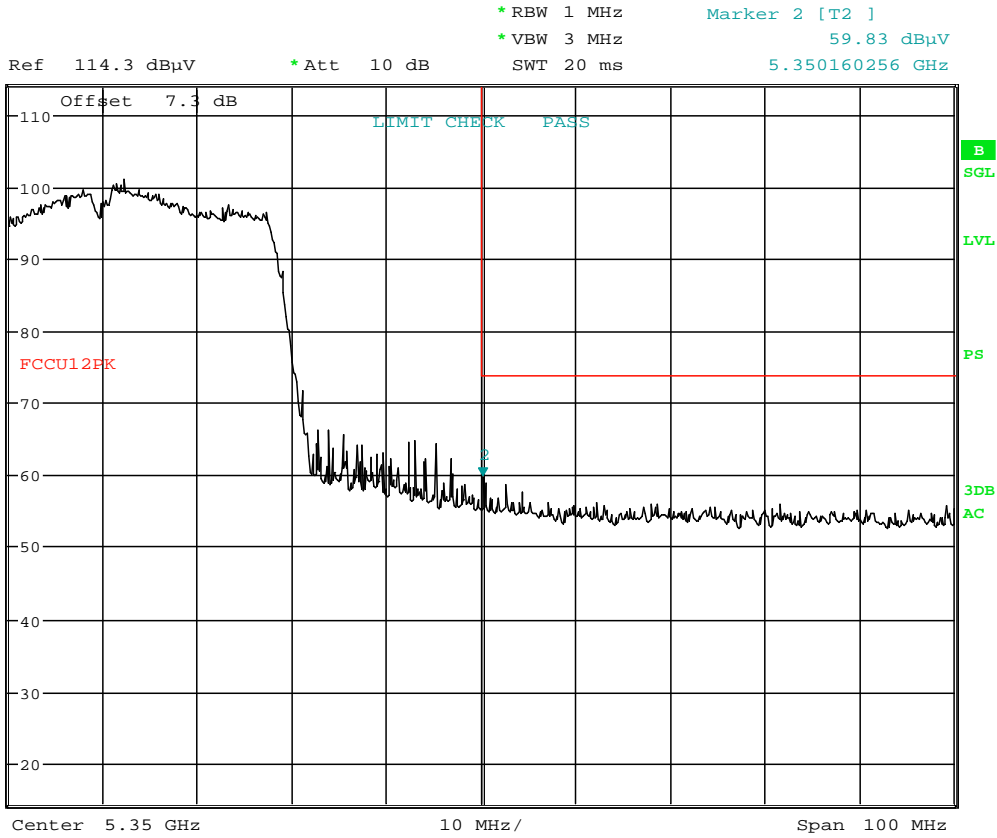


Date: 22.JAN.2017 23:36:33

Plot 7-219. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 185 of 251	

Antenna-2 Radiated Band Edge Measurements (40MHz BW)
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Date: 22.JAN.2017 23:36:45

Plot 7-220. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 186 of 251	

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

§15.407(b.1)(b.2) §15.205 §15.209

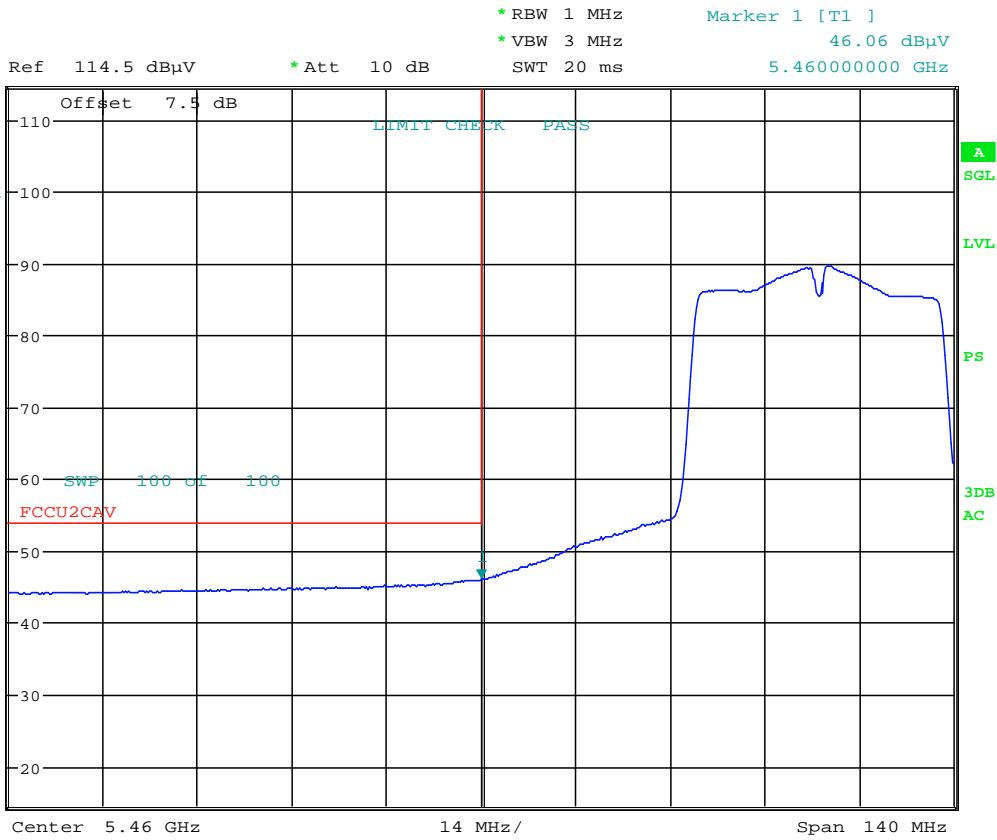
Worst Case Mode: 802.11n (40MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters



Operating Frequency: 5510MHz

Channel: 102

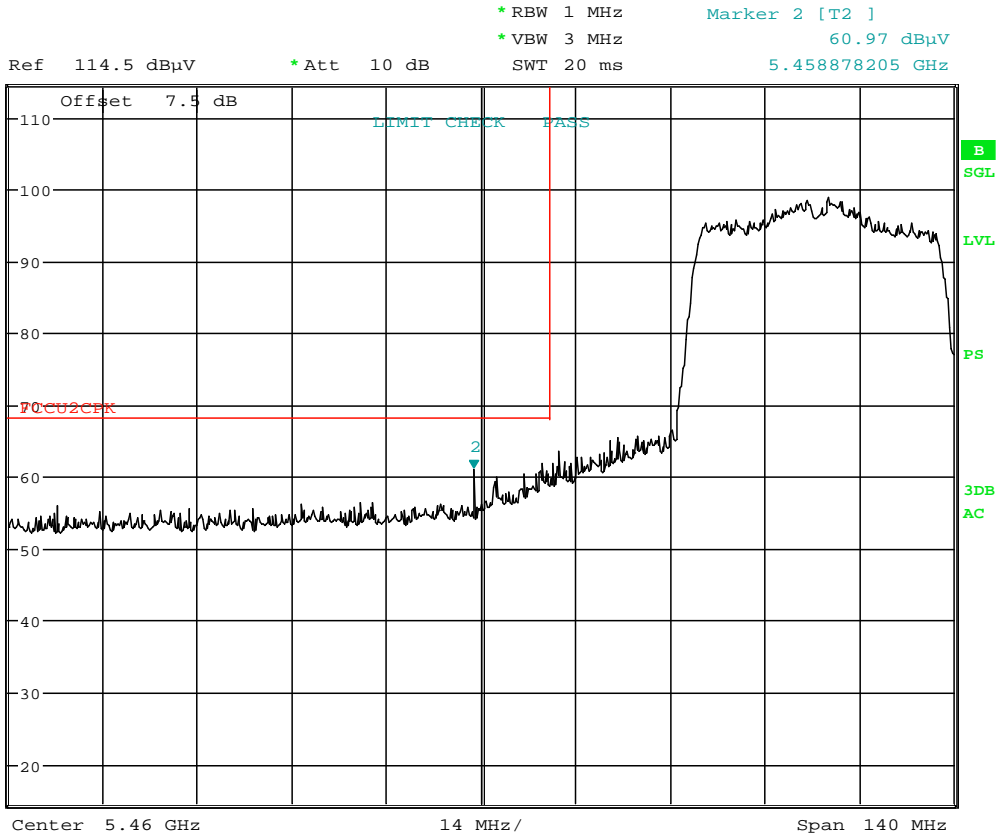


Date: 22.JAN.2017 23:46:32

Plot 7-221. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 187 of 251	

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



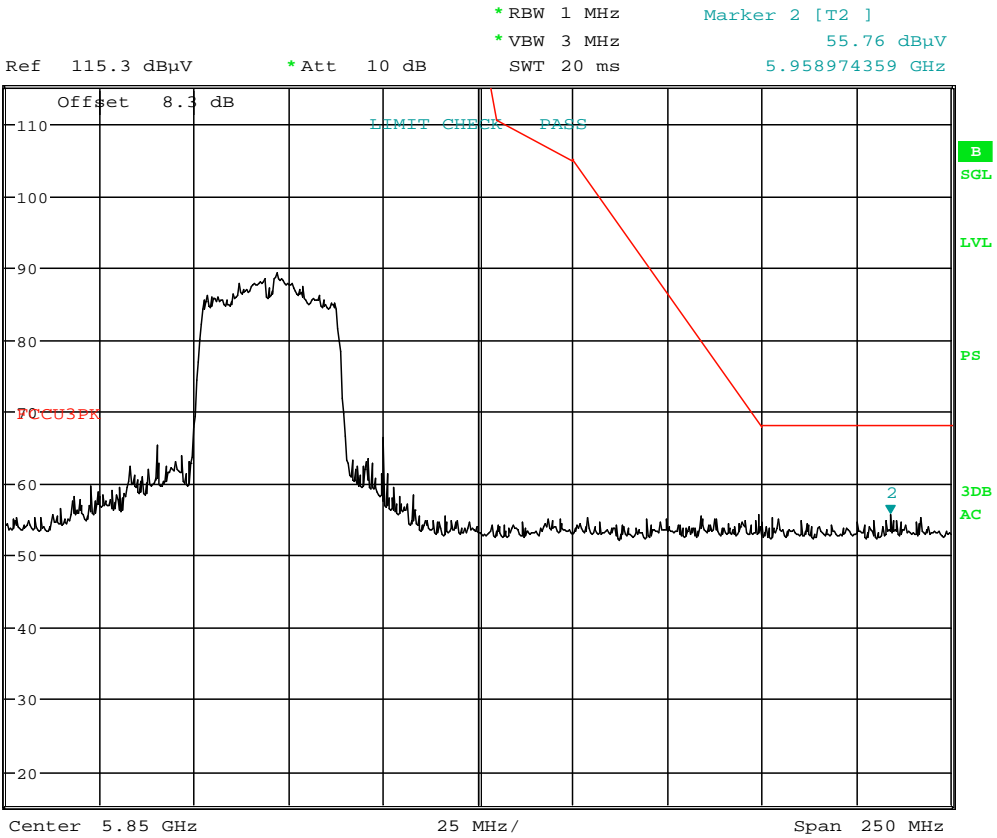
Date: 22.JAN.2017 23:47:05

Plot 7-222. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 188 of 251	

Antenna-2 Radiated Band Edge Measurements (40MHz BW)
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Worst Case Mode: 802.11n (40MHz)
 Worst Case Transfer Rate: MCS0
 Distance of Measurements: 3 Meters
 Operating Frequency: 5795MHz
 Channel: 159



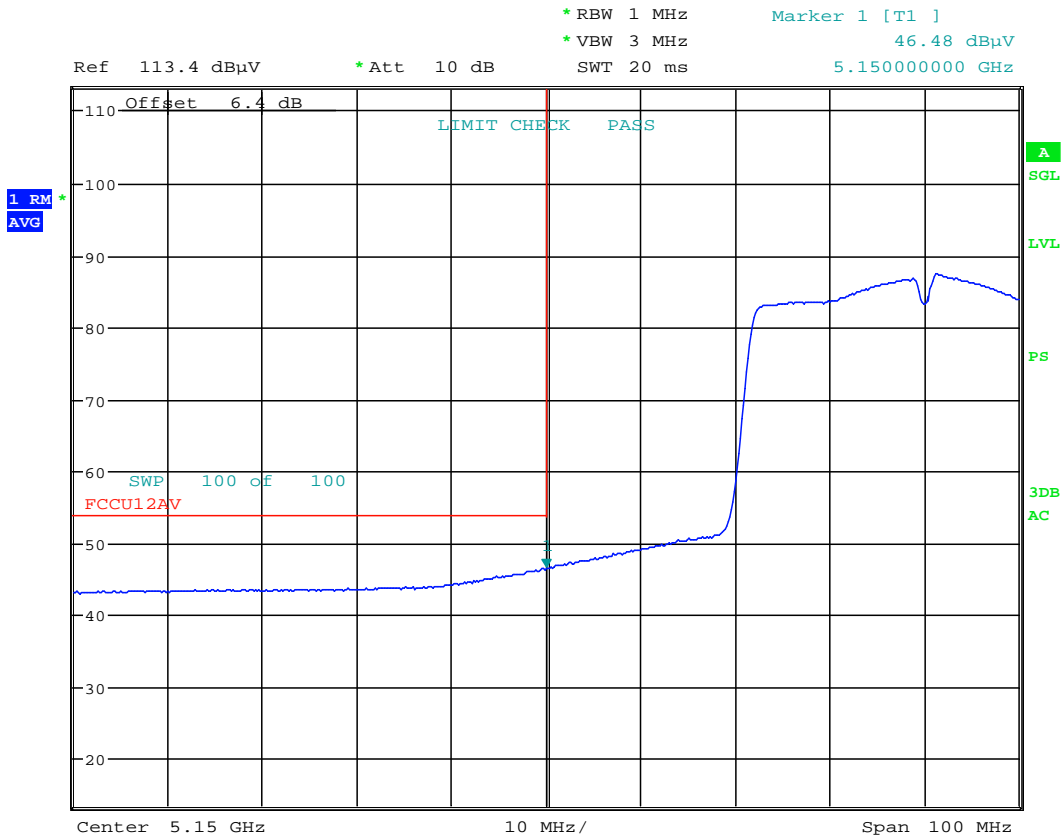
Date: 22.JAN.2017 23:54:55

Plot 7-223. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 189 of 251	

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

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

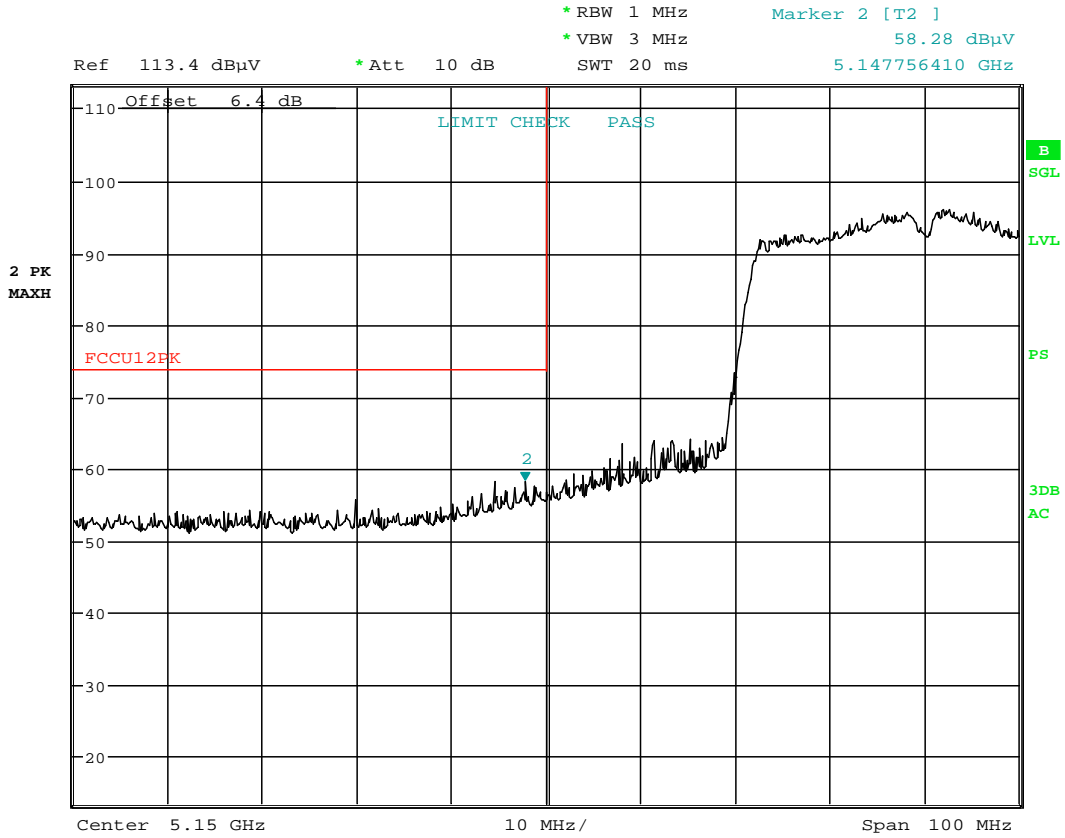


Date: 1.FEB.2017 11:31:41

Plot 7-224. Radiated Restricted Band Edge Plot with WCP



FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 190 of 251	

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



Date: 1.FEB.2017 11:31:51

Plot 7-225. Radiated Restricted Band Edge Plot with WCP

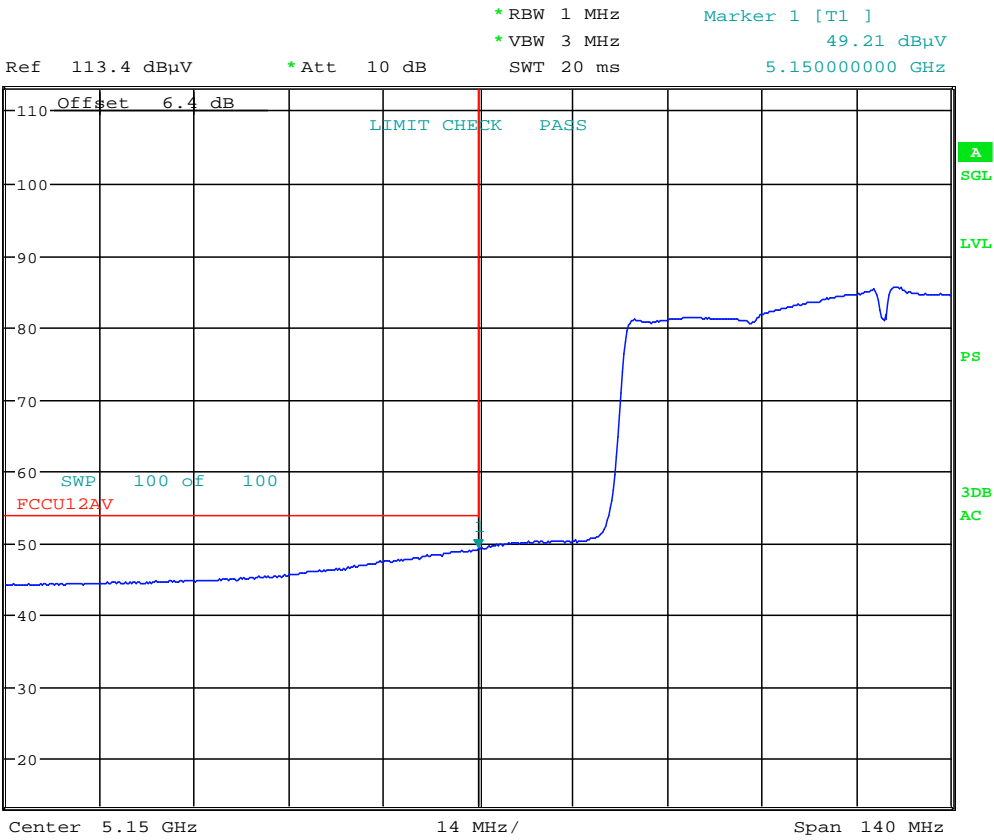
FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 191 of 251	

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7.7.9 Antenna-2 Radiated Band Edge Measurements (80MHz BW)
§15.407(b.1)(b.2) §15.205 §15.209

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



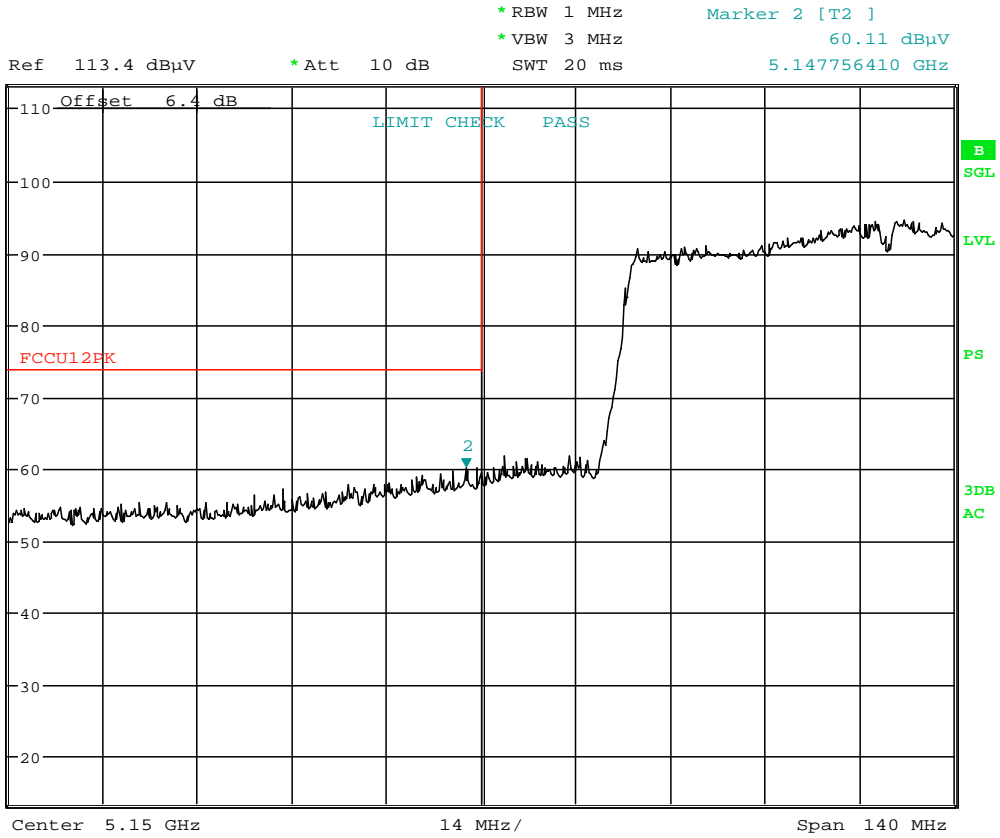
Date: 22.JAN.2017 23:28:45

Plot 7-226. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 192 of 251	

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

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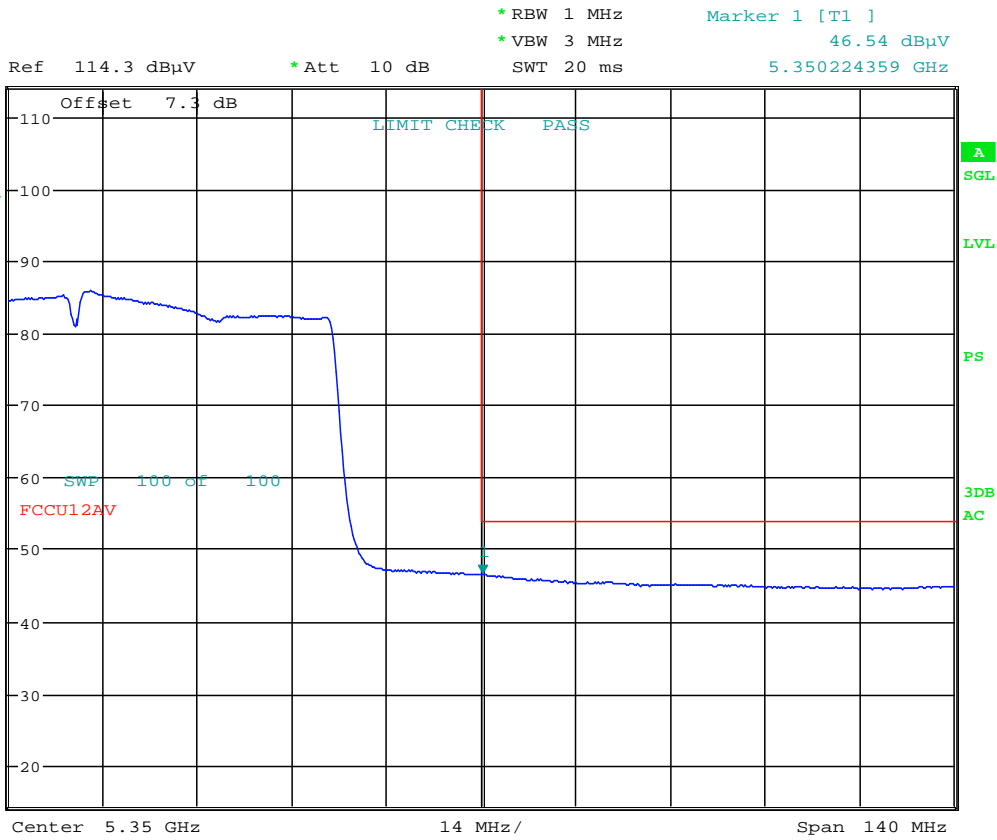
Date: 22.JAN.2017 23:29:09

