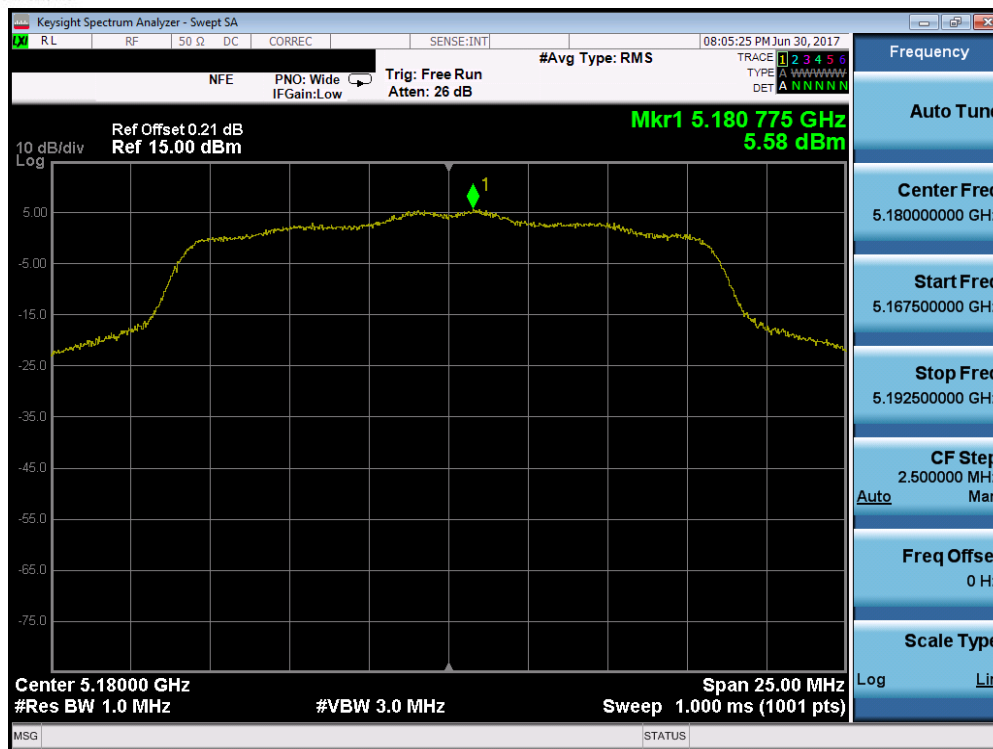


Antenna-2 Power Spectral Density Measurements

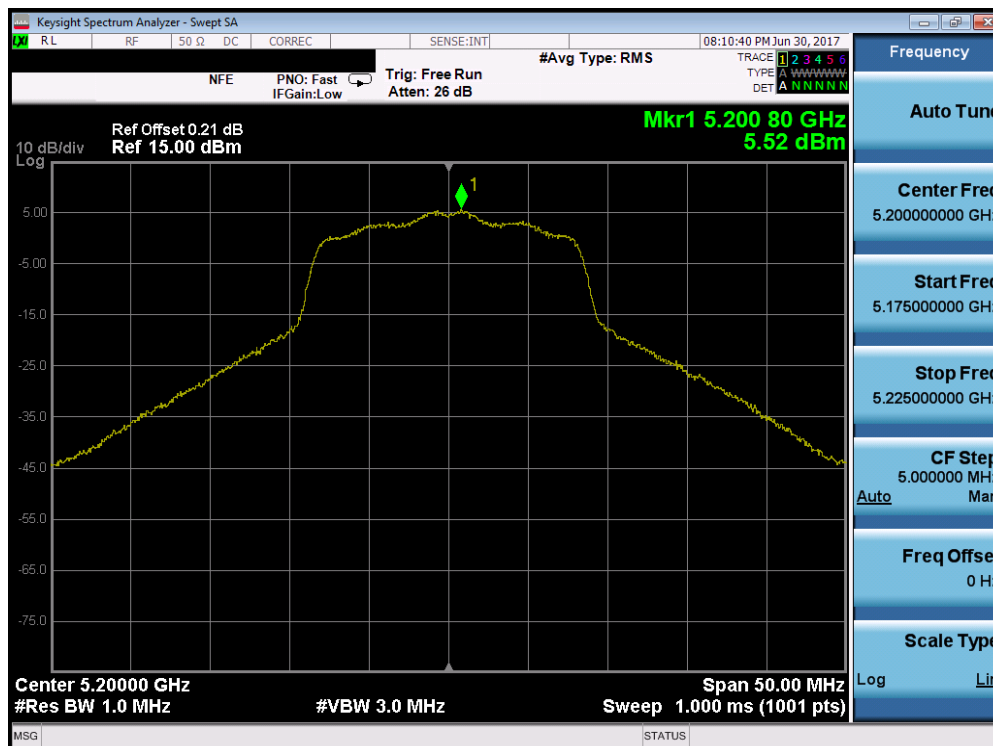
	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured Power Density [dBm]	Max Permissible Power Density [dBm/MHz]	Margin [dB]
Band 1	5180	36	a	6	5.58	11.0	-5.42
	5200	40	a	6	5.52	11.0	-5.48
	5240	48	a	6	5.63	11.0	-5.37
	5180	36	n (20MHz)	6.5/7.2 (MCS0)	4.66	11.0	-6.34
	5200	40	n (20MHz)	6.5/7.2 (MCS0)	4.65	11.0	-6.35
	5240	48	n (20MHz)	6.5/7.2 (MCS0)	5.05	11.0	-5.95
	5190	38	n (40MHz)	13.5/15 (MCS0)	-0.45	11.0	-11.45
	5230	46	n (40MHz)	13.5/15 (MCS0)	1.68	11.0	-9.32
	5210	42	ac (80MHz)	29.3/32.5 (MCS0)	-4.60	11.0	-15.60
Band 2A	5260	52	a	6	5.63	11.0	-5.37
	5280	56	a	6	5.31	11.0	-5.69
	5320	64	a	6	5.44	11.0	-5.56
	5260	52	n (20MHz)	6.5/7.2 (MCS0)	5.15	11.0	-5.85
	5280	56	n (20MHz)	6.5/7.2 (MCS0)	4.47	11.0	-6.53
	5320	64	n (20MHz)	6.5/7.2 (MCS0)	4.90	11.0	-6.10
	5270	54	n (40MHz)	13.5/15 (MCS0)	1.65	11.0	-9.35
	5310	62	n (40MHz)	13.5/15 (MCS0)	-0.22	11.0	-11.22
	5290	58	ac (80MHz)	29.3/32.5 (MCS0)	-4.87	11.0	-15.87
Band 2C	5500	100	a	6	5.95	11.0	-5.05
	5580	116	a	6	4.60	11.0	-6.40
	5720	144	a	6	6.05	11.0	-4.95
	5500	100	n (20MHz)	6.5/7.2 (MCS0)	5.97	11.0	-5.04
	5580	116	n (20MHz)	6.5/7.2 (MCS0)	4.24	11.0	-6.76
	5720	144	n (20MHz)	6.5/7.2 (MCS0)	5.92	11.0	-5.08
	5510	102	n (40MHz)	13.5/15 (MCS0)	0.82	11.0	-10.18
	5550	110	n (40MHz)	13.5/15 (MCS0)	2.22	11.0	-8.78
	5710	142	n (40MHz)	13.5/15 (MCS0)	1.61	11.0	-9.39
	5530	106	ac (80MHz)	29.3/32.5 (MCS0)	-4.74	11.0	-15.74
	5690	138	ac (80MHz)	29.3/32.5 (MCS0)	-3.78	11.0	-14.78

Table 7-20. Conducted Power Spectral Density Measurements

FCC ID: ZNFG011C		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 86 of 221

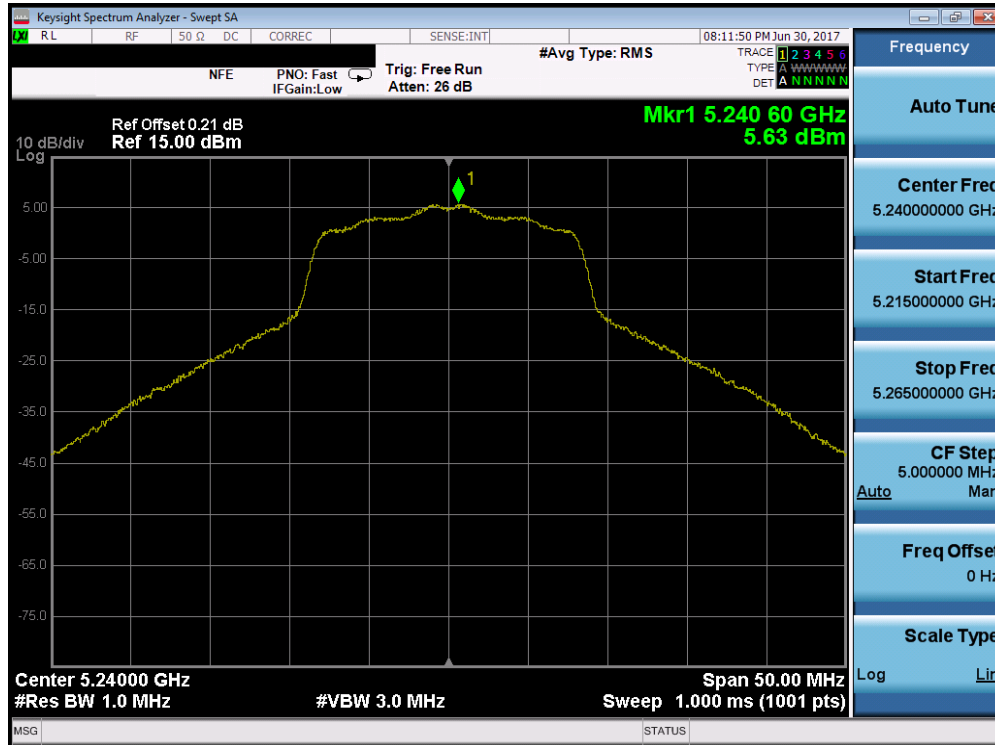


Plot 7-115. Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 36)

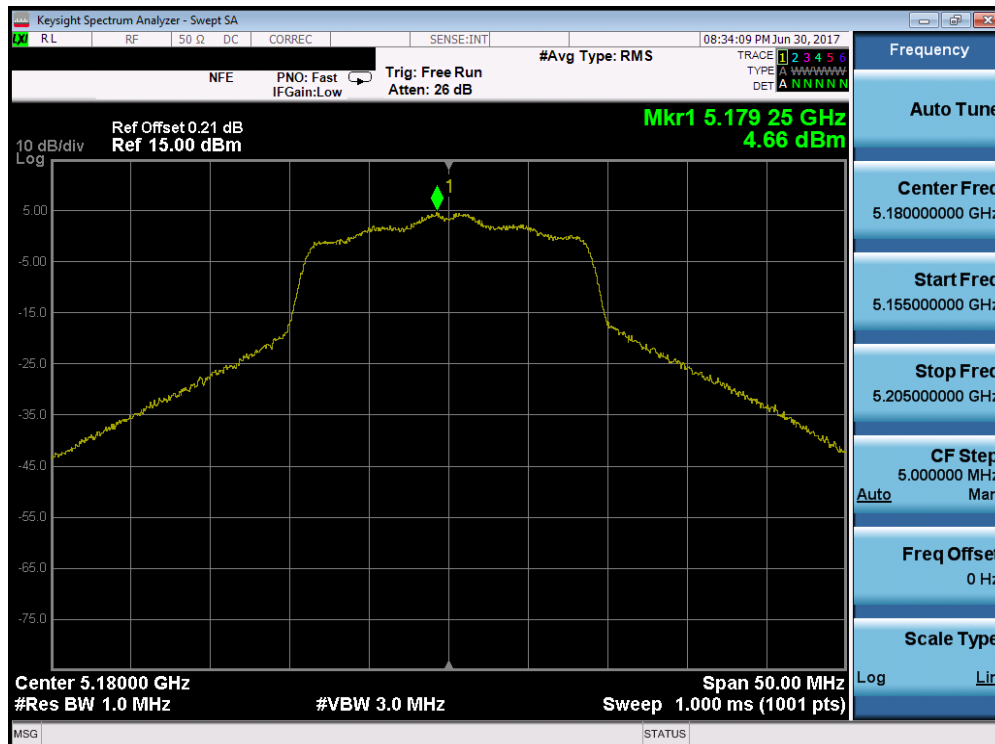


Plot 7-116. Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 40)

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 87 of 221

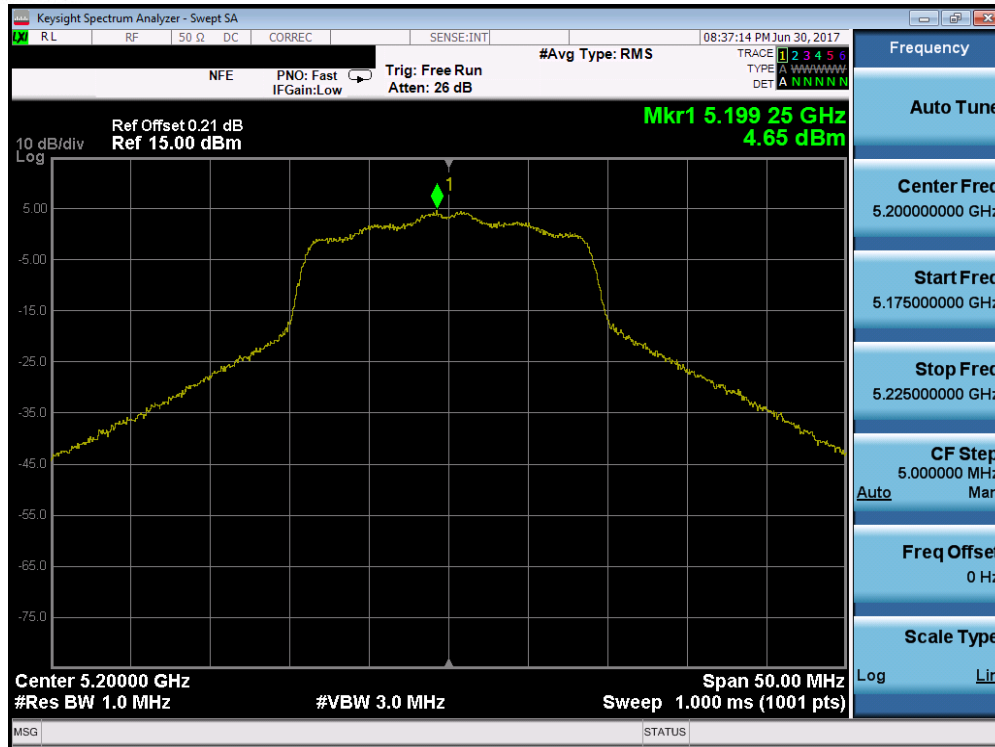


Plot 7-117. Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 48)

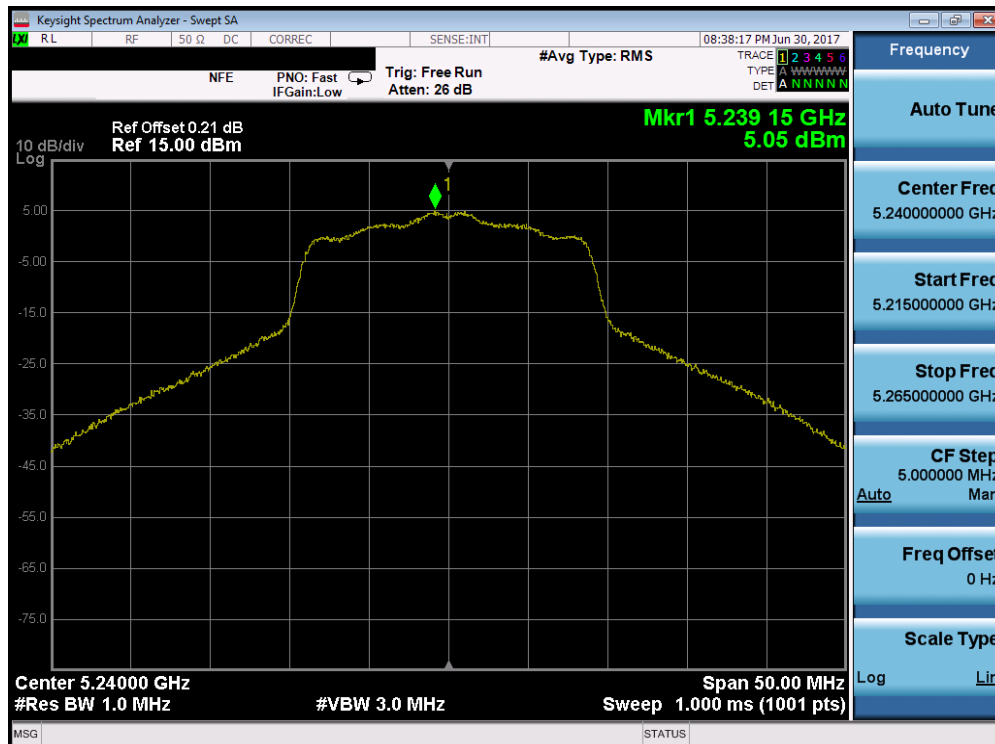


Plot 7-118. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 36)

FCC ID: ZNFG011C	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 88 of 221

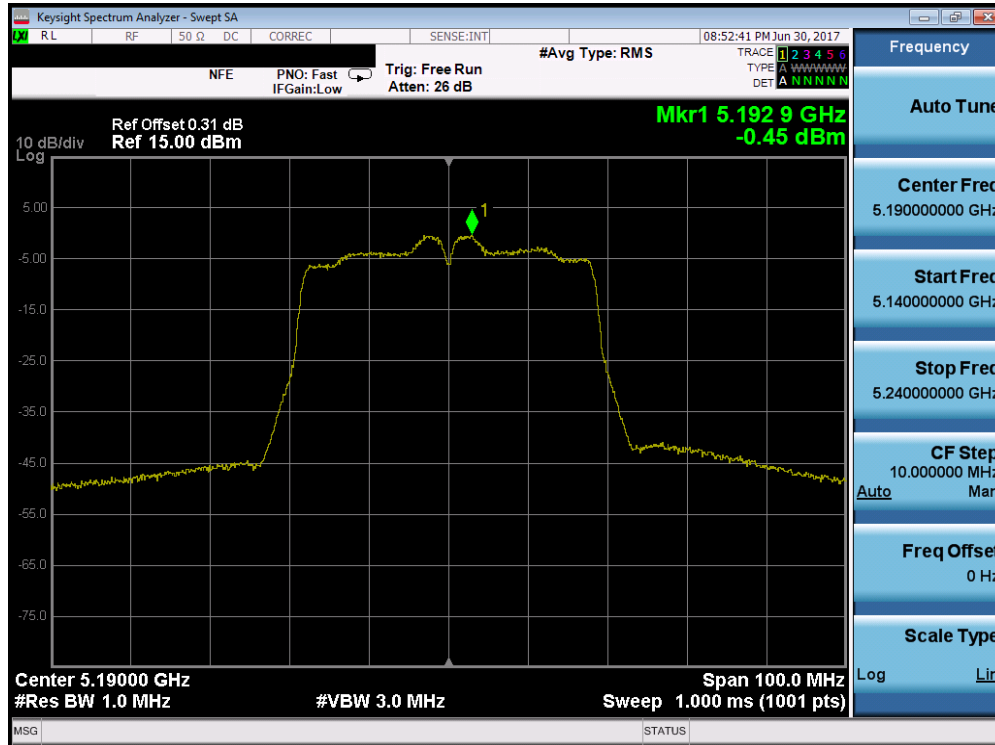


Plot 7-119. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 40)

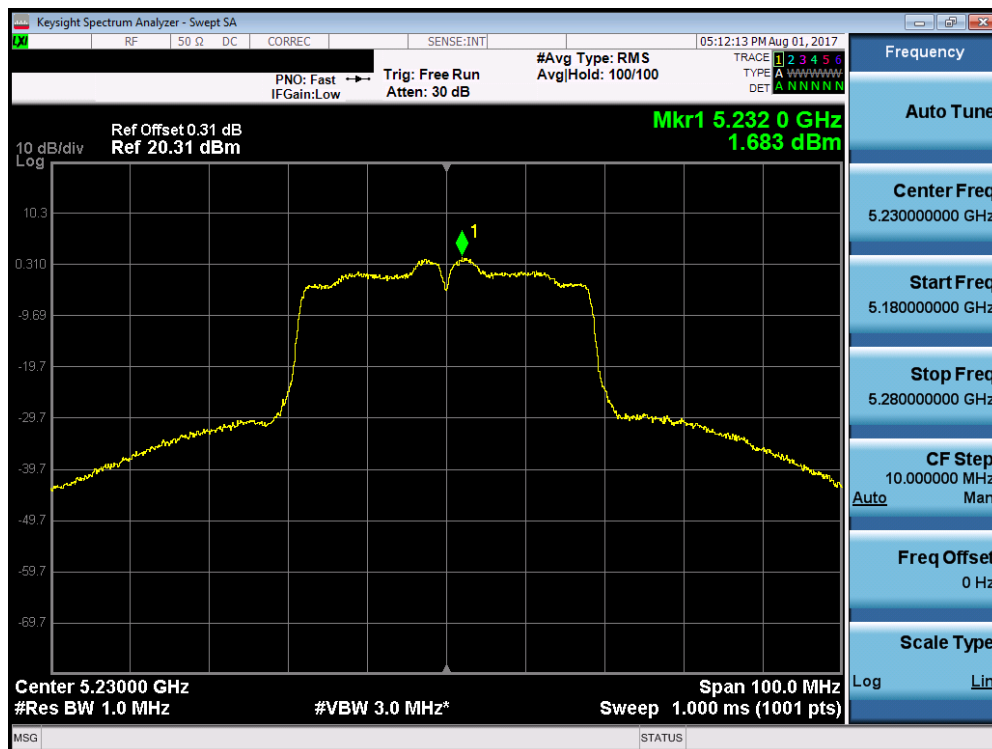


Plot 7-120. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 48)

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 89 of 221

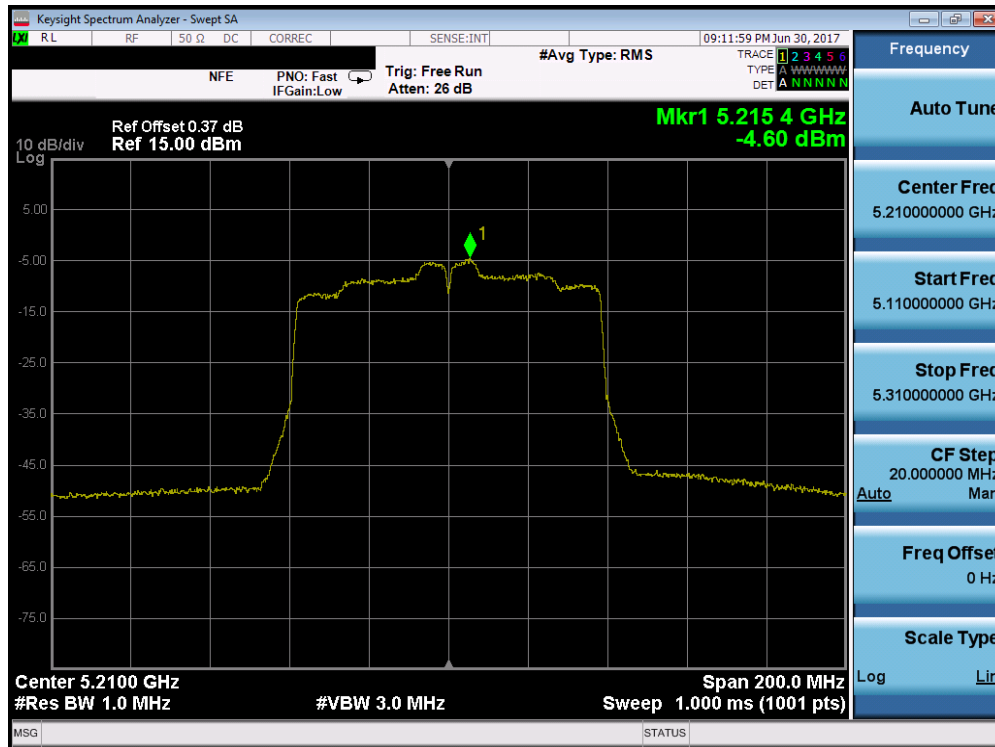


Plot 7-121. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 1) – Ch. 38)