Plot 7-227. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 193 of 251	

Antenna-2 Radiated Band Edge Measurements (80MHz BW)
§15.407(b.1)(b.2) §15.205 §15.209

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

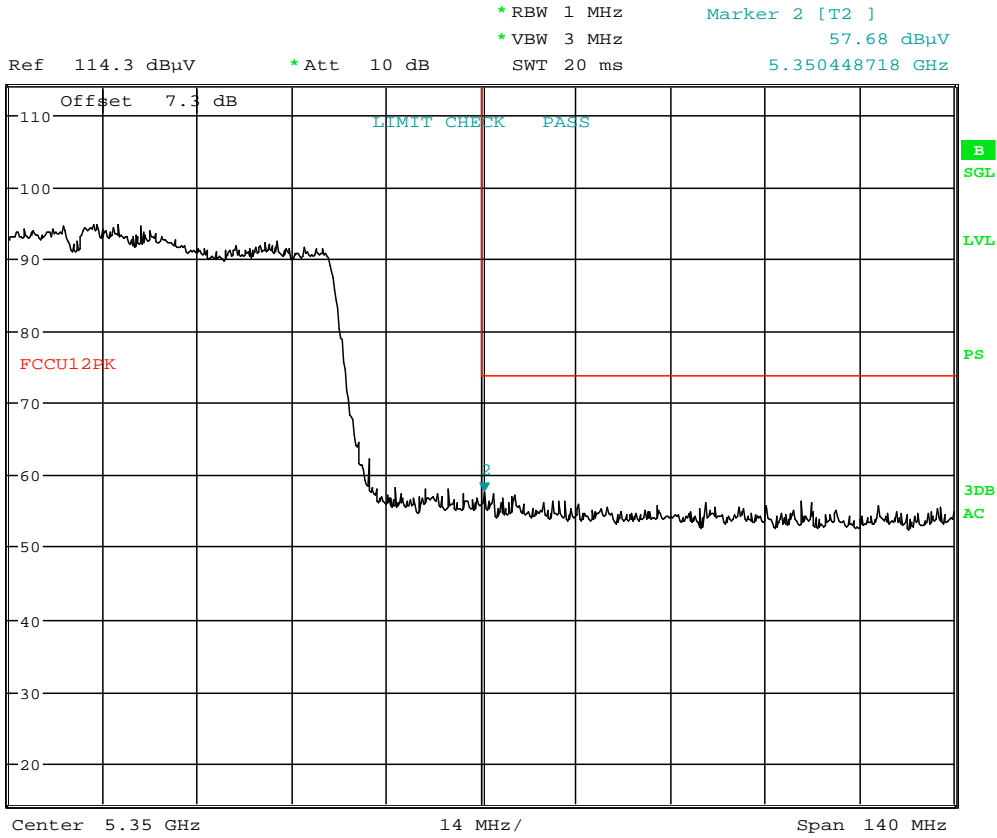


Date: 22.JAN.2017 23:38:15

Plot 7-228. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 194 of 251	

Antenna-2 Radiated Band Edge Measurements (80MHz BW)
§15.407(b.1)(b.2) §15.205 §15.209



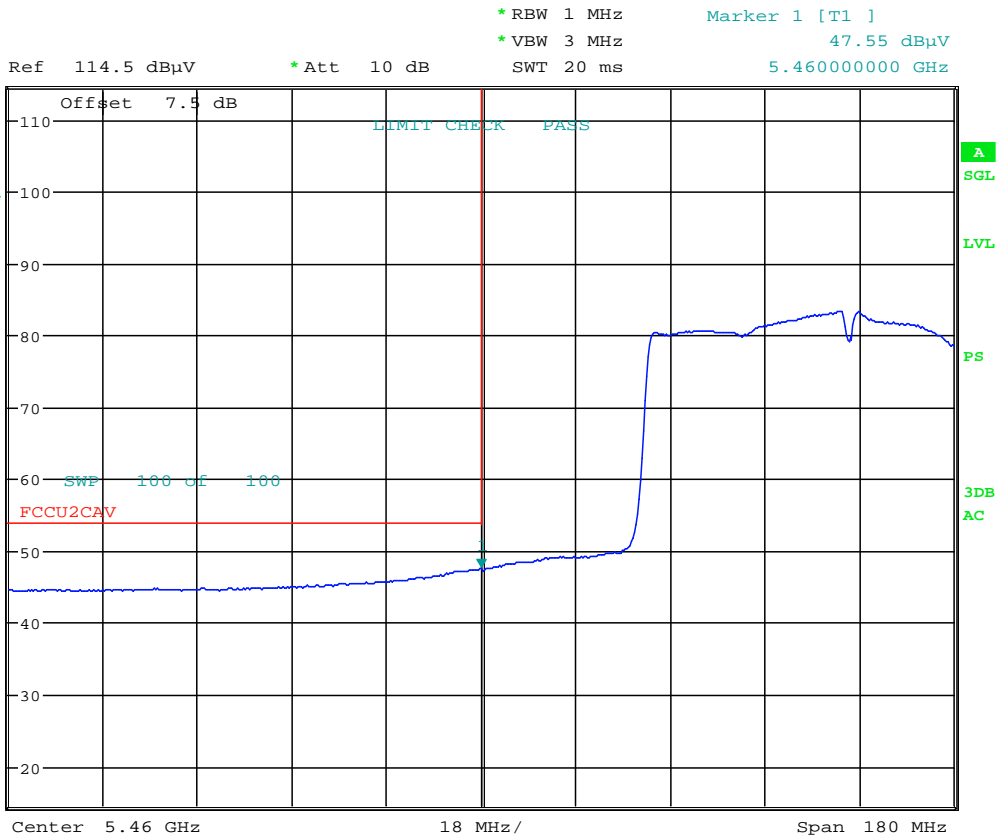
Date: 22.JAN.2017 23:38:29

Plot 7-229. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 195 of 251	

Antenna-2 Radiated Band Edge Measurements (80MHz BW)
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Worst Case Mode: 802.11ac (80MHz)
 Worst Case Transfer Rate: MCS0
 Distance of Measurements: 3 Meters
 Operating Frequency: 5530MHz
 Channel: 106

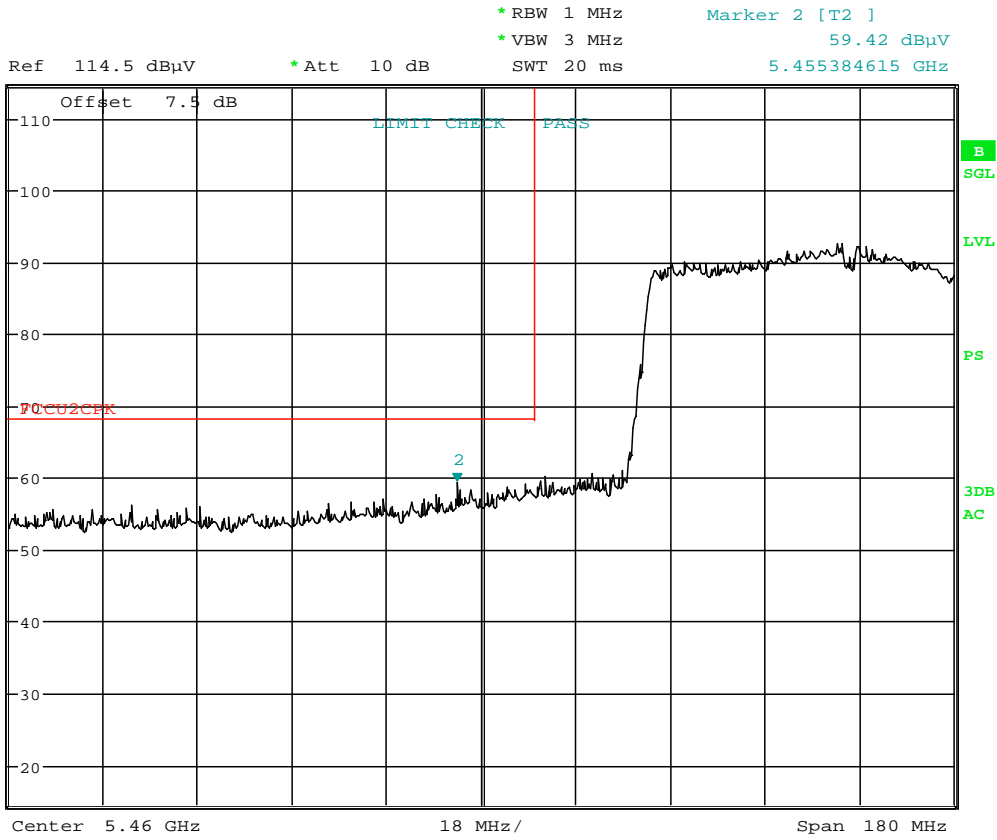


Date: 22.JAN.2017 23:48:24

Plot 7-230. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 196 of 251	

Antenna-2 Radiated Band Edge Measurements (80MHz BW)
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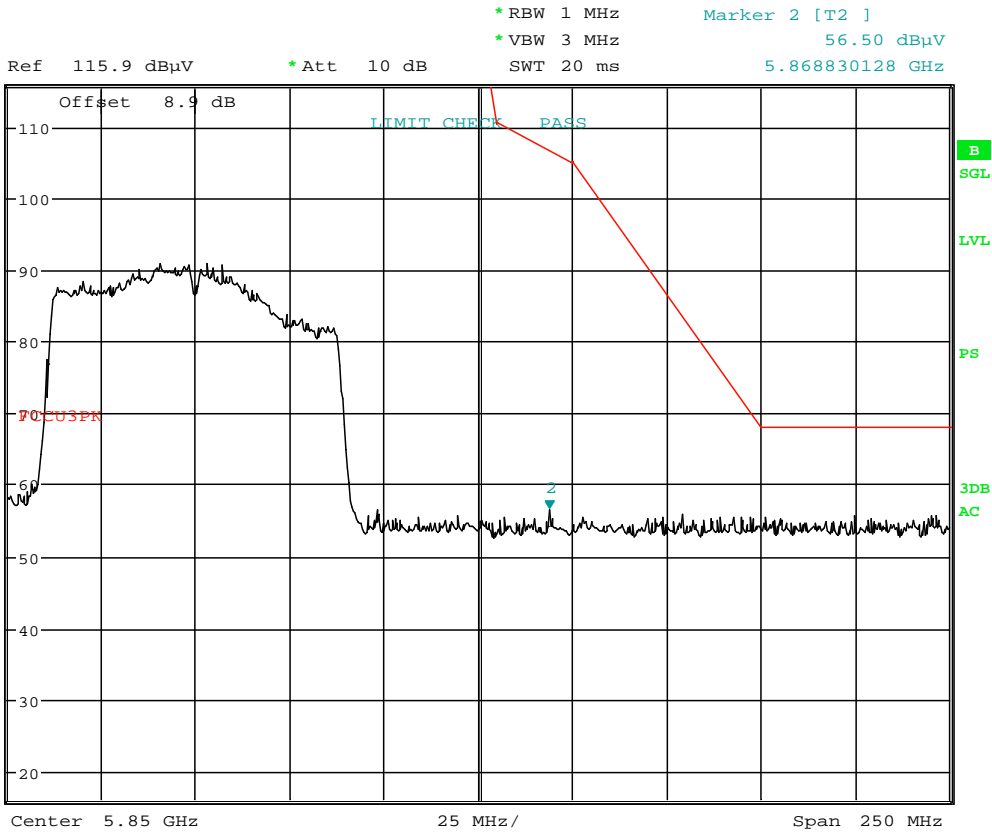
Date: 22.JAN.2017 23:48:36

Plot 7-231. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 197 of 251	

Antenna-2 Radiated Band Edge Measurements (80MHz BW)
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Worst Case Mode: 802.11ac (80MHz)
 Worst Case Transfer Rate: MCS0
 Distance of Measurements: 3 Meters
 Operating Frequency: 5775MHz
 Channel: 155



Date: 19.JAN.2017 16:43:38

Plot 7-232. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 198 of 251	

Antenna-2 WCP Radiated Band Edge Measurements (80MHz BW) §15.407(b.1)(b.2) §15.205 §15.209

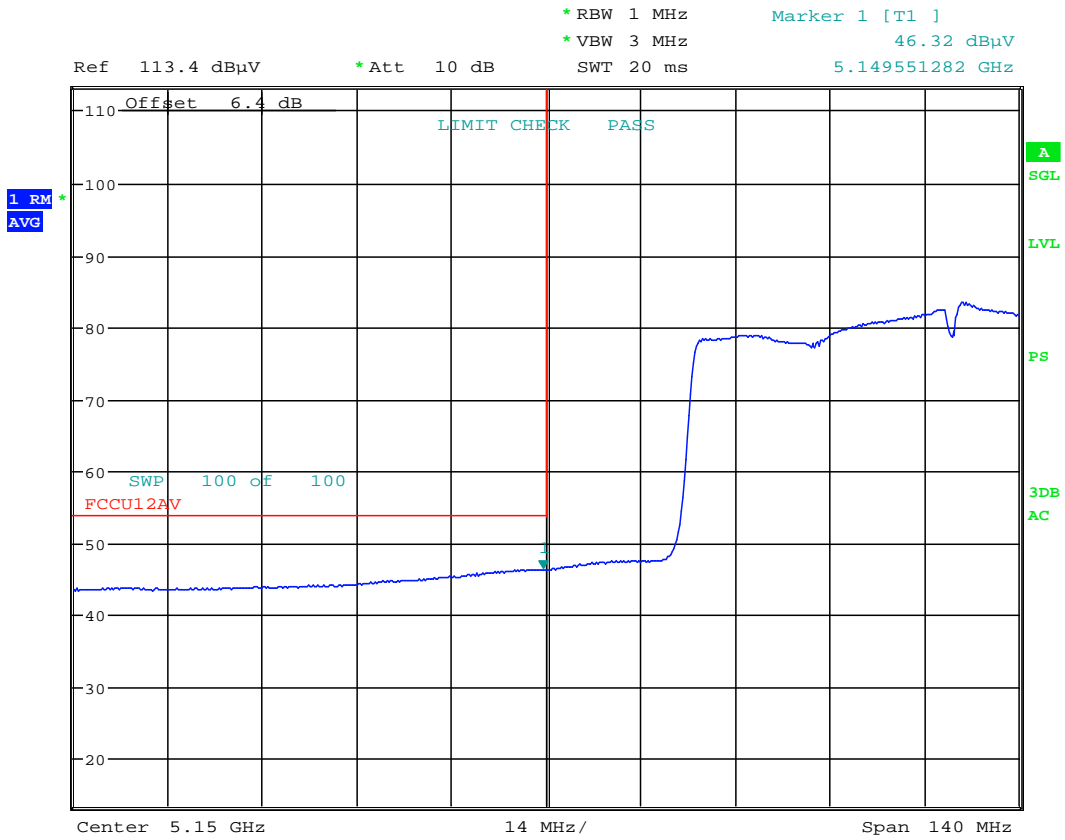
Worst Case Mode: 802.11ac

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5210MHz

Channel: 42

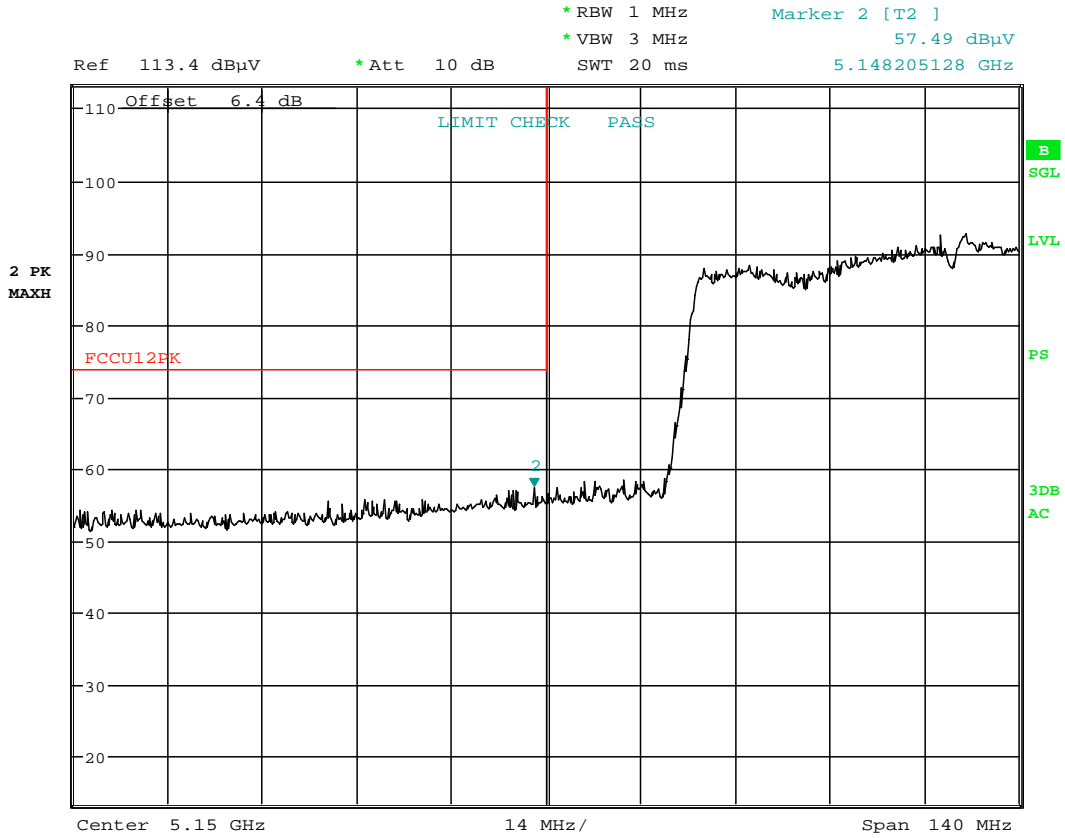


Date: 1.FEB.2017 11:39:52

Plot 7-233. Radiated Restricted Band Edge Plot with WCP


FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 199 of 251	

Antenna-2 WCP Radiated Band Edge Measurements (80MHz BW) \$15.407(b.1)(b.2) \$15.205 \$15.209



Date: 1.FEB.2017 11:40:16

Plot 7-234. Radiated Restricted Band Edge Plot with WCP

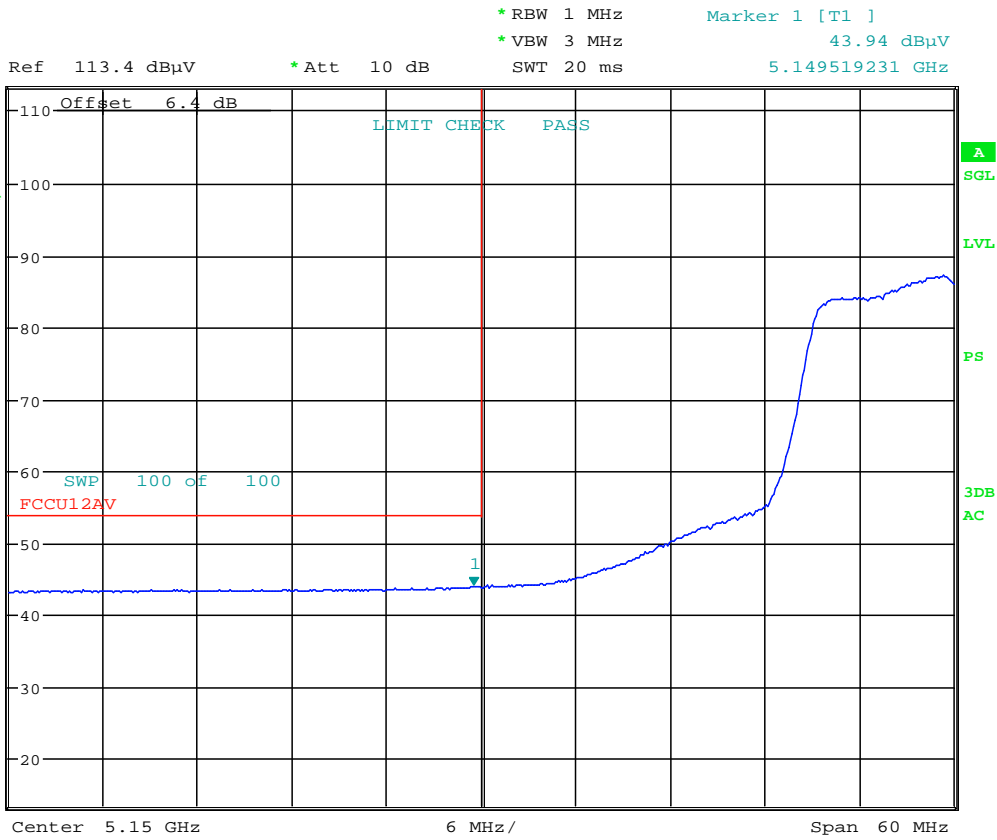
FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 200 of 251	

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7.7.10 MIMO Radiated Band Edge Measurements (20MHz BW)
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Worst Case Mode: 802.11n (20MHz)
 Worst Case Transfer Rate: MCS8
 Distance of Measurements: 3 Meters
 Operating Frequency: 5180MHz
 Channel: 36



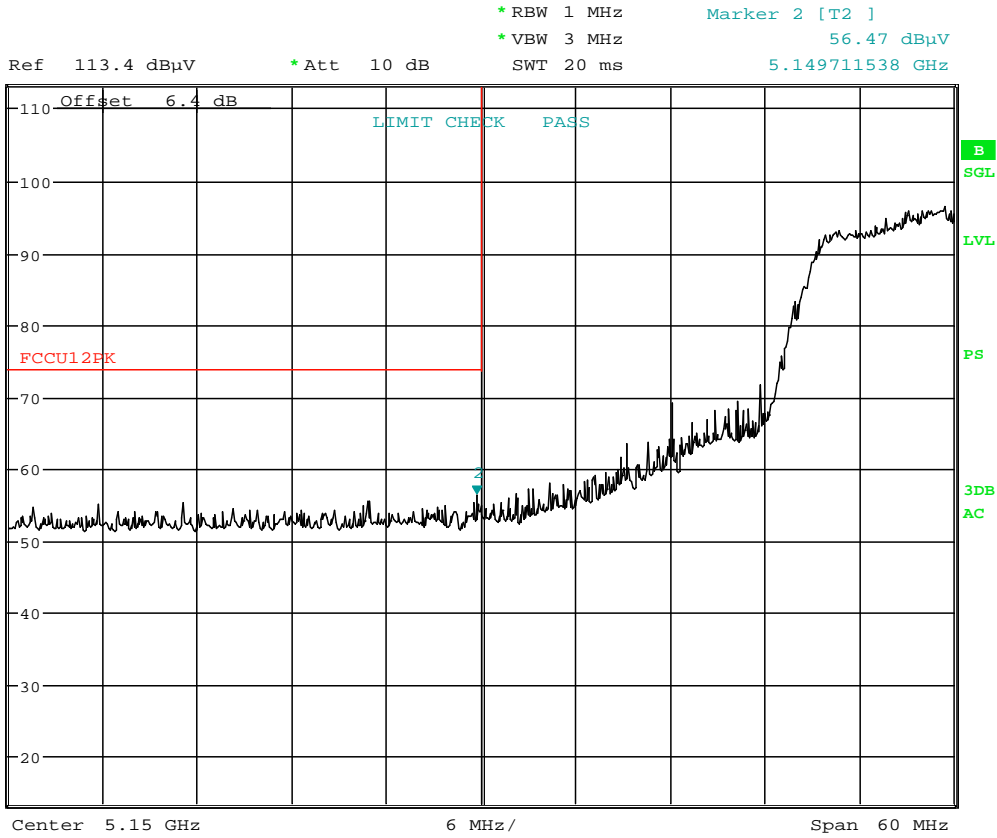
Date: 23.JAN.2017 11:48:02

Plot 7-235. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 201 of 251	

MIMO Radiated Band Edge Measurements (20MHz BW)

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Date: 23.JAN.2017 11:48:16

Plot 7-236. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)

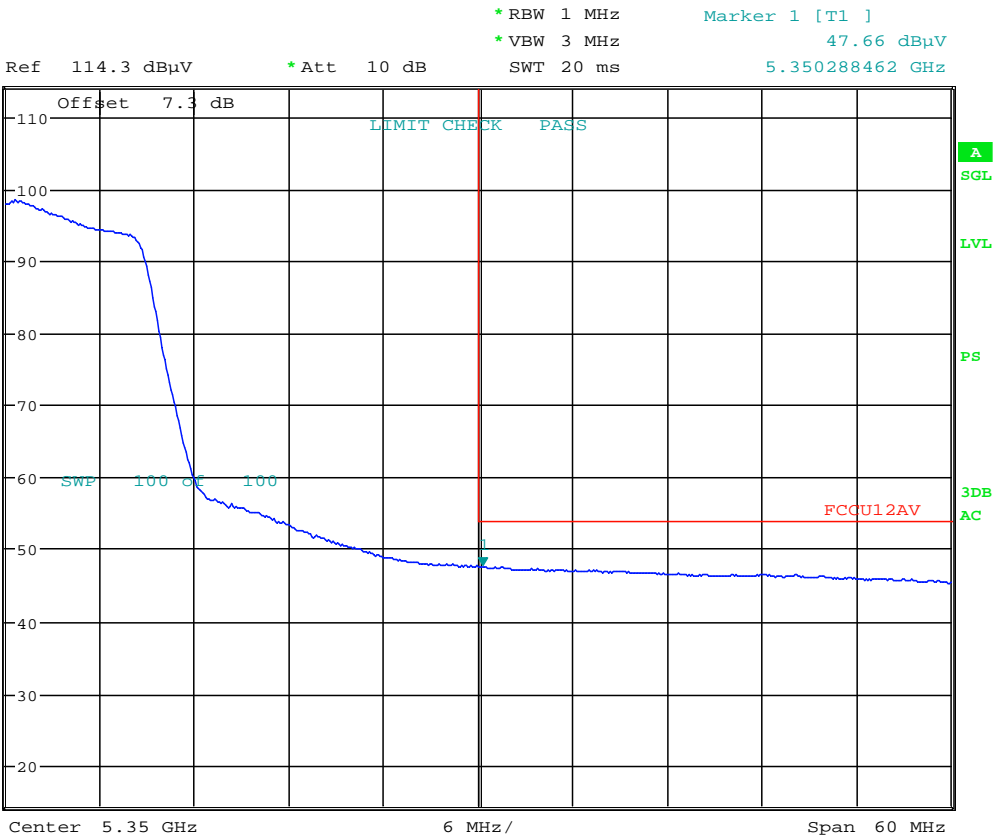
FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 202 of 251	

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

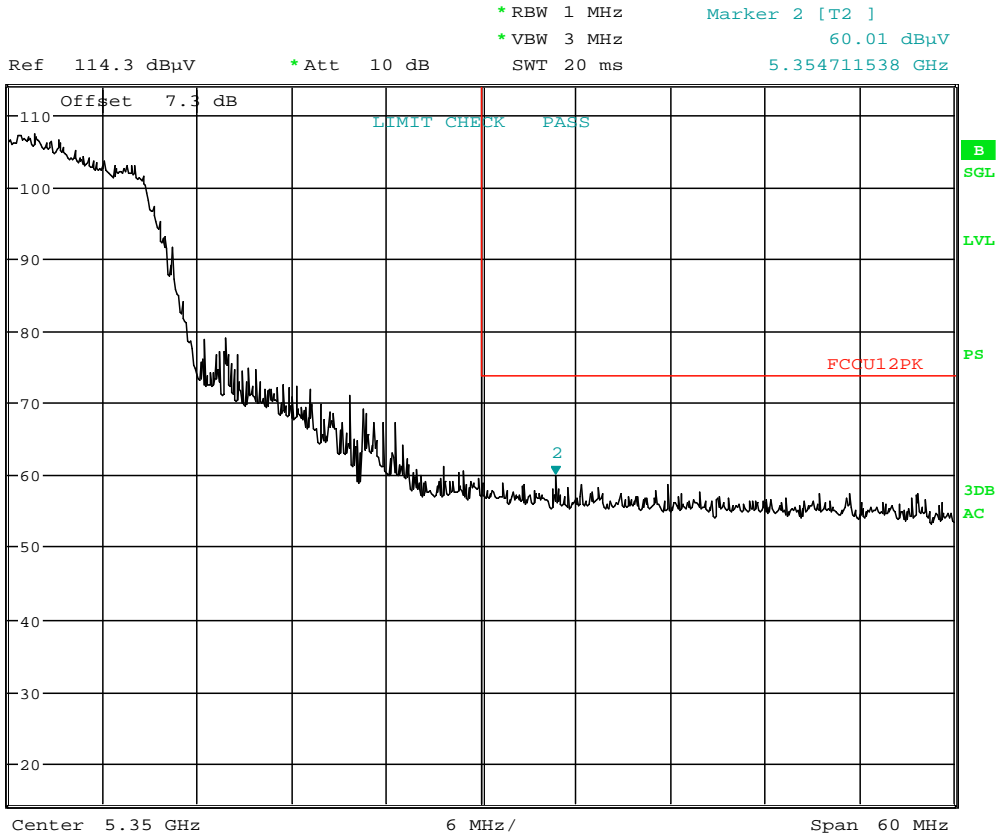


Date: 23.JAN.2017 12:10:59

Plot 7-237. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 203 of 251	

MIMO Radiated Band Edge Measurements (20MHz BW)
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Date: 23.JAN.2017 12:11:11

Plot 7-238. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

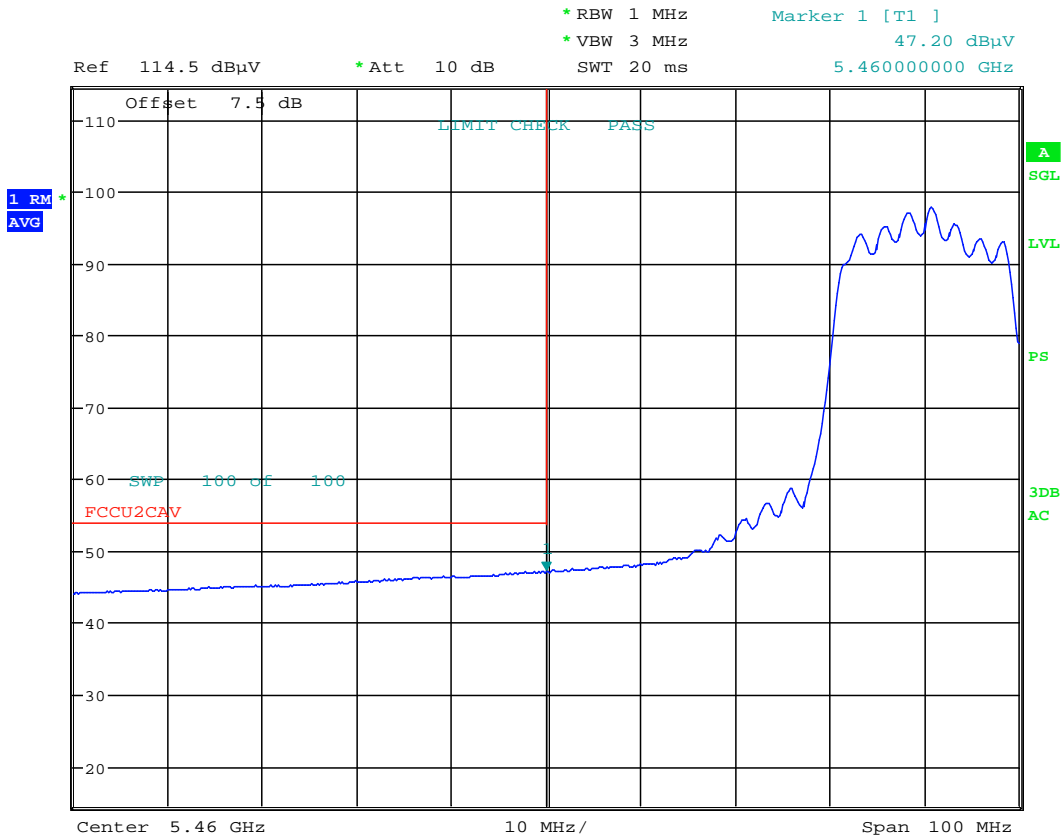
FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 204 of 251	

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

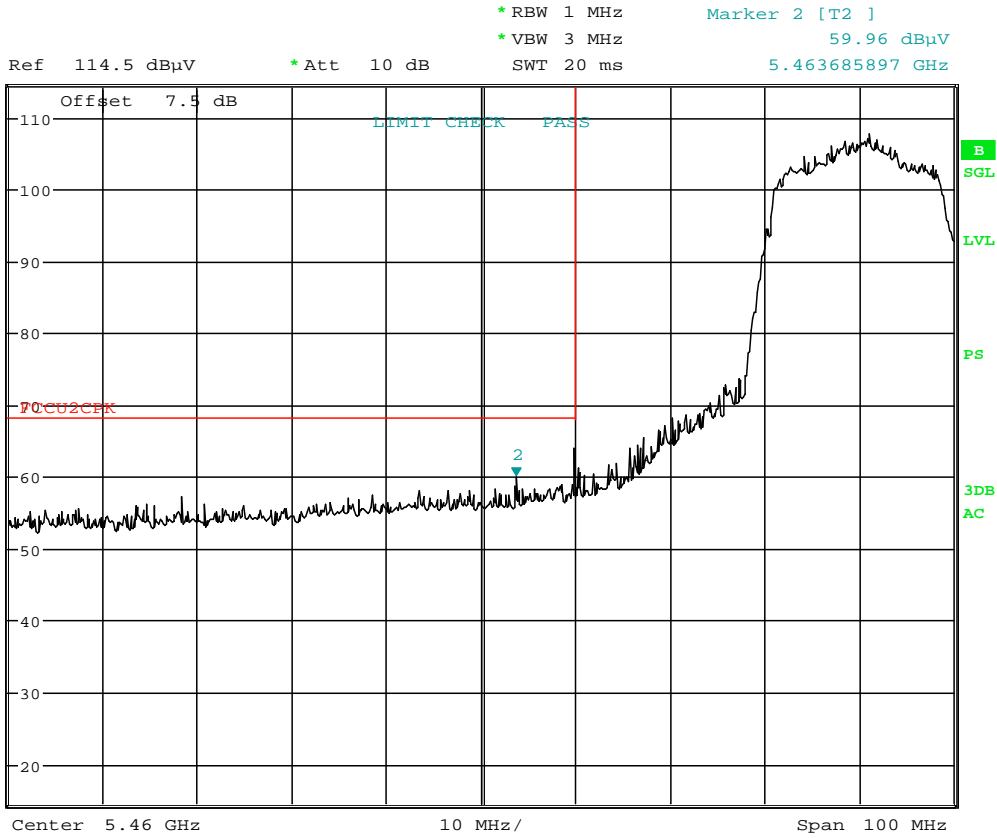


Date: 1.FEB.2017 12:06:02

Plot 7-239. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset		Page 205 of 251

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



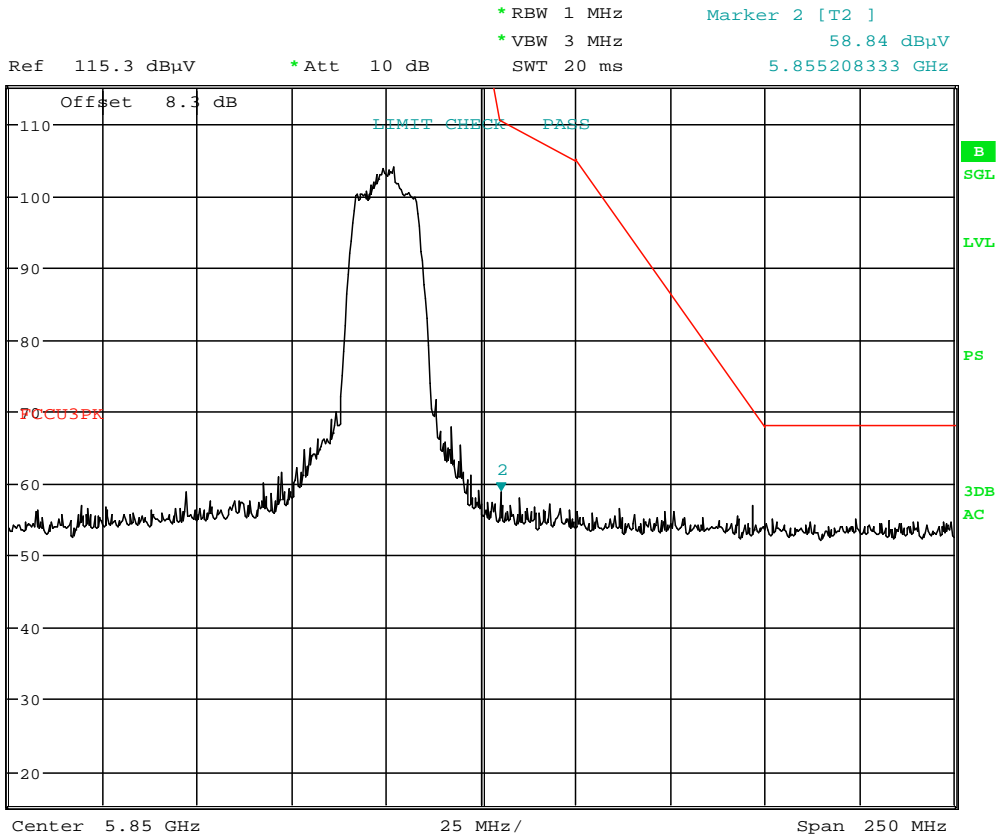
Date: 23.JAN.2017 12:31:46

Plot 7-240. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 206 of 251	

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



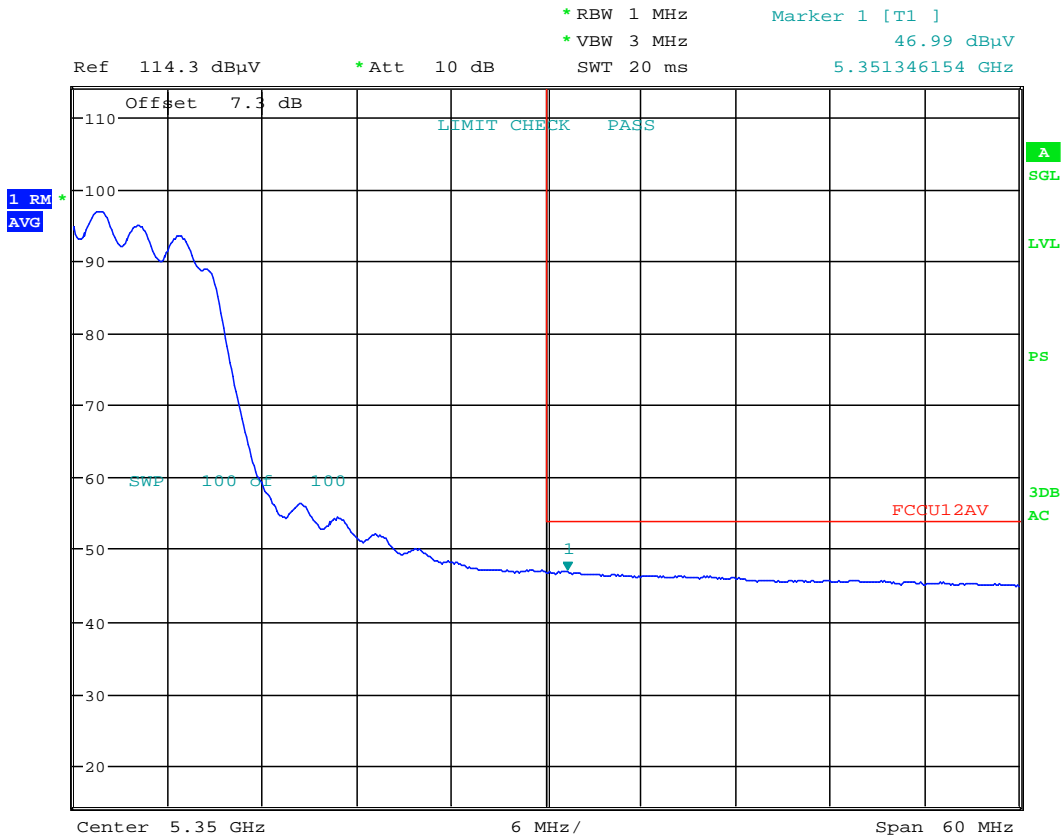
Date: 23.JAN.2017 12:44:52

Plot 7-241. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 207 of 251	

MIMO WCP Radiated Band Edge Measurements (20MHz BW)
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Worst Case Mode: 802.11n (20MHz)
 Worst Case Transfer Rate: MCS8
 Distance of Measurements: 3 Meters
 Operating Frequency: 5320MHz
 Channel: 64