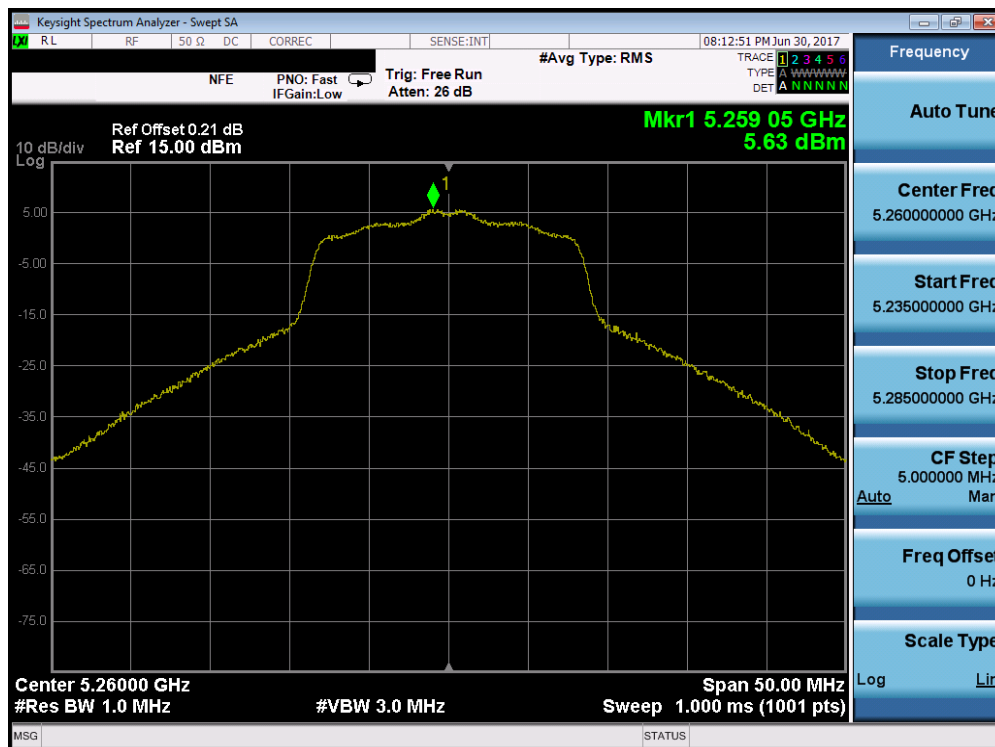


Plot 7-122. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 1) – Ch. 46)

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 90 of 221

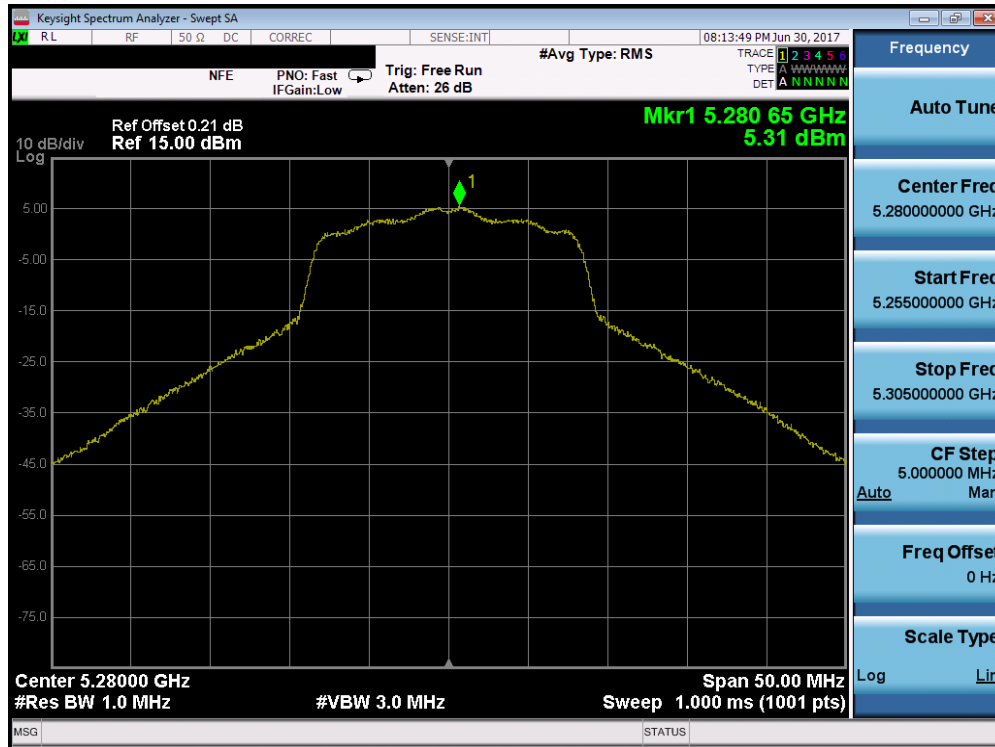


Plot 7-123. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 1) – Ch. 42)

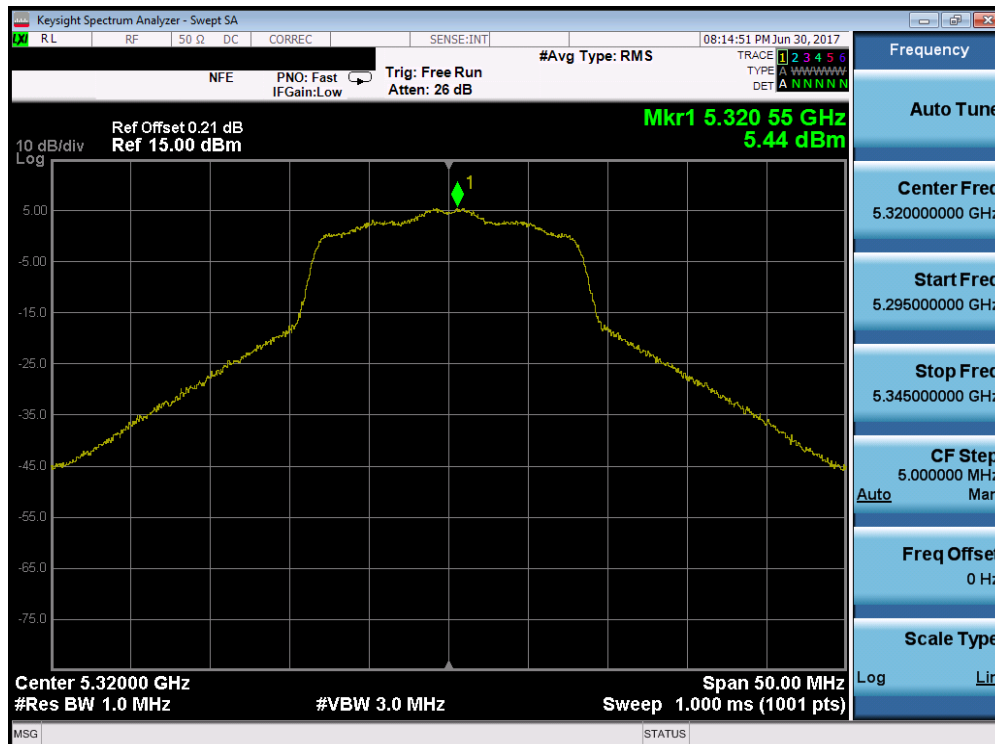


Plot 7-124. Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 52)

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 91 of 221

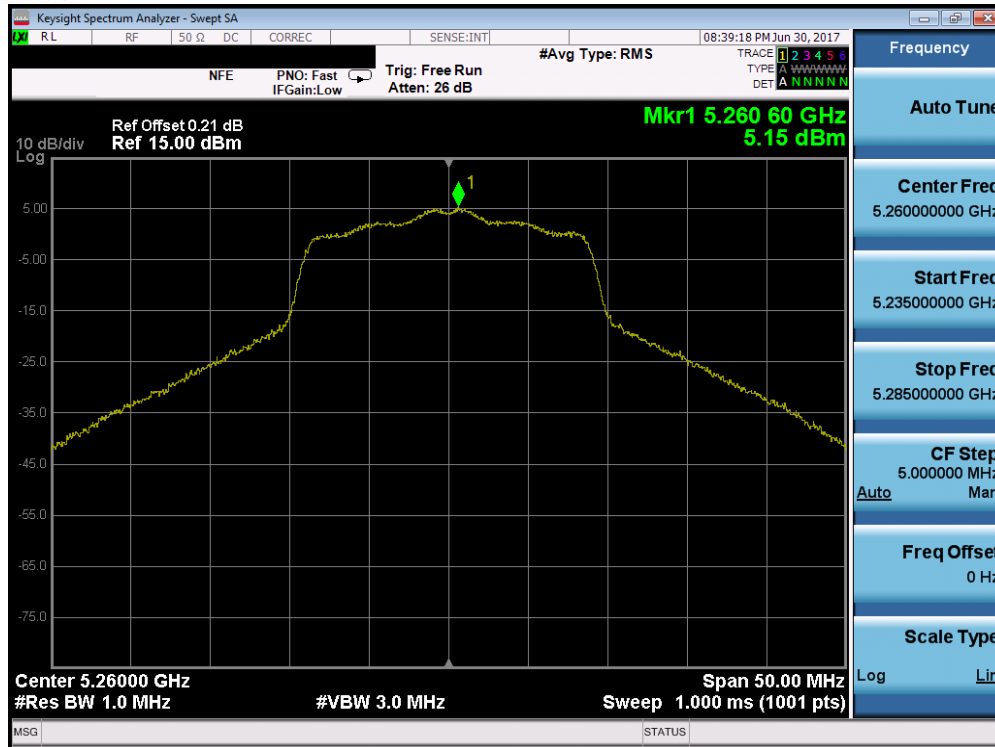


Plot 7-125. Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 56)

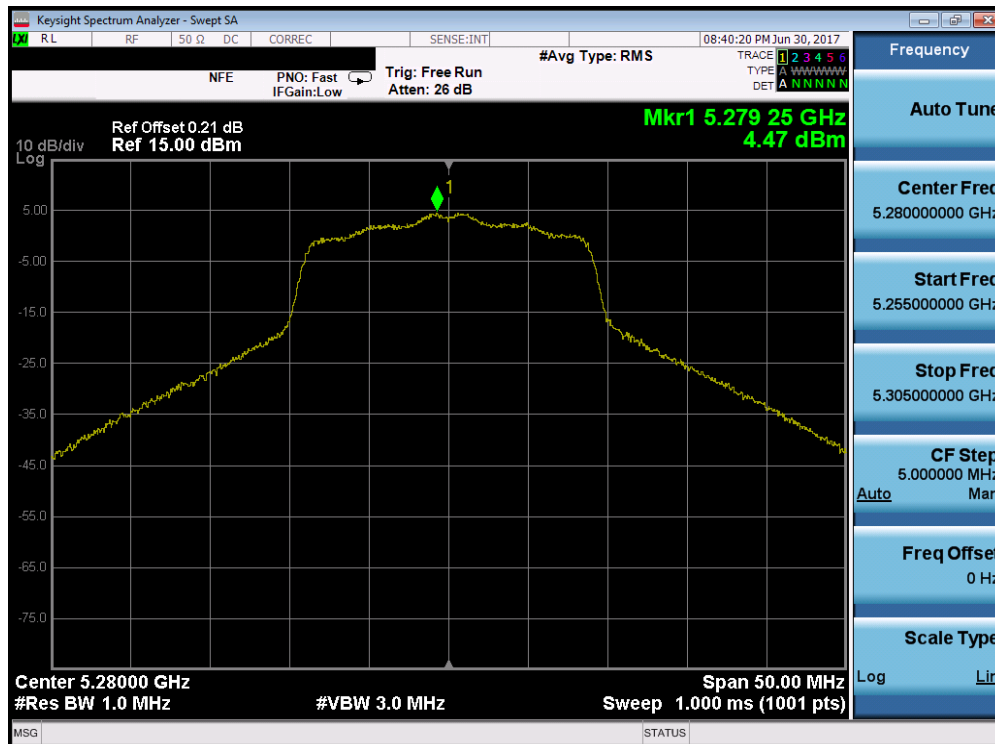


Plot 7-126. Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 64)

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 92 of 221

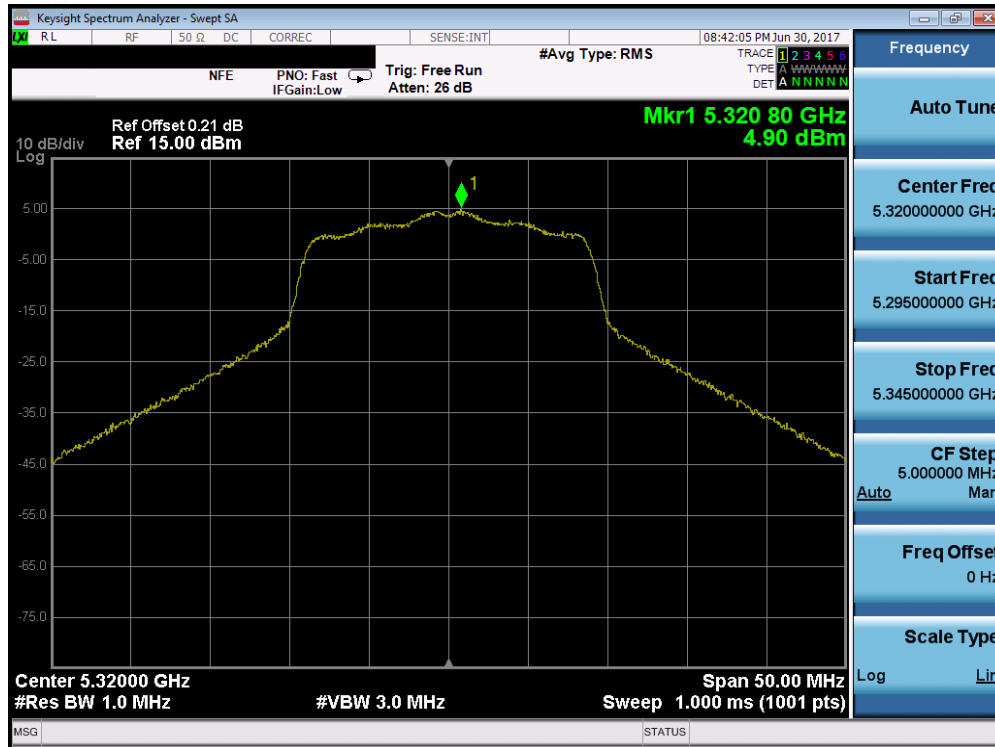


Plot 7-127. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 52)

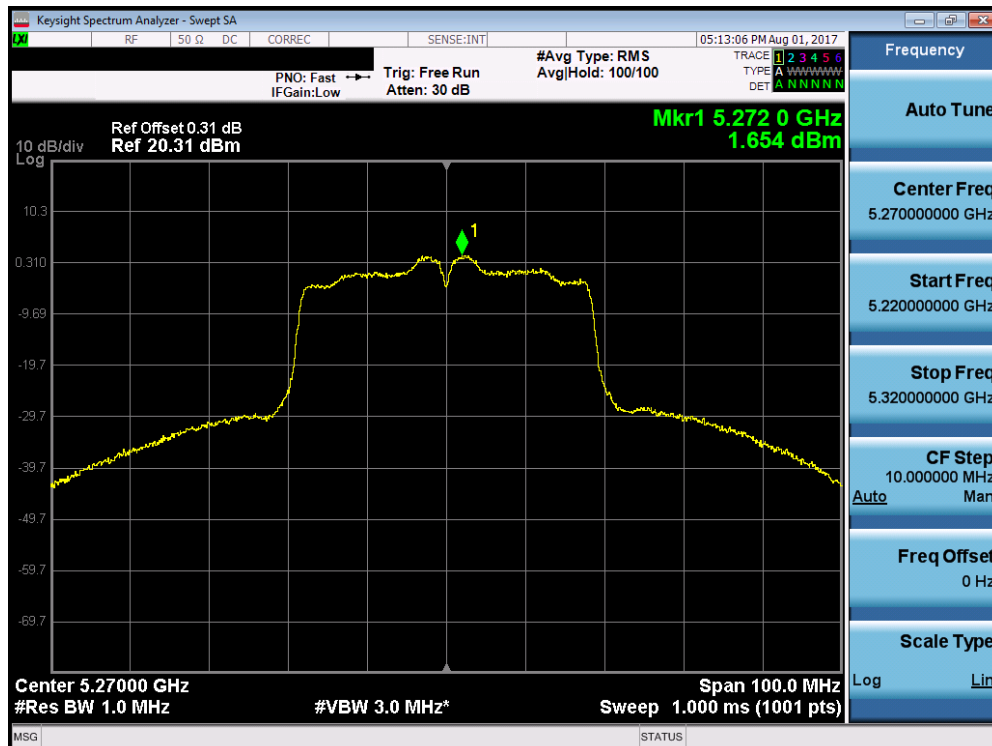


Plot 7-128. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 56)

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 93 of 221

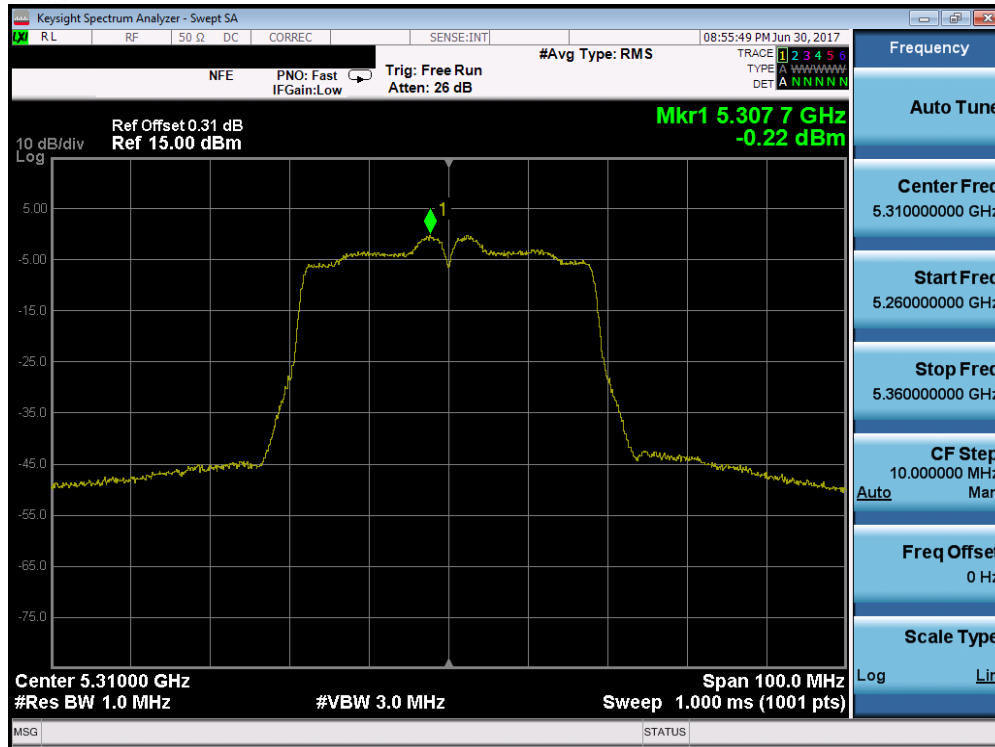


Plot 7-129. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 64)

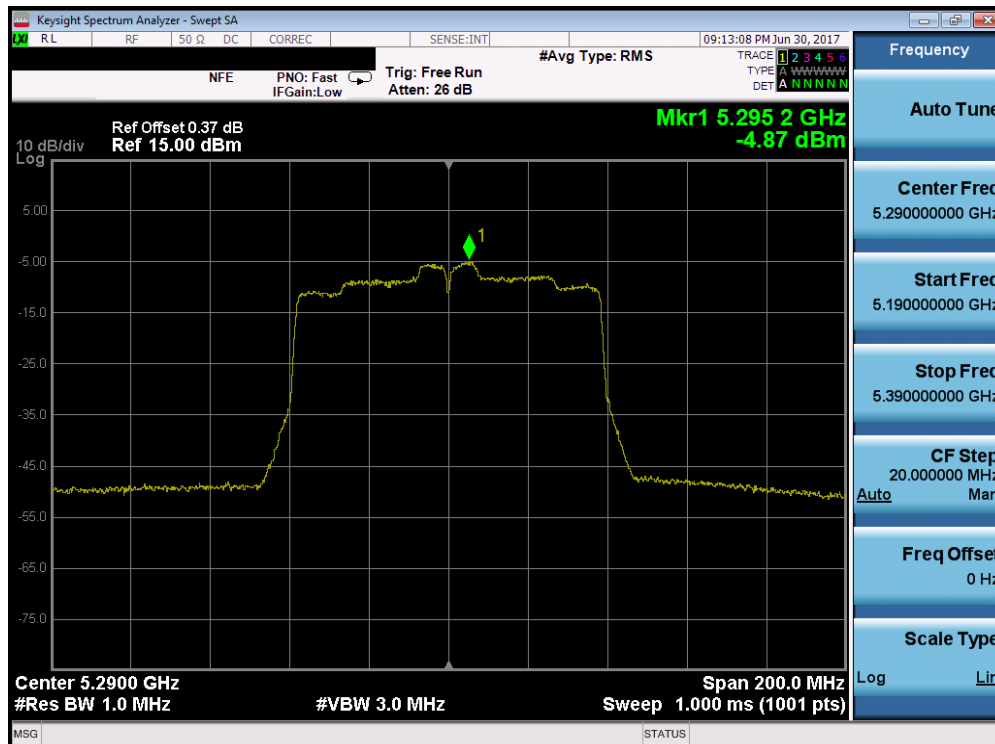


Plot 7-130. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2A) – Ch. 54)

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 94 of 221

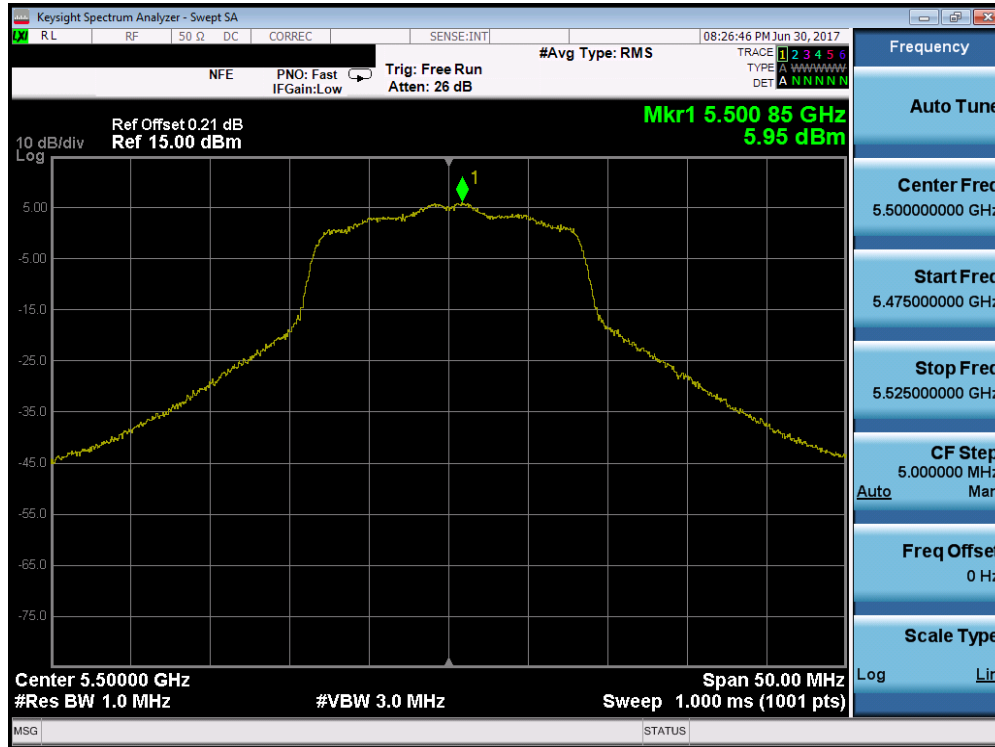


Plot 7-131. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2A) – Ch. 62)

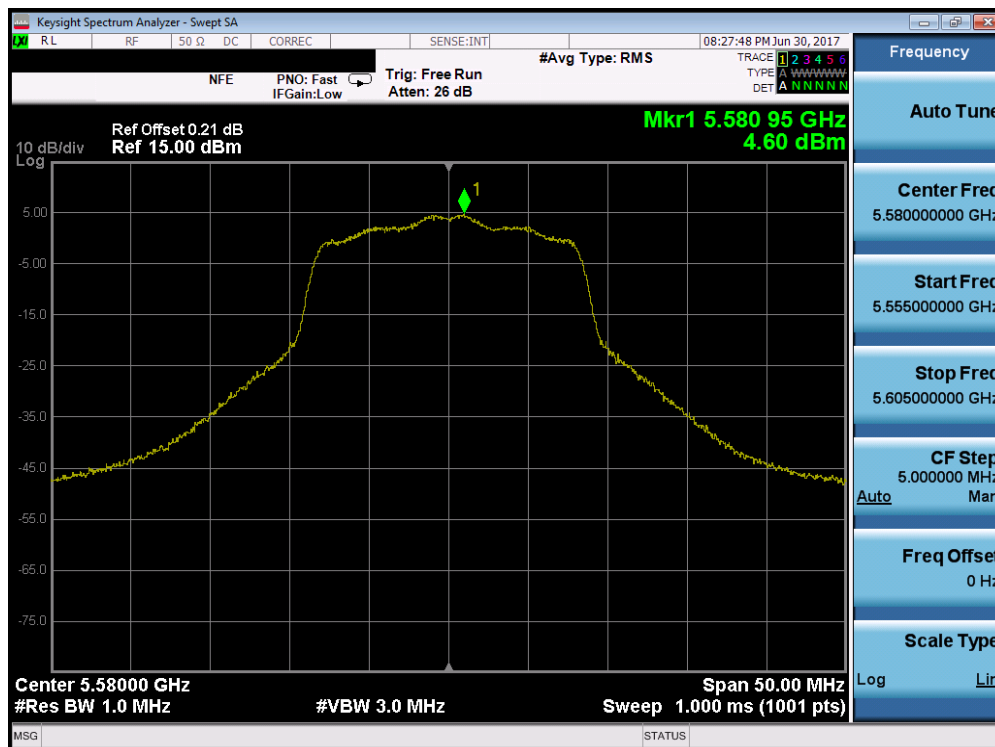


Plot 7-132. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2A) – Ch. 58)

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 95 of 221

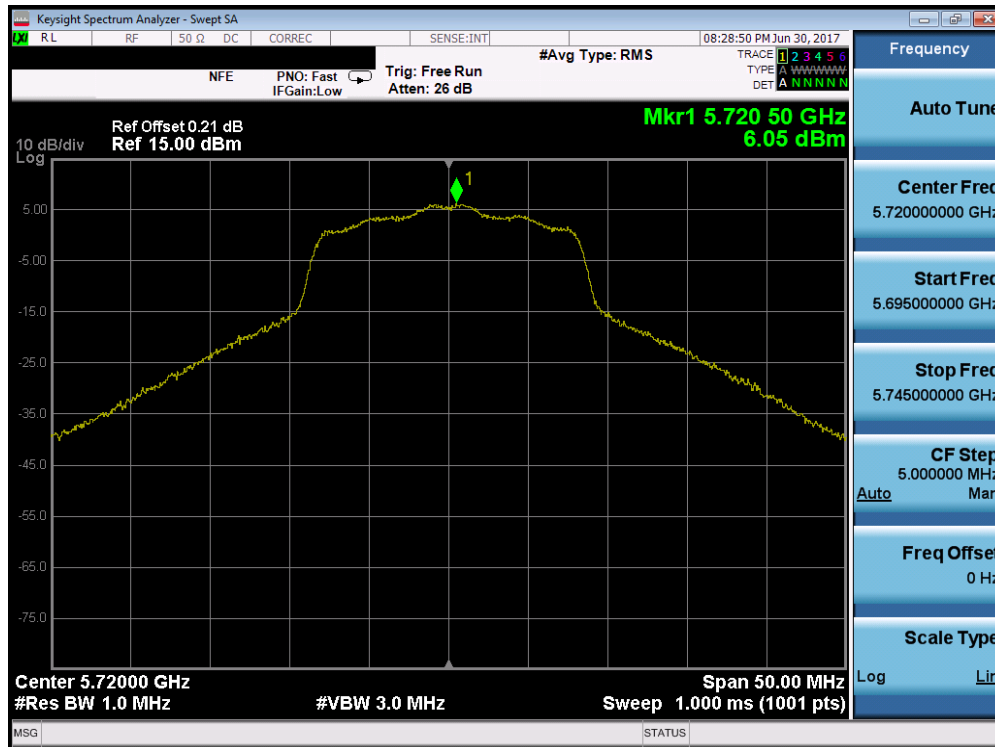


Plot 7-133. Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 100)

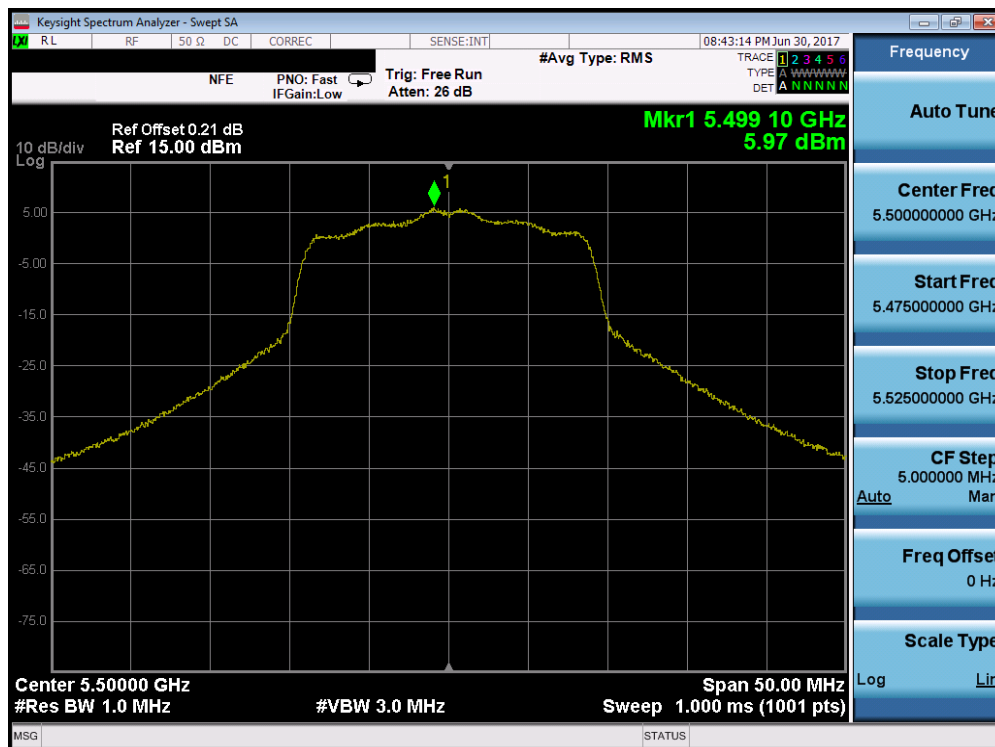


Plot 7-134. Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 116)

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 96 of 221

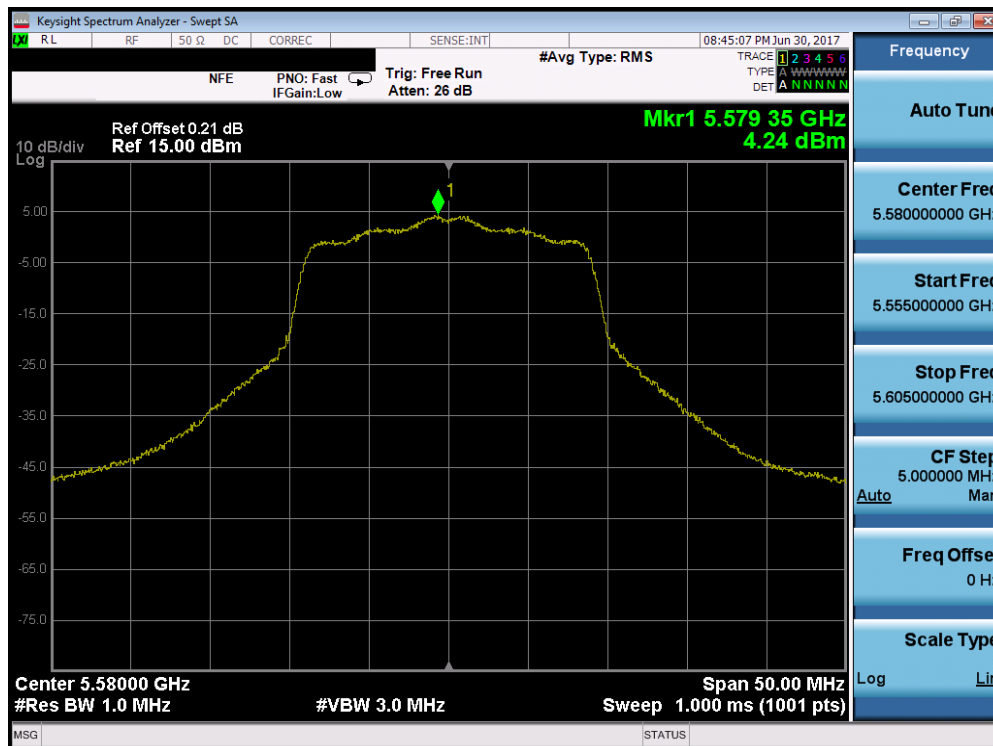


Plot 7-135. Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 144)

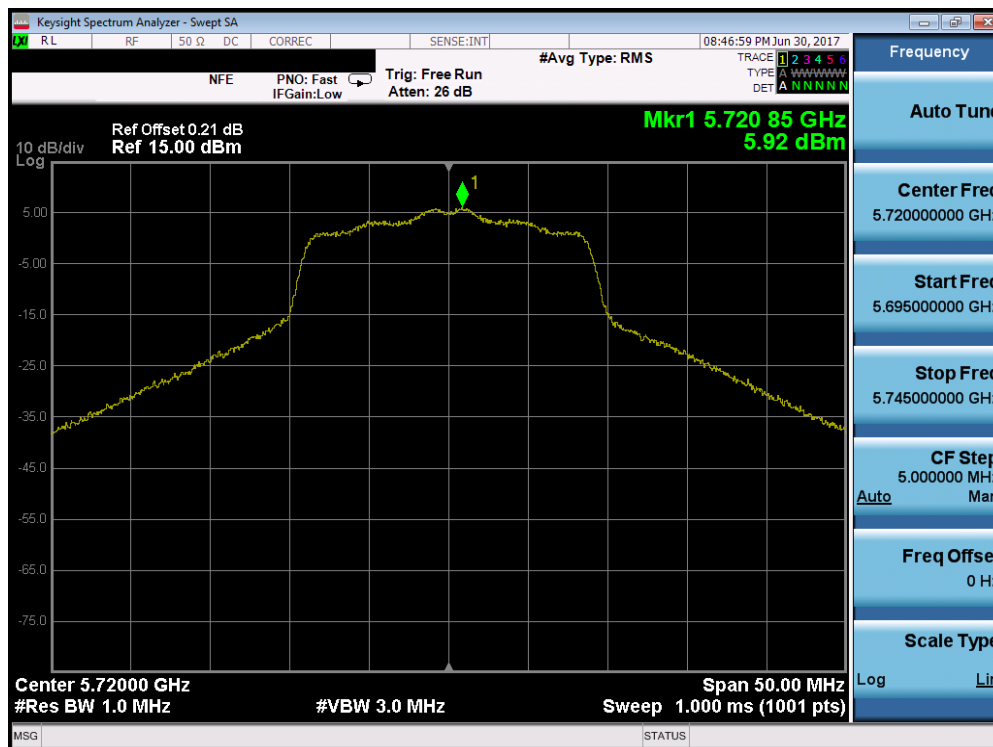


Plot 7-136. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 100)

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 97 of 221

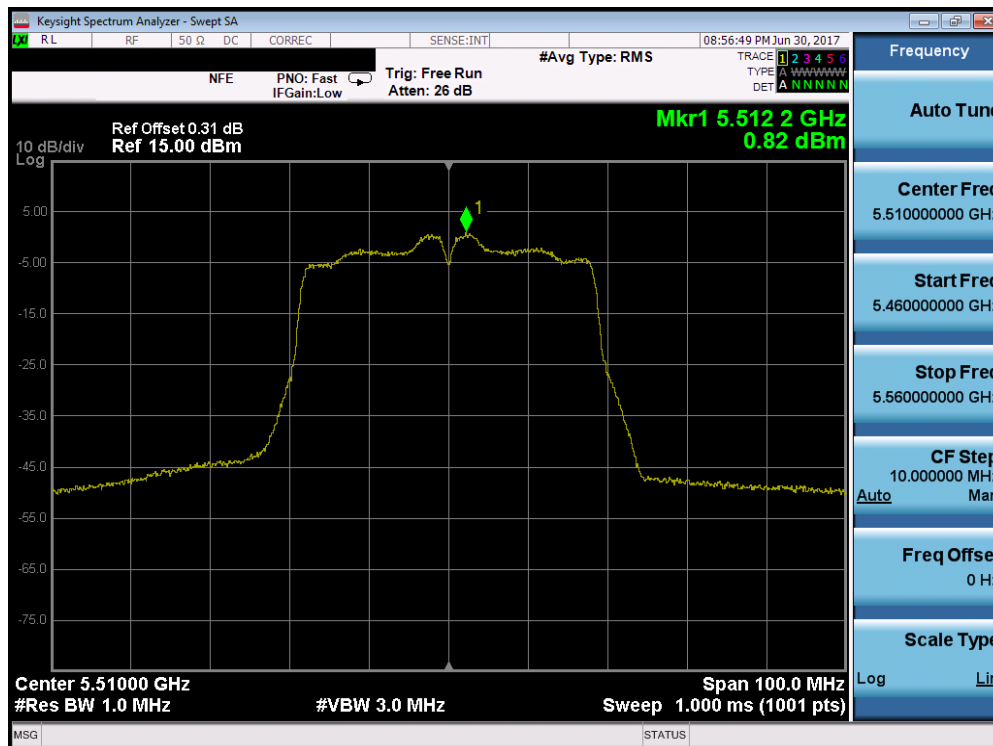


Plot 7-137. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 116)

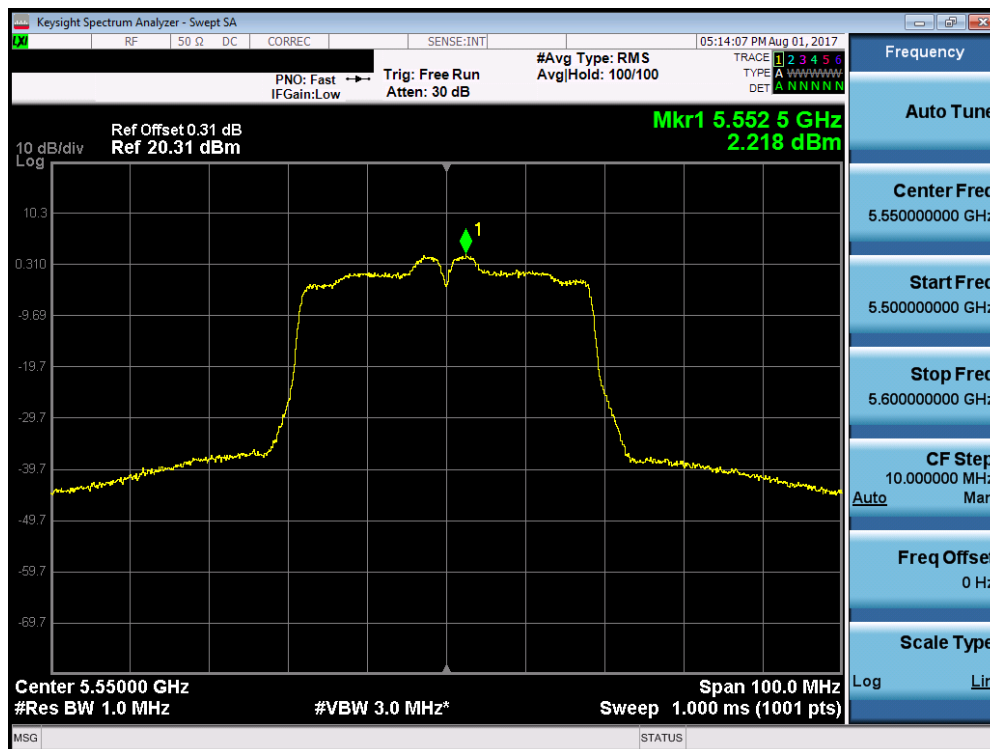


Plot 7-138. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 144)

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 98 of 221

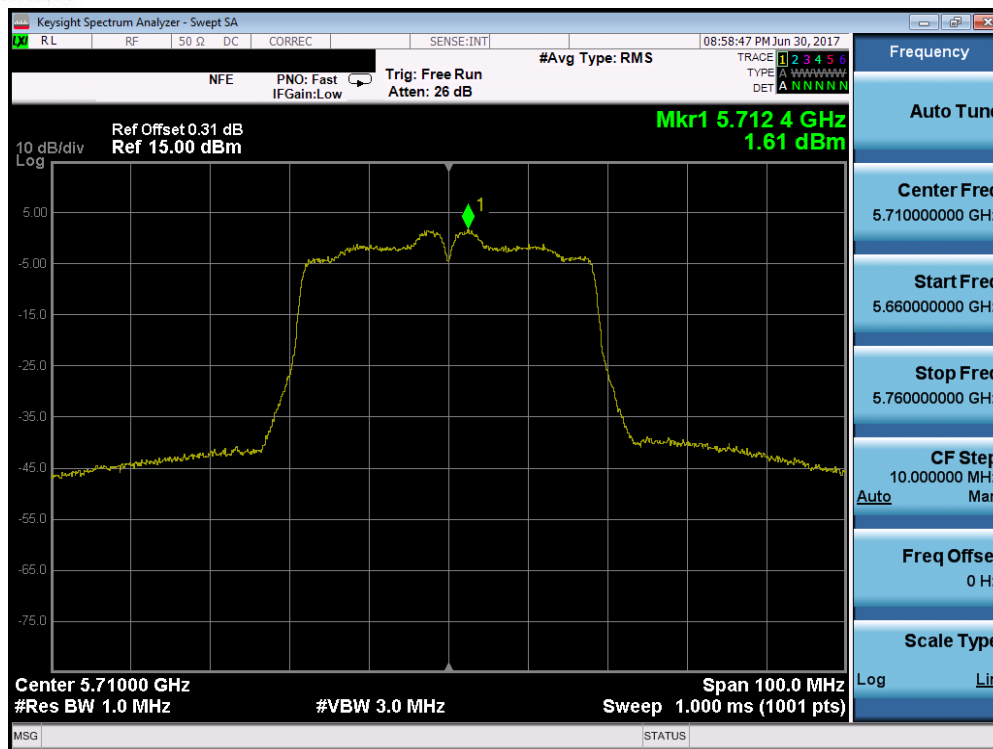


Plot 7-139. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 102)

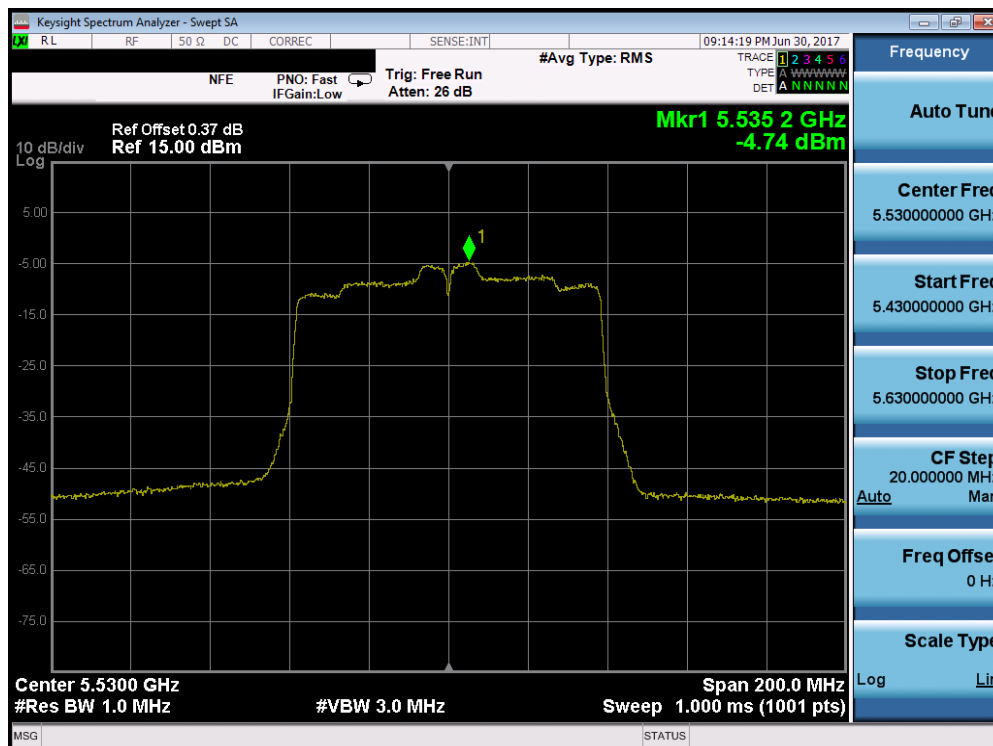


Plot 7-140. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 110)

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 99 of 221

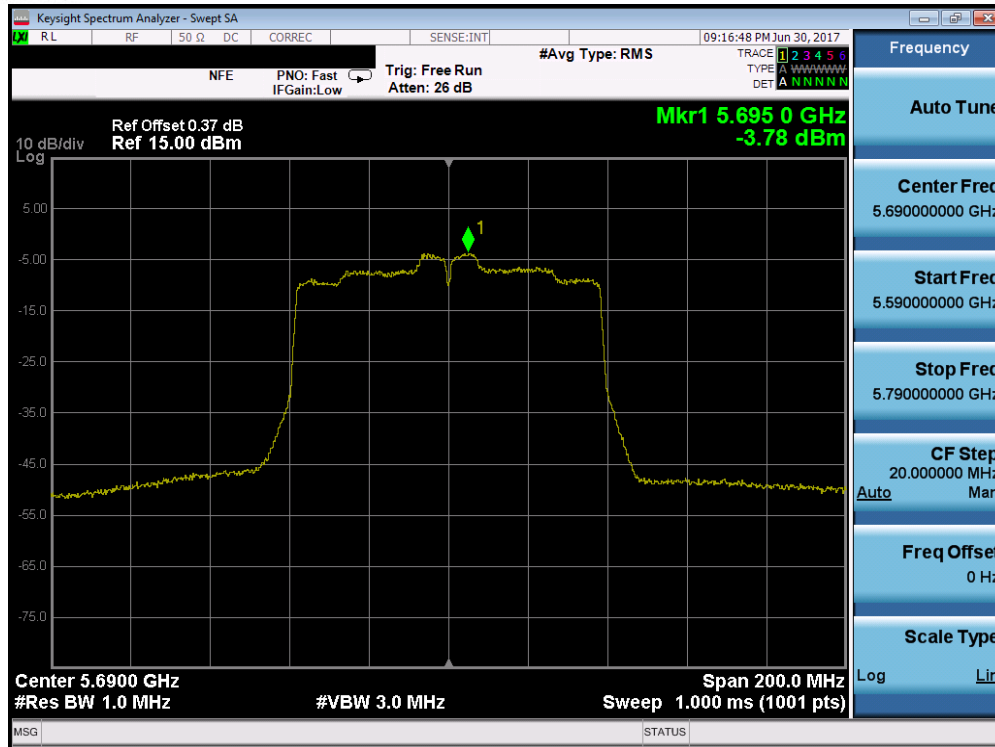


Plot 7-141. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 142)