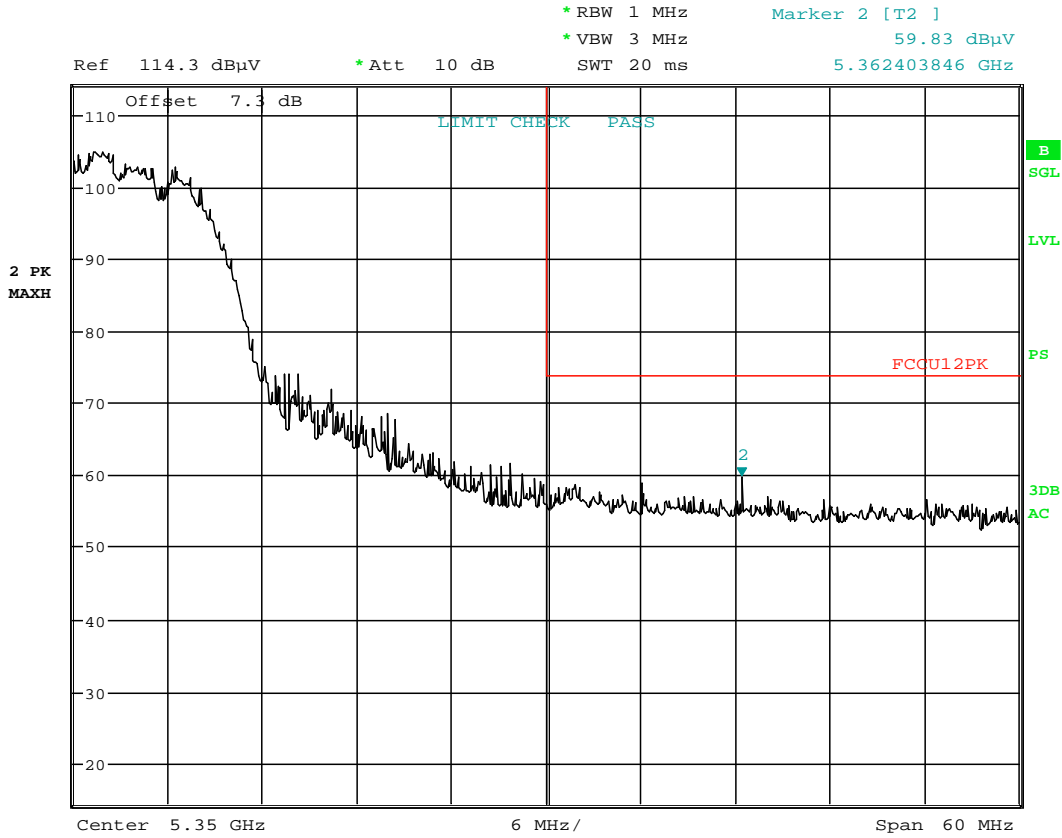


Date: 1.FEB.2017 11:45:36

Plot 7-242. Radiated Restricted Band Edge Plot with WCP



FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset		Page 208 of 251

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



Date: 1.FEB.2017 11:46:00

Plot 7-243. Radiated Restricted Band Edge Plot with WCP

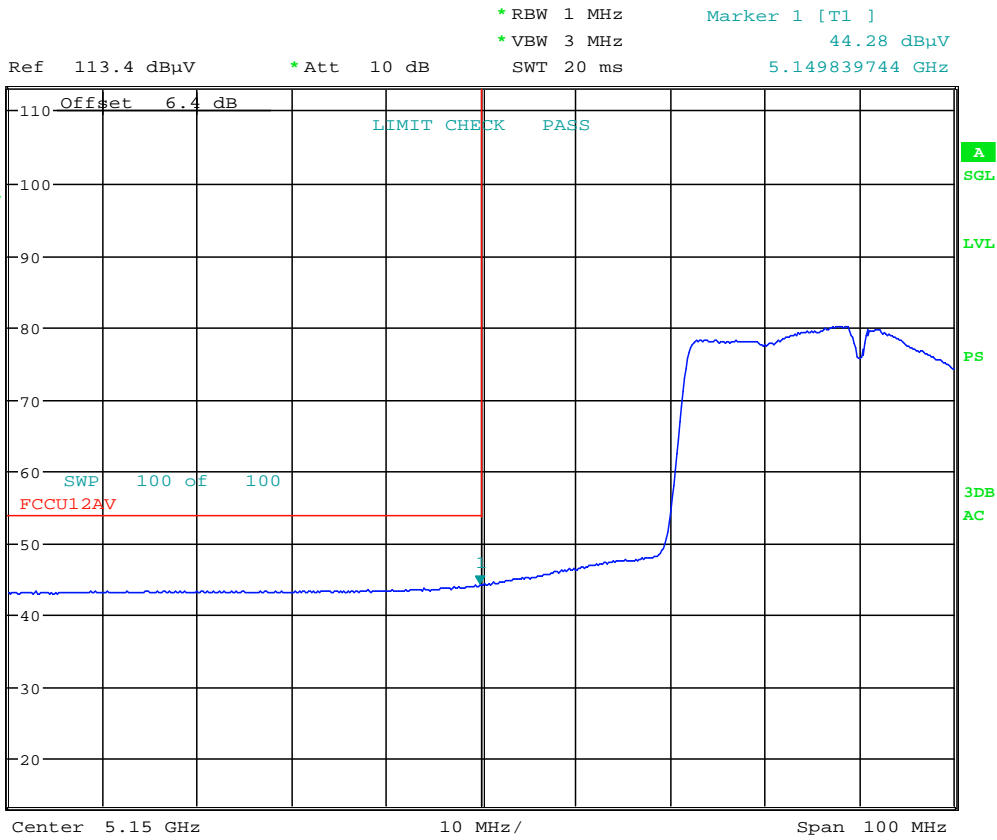
FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 209 of 251	

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7.7.11 MIMO Radiated Band Edge Measurements (40MHz BW)
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Worst Case Mode: 802.11n (40MHz)
 Worst Case Transfer Rate: MCS8
 Distance of Measurements: 3 Meters
 Operating Frequency: 5190MHz
 Channel: 38

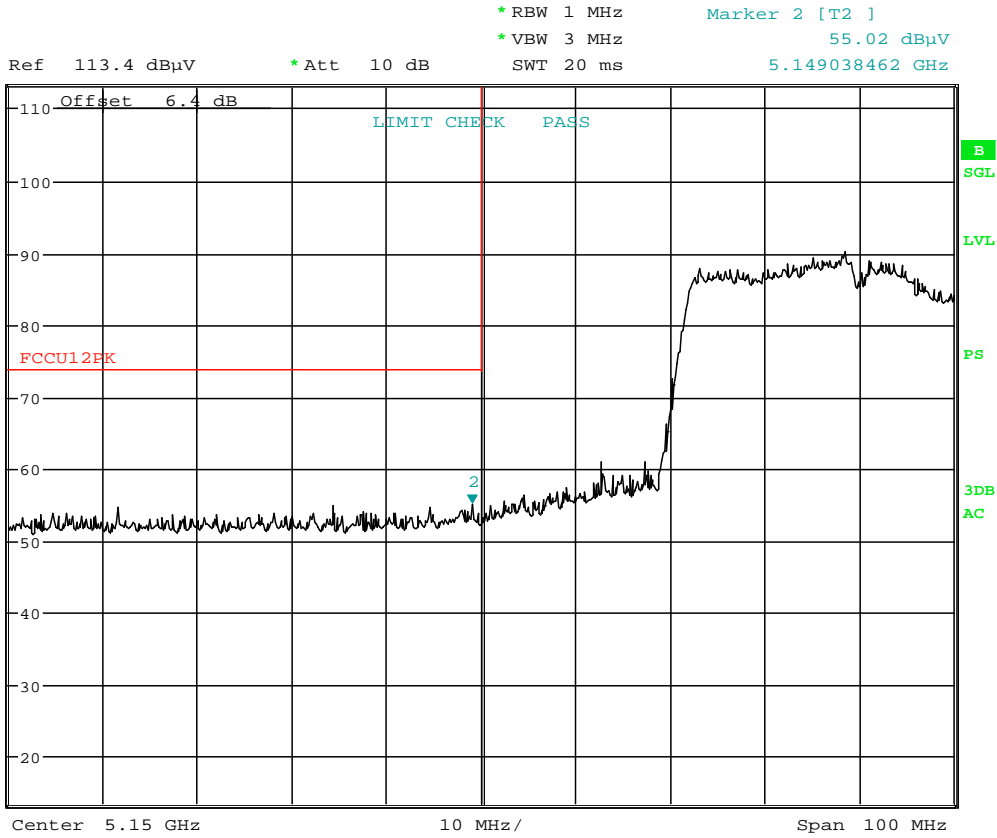


Date: 23.JAN.2017 11:52:59

Plot 7-244. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 210 of 251	

MIMO Radiated Band Edge Measurements (40MHz BW)
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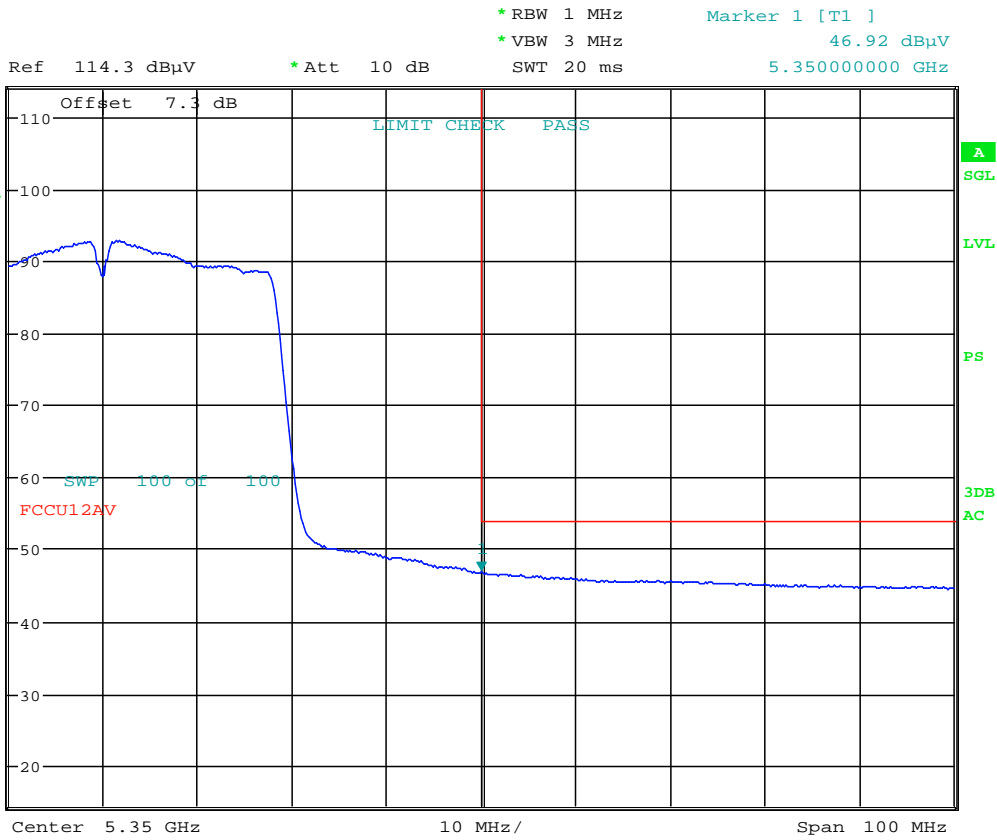
Date: 23.JAN.2017 11:53:39

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

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 211 of 251	

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

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

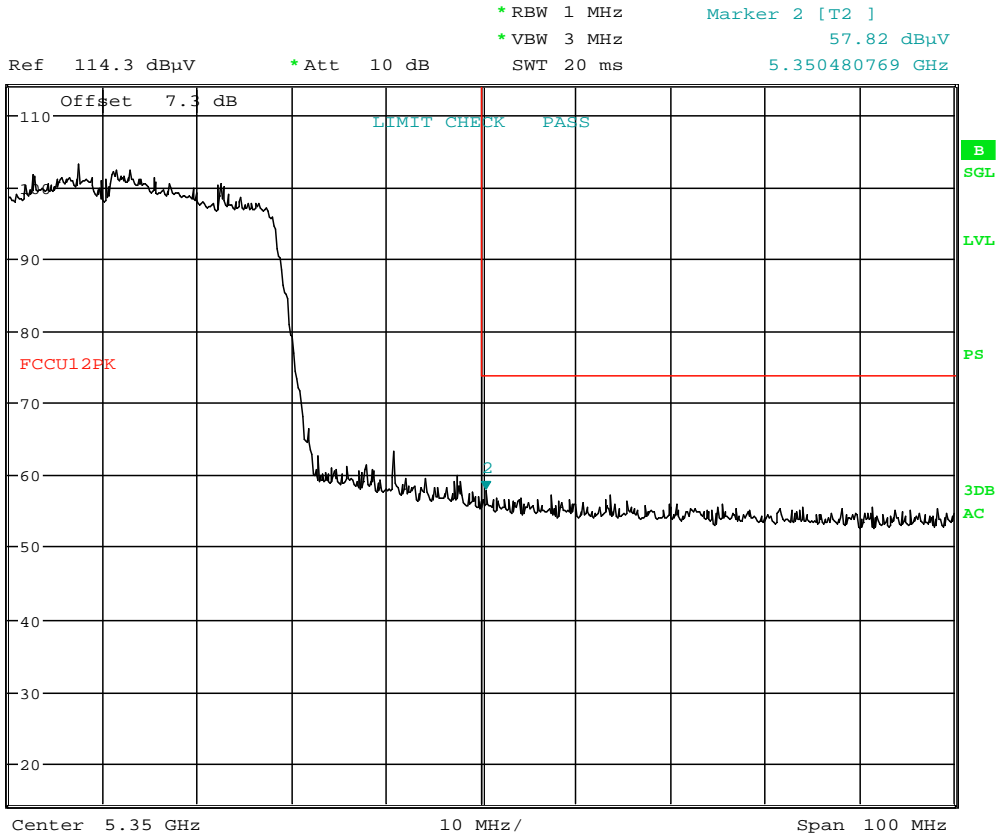


Date: 23.JAN.2017 12:13:43

Plot 7-246. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 212 of 251	

MIMO Radiated Band Edge Measurements (40MHz BW)
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Date: 23.JAN.2017 12:13:53

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

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 213 of 251	

MIMO Radiated Band Edge Measurements (40MHz BW)

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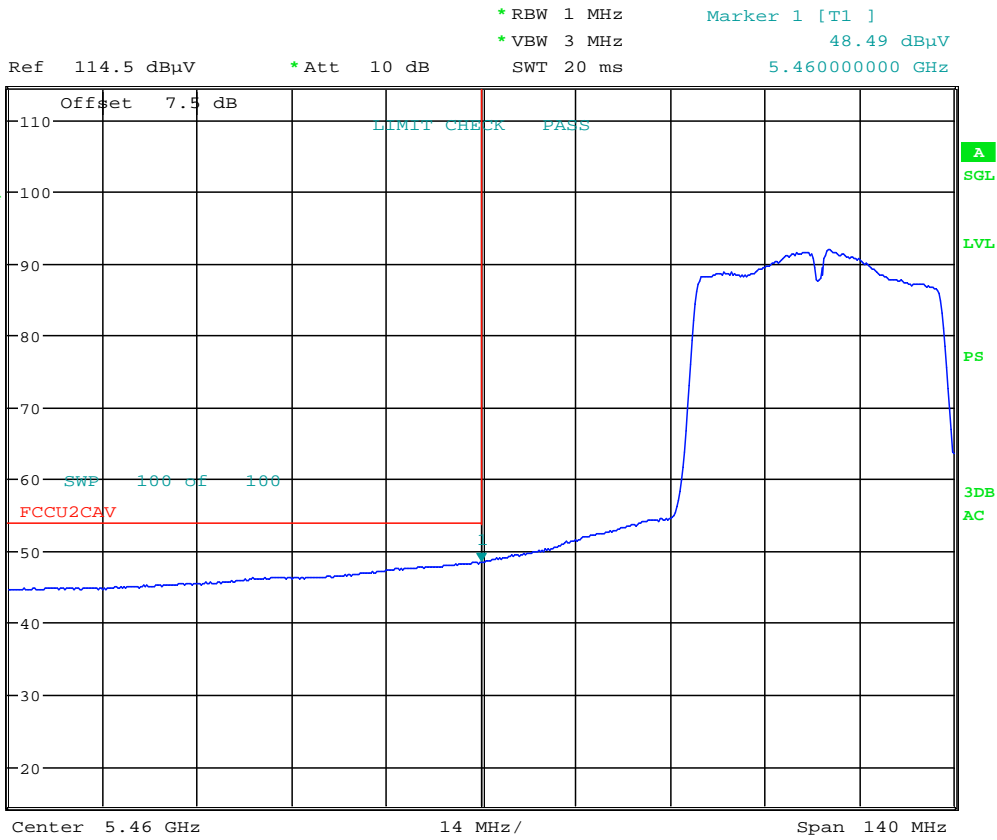
Worst Case Mode: 802.11n (40MHz)

Worst Case Transfer Rate: MCS8

Distance of Measurements: 3 Meters

Operating Frequency: 5510MHz

Channel: 102

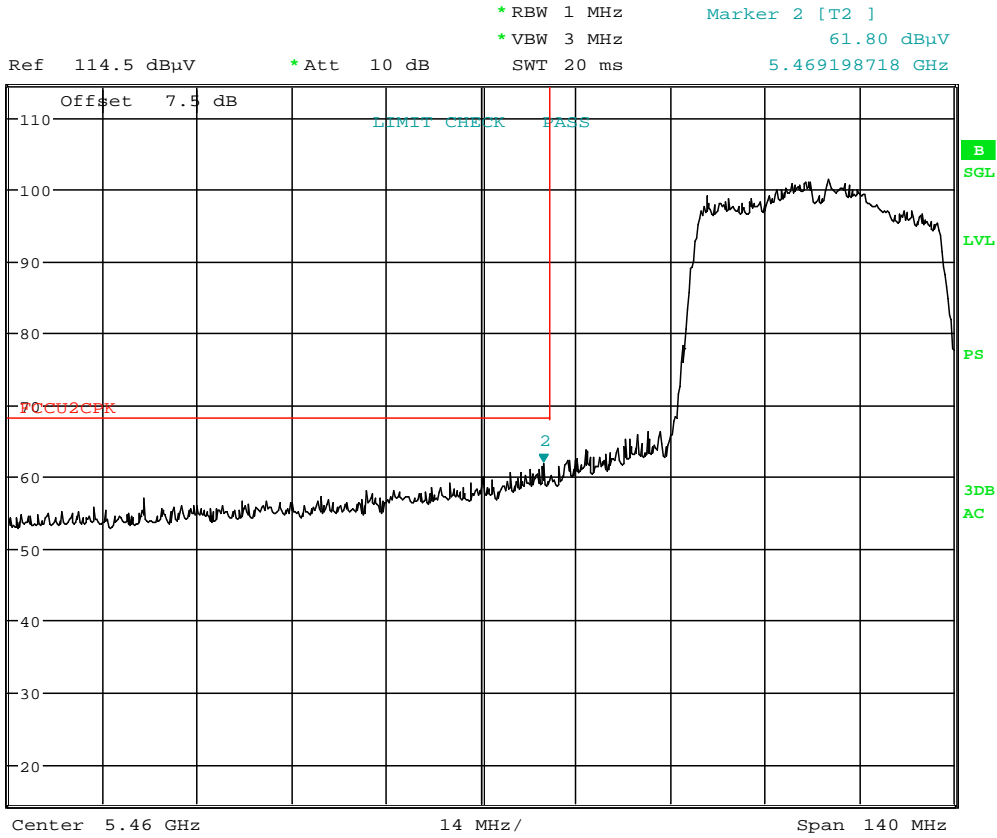


Date: 23.JAN.2017 12:33:46

Plot 7-248. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 214 of 251	

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



Date: 23.JAN.2017 12:34:10

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

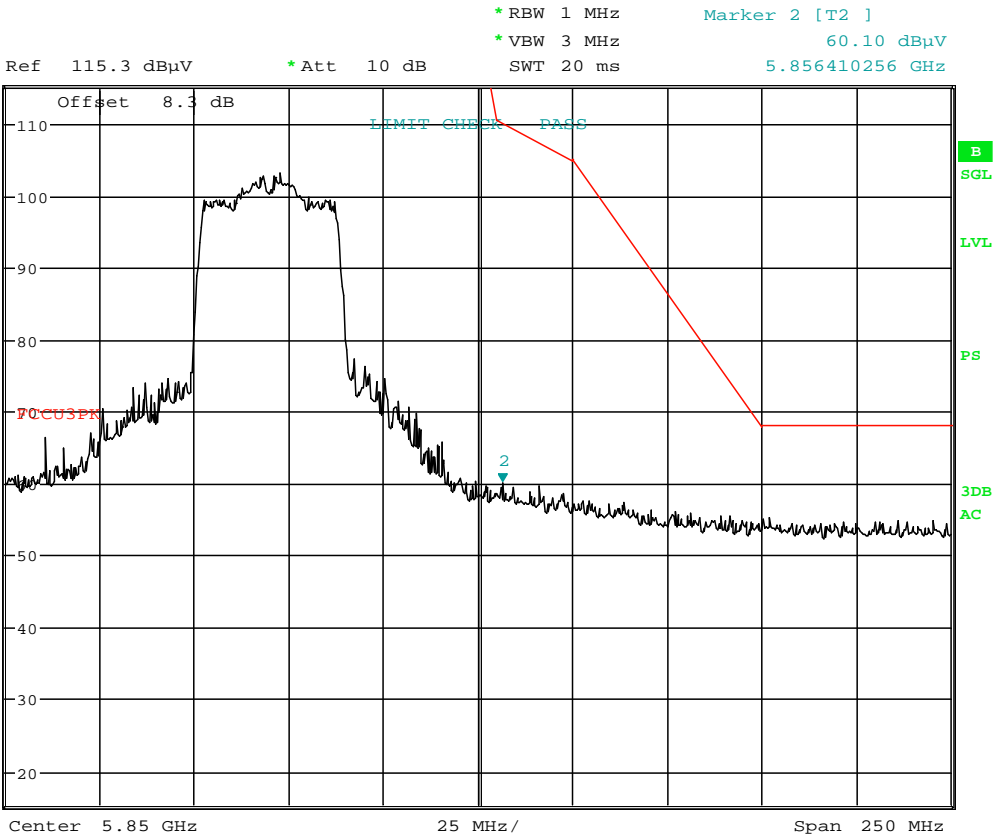
FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 215 of 251	

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



Date: 23.JAN.2017 12:49:30

Plot 7-250. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 216 of 251	

MIMO WCP Radiated Band Edge Measurements (40MHz BW)

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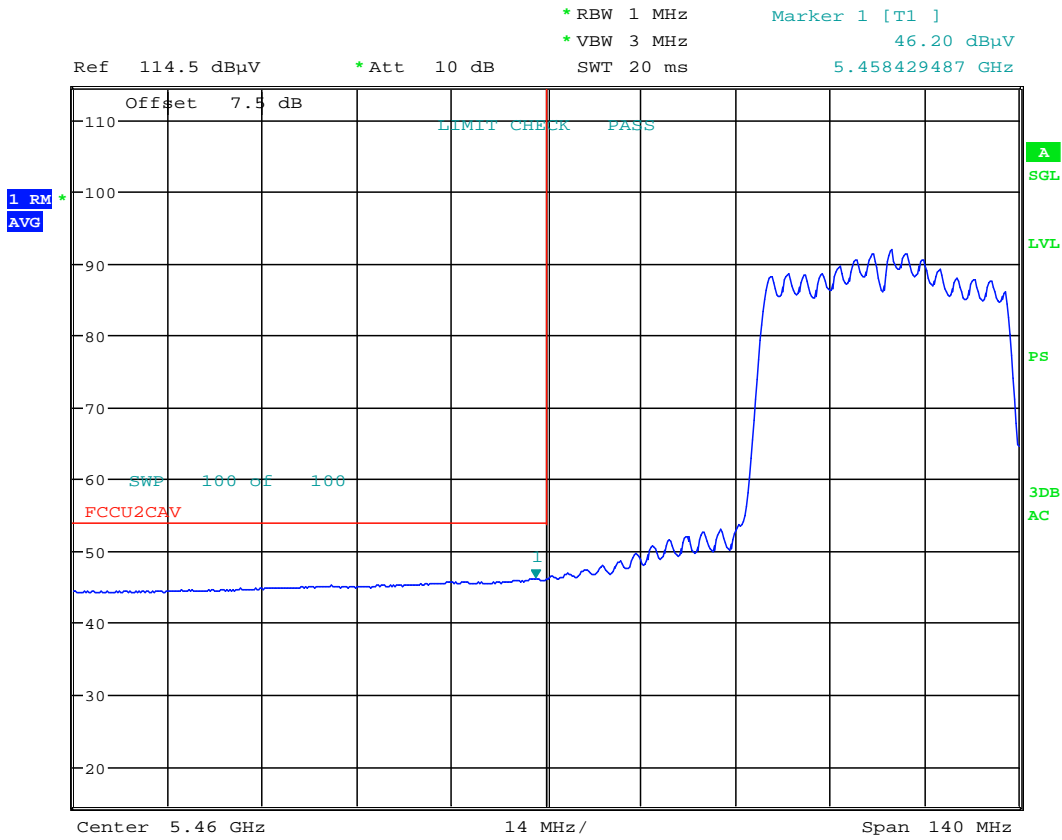
Worst Case Mode: 802.11n (40MHz)