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

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 100 of 221

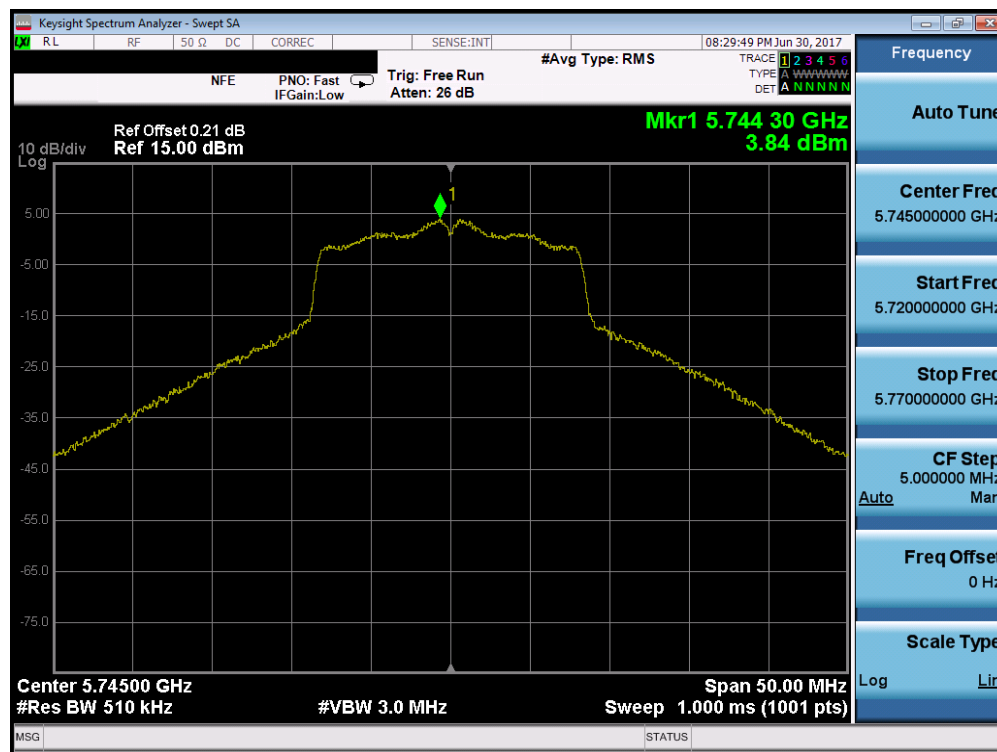


Plot 7-143. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2C) – Ch. 138)

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 101 of 221

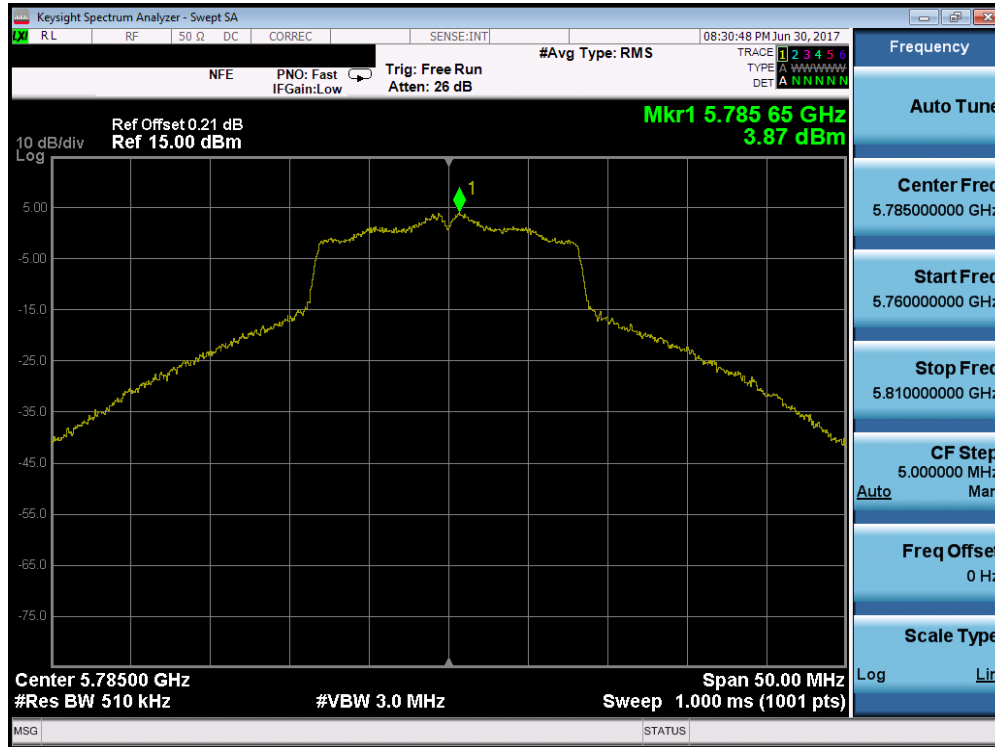
	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured Power Density [dBm]	Max Permissible Power Density [dBm/500kHz]	Margin [dB]
Band 3	5745	149	a	6	3.84	30.0	-26.16
	5785	157	a	6	3.87	30.0	-26.13
	5825	165	a	6	4.49	30.0	-25.51
	5745	149	n (20MHz)	6.5/7.2 (MCS0)	3.57	30.0	-26.43
	5785	157	n (20MHz)	6.5/7.2 (MCS0)	4.09	30.0	-25.91
	5825	165	n (20MHz)	6.5/7.2 (MCS0)	4.64	30.0	-25.36
	5755	151	n (40MHz)	13.5/15 (MCS0)	-1.09	30.0	-31.09
	5795	159	n (40MHz)	13.5/15 (MCS0)	3.61	30.0	-26.39
	5775	155	ac (80MHz)	29.3/32.5 (MCS0)	-3.15	30.0	-33.15

Table 7-21. Band 3 Conducted Power Spectral Density Measurements

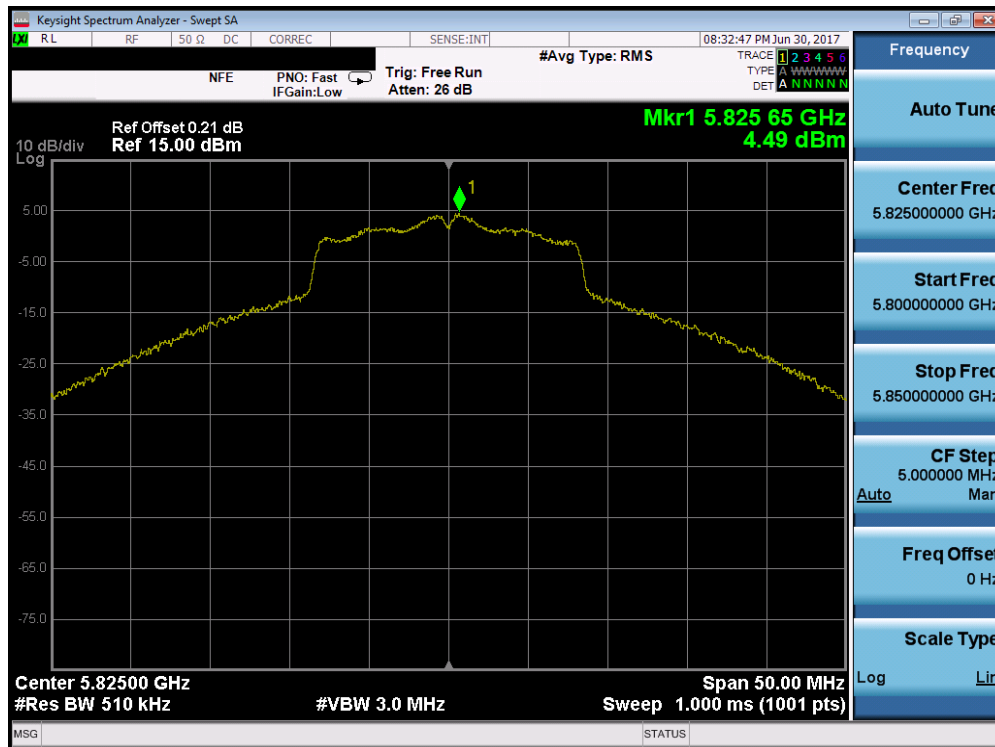


Plot 7-144. Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 149)

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 102 of 221

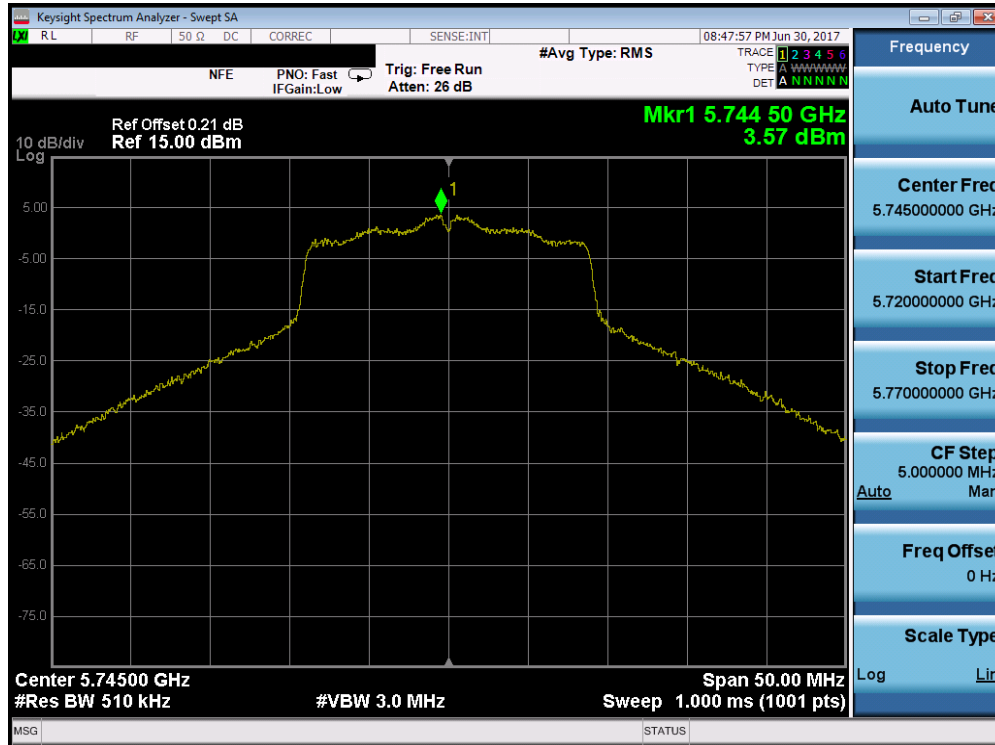


Plot 7-145. Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 157)

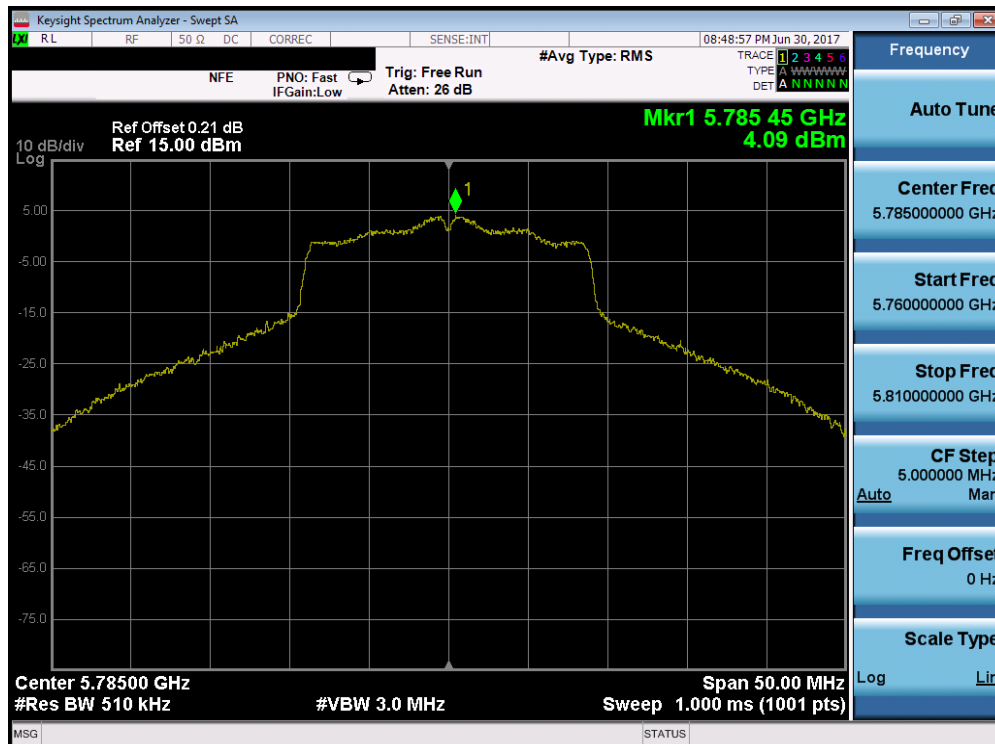


Plot 7-146. Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 165)

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 103 of 221

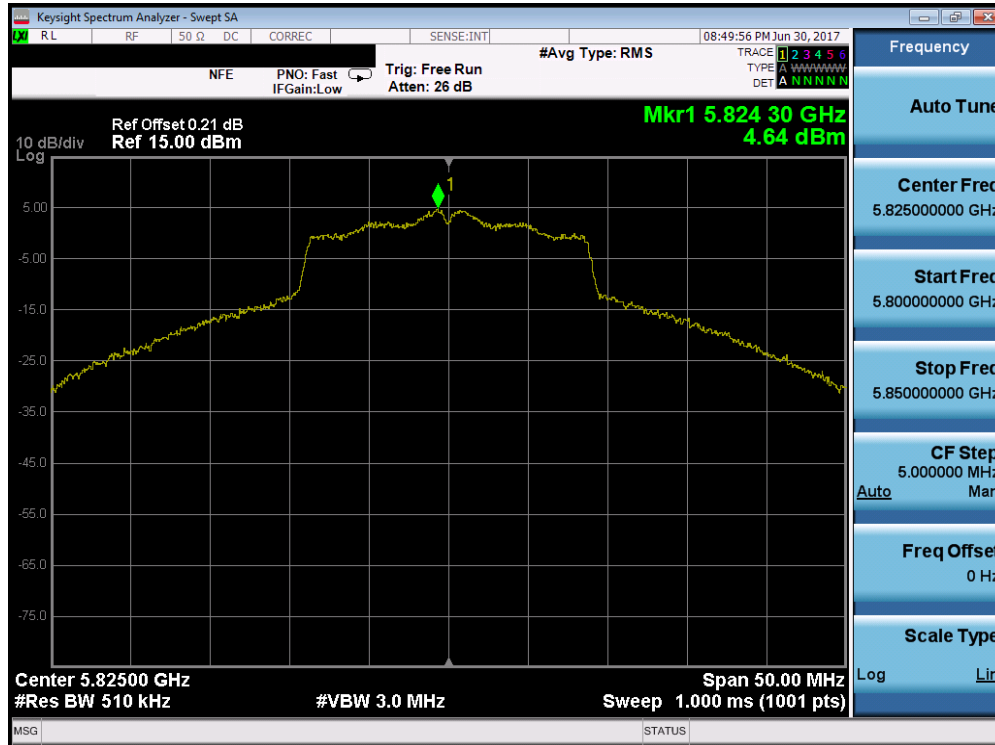


Plot 7-147. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 149)

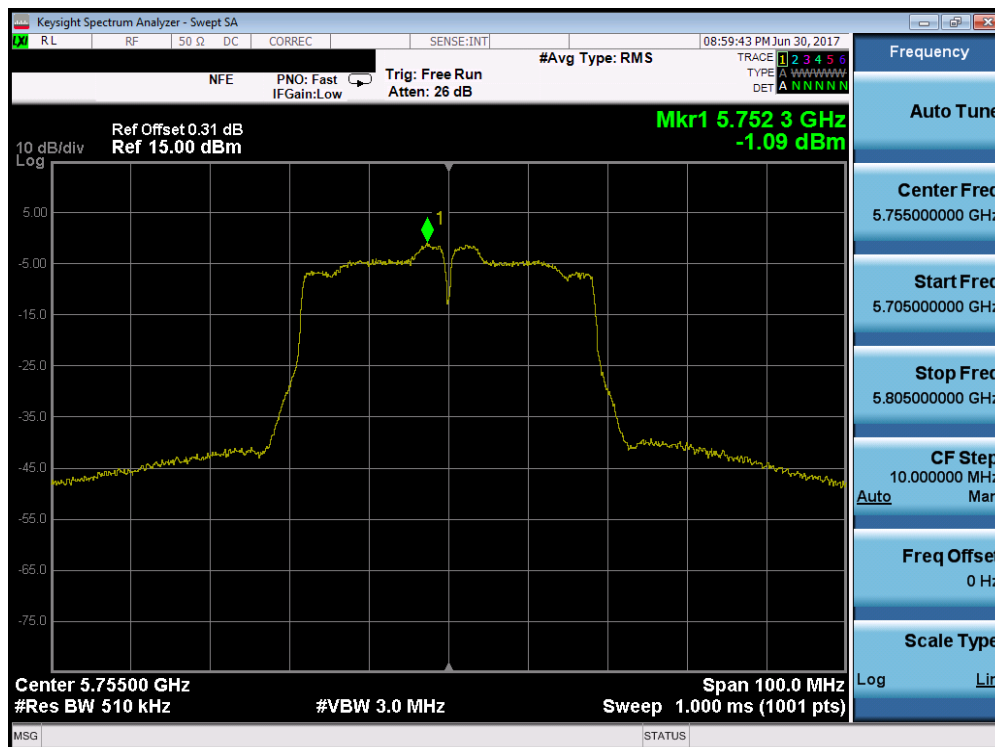


Plot 7-148. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 157)

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 104 of 221

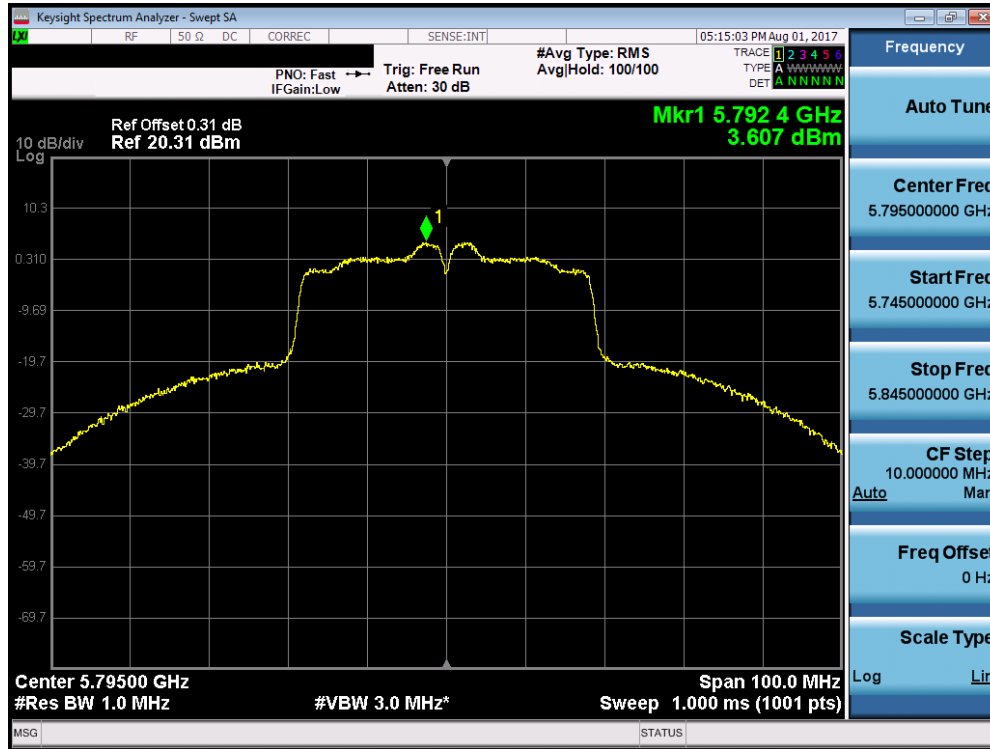


Plot 7-149. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 165)

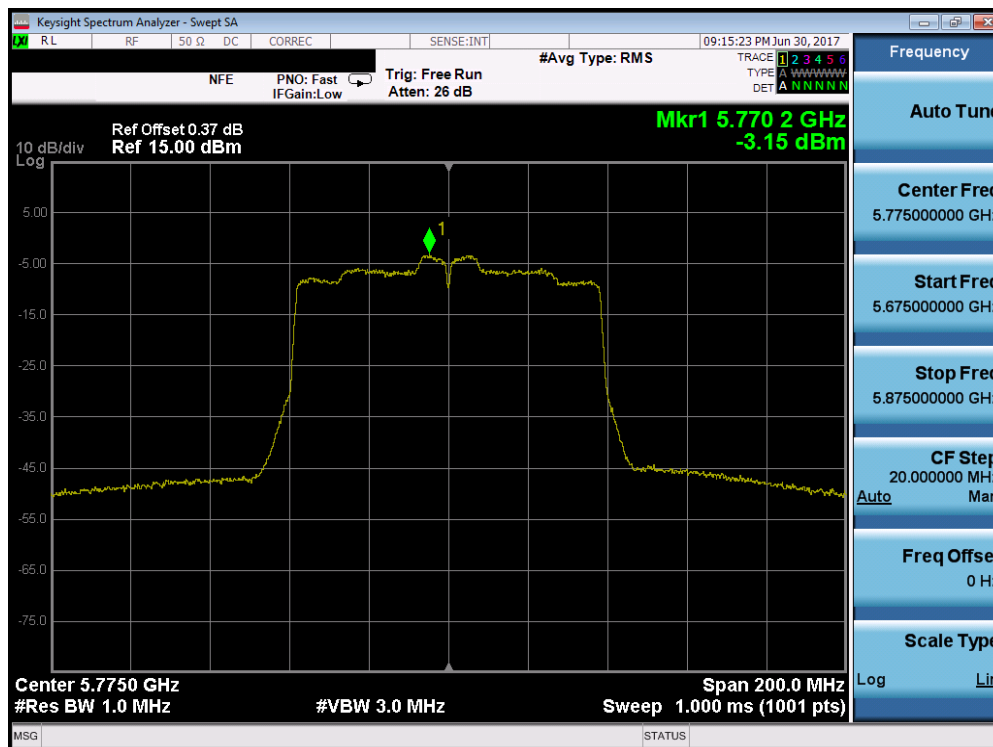


Plot 7-150. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 3) – Ch. 151)

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 105 of 221



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 802.11ac (UNII Band 3) – Ch. 155)

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 106 of 221

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]
Band 1	5180	36	a	6.5/7.2 (MCS0)	5.29	5.58	8.45	11.0	-2.55
	5200	40	a	6.5/7.2 (MCS0)	5.41	5.52	8.48	11.0	-2.52
	5240	48	a	6.5/7.2 (MCS0)	6.59	5.63	9.14	11.0	-1.86
	5180	36	n (20MHz)	6.5/7.2 (MCS0)	4.78	4.66	7.73	11.0	-3.27
	5200	40	n (20MHz)	6.5/7.2 (MCS0)	5.34	4.65	8.02	11.0	-2.98
	5240	48	n (20MHz)	6.5/7.2 (MCS0)	6.27	5.05	8.71	11.0	-2.29
	5190	38	n (40MHz)	13.5/15 (MCS0)	-0.08	-0.45	2.75	11.0	-8.25
	5230	46	n (40MHz)	13.5/15 (MCS0)	2.52	1.68	5.13	11.0	-5.87
	5210	42	ac (80MHz)	29.3/32.5 (MCS0)	-4.42	-4.60	-1.50	11.0	-12.50
Band 2A	5260	52	a	6.5/7.2 (MCS0)	6.44	5.63	9.07	11.0	-1.93
	5280	56	a	6.5/7.2 (MCS0)	5.94	5.31	8.65	11.0	-2.35
	5320	64	a	6.5/7.2 (MCS0)	5.51	5.44	8.49	11.0	-2.51
	5260	52	n (20MHz)	6.5/7.2 (MCS0)	6.23	5.15	8.73	11.0	-2.27
	5280	56	n (20MHz)	6.5/7.2 (MCS0)	6.01	4.47	8.32	11.0	-2.68
	5320	64	n (20MHz)	6.5/7.2 (MCS0)	5.44	4.90	8.19	11.0	-2.81
	5270	54	n (40MHz)	13.5/15 (MCS0)	2.25	1.65	4.97	11.0	-6.03
	5310	62	n (40MHz)	13.5/15 (MCS0)	0.41	-0.22	3.11	11.0	-7.89
	5290	58	ac (80MHz)	29.3/32.5 (MCS0)	-4.44	-4.87	-1.64	11.0	-12.64
Band 2C	5500	100	a	6.5/7.2 (MCS0)	6.28	5.95	9.13	11.0	-1.87
	5580	116	a	6.5/7.2 (MCS0)	3.95	4.60	7.29	11.0	-3.71
	5720	144	a	6.5/7.2 (MCS0)	5.23	6.05	8.67	11.0	-2.33
	5500	100	n (20MHz)	6.5/7.2 (MCS0)	6.04	5.97	9.01	11.0	-1.99
	5580	116	n (20MHz)	6.5/7.2 (MCS0)	4.11	4.24	7.18	11.0	-3.82
	5720	144	n (20MHz)	6.5/7.2 (MCS0)	5.22	5.92	8.59	11.0	-2.41
	5510	102	n (40MHz)	13.5/15 (MCS0)	0.23	0.82	3.55	11.0	-7.45
	5550	110	n (40MHz)	13.5/15 (MCS0)	3.33	2.22	5.82	11.0	-5.18
	5710	142	n (40MHz)	13.5/15 (MCS0)	0.01	1.61	3.89	11.0	-7.11
	5530	106	ac (80MHz)	29.3/32.5 (MCS0)	-5.11	-4.74	-1.91	11.0	-12.91
	5690	138	ac (80MHz)	29.3/32.5 (MCS0)	-4.75	-3.78	-1.23	11.0	-12.23

Table 7-22. 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]
Band 3	5745	149	a	6.5/7.2 (MCS0)	3.20	3.84	6.54	30.0	-23.46
	5785	157	a	6.5/7.2 (MCS0)	3.77	3.87	6.83	30.0	-23.17
	5825	165	a	6.5/7.2 (MCS0)	4.04	4.49	7.28	30.0	-22.72
	5745	149	n (20MHz)	6.5/7.2 (MCS0)	3.15	3.57	6.37	30.0	-23.63
	5785	157	n (20MHz)	6.5/7.2 (MCS0)	3.36	4.09	6.75	30.0	-23.25
	5825	165	n (20MHz)	6.5/7.2 (MCS0)	2.37	4.64	6.66	30.0	-23.34
	5755	151	n (40MHz)	13.5/15 (MCS0)	-2.30	-1.09	1.36	30.0	-28.64
	5795	159	n (40MHz)	13.5/15 (MCS0)	2.78	3.61	6.22	30.0	-23.78
	5775	155	ac (80MHz)	29.3/32.5 (MCS0)	-7.31	-3.15	-1.74	30.0	-31.74

Table 7-23. Band 3 MIMO Conducted Power Spectral Density Measurements

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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 4.78 dBm for Antenna-1 and 4.66 dBm for Antenna-2.

Antenna 1 + Antenna 2 = MIMO

$$(4.78 \text{ dBm} + 4.66 \text{ dBm}) = (3.00 \text{ mW} + 2.92 \text{ mW}) = 5.93 \text{ mW} = 7.73 \text{ dBm}$$

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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)	5,179,999,735	-265	-0.00000512
100 %		- 30	5,179,999,925	-75	-0.00000145
100 %		- 20	5,180,000,273	273	0.00000527
100 %		- 10	5,180,000,001	1	0.00000002
100 %		0	5,179,999,933	-67	-0.00000129
100 %		+ 10	5,180,000,006	6	0.00000012
100 %		+ 20	5,180,000,258	258	0.00000498
100 %		+ 30	5,179,999,973	-27	-0.00000052
100 %		+ 40	5,180,000,026	26	0.00000050
100 %		+ 50	5,180,000,056	56	0.00000108
BATT. ENDPOINT	3.40	+ 20	5,179,999,900	-100	-0.00000193

Table 7-24. 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

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

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

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	5,260,000,096	96	0.00000183
100 %		- 30	5,259,999,656	-344	-0.00000654
100 %		- 20	5,260,000,033	33	0.00000063
100 %		- 10	5,260,000,084	84	0.00000160
100 %		0	5,259,999,878	-122	-0.00000232
100 %		+ 10	5,259,999,844	-156	-0.00000297
100 %		+ 20	5,259,999,936	-64	-0.00000122
100 %		+ 30	5,260,000,129	129	0.00000245
100 %		+ 40	5,259,999,807	-193	-0.00000367
100 %		+ 50	5,260,000,340	340	0.00000646
BATT. ENDPOINT	3.40	+ 20	5,259,999,982	-18	-0.00000034

Table 7-25. 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

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

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

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	5,499,999,772	-228	-0.00000415
100 %		- 30	5,500,000,055	55	0.00000100
100 %		- 20	5,499,999,896	-104	-0.00000189
100 %		- 10	5,499,999,570	-430	-0.00000782
100 %		0	5,500,000,198	198	0.00000360
100 %		+ 10	5,500,000,287	287	0.00000522
100 %		+ 20	5,500,000,228	228	0.00000415
100 %		+ 30	5,499,999,721	-279	-0.00000507
100 %		+ 40	5,500,000,135	135	0.00000245
100 %		+ 50	5,499,999,994	-6	-0.00000011
BATT. ENDPOINT	3.40	+ 20	5,499,999,885	-115	-0.00000209

Table 7-26. Frequency Stability Measurements for UNII Band 2C (Ch. 100)

Note:

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

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Frequency Stability

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

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

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	5,745,000,382	382	0.00000665
100 %		- 30	5,745,000,132	132	0.00000230
100 %		- 20	5,744,999,683	-317	-0.00000552
100 %		- 10	5,744,999,727	-273	-0.00000475
100 %		0	5,744,999,776	-224	-0.00000390
100 %		+ 10	5,745,000,070	70	0.00000122
100 %		+ 20	5,745,000,009	9	0.00000016
100 %		+ 30	5,744,999,676	-324	-0.00000564
100 %		+ 40	5,744,999,920	-80	-0.00000139
100 %		+ 50	5,744,999,633	-367	-0.00000639
BATT. ENDPOINT	3.40	+ 20	5,745,000,196	196	0.00000341

Table 7-27. 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 v01r04, 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 7-28 per Section 15.209.

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

Table 7-28. Radiated Limits

Test Procedures Used

KDB 789033 D02 v01r04 – Section G

Test Settings

Average Measurements above 1GHz (Method AD)

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

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Peak Measurements above 1GHz

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

Peak Measurements below 1GHz

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

Test Setup

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

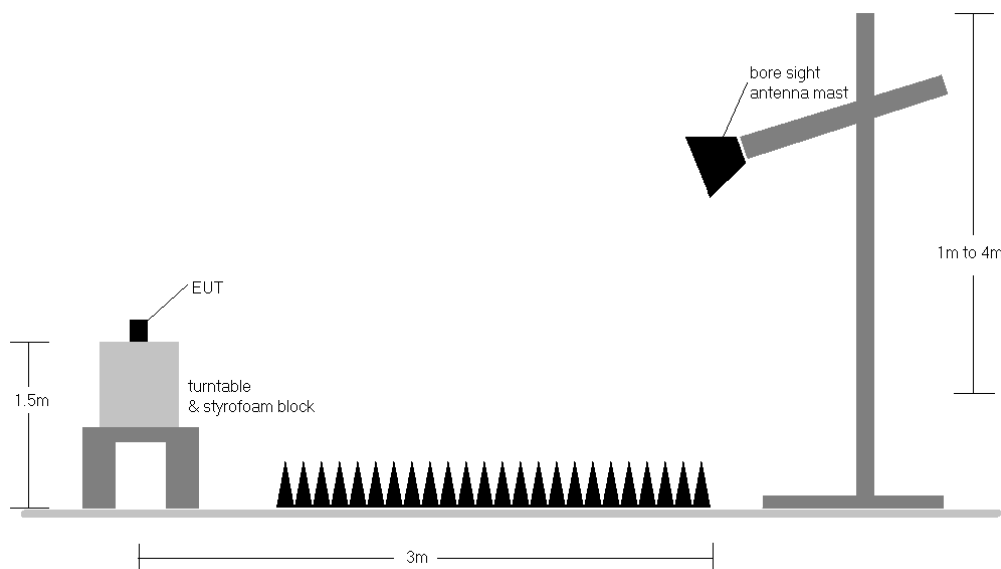


Figure 7-5. Test Instrument & Measurement Setup

FCC ID: ZNFG011C	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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Test Notes

1. All radiated spurious emissions levels were measured in a radiated test setup per the guidance of KDB 789033 D02 v01r04 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 7-28.
3. All spurious emissions lying in restricted bands specified in §15.205 are below the limit shown in Table 7-28. All spurious emissions that do not lie in a restricted band are subject to a peak limit of -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a “conversion” factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions of 68.2dBμV/m.
4. The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
5. This unit was tested with its standard battery.
6. The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter using CISPR quasi peak detector below 1GHz. Above 1 GHz, average and peak measurements were taken using linearly polarized horn antennas. The worst-case emissions are reported however emissions whose levels were not within 20dB of the respective limits were not reported.
7. Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.
8. Radiated spurious emissions were investigated while operating in MIMO mode, however, it was determined that single antenna operation produced the worst case emissions. Since the emissions produced from MIMO operation were found to be more than 20dB below the limit, the MIMO emissions are not reported.
9. The wide spectrum spurious emissions plots shown on the following pages are used only for the purpose of emission identification. Any emissions found to be within 20dB of the limit are fully investigated and the results are shown in this section. Rohde & Schwarz EMC32, Version 9.15.00 automated test software was used to perform the Radiated Spurious Emissions Pre-Scan testing.
10. The "-" shown in the following RSE tables are used to denote a noise floor measurement.

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Sample Calculations

Determining Spurious Emissions Levels

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

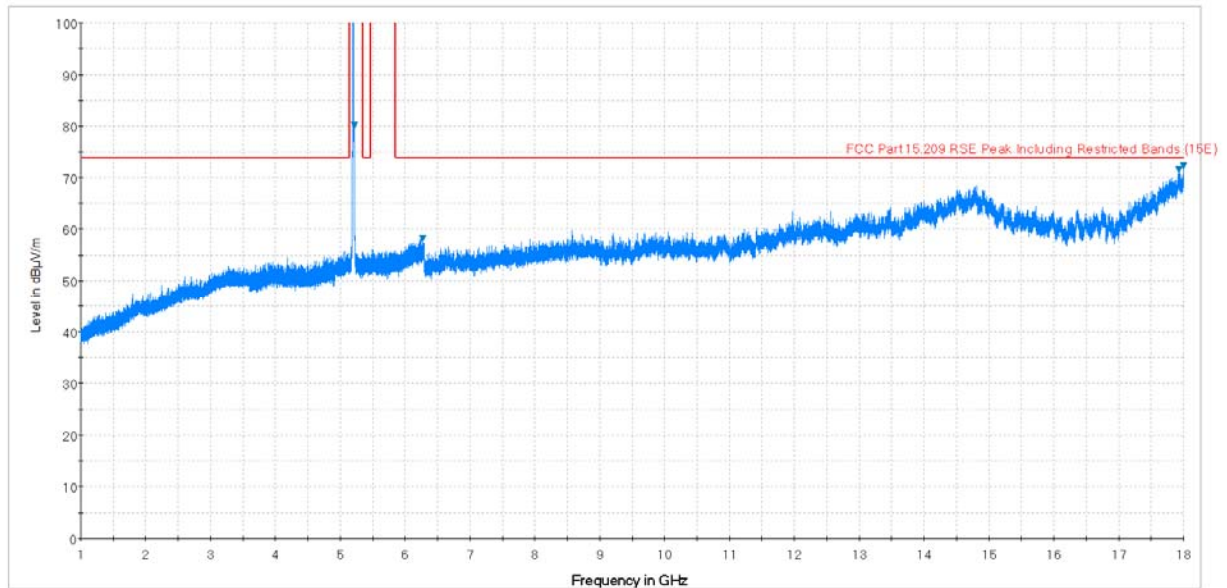
Radiated Band Edge Measurement Offset

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

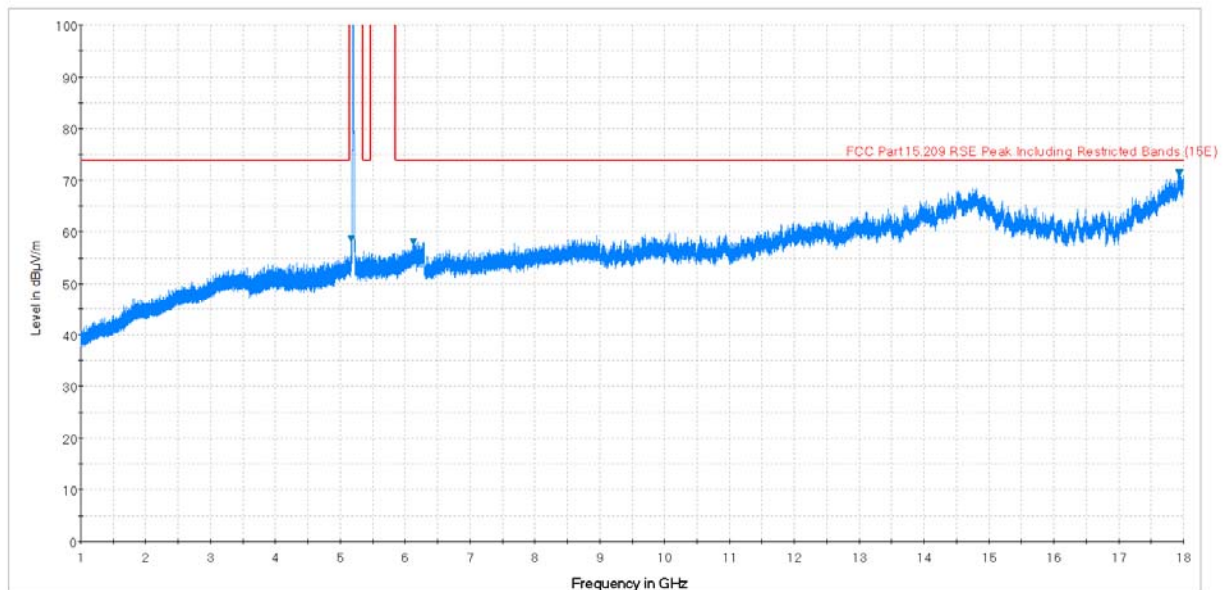
$$\text{Offset (dB)} = (\text{Antenna Factor} + \text{Cable Loss} + \text{Attenuator}) - \text{Preamplifier Gain}$$

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7.7.1 Antenna-1 Radiated Spurious Emission Measurements

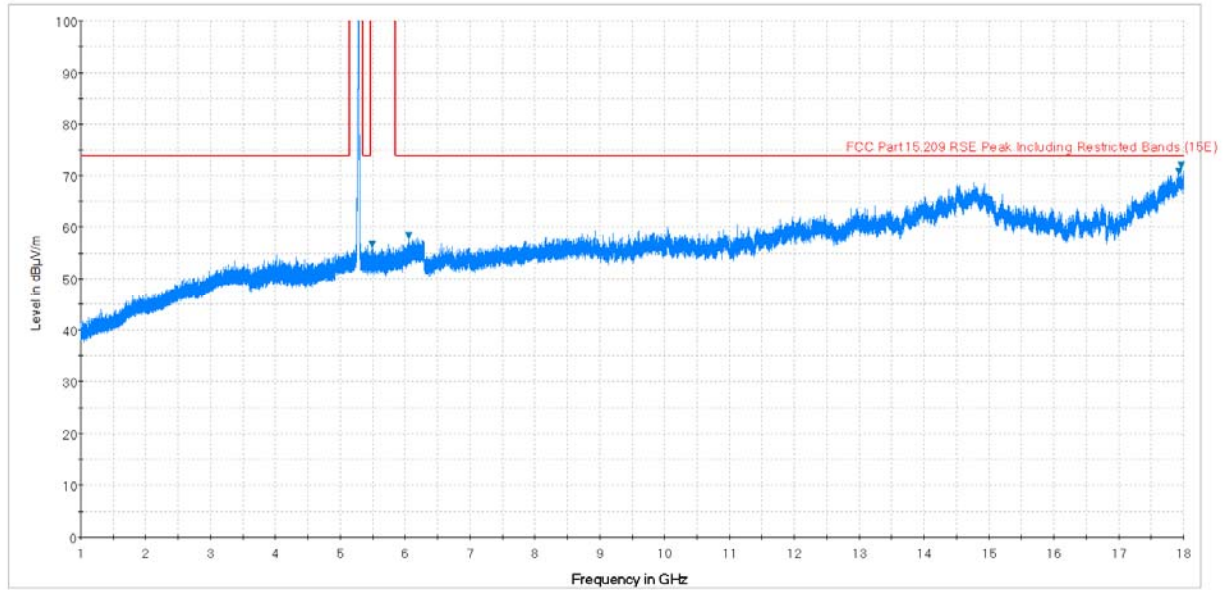


Plot 7-153. Radiated Spurious Plot above 1GHz (802.11a – U1 Ch. 40, Ant. Pol. H)

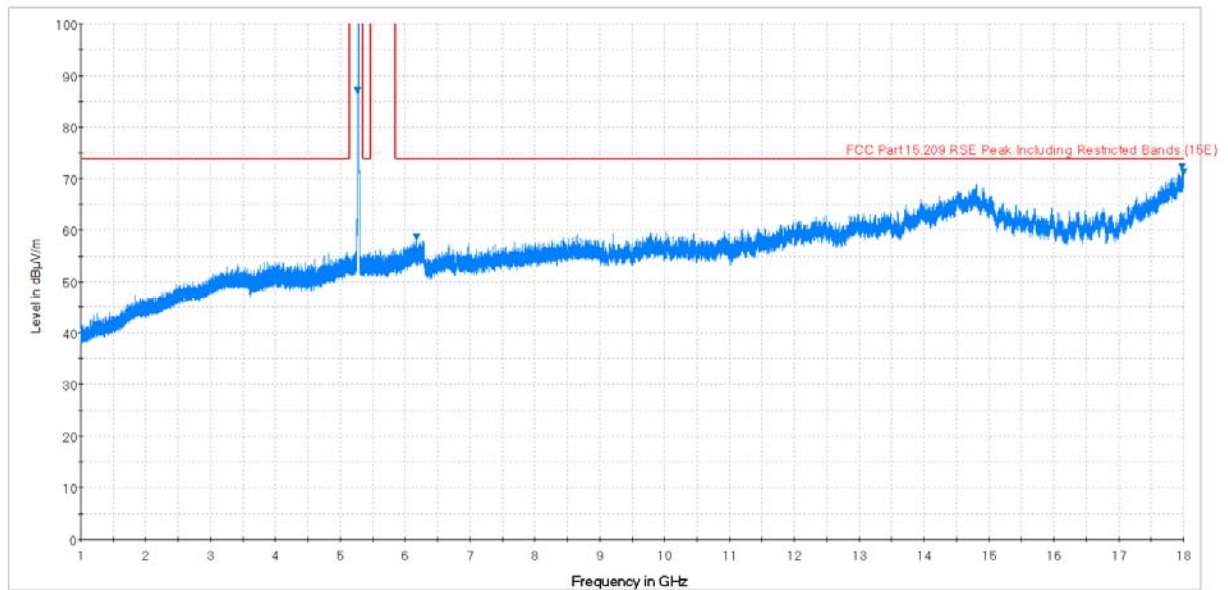


Plot 7-154. Radiated Spurious Plot above 1GHz (802.11a – U1 Ch. 40, Ant. Pol. V)

FCC ID: ZNFG011C	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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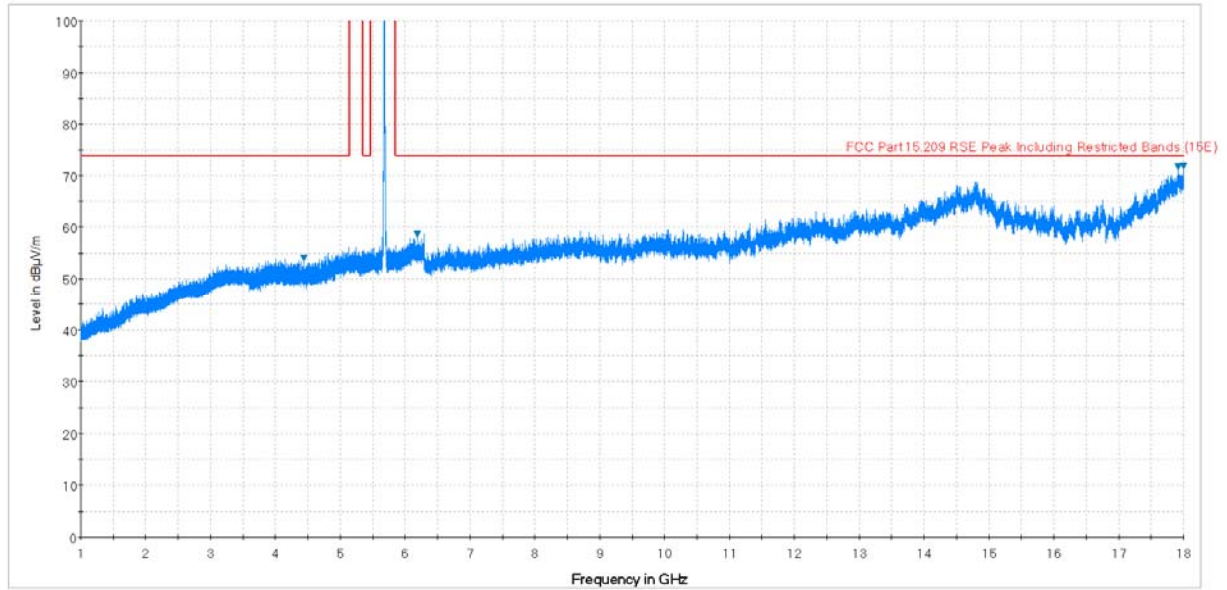


Plot 7-155. Radiated Spurious Plot above 1GHz (802.11a – U2A Ch. 56, Ant. Pol. H)

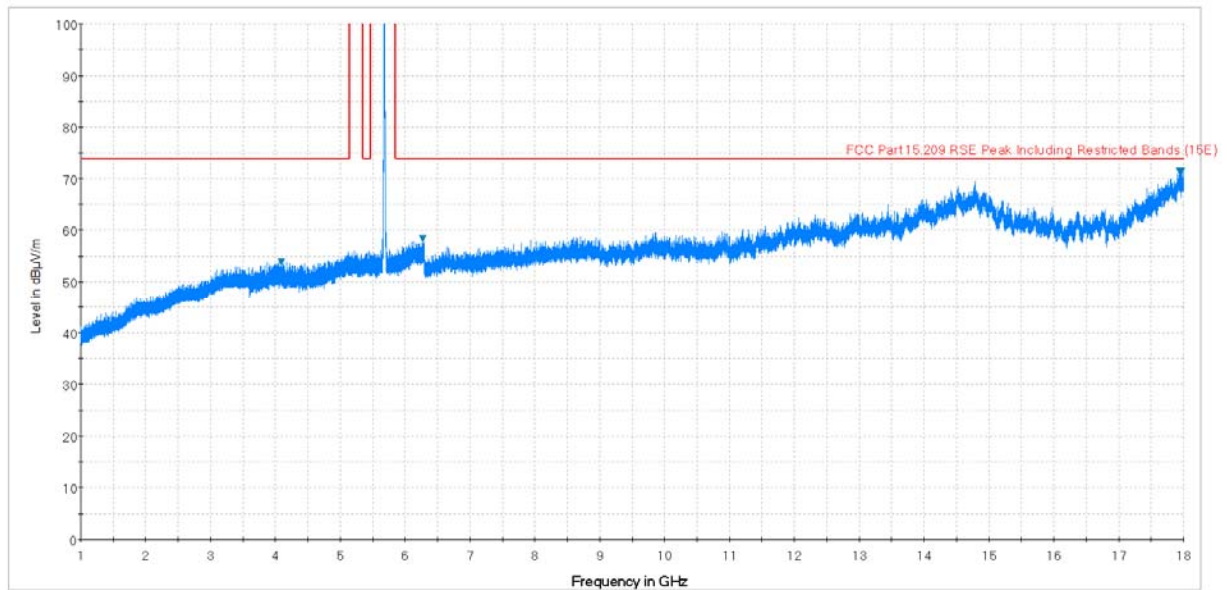


Plot 7-156. Radiated Spurious Plot above 1GHz (802.11a – U2A Ch. 56, Ant. Pol. V)