Worst Case Transfer Rate: MCS8

Distance of Measurements: 3 Meters

Operating Frequency: 5510MHz

Channel: 102

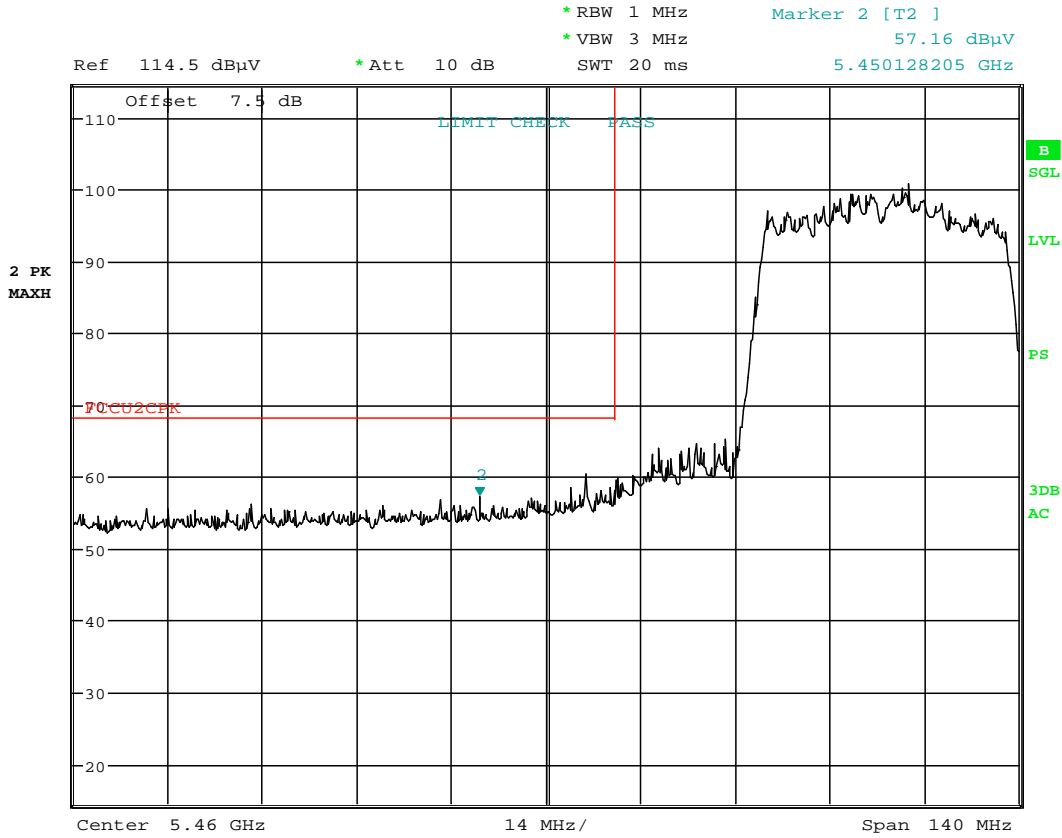


Date: 1.FEB.2017 11:51:06

Plot 7-251. Radiated Restricted Band Edge Plot with WCP



FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 217 of 251	

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



Date: 1.FEB.2017 11:51:20

Plot 7-252. Radiated Restricted Band Edge Plot with WCP

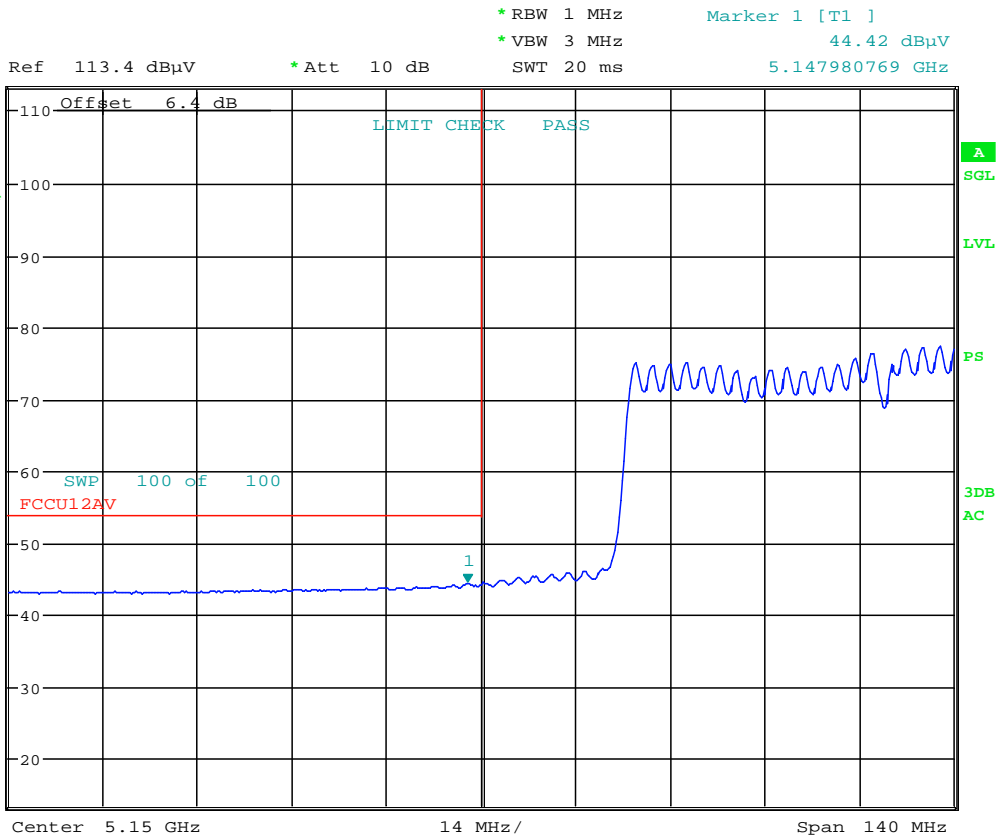
FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset		Page 218 of 251

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7.7.12 MIMO Radiated Band Edge Measurements (80MHz BW)
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Worst Case Mode: 802.11ac (80MHz)
 Worst Case Transfer Rate: MCS0
 Distance of Measurements: 3 Meters
 Operating Frequency: 5210MHz
 Channel: 42



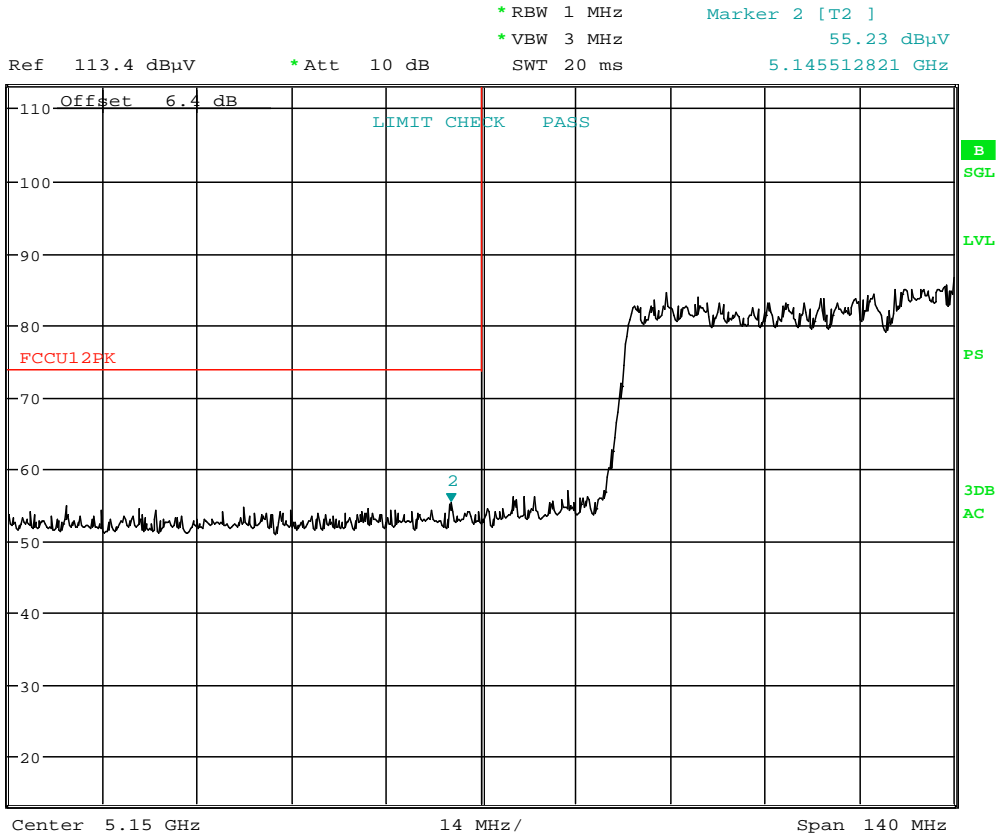
Date: 23.JAN.2017 11:58:43

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

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 219 of 251	

MIMO Radiated Band Edge Measurements (80MHz BW)

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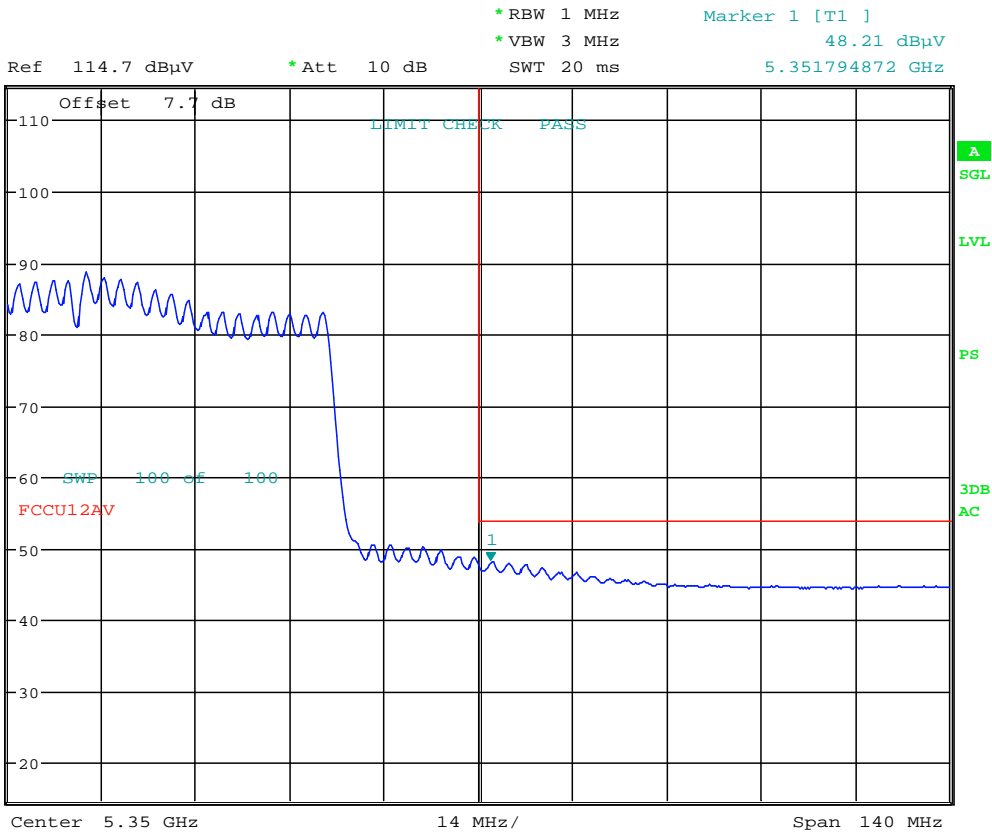
Date: 23.JAN.2017 11:58:56

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

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 220 of 251	

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

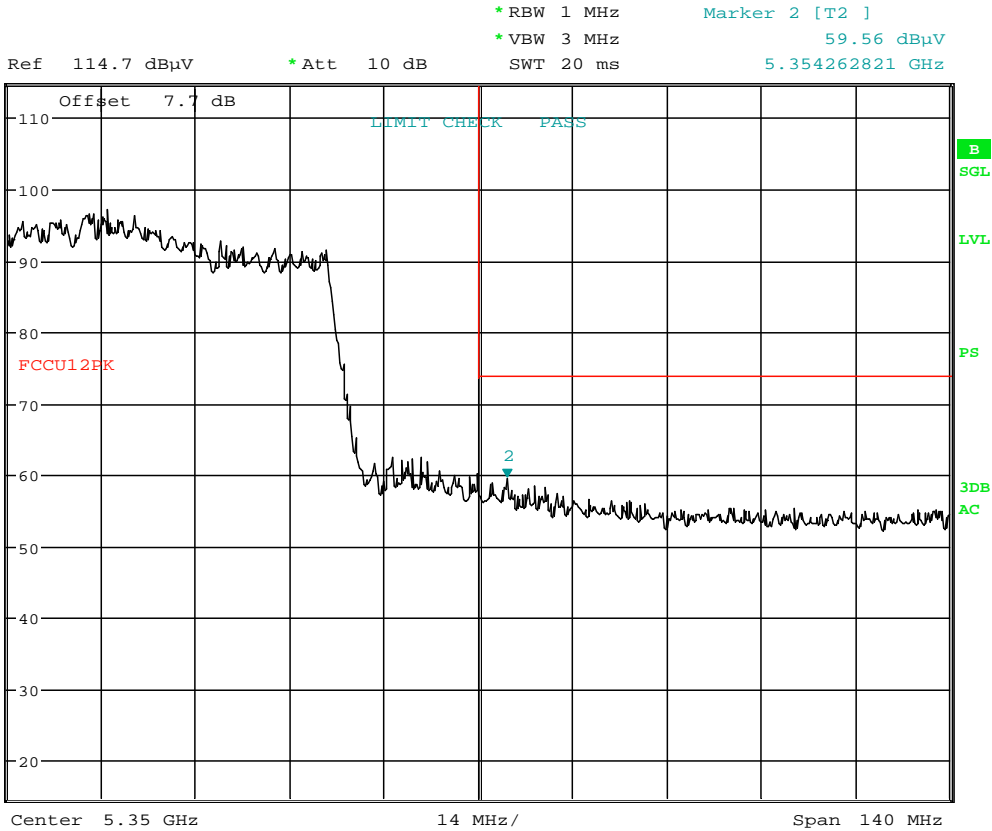


Date: 19.JAN.2017 16:47:31

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

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 221 of 251	

MIMO Radiated Band Edge Measurements (80MHz BW)
§15.407(b.1)(b.2) §15.205 §15.209



Date: 19.JAN.2017 16:47:44

Plot 7-256. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

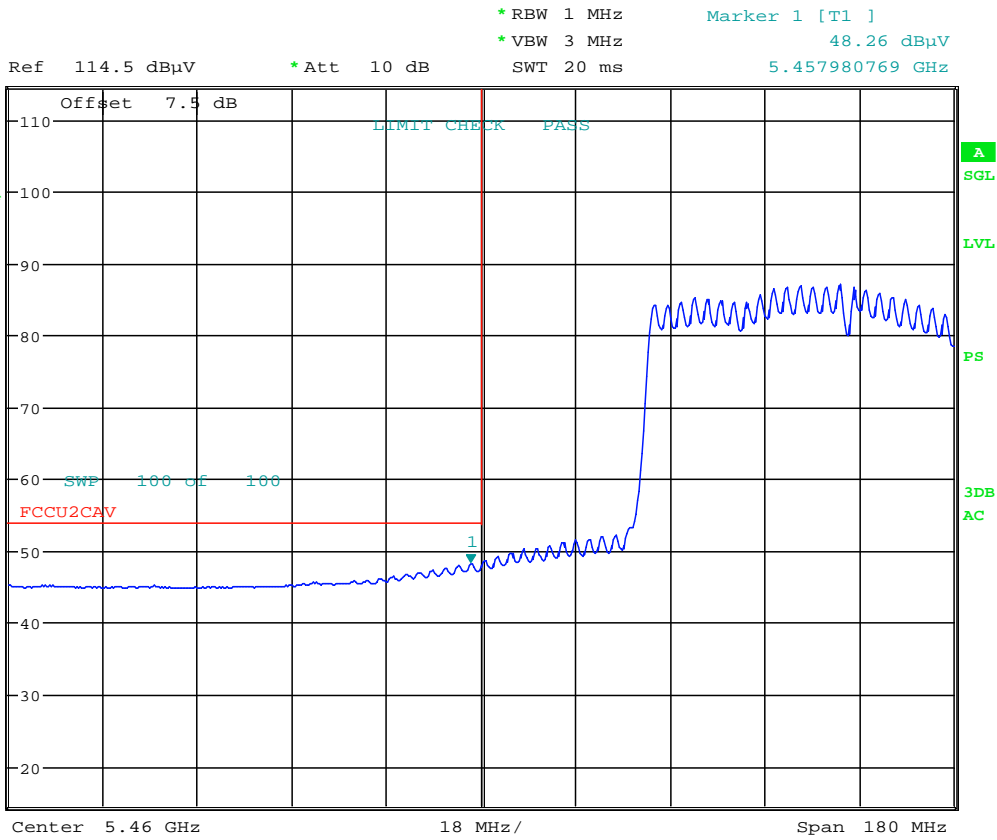
FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 222 of 251	

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

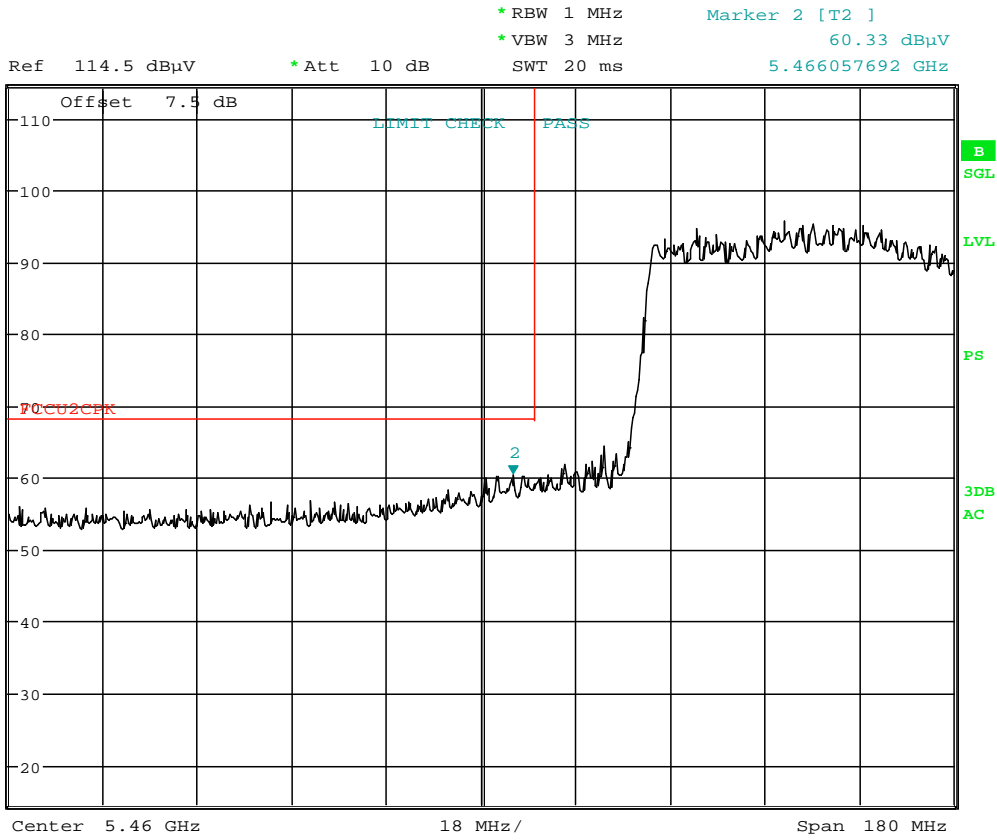


Date: 23.JAN.2017 12:38:02

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



FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 223 of 251	

MIMO Radiated Band Edge Measurements (80MHz BW)
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Date: 23.JAN.2017 12:38:38

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

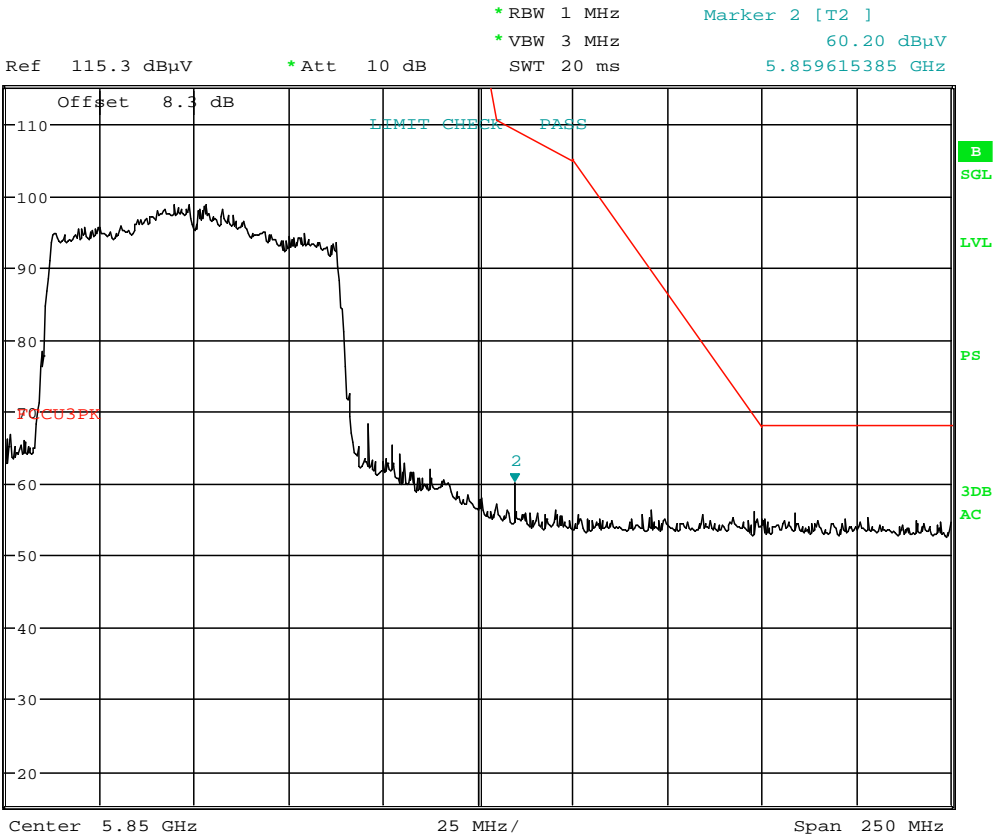
FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 224 of 251	

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



Date: 23.JAN.2017 12:50:41

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

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 225 of 251	

MIMO WCP Radiated Band Edge Measurements (80MHz BW)

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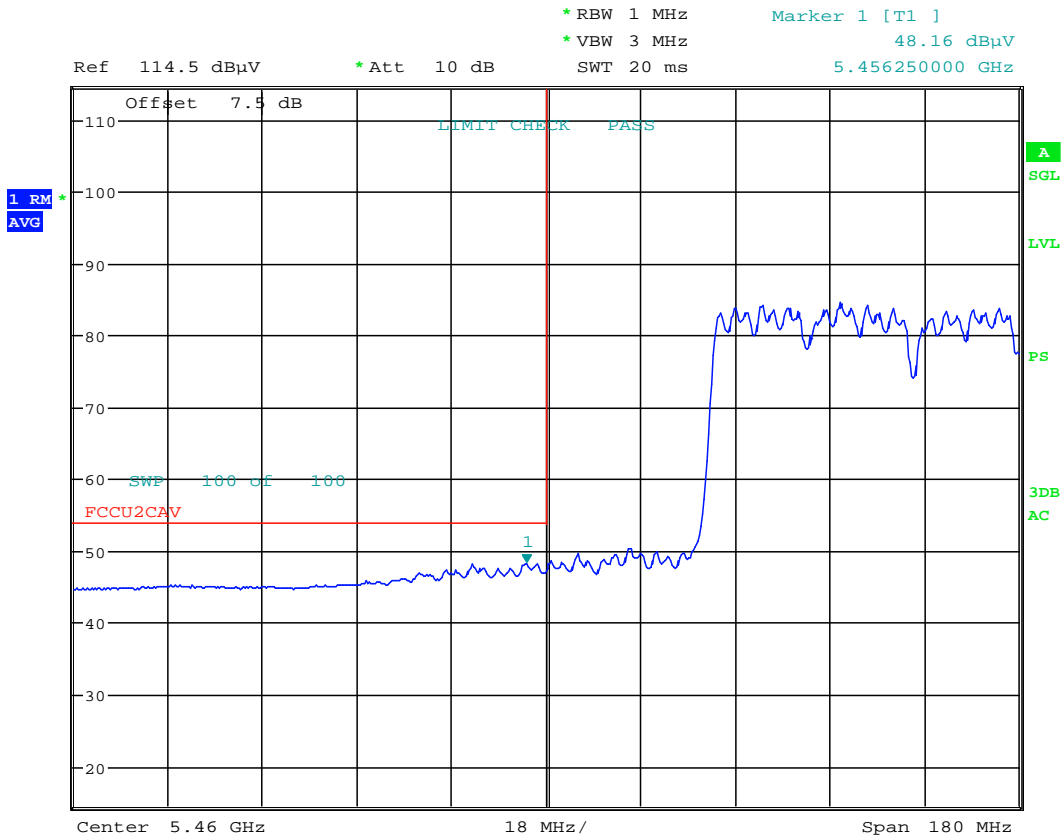
Worst Case Mode: 802.11ac (80MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5530MHz

Channel: 106

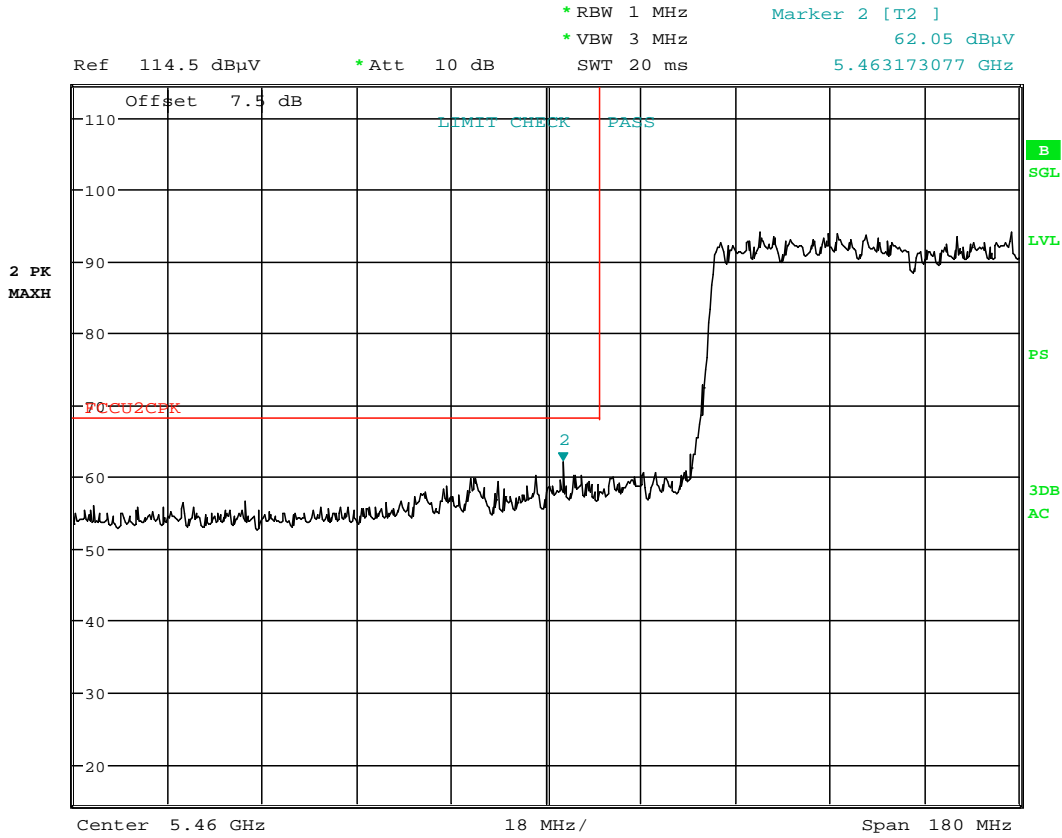


Date: 1.FEB.2017 11:56:23

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

FCC ID: ZNFLS993			FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 226 of 251		

MIMO WCP Radiated Band Edge Measurements (80MHz BW)
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Date: 1.FEB.2017 11:57:43

Plot 7-261. Radiated Restricted Band Edge Plot with WCP

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 227 of 251	

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 [$\mu\text{V/m}$]	Measured Distance [Meters]
0.009 – 0.490 MHz	2400/F (kHz)	300
0.490 – 1.705 MHz	24000/F (kHz)	30
1.705 – 30.00 MHz	30	30
30.00 – 88.00 MHz	100	3
88.00 – 216.0 MHz	150	3
216.0 – 960.0 MHz	200	3
Above 960.0 MHz	500	3

Table 7-64. 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

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 228 of 251	

Test Setup

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

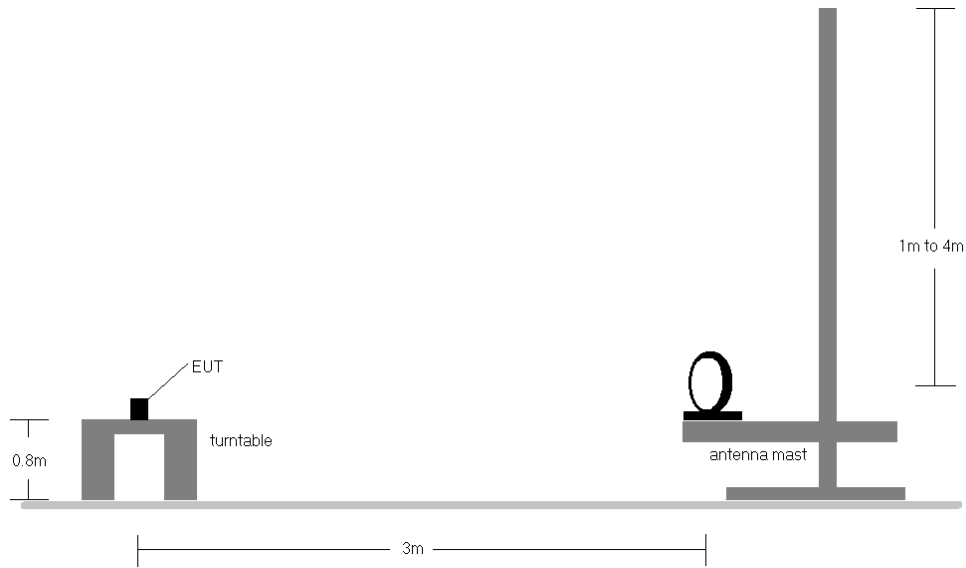


Figure 7-6. Radiated Test Setup < 30MHz

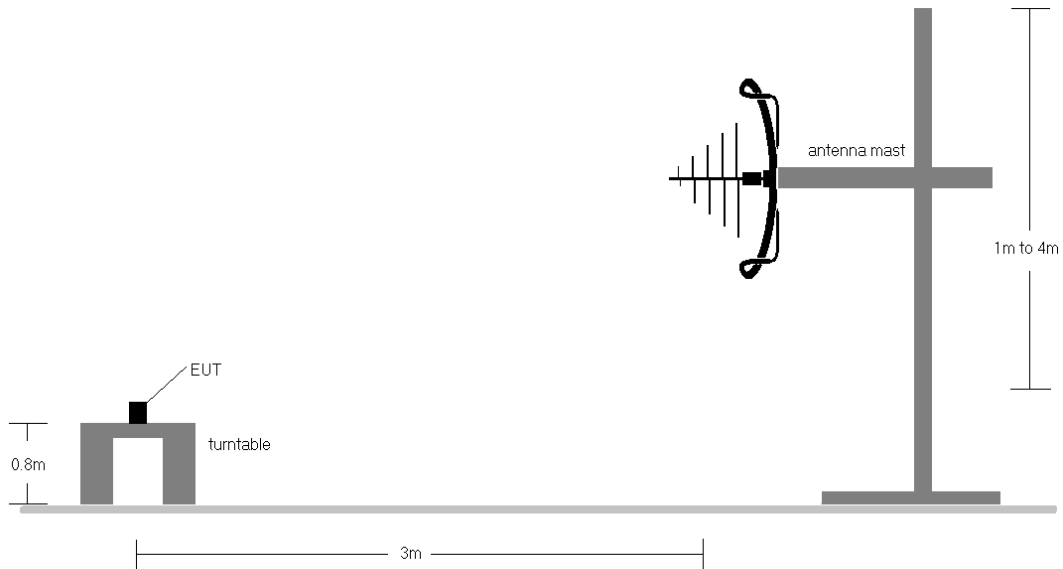





Figure 7-7. Radiated Test Setup < 1GHz

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.

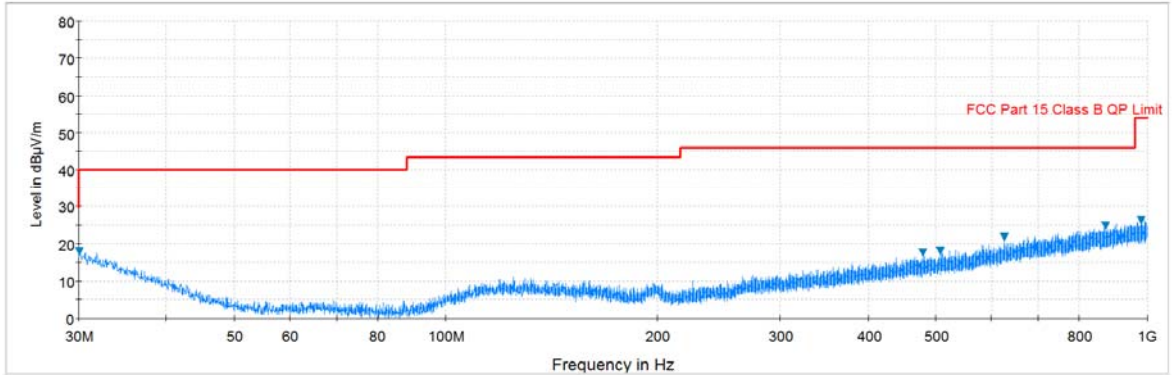
FCC ID: ZNFLS993	 PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	 LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 229 of 251	

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

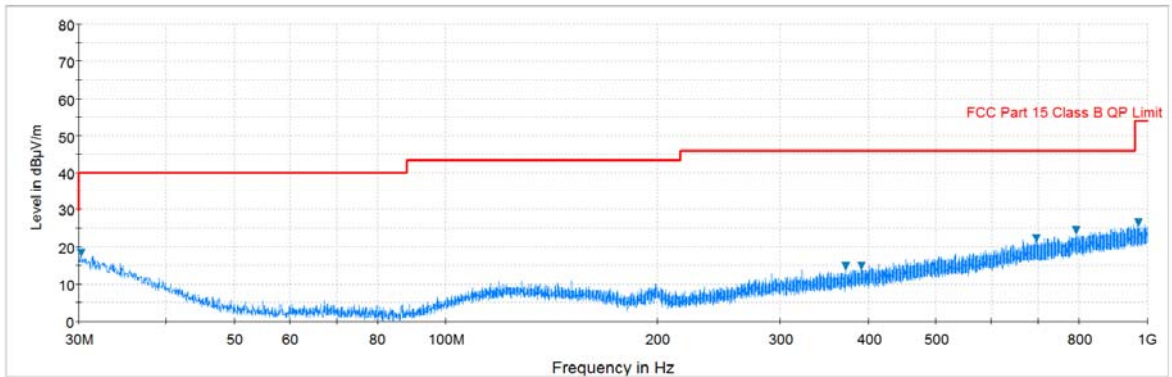
FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 230 of 251	

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


§15.209



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

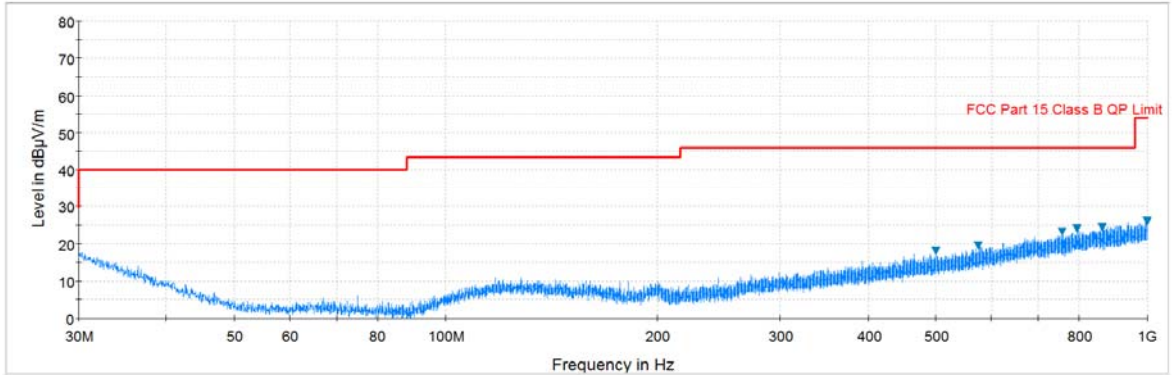


Plot 7-263. Radiated Spurious Plot below 1GHz (802.11a – U3 Ch. 157, Ant. Pol. V)

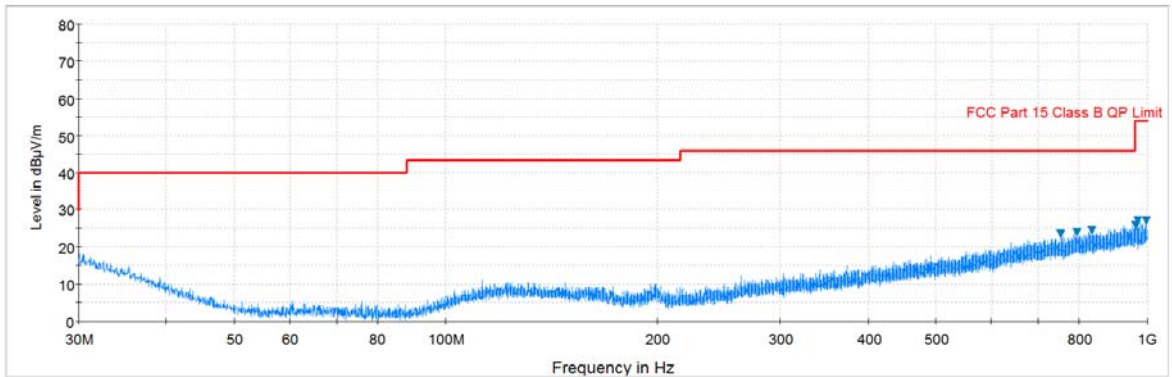
FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 231 of 251	

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. H)



Plot 7-265. Radiated Spurious Plot below 1GHz (802.11a – U3 Ch. 157, Ant. Pol. V)

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 232 of 251	

7.9 Line-Conducted Test Data

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

Table 7-65. 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

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 233 of 251	

Test Setup

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

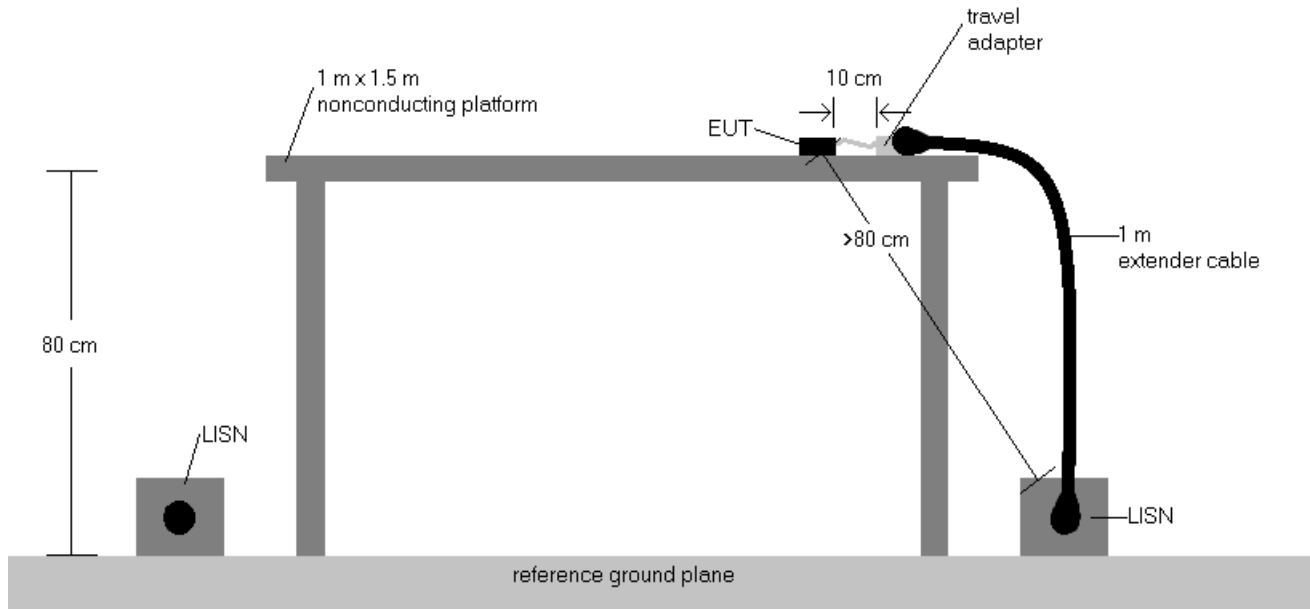




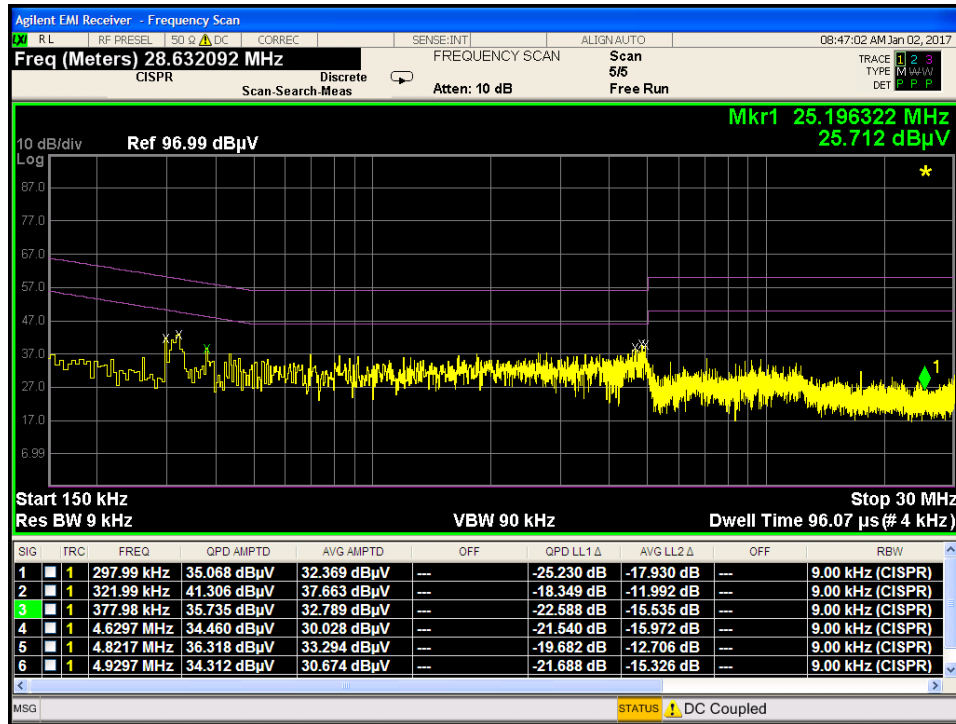
Figure 7-8. Test Instrument & Measurement Setup

Test Notes

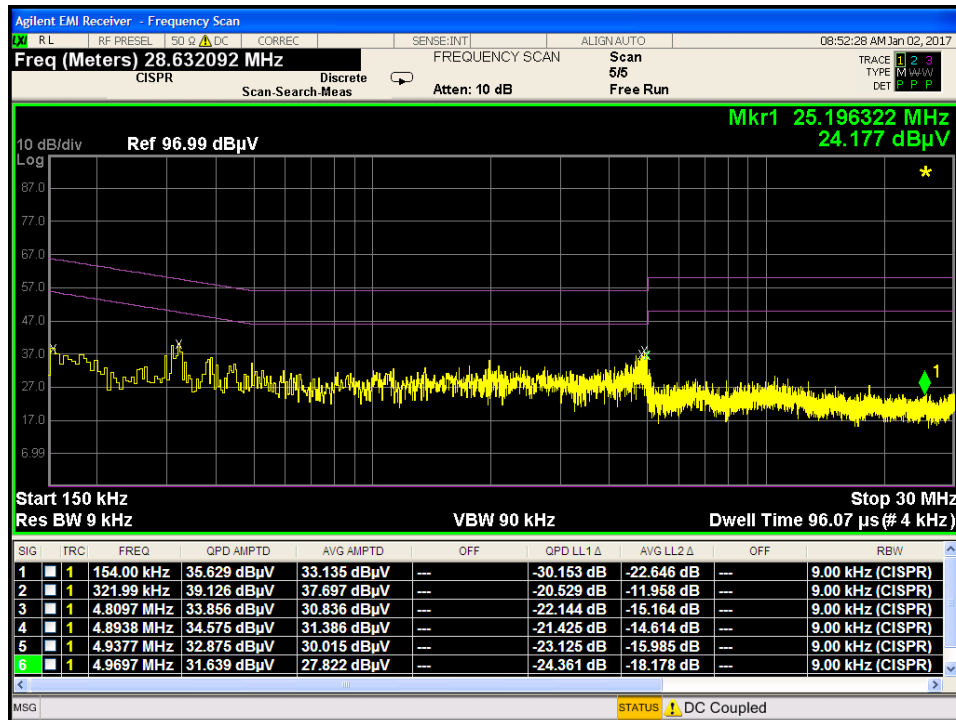
1. All modes of operation were investigated and the worst-case emissions are reported using mid channel. The emissions found were not affected by the choice of channel used during testing.
2. The limit for an intentional radiator from 150kHz to 30MHz are specified in 15.207.
3. $\text{Corr. (dB)} = \text{Cable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