FCC ID: ZNFG011C	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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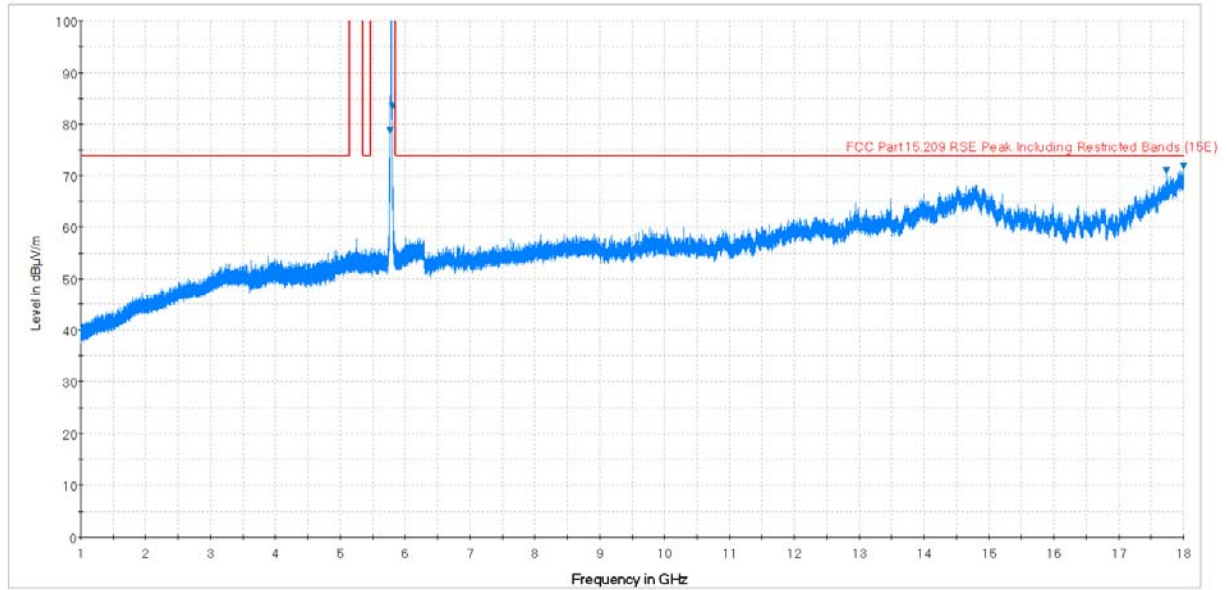


Plot 7-157. Radiated Spurious Plot above 1GHz (802.11a – U2C Ch. 116, Ant. Pol. H)

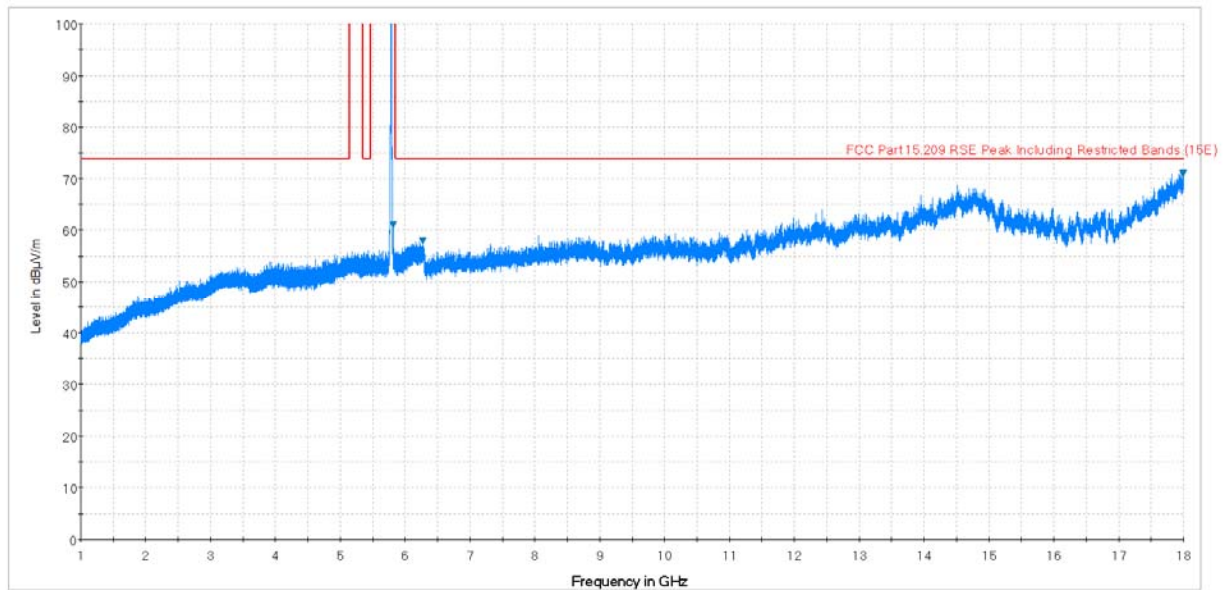


Plot 7-158. Radiated Spurious Plot above 1GHz (802.11a – U2C Ch. 116, Ant. Pol. V)

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 119 of 221



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

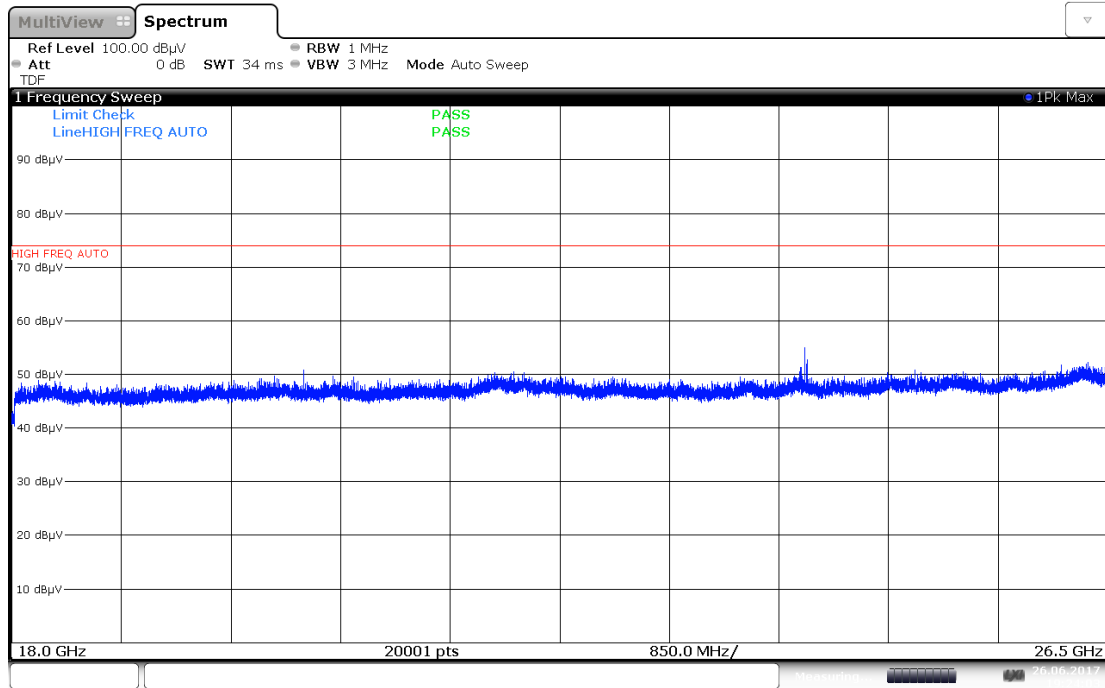


Plot 7-160. Radiated Spurious Plot above 1GHz (802.11a – U3 Ch. 157, Ant. Pol. V)

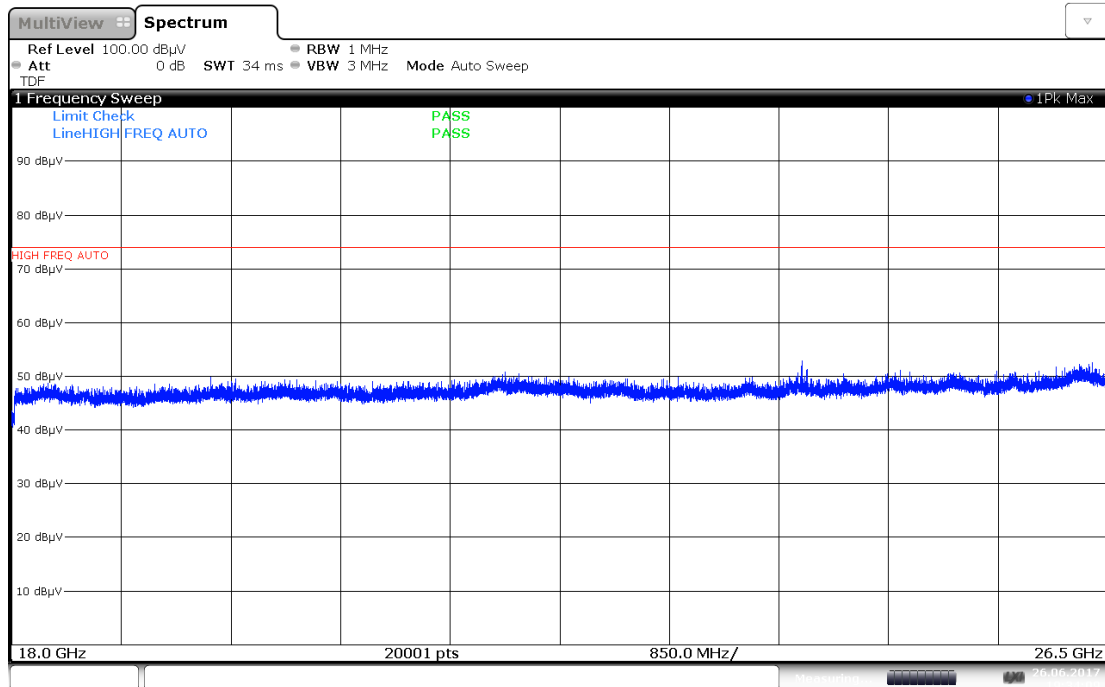
FCC ID: ZNFG011C	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 120 of 221

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: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 121 of 221

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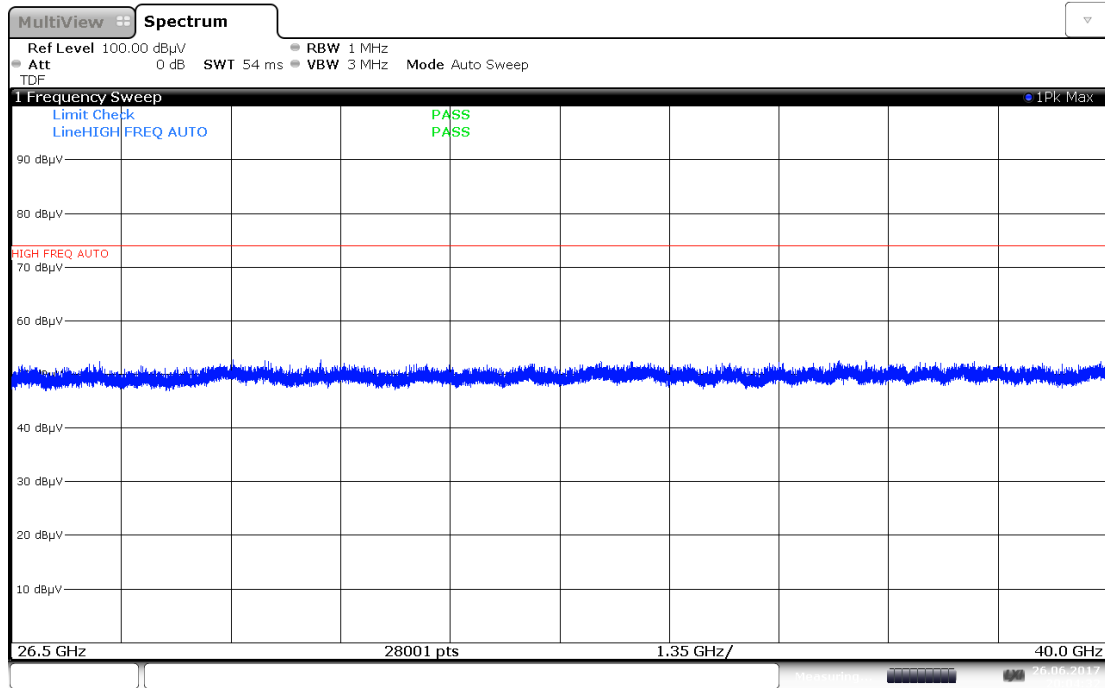
V 6.6

06/06/2017

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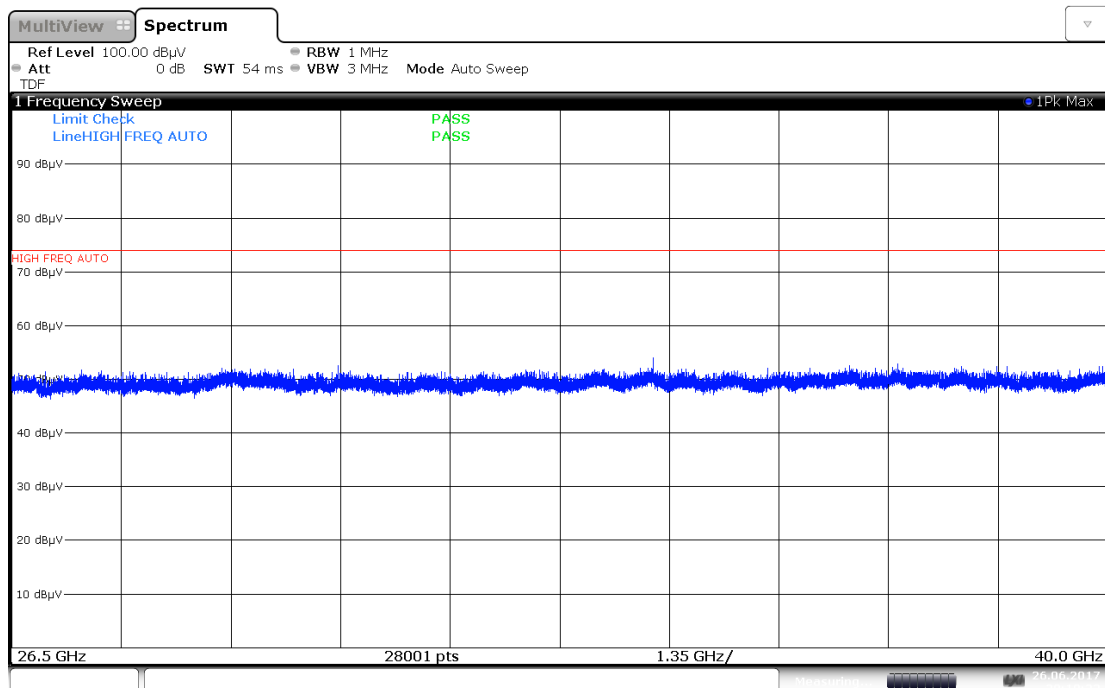
Antenna-1 Radiated Spurious Emissions Measurements (Above 18GHz)

§15.209



20:04:33 26.06.2017

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



20:19:22 26.06.2017

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

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 122 of 221

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V 6.6

06/06/2017

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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 Meter
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	-	-	-64.09	12.13	-9.54	45.50	68.20	-22.70
* 15540.00	Average	H	-	-	-75.11	14.49	-9.54	36.84	53.98	-17.14
* 15540.00	Peak	H	-	-	-61.28	14.49	-9.54	50.67	73.98	-23.31
* 20720.00	Average	H	-	-	-71.59	7.94	-9.54	33.81	53.98	-20.17
* 20720.00	Peak	H	-	-	-59.72	7.94	-9.54	45.68	73.98	-28.30
25900.00	Peak	H	-	-	-46.31	8.46	-9.54	59.61	68.20	-8.59

Table 7-29. Radiated Measurements

Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6 Mbps
Distance of Measurements: 1 Meter
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	-	-	-64.03	12.12	-9.54	45.55	68.20	-22.65
* 15600.00	Average	H	-	-	-75.29	14.31	-9.54	36.48	53.98	-17.50
* 15600.00	Peak	H	-	-	-62.66	14.31	-9.54	49.11	73.98	-24.87
* 20800.00	Average	H	-	-	-71.62	7.95	-9.54	33.79	53.98	-20.19
* 20800.00	Peak	H	-	-	-59.21	7.95	-9.54	46.20	73.98	-27.78
26000.00	Peak	H	-	-	-46.57	8.60	-9.54	59.49	68.20	-8.71

Table 7-30. Radiated Measurements

FCC ID: ZNFG011C		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 123 of 221

Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps
 Distance of Measurements: 1 Meter
 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	-	-	-64.14	12.09	-9.54	45.41	68.20	-22.79
* 15720.00	Average	H	-	-	-75.13	14.02	-9.54	36.35	53.98	-17.63
* 15720.00	Peak	H	-	-	-61.77	14.02	-9.54	49.71	73.98	-24.27
* 20960.00	Average	H	-	-	-71.79	7.91	-9.54	33.58	53.98	-20.40
* 20960.00	Peak	H	-	-	-60.02	7.91	-9.54	45.35	73.98	-28.63
26200.00	Peak	H	-	-	-46.42	8.62	-9.54	59.66	68.20	-8.54

Table 7-31. Radiated Measurements

Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps
 Distance of Measurements: 1 Meter
 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	-	-	-64.21	12.16	-9.54	45.41	68.20	-22.79
* 15780.00	Average	H	-	-	-75.06	14.03	-9.54	36.43	53.98	-17.55
* 15780.00	Peak	H	-	-	-61.96	14.03	-9.54	49.53	73.98	-24.45
* 21040.00	Average	H	-	-	-71.63	7.92	-9.54	33.75	53.98	-20.23
* 21040.00	Peak	H	-	-	-58.88	7.92	-9.54	46.50	73.98	-27.48
26300.00	Peak	H	-	-	-46.61	8.73	-9.54	59.58	68.20	-8.62

Table 7-32. Radiated Measurements

FCC ID: ZNFG011C		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 124 of 221

Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps
 Distance of Measurements: 1 Meter
 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	-	-	-63.82	12.04	-9.54	45.68	68.20	-22.52
* 15840.00	Average	H	-	-	-74.37	14.25	-9.54	37.33	53.98	-16.65
* 15840.00	Peak	H	-	-	-61.90	14.25	-9.54	49.80	73.98	-24.18
* 21120.00	Average	H	-	-	-71.33	7.96	-9.54	34.09	53.98	-19.89
* 21120.00	Peak	H	-	-	-58.88	7.96	-9.54	46.54	73.98	-27.44
26400.00	Peak	H	-	-	-45.51	8.94	-9.54	60.89	68.20	-7.31

Table 7-33. Radiated Measurements

Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps
 Distance of Measurements: 1 Meter
 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	-	-	-76.73	12.06	-9.54	32.79	53.98	-21.19
* 10640.00	Peak	H	-	-	-64.09	12.06	-9.54	45.43	73.98	-28.55
* 15960.00	Average	H	-	-	-74.31	14.55	-9.54	37.70	53.98	-16.28
* 15960.00	Peak	H	-	-	-61.48	14.55	-9.54	50.53	73.98	-23.45
* 21280.00	Average	H	-	-	-71.20	8.04	-9.54	34.30	53.98	-19.68
* 21280.00	Peak	H	-	-	-58.31	8.04	-9.54	47.19	73.98	-26.79
26600.00	Peak	H	-	-	-46.00	-8.30	-9.54	43.15	68.20	-25.05

Table 7-34. Radiated Measurements

FCC ID: ZNFG011C		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 125 of 221

Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6 Mbps
Distance of Measurements: 1 Meter
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	-	-	-77.08	12.87	-9.54	33.25	53.98	-20.73
* 11000.00	Peak	H	-	-	-64.37	12.87	-9.54	45.96	73.98	-28.02
16500.00	Peak	H	-	-	-60.19	16.61	-9.54	53.88	68.20	-14.32
22000.00	Peak	H	-	-	-57.78	8.43	-9.54	48.10	68.20	-20.10
27500.00	Peak	H	-	-	-45.18	-8.80	-9.54	43.48	68.20	-24.72

Table 7-35. Radiated Measurements

Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6 Mbps
Distance of Measurements: 1 Meter
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	-	-	-76.19	12.64	-9.54	33.91	53.98	-20.07
* 11160.00	Peak	H	-	-	-63.14	12.64	-9.54	46.96	73.98	-27.02
16740.00	Peak	H	-	-	-61.43	16.21	-9.54	52.24	68.20	-15.96
* 22320.00	Average	H	-	-	-70.91	8.08	-9.54	34.63	53.98	-19.35
* 22320.00	Peak	H	-	-	-57.99	8.08	-9.54	47.55	73.98	-26.43
27900.00	Peak	H	-	-	-44.99	-9.08	-9.54	43.39	68.20	-24.81

Table 7-36. Radiated Measurements

FCC ID: ZNFG011C		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 126 of 221

Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6 Mbps
Distance of Measurements: 1 Meter
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	-	-	-76.55	12.47	-9.54	33.38	53.98	-20.60
* 11400.00	Peak	H	-	-	-63.25	12.47	-9.54	46.68	73.98	-27.30
17100.00	Peak	H	-	-	-63.02	18.06	-9.54	52.50	68.20	-15.70
* 22800.00	Average	H	-	-	-71.30	8.37	-9.54	34.53	53.98	-19.45
* 22800.00	Peak	H	-	-	-58.30	8.37	-9.54	47.53	73.98	-26.45
28500.00	Peak	H	-	-	-44.88	-8.95	-9.54	43.63	68.20	-24.57

Table 7-37. Radiated Measurements

Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6 Mbps
Distance of Measurements: 1 Meter
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	-	-	-76.54	12.43	-9.54	33.35	53.98	-20.63
* 11490.00	Peak	H	-	-	-63.56	12.43	-9.54	46.33	73.98	-27.65
17235.00	Peak	H	-	-	-60.49	18.61	-9.54	55.58	68.20	-12.62
* 22980.00	Average	H	-	-	-72.13	8.16	-9.54	33.49	53.98	-20.49
* 22980.00	Peak	H	-	-	-59.96	8.16	-9.54	45.66	73.98	-28.32
28725.00	Peak	H	-	-	-44.81	-9.24	-9.54	43.41	68.20	-24.79

Table 7-38. Radiated Measurements

FCC ID: ZNFG011C		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 127 of 221

Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6 Mbps
Distance of Measurements: 1 Meter
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	-	-	-76.17	12.54	-9.54	33.83	53.98	-20.15
* 11570.00	Peak	H	-	-	-63.70	12.54	-9.54	46.30	73.98	-27.68
17355.00	Peak	H	-	-	-60.14	18.73	-9.54	56.05	68.20	-12.15
23140.00	Peak	H	-	-	-59.09	8.37	-9.54	46.74	68.20	-21.46
28925.00	Peak	H	-	-	-44.16	-9.65	-9.54	43.65	68.20	-24.55