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Line-Conducted Test Data
§15.407



Plot 7-266. Line Conducted Plot with 802.11a UNII Band 1 (L1)

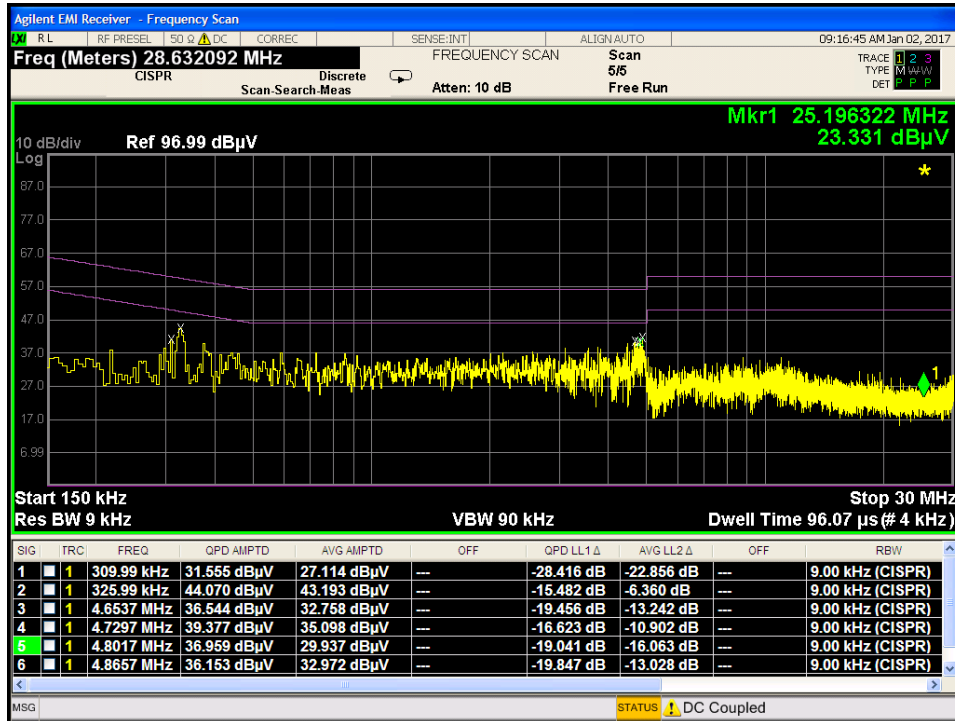


Plot 7-267. Line Conducted Plot with 802.11a UNII Band 1 (N)

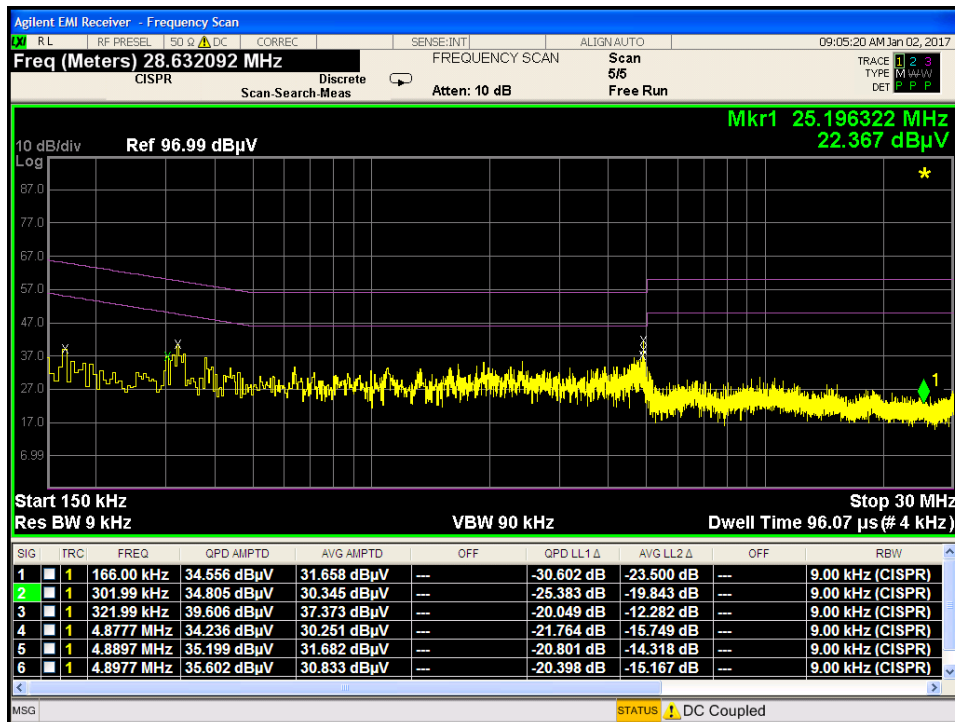
FCC ID: ZNFLS993	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 235 of 251	

Line-Conducted Test Data

\$15.407



Plot 7-268. Line Conducted Plot with 802.11a UNII Band 2A (L1)

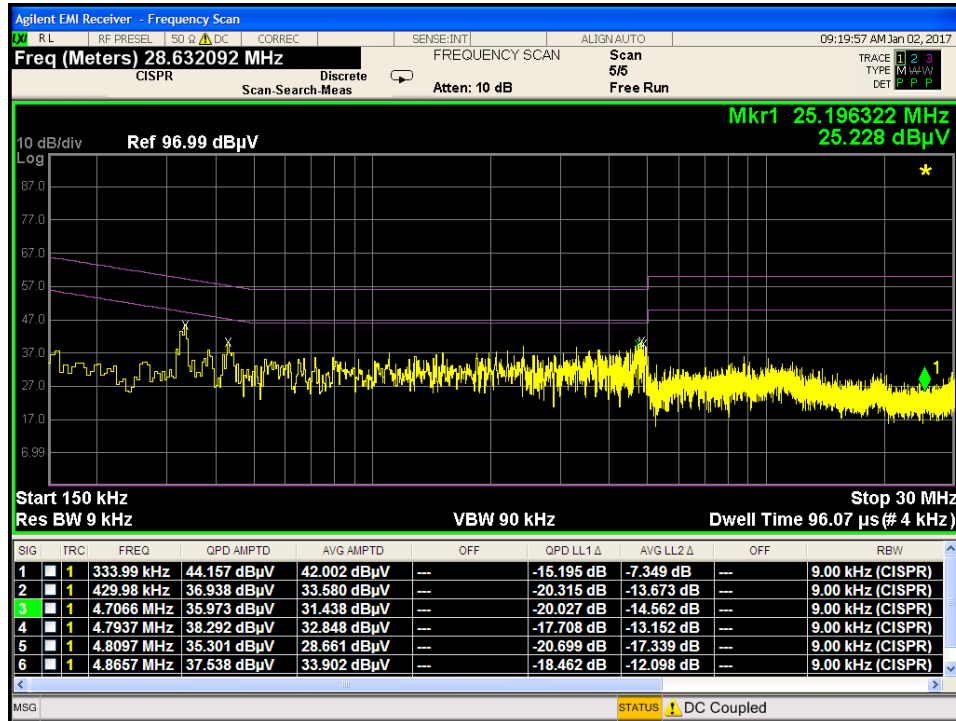


Plot 7-269. Line Conducted Plot with 802.11a UNII Band 2A (N)

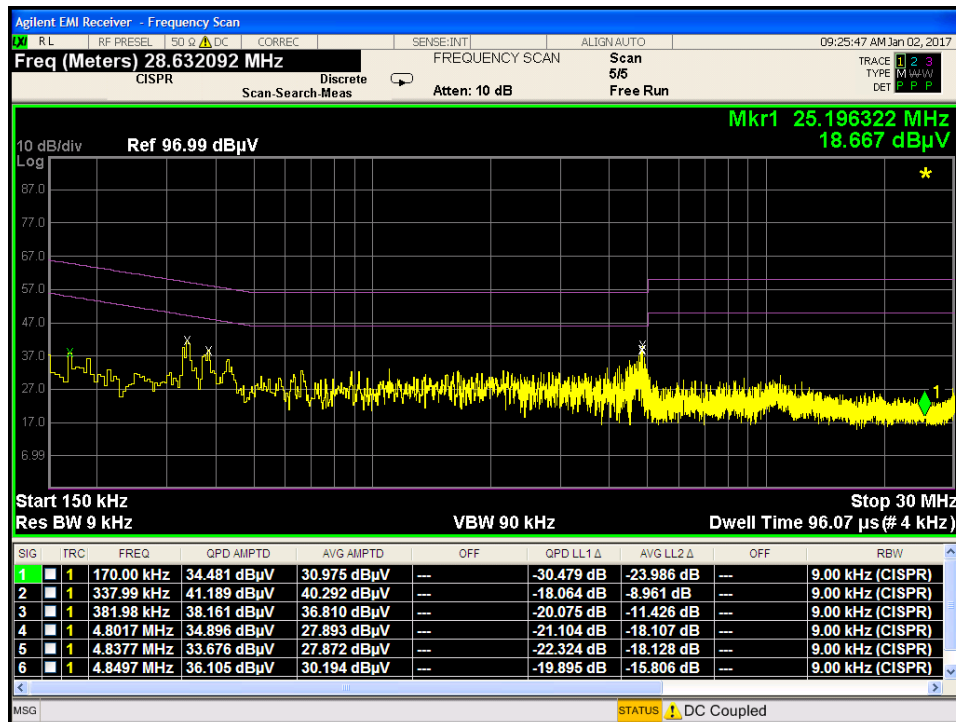
FCC ID: ZNFLS993			FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset			Page 236 of 251

Line-Conducted Test Data

\$15.407



Plot 7-270. Line Conducted Plot with 802.11a UNII Band 2C (L1)

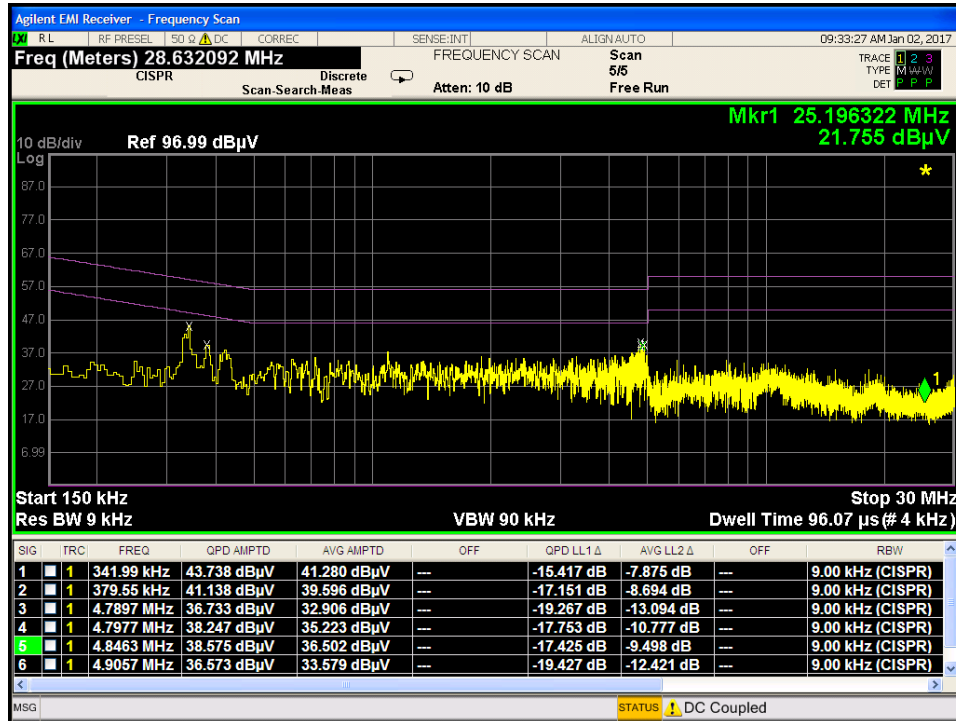


Plot 7-271. Line Conducted Plot with 802.11a UNII Band 2C (N)

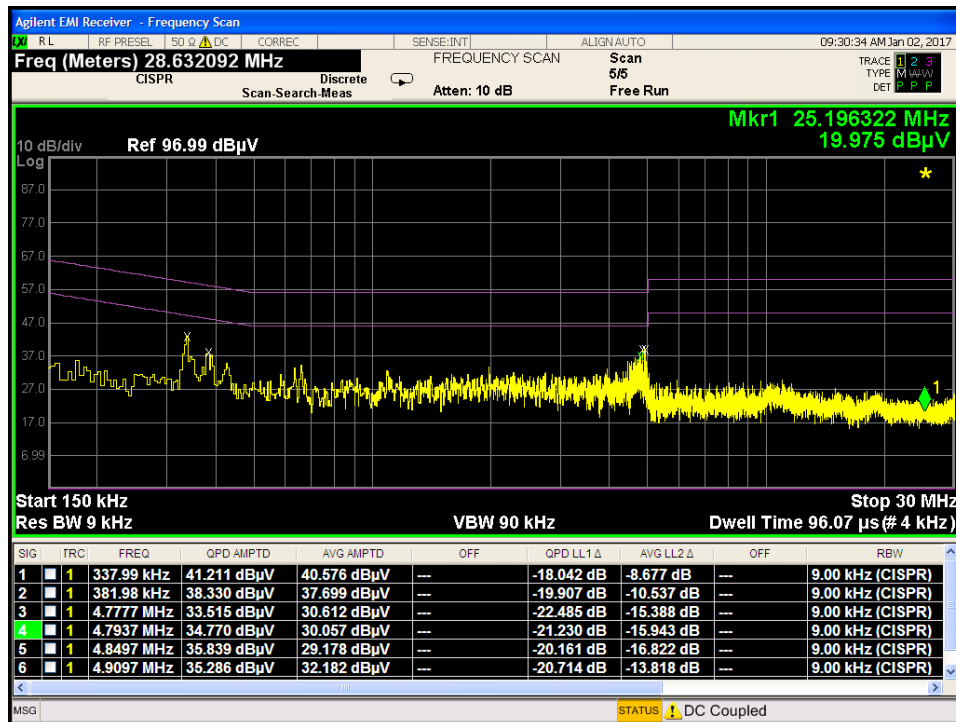
FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset		Page 237 of 251

Line-Conducted Test Data

\$15.407



Plot 7-272. Line Conducted Plot with 802.11a UNII Band 3 (L1)



Plot 7-273. Line Conducted Plot with 802.11a UNII Band 3 (N)

FCC ID: ZNFLS993			FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 238 of 251		

APPENDIX A. 802.11A DUAL TX



A.1 Summary

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
TRANSMITTER MODE (TX)					
15.407 (a.1)	Maximum Conducted Output Power	Maximum conducted powers must meet limits detailed in 15.407(a)	CONDUCTED	PASS	Section A.2
15.407 (a.1), (5)	Maximum Power Spectral Density	Maximum power spectral density must meet the limits detailed in 15.407(a)		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		PASS	Section A.4

Table A.1-1. Summary of Test Results

Notes:

- 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.
- 2) All data found in this section is compiled from plots found in the main body of this test report.
- 3) 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 $10\log_{10}(N_{ant}/N_{ss}) = 3\text{dB}$, 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.

Freq [MHz]	Channel	Detector	5GHz (20MHz) Conducted Power [dBm]		
			IEEE Transmission Mode		
			ANT1	ANT2	CDD
5180	36	AVG	11.91	12.08	15.01
5200	40	AVG	15.94	16.20	19.08
5220	44	AVG	16.03	16.22	19.14
5240	48	AVG	15.98	16.49	19.25
5260	52	AVG	16.01	16.25	19.14
5280	56	AVG	15.98	16.03	19.02
5300	60	AVG	15.85	16.00	18.94
5320	64	AVG	12.13	12.19	15.17
5500	100	AVG	12.23	12.17	15.21
5520	104	AVG	16.23	16.23	19.24
5540	108	AVG	16.00	16.17	19.10
5560	112	AVG	16.02	16.05	19.05
5580	116	AVG	16.14	15.91	19.04
5660	132	AVG	15.89	15.18	18.56
5680	136	AVG	15.84	15.10	18.50
5700	140	AVG	15.74	15.24	18.51
5720	144	AVG	15.87	14.87	18.41
5745	149	AVG	16.26	15.84	19.07
5785	157	AVG	16.04	15.74	18.90
5825	165	AVG	12.08	12.27	15.19

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

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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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]	Antenn-2 Power Density [dBm]	Summed CDD Power Density [dBm]	Max Permissible Power Density [dBm/MHz]	Margin [dB]	Pass / Fail
Band 1	5180	36	a	6.5/7.2 (MCS0)	2.14	3.09	5.65	11.0	-5.35	Pass
	5200	40	a	6.5/7.2 (MCS0)	6.07	6.55	9.32	11.0	-1.68	Pass
	5240	48	a	6.5/7.2 (MCS0)	6.15	6.58	9.38	11.0	-1.62	Pass
Band 2A	5260	52	a	6.5/7.2 (MCS0)	5.89	6.63	9.28	11.0	-1.72	Pass
	5280	56	a	6.5/7.2 (MCS0)	5.90	6.75	9.36	11.0	-1.64	Pass
	5320	64	a	6.5/7.2 (MCS0)	2.19	2.69	5.45	11.0	-5.55	Pass
Band 2C	5500	100	a	6.5/7.2 (MCS0)	2.41	3.56	6.03	11.0	-4.97	Pass
	5600	120	a	6.5/7.2 (MCS0)	5.98	6.80	9.42	11.0	-1.58	Pass
	5720	144	a	6.5/7.2 (MCS0)	6.01	6.01	9.02	11.0	-1.98	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]	Antenn-2 Power Density [dBm]	Summed CDD Power Density [dBm]	Max Permissible Power Density [dBm/500kHz]	Margin [dB]	Pass / Fail
Band 3	5745	149	a	6.5/7.2 (MCS0)	3.92	4.43	7.20	30.0	-22.80	Pass
	5785	157	a	6.5/7.2 (MCS0)	3.60	4.29	6.97	30.0	-23.03	Pass
	5825	165	a	6.5/7.2 (MCS0)	-0.06	0.92	3.47	30.0	-26.53	Pass

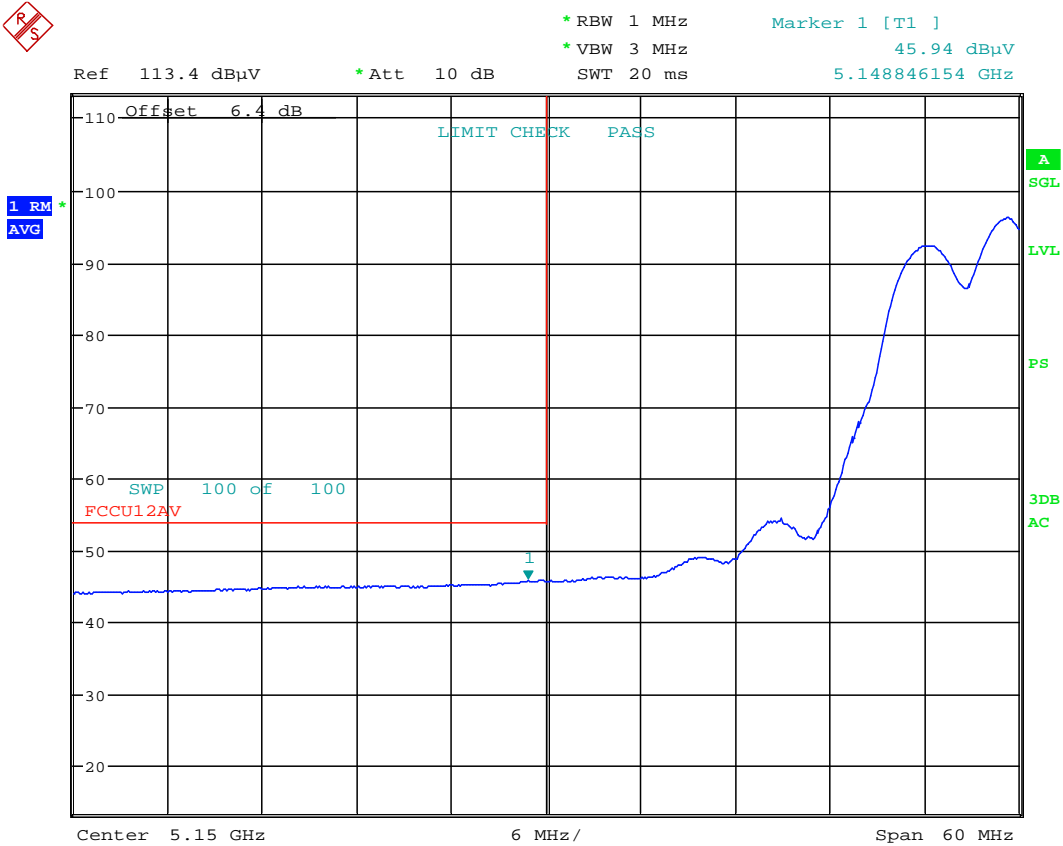
Table A3-2.802.11a Dual Tx Conducted Power Density Measurements

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		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.

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



Date: 7.FEB.2017 11:50:00

Plot A.4-1. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 242 of 251	

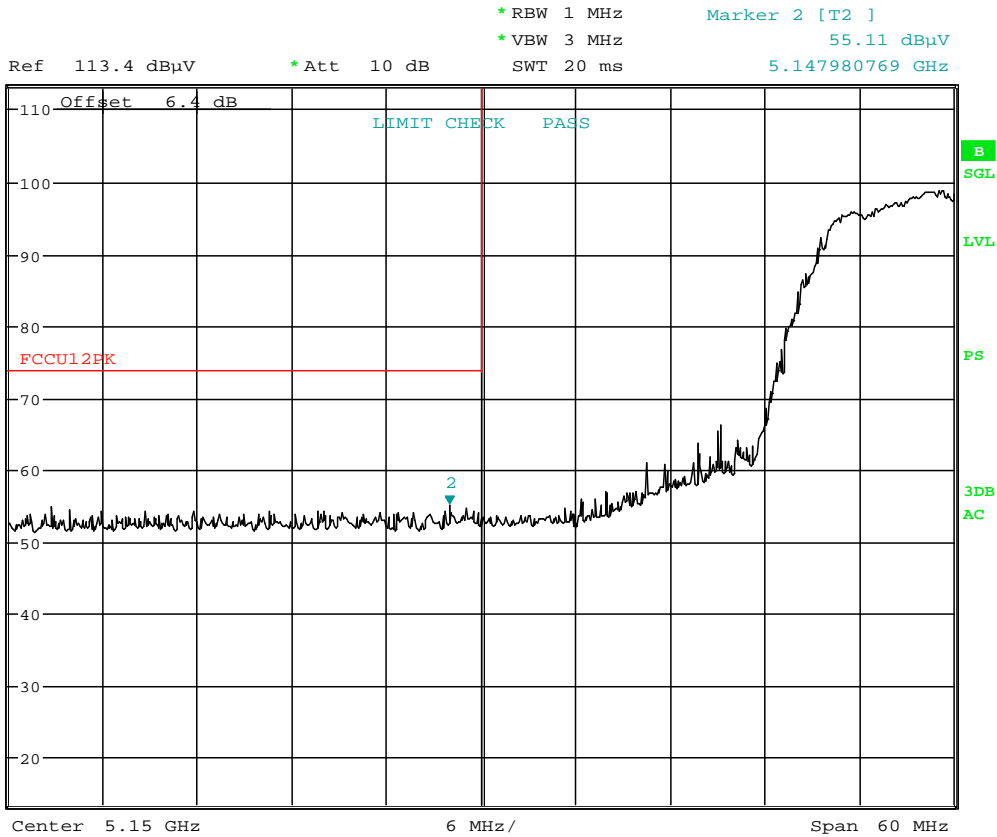
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V 6.2
01/09/2016

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Dual Tx Radiated Restricted Band Edge Measurements

§15.407(b.1)(b.2) §15.205 §15.209



Date: 22.JAN.2017 22:13:20

Plot A.4-1. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

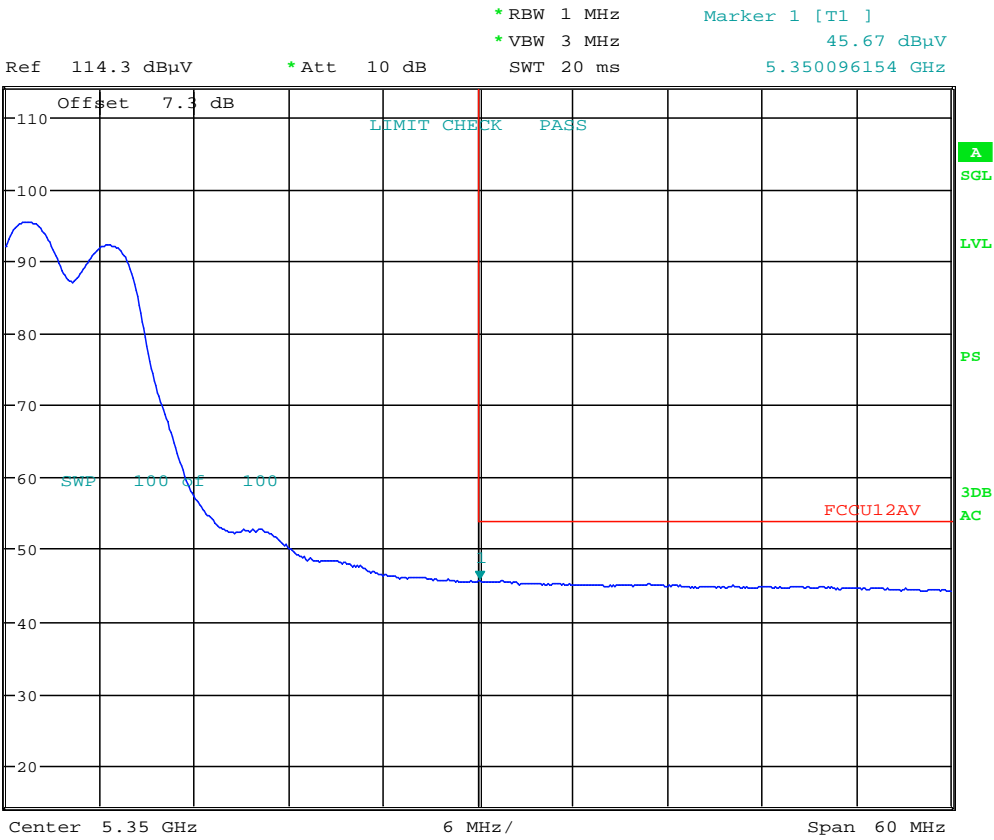
FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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Dual Tx Radiated Restricted Band Edge Measurements
§15.407(b.1)(b.2) §15.205 §15.209

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



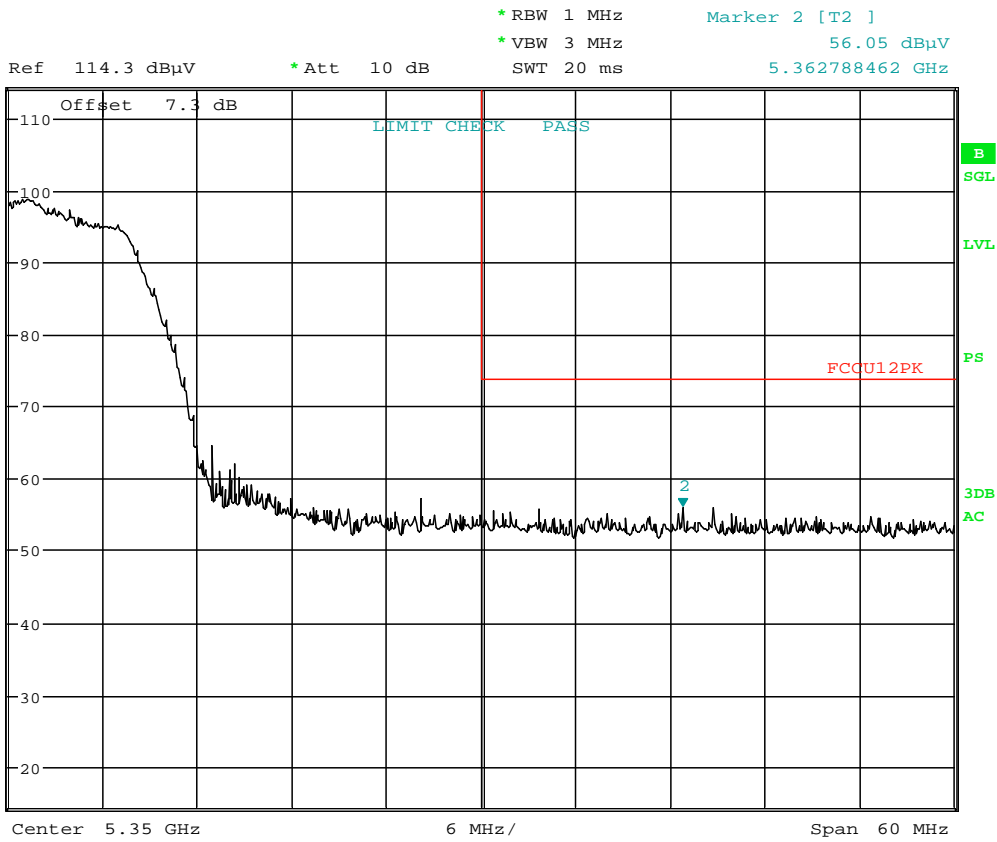
Date: 7.FEB.2017 11:56:26

Plot A.4-3. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 244 of 251	

Dual Tx Radiated Restricted Band Edge Measurements

§15.407(b.1)(b.2) §15.205 §15.209



Date: 22.JAN.2017 22:22:46

Plot A.4-3. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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Dual Tx Radiated Restricted Band Edge Measurements

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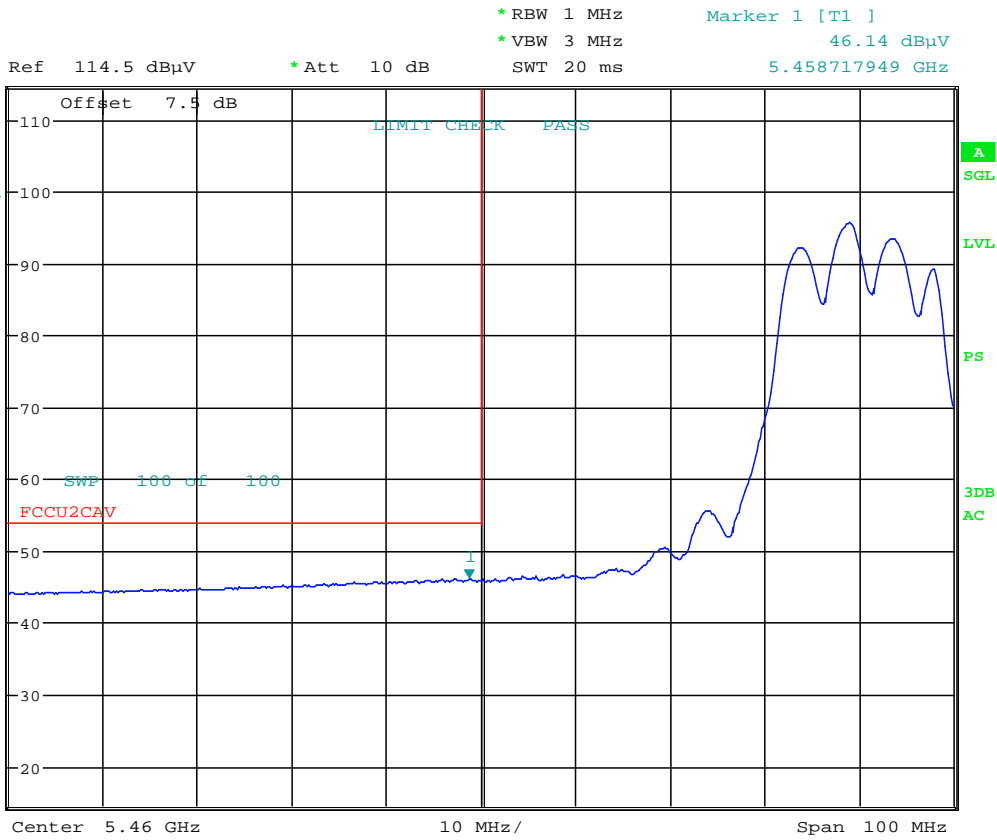
Worst Case Mode: 802.11a

Worst Case Transfer Rate: 6Mbps

Distance of Measurements: 3 Meters

Operating Frequency: 5500MHz

Channel: 100



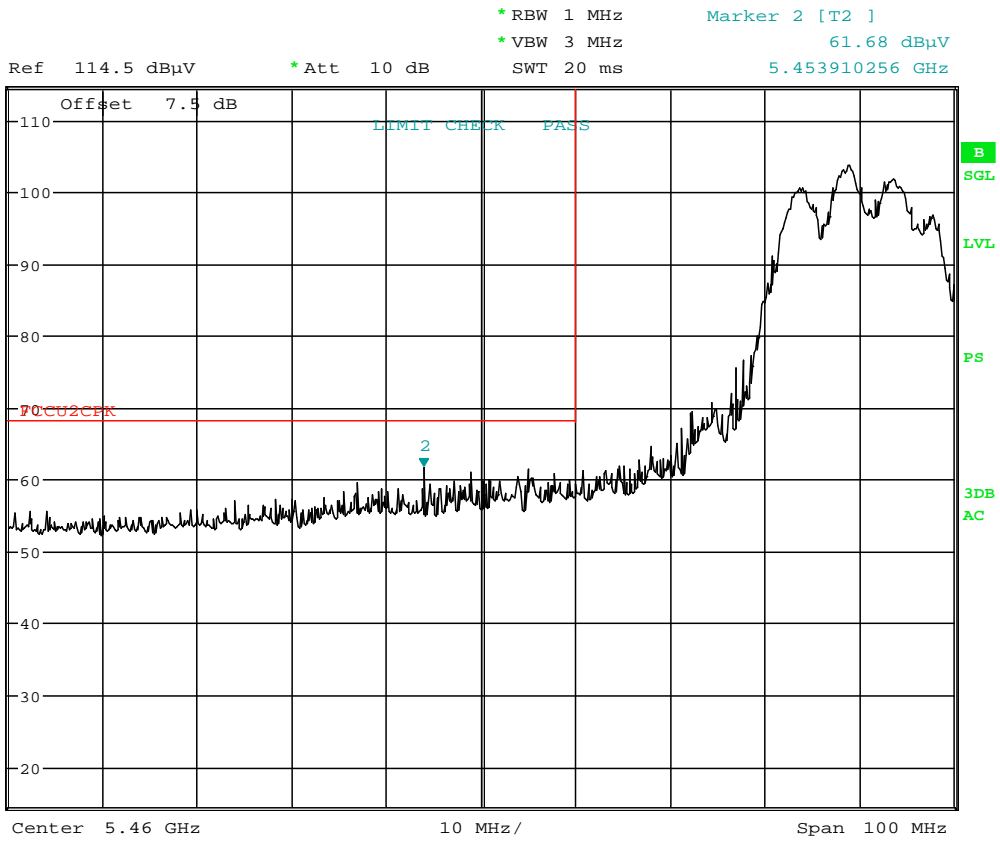
Date: 7.FEB.2017 12:03:46

Plot A.4-5. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 246 of 251	

Dual Tx Radiated Restricted Band Edge Measurements

§15.407(b.1)(b.2) §15.205 §15.209



Date: 7.FEB.2017 12:04:26

Plot A.4-1. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Dual Tx Radiated Restricted Band Edge Measurements

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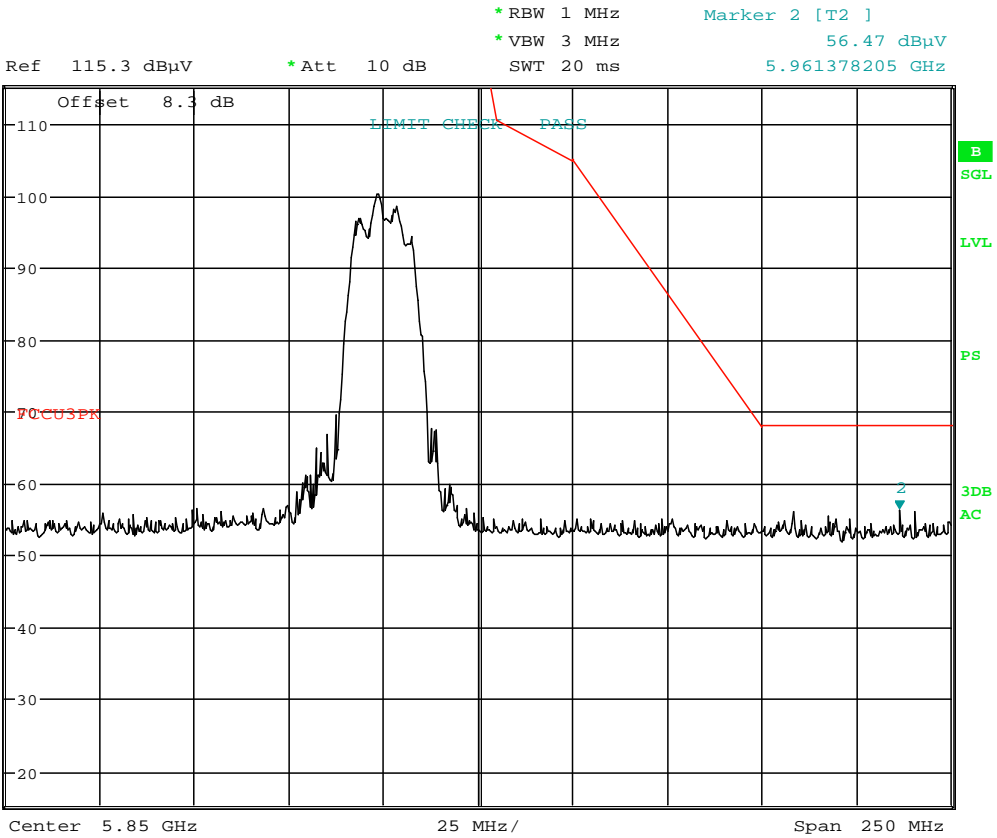
Worst Case Mode: 802.11a

Worst Case Transfer Rate: 6Mbps

Distance of Measurements: 3 Meters

Operating Frequency: 5825MHz

Channel: 165



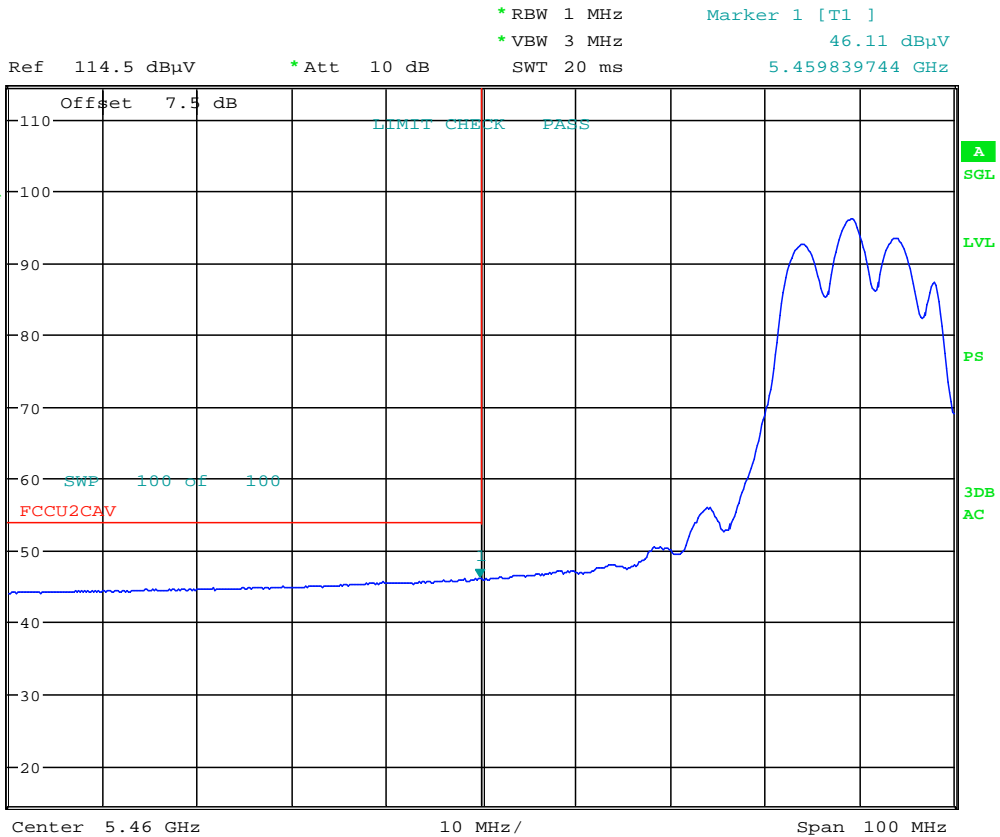
Date: 7.FEB.2017 12:14:32

Plot A.4-9. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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Dual Tx Radiated Restricted Band Edge Measurements §15.407(b.1)(b.2) §15.205 §15.209

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



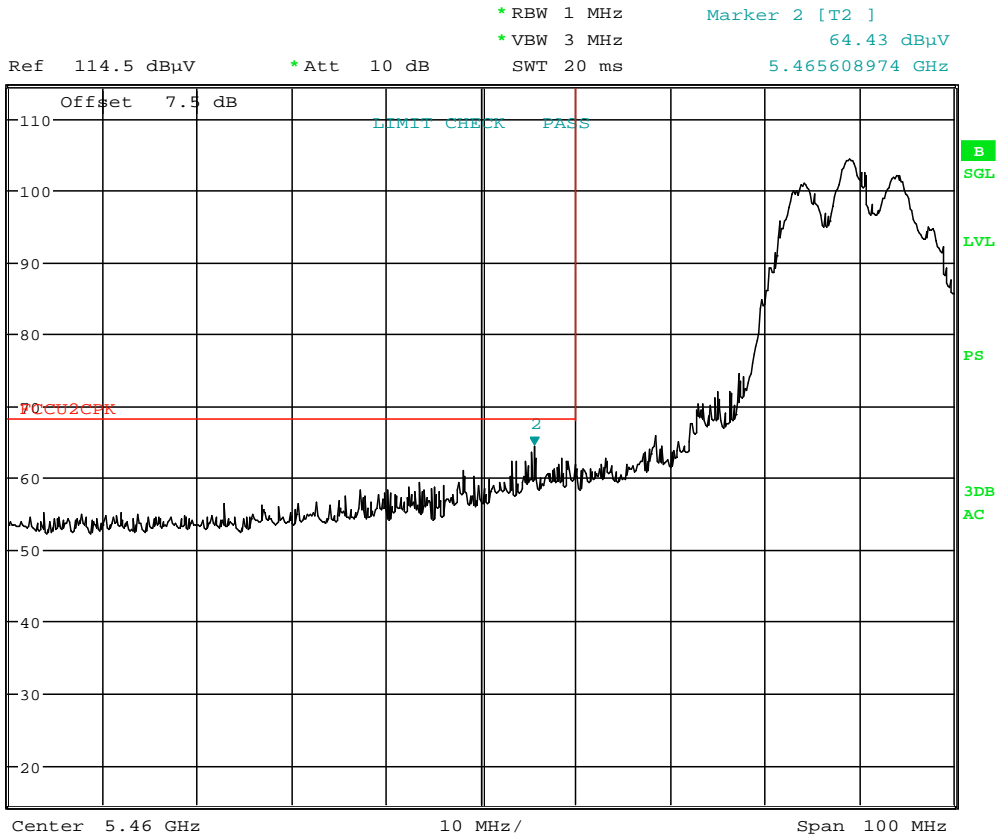
Date: 7.FEB.2017 12:22:18

Plot A.4-5. Radiated Restricted Lower Band Edge Plot with WCP (Average – UNII Band 2C)

FCC ID: ZNFLS993	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 249 of 251	

Dual Tx Radiated Restricted Band Edge Measurements

§15.407(b.1)(b.2) §15.205 §15.209





Date: 7.FEB.2017 12:22:45

Plot A.4-1. Radiated Restricted Lower Band Edge Plot with WCP (Average – UNII Band 1)

FCC ID: ZNFLS993		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 250 of 251	

8.0 CONCLUSION

The data collected relate only the item(s) tested and show that the **LG Portable Handset FCC ID: ZNFLS993** is in compliance with Part 15E of the FCC Rules.

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Test Report S/N: 1M1701180034-06-R1.ZNF	Test Dates: 12/27/2016-2/20/2017	EUT Type: Portable Handset	Page 251 of 251	