Table 7-39. Radiated Measurements

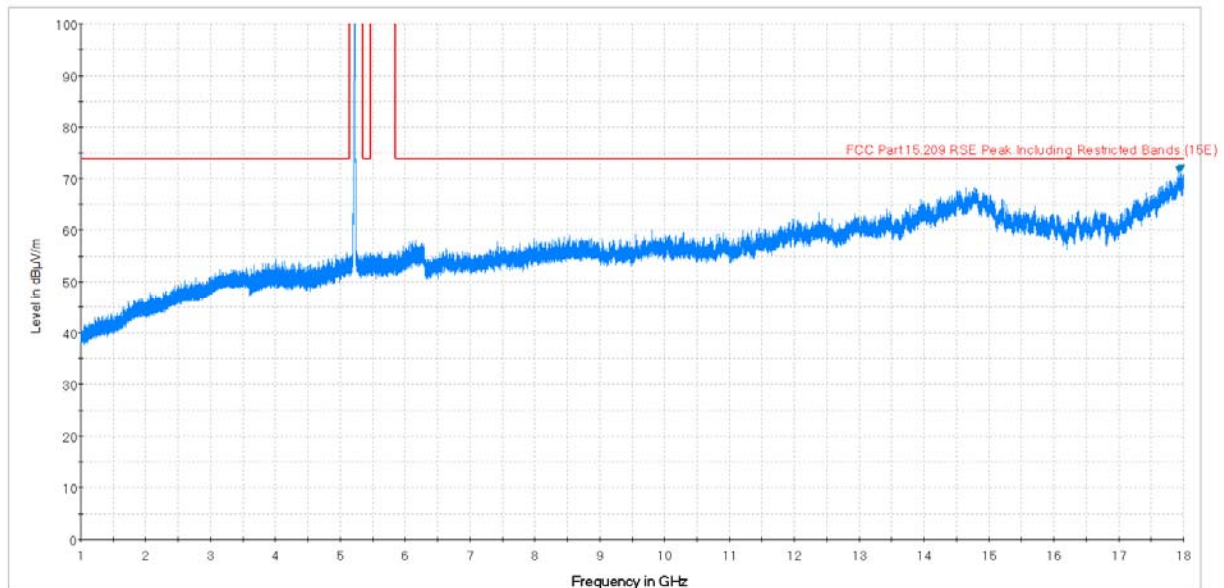
Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6 Mbps
Distance of Measurements: 1 Meter
Operating Frequency: 5825MHz
Channel: 165

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	-	-	-75.85	12.99	-9.54	34.59	53.98	-19.39
* 11650.00	Peak	H	-	-	-63.36	12.99	-9.54	47.08	73.98	-26.90
17475.00	Peak	H	-	-	-60.77	19.25	-9.54	55.93	68.20	-12.27
23300.00	Peak	H	-	-	-58.94	8.50	-9.54	47.01	68.20	-21.19
29125.00	Peak	H	-	-	-43.71	-9.87	-9.54	43.88	68.20	-24.32

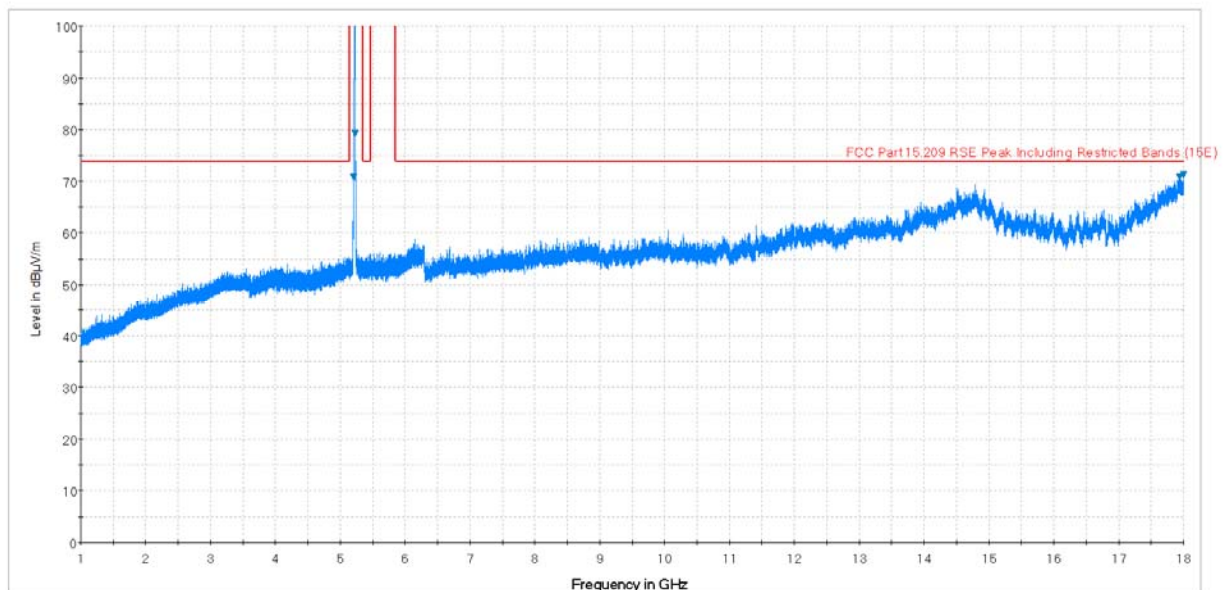
Table 7-40. Radiated Measurements

FCC ID: ZNFG011C		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 128 of 221

7.7.2 Antenna-2 Radiated Spurious Emission Measurements

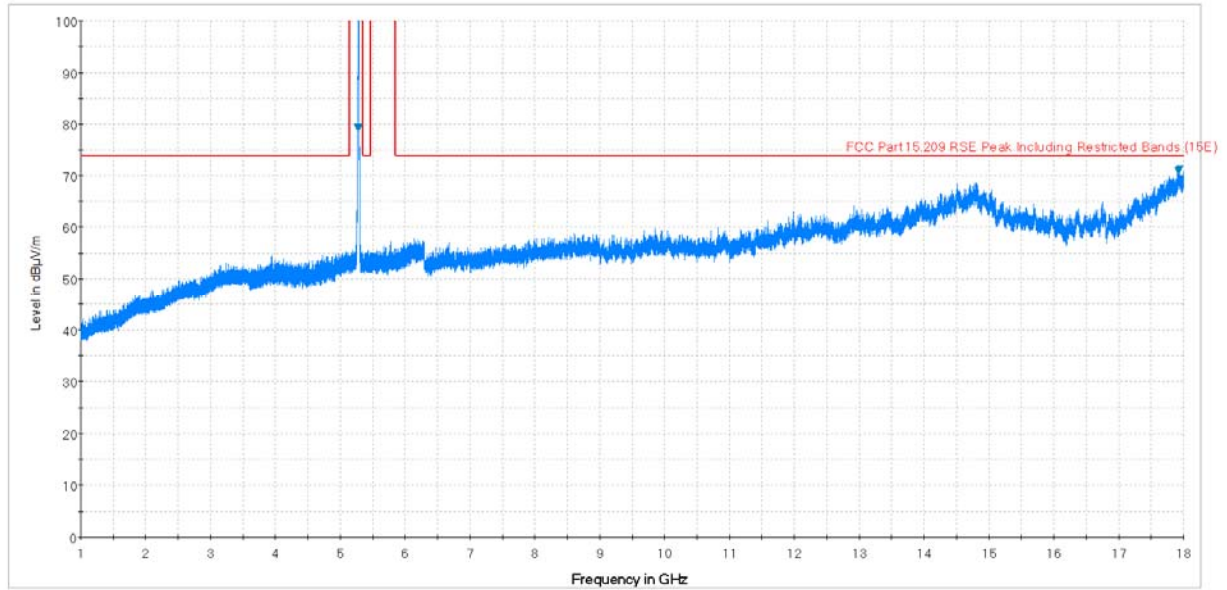


Plot 7-165. Radiated Spurious Plot above 1GHz (802.11a – U1 Ch. 40, Ant. Pol. H)

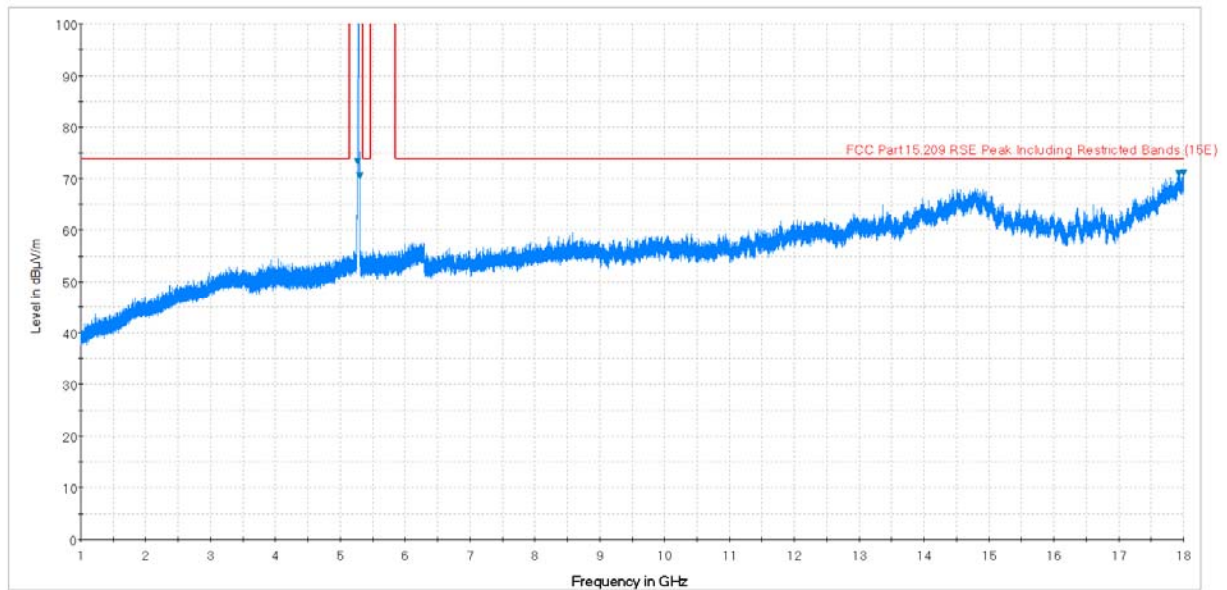


Plot 7-166. Radiated Spurious Plot above 1GHz (802.11a – U1 Ch. 40, Ant. Pol. V)

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 129 of 221

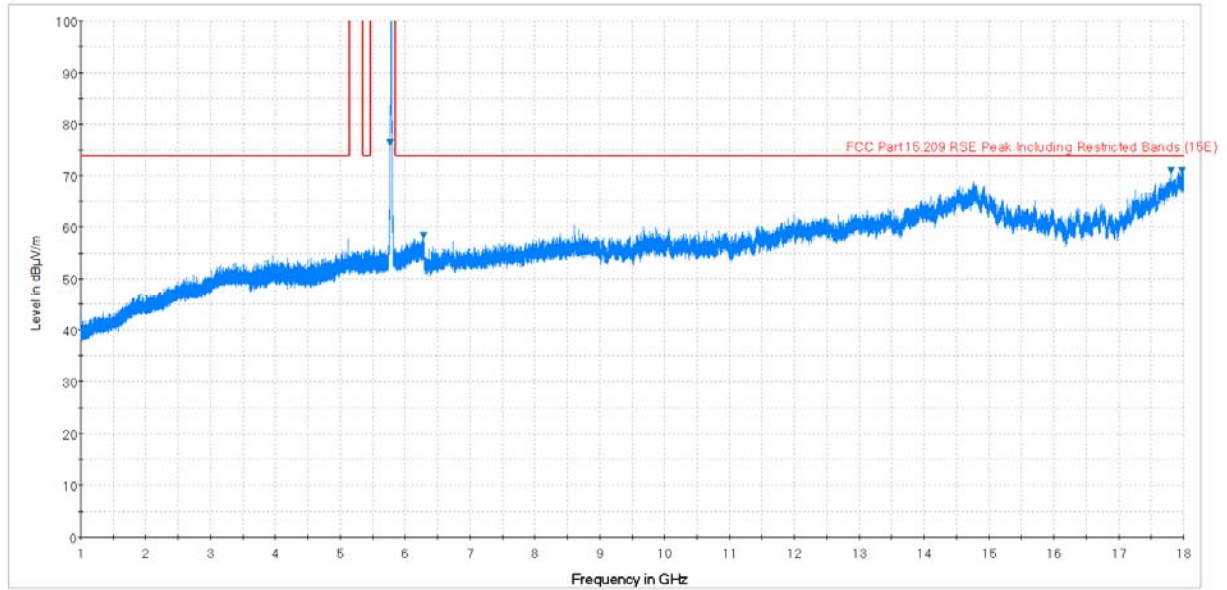


Plot 7-167. Radiated Spurious Plot above 1GHz (802.11a – U2A Ch. 56, Ant. Pol. H)

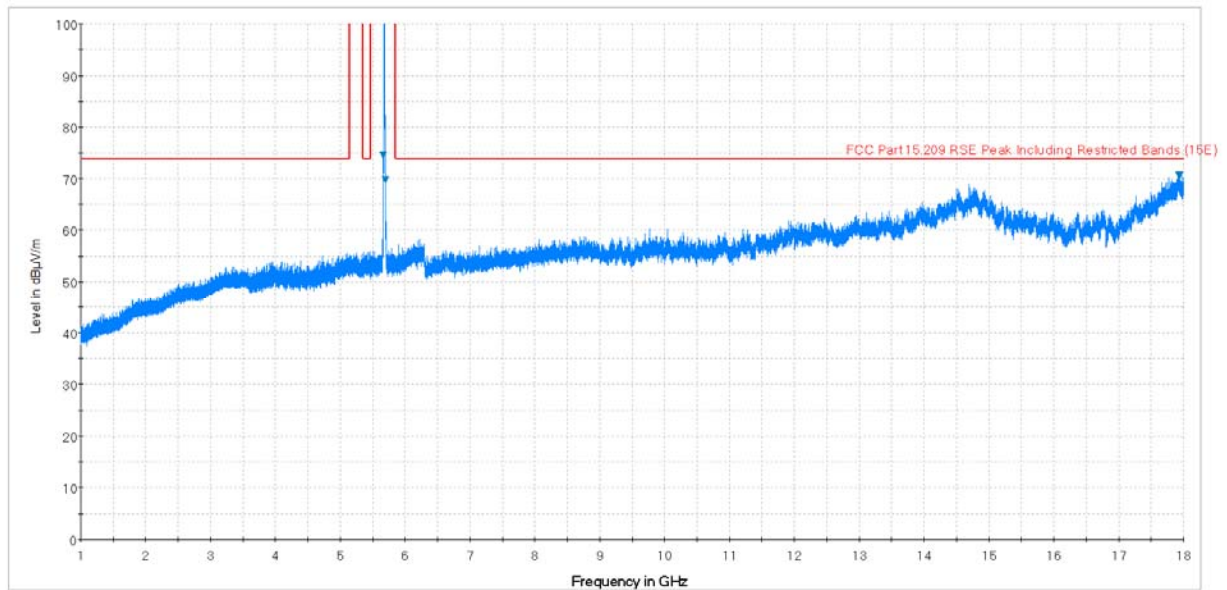


Plot 7-168. Radiated Spurious Plot above 1GHz (802.11a – U2A Ch. 56, Ant. Pol. V)

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 130 of 221

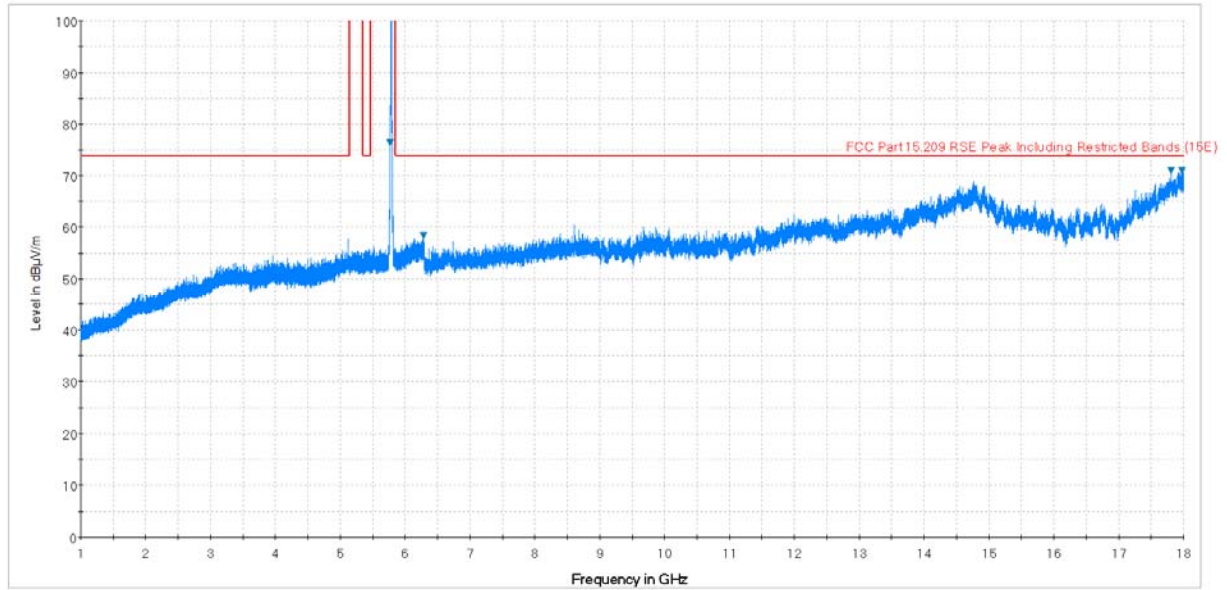


Plot 7-169. Radiated Spurious Plot above 1GHz (802.11a – U2C Ch. 116, Ant. Pol. H)

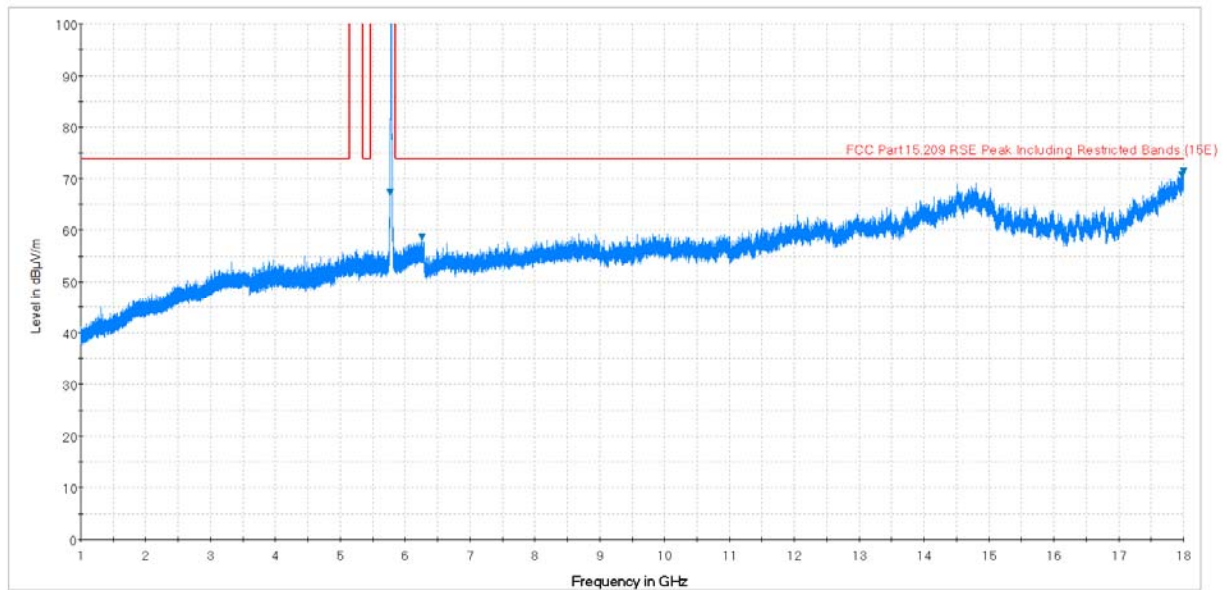


Plot 7-170. Radiated Spurious Plot above 1GHz (802.11a – U2C Ch. 116, Ant. Pol. V)

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 131 of 221



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

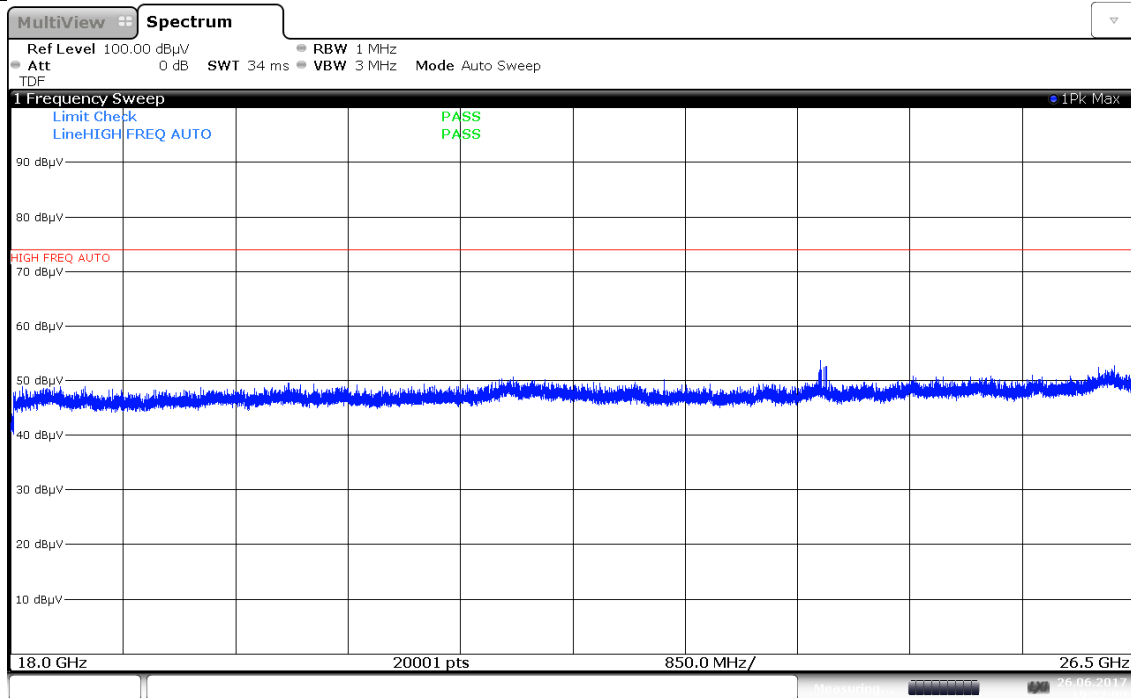


Plot 7-172. Radiated Spurious Plot above 1GHz (802.11a – U3 Ch. 157, Ant. Pol. V)

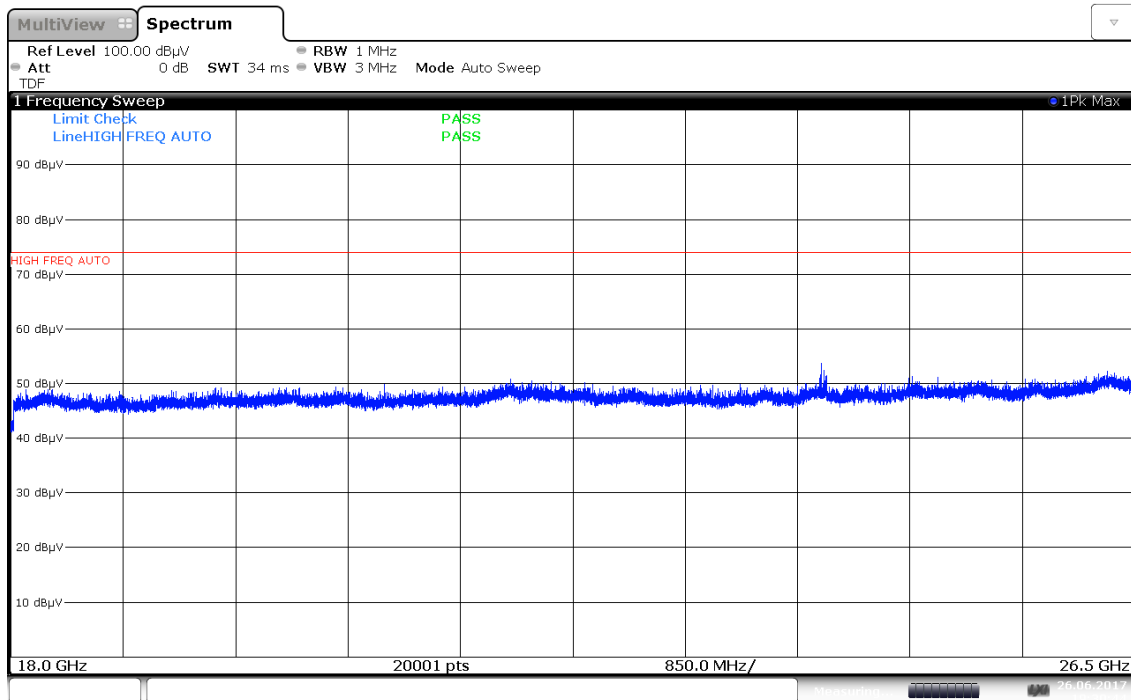
FCC ID: ZNFG011C	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 132 of 221

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

§15.209



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



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

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 133 of 221

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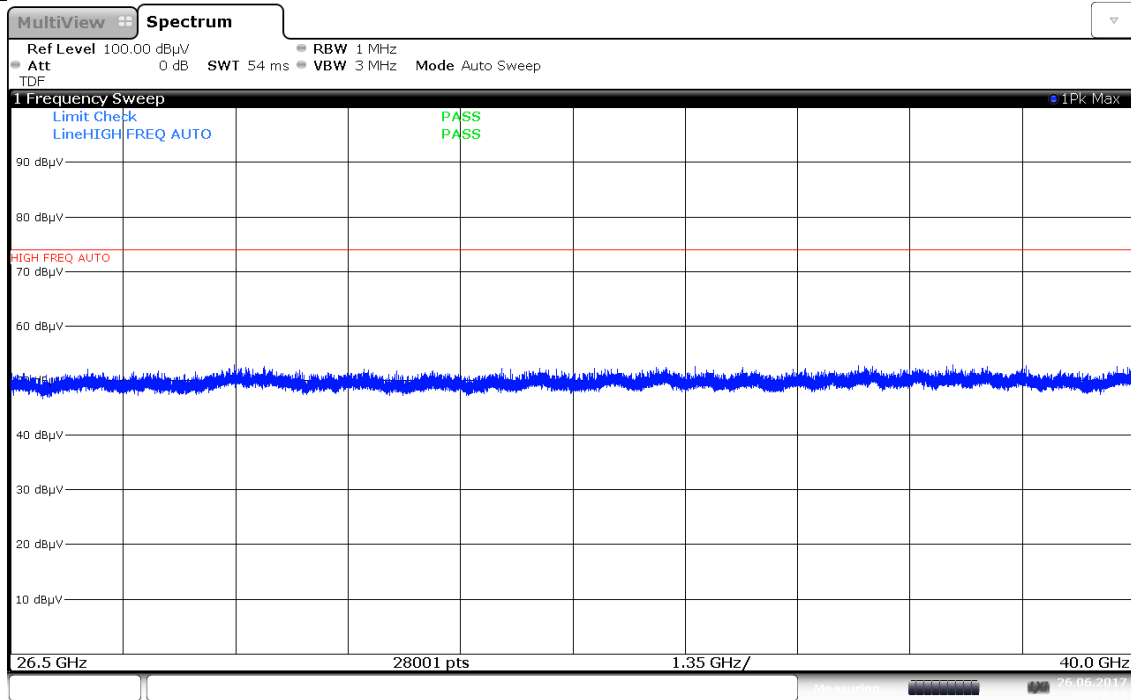
V 6.6

06/06/2017

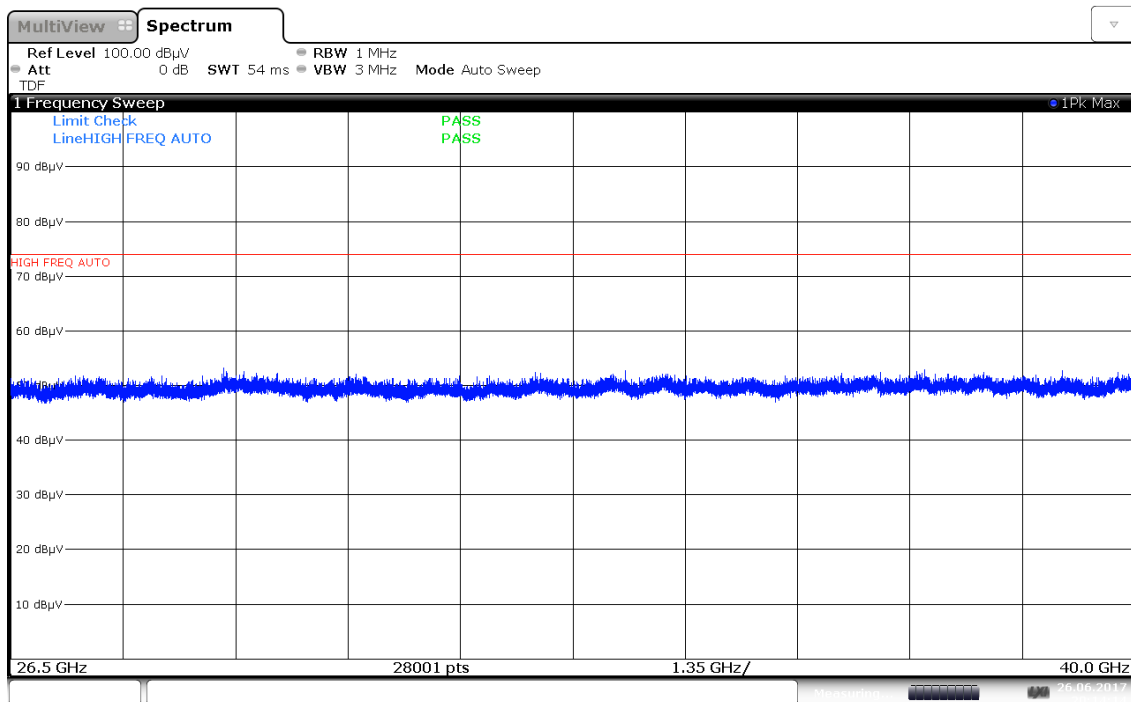
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Antenna-2 Radiated Spurious Emissions Measurements (Above 18GHz)

§15.209



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



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

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 134 of 221

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 Meter
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	V	-	-	-64.14	12.13	-9.54	45.45	68.20	-22.75
* 15540.00	Average	V	-	-	-75.16	14.49	-9.54	36.79	53.98	-17.19
* 15540.00	Peak	V	-	-	-63.40	14.49	-9.54	48.55	73.98	-25.43
* 20720.00	Average	V	-	-	-72.15	7.94	-9.54	33.25	53.98	-20.73
* 20720.00	Peak	V	-	-	-60.62	7.94	-9.54	44.78	73.98	-29.20
25900.00	Peak	V	-	-	-44.87	8.46	-9.54	61.05	68.20	-7.15

Table 7-41. Radiated Measurements

Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6 Mbps
Distance of Measurements: 1 Meter
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	V	-	-	-64.52	12.12	-9.54	45.06	68.20	-23.14
* 15600.00	Average	V	-	-	-75.10	14.31	-9.54	36.67	53.98	-17.31
* 15600.00	Peak	V	-	-	-62.21	14.31	-9.54	49.56	73.98	-24.42
* 20800.00	Average	V	-	-	-72.07	7.95	-9.54	33.34	53.98	-20.64
* 20800.00	Peak	V	-	-	-58.56	7.95	-9.54	46.85	73.98	-27.13
26000.00	Peak	V	-	-	-46.55	8.60	-9.54	59.51	68.20	-8.69

Table 7-42. Radiated Measurements

FCC ID: ZNFG011C		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 Meter
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	V	-	-	-64.44	12.09	-9.54	45.11	68.20	-23.09
* 15720.00	Average	V	-	-	-75.23	14.02	-9.54	36.25	53.98	-17.73
* 15720.00	Peak	V	-	-	-62.55	14.02	-9.54	48.93	73.98	-25.05
* 20960.00	Average	V	-	-	-72.40	7.91	-9.54	32.97	53.98	-21.01
* 20960.00	Peak	V	-	-	-60.20	7.91	-9.54	45.17	73.98	-28.81
26200.00	Peak	V	-	-	-46.20	8.62	-9.54	59.88	68.20	-8.32

Table 7-43. Radiated Measurements

Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6 Mbps
Distance of Measurements: 1 Meter
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	V	-	-	-64.25	12.16	-9.54	45.37	68.20	-22.83
* 15780.00	Average	V	-	-	-74.97	14.03	-9.54	36.52	53.98	-17.46
* 15780.00	Peak	V	-	-	-62.39	14.03	-9.54	49.10	73.98	-24.88
* 21040.00	Average	V	-	-	-72.95	7.92	-9.54	32.43	53.98	-21.55
* 21040.00	Peak	V	-	-	-59.43	7.92	-9.54	45.95	73.98	-28.03
26300.00	Peak	V	-	-	-45.77	8.73	-9.54	60.42	68.20	-7.78

Table 7-44. Radiated Measurements

FCC ID: ZNFG011C		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 136 of 221

Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6 Mbps
Distance of Measurements: 1 Meter
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	V	-	-	-63.90	12.04	-9.54	45.60	68.20	-22.60
* 15840.00	Average	V	-	-	-74.58	14.25	-9.54	37.12	53.98	-16.86
* 15840.00	Peak	V	-	-	-63.08	14.25	-9.54	48.62	73.98	-25.36
* 21120.00	Average	V	-	-	-71.79	7.96	-9.54	33.63	53.98	-20.35
* 21120.00	Peak	V	-	-	-59.12	7.96	-9.54	46.30	73.98	-27.68
26400.00	Peak	V	-	-	-45.56	8.94	-9.54	60.84	68.20	-7.36

Table 7-45. Radiated Measurements

Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6 Mbps
Distance of Measurements: 1 Meter
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	V	-	-	-76.71	12.06	-9.54	32.81	53.98	-21.17
* 10640.00	Peak	V	-	-	-63.40	12.06	-9.54	46.12	73.98	-27.86
* 15960.00	Average	V	-	-	-74.56	14.55	-9.54	37.45	53.98	-16.53
* 15960.00	Peak	V	-	-	-62.48	14.55	-9.54	49.53	73.98	-24.45
* 21280.00	Average	V	-	-	-71.15	8.04	-9.54	34.35	53.98	-19.63
* 21280.00	Peak	V	-	-	-58.02	8.04	-9.54	47.48	73.98	-26.50
26600.00	Peak	V	-	-	-46.04	-8.30	-9.54	43.11	68.20	-25.09

Table 7-46. Radiated Measurements

FCC ID: ZNFG011C		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 137 of 221

Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6 Mbps
Distance of Measurements: 1 Meter
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	V	-	-	-77.18	12.87	-9.54	33.15	53.98	-20.83
* 11000.00	Peak	V	-	-	-65.16	12.87	-9.54	45.17	73.98	-28.81
16500.00	Peak	V	-	-	-60.52	16.61	-9.54	53.55	68.20	-14.65
22000.00	Peak	V	-	-	-57.48	8.43	-9.54	48.40	68.20	-19.80
27500.00	Peak	V	-	-	-45.60	-8.80	-9.54	43.06	68.20	-25.14

Table 7-47. Radiated Measurements

Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6 Mbps
Distance of Measurements: 1 Meter
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	V	-	-	-76.27	12.64	-9.54	33.83	53.98	-20.15
* 11160.00	Peak	V	-	-	-63.23	12.64	-9.54	46.87	73.98	-27.11
16740.00	Peak	V	-	-	-61.36	16.21	-9.54	52.31	68.20	-15.89
* 22320.00	Average	V	-	-	-70.99	8.08	-9.54	34.55	53.98	-19.43
* 22320.00	Peak	V	-	-	-58.01	8.08	-9.54	47.53	73.98	-26.45
27900.00	Peak	V	-	-	-45.71	-9.08	-9.54	42.67	68.20	-25.53

Table 7-48. Radiated Measurements

FCC ID: ZNFG011C		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 138 of 221

Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6 Mbps
Distance of Measurements: 1 Meter
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]
* 11440.00	Average	V	-	-	-76.63	12.47	-9.54	33.30	53.98	-20.68
* 11440.00	Peak	V	-	-	-64.05	12.47	-9.54	45.88	73.98	-28.10
17160.00	Peak	V	-	-	-60.81	18.06	-9.54	54.71	68.20	-13.49
* 22880.00	Average	V	-	-	-71.32	8.37	-9.54	34.51	53.98	-19.47
* 22880.00	Peak	V	-	-	-58.98	8.37	-9.54	46.85	73.98	-27.13
28600.00	Peak	V	-	-	-45.79	-8.95	-9.54	42.72	68.20	-25.48

Table 7-49. Radiated Measurements

Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6 Mbps
Distance of Measurements: 1 Meter
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	V	-	-	-76.26	12.43	-9.54	33.63	53.98	-20.35
* 11490.00	Peak	V	-	-	-63.24	12.43	-9.54	46.65	73.98	-27.33
17235.00	Peak	V	-	-	-61.14	18.61	-9.54	54.93	68.20	-13.27
* 22980.00	Average	V	-	-	-72.13	8.16	-9.54	33.49	53.98	-20.49
* 22980.00	Peak	V	-	-	-59.96	8.16	-9.54	45.66	73.98	-28.32
28725.00	Peak	V	-	-	-44.81	-9.24	-9.54	43.41	68.20	-24.79

Table 7-50. Radiated Measurements

FCC ID: ZNFG011C		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 139 of 221

Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6 Mbps
Distance of Measurements: 1 Meter
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	V	-	-	-76.06	12.54	-9.54	33.94	53.98	-20.04
* 11570.00	Peak	V	-	-	-63.36	12.54	-9.54	46.64	73.98	-27.34
17355.00	Peak	V	-	-	-60.14	18.73	-9.54	56.05	68.20	-12.15
23140.00	Peak	V	-	-	-59.09	8.37	-9.54	46.74	68.20	-21.46
28925.00	Peak	V	-	-	-44.16	-9.65	-9.54	43.65	68.20	-24.55

Table 7-51. Radiated Measurements

Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6 Mbps
Distance of Measurements: 1 Meter
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	V	-	-	-75.99	12.99	-9.54	34.45	53.98	-19.53
* 11650.00	Peak	V	-	-	-63.39	12.99	-9.54	47.05	73.98	-26.93
17475.00	Peak	V	-	-	-60.76	19.25	-9.54	55.94	68.20	-12.26
23300.00	Peak	V	-	-	-58.94	8.50	-9.54	47.01	68.20	-21.19
29125.00	Peak	V	-	-	-43.71	-9.87	-9.54	43.88	68.20	-24.32

Table 7-52. Radiated Measurements

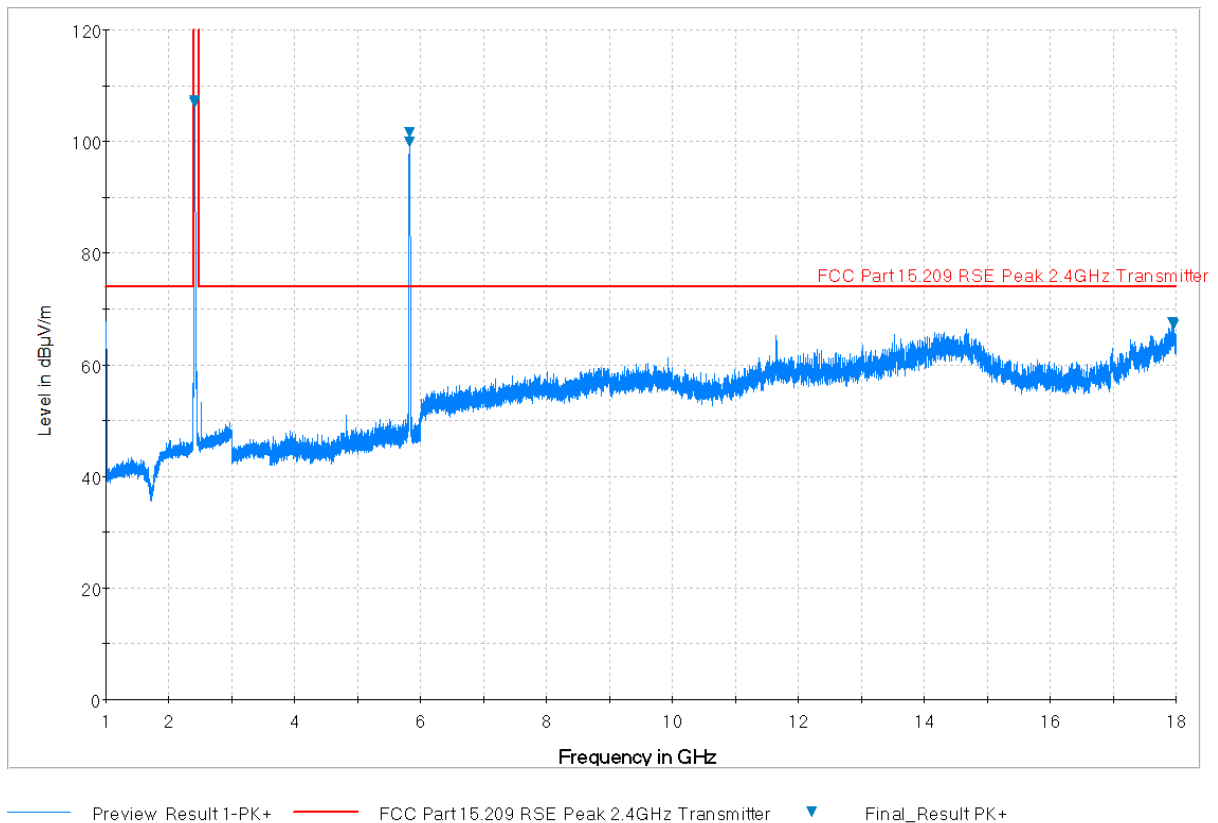
FCC ID: ZNFG011C		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 140 of 221

7.7.3 Simultaneous Tx Radiated Spurious Emissions Measurements

§15.247(d) §15.205 & §15.209

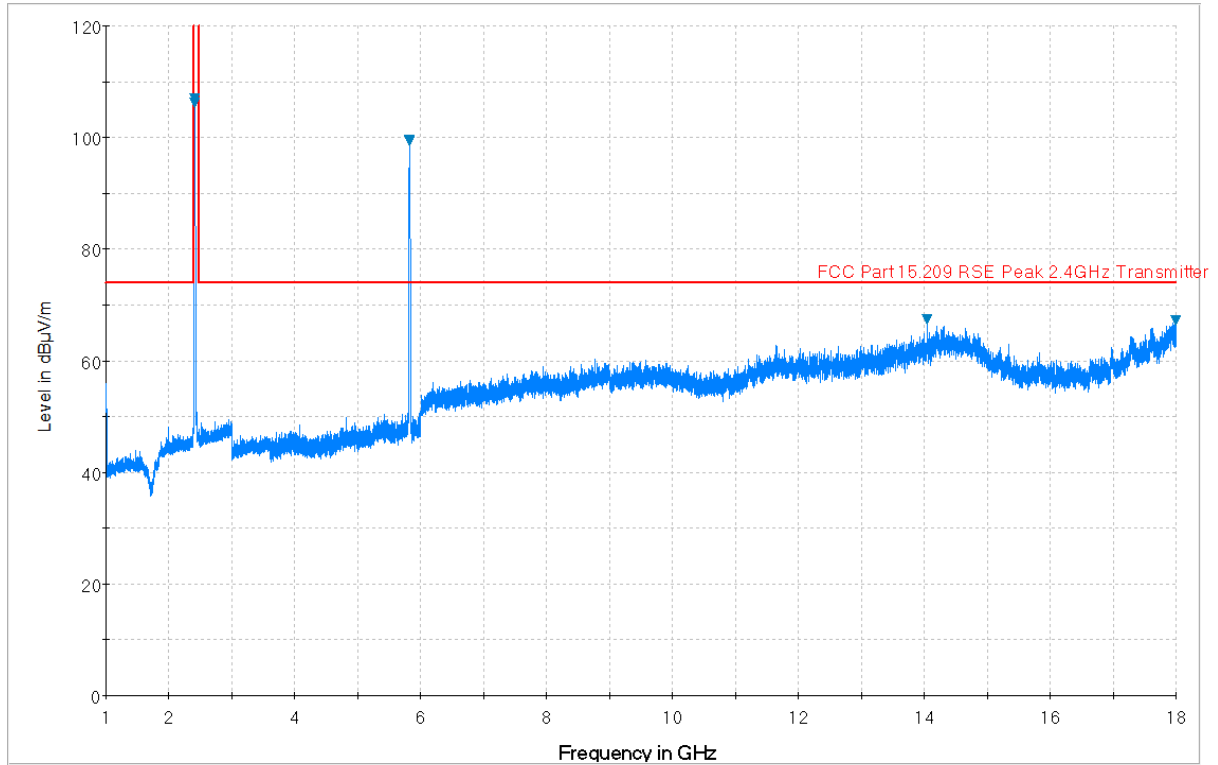
Description	2.4 GHz Emission	5 GHz Emission
Antenna	1	2
Channel	1	165
Operating Frequency (MHz)	2412	5825
Data Rate (Mbps)	1	6
Mode	b	a

Table 7-53. Simultaneous Transmission Config-1



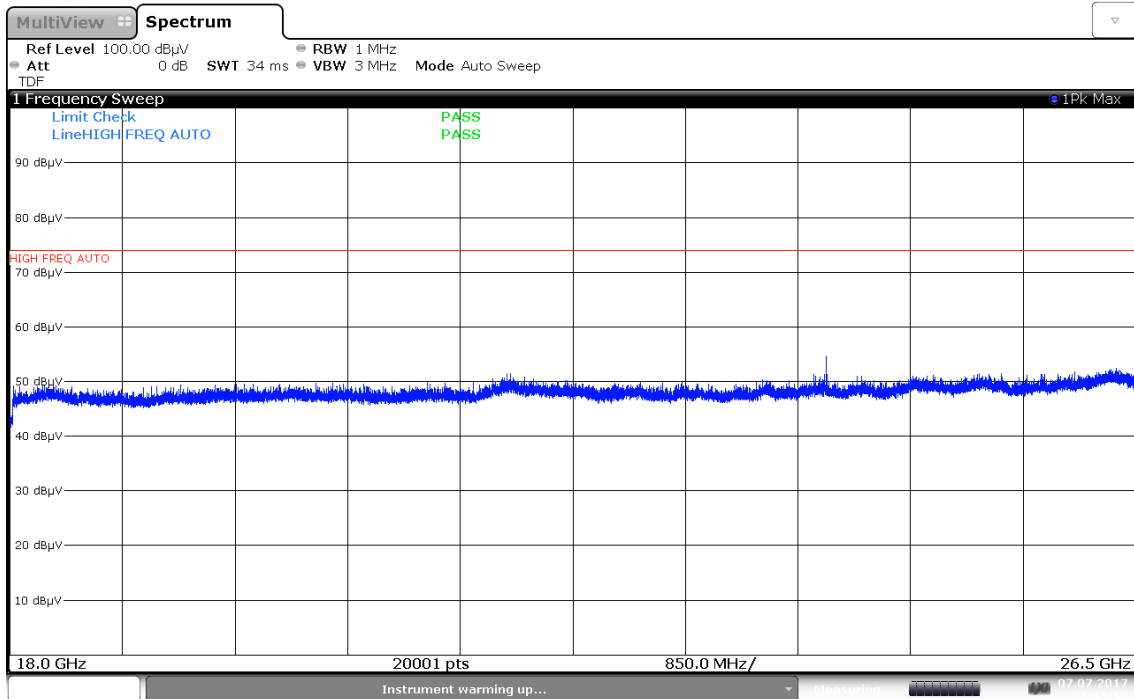
Plot 7-177. Radiated Spurious Plot above 1GHz (2.4GHz – 5GHz, Ant. Pol. H)

FCC ID: ZNFG011C	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset	Page 141 of 221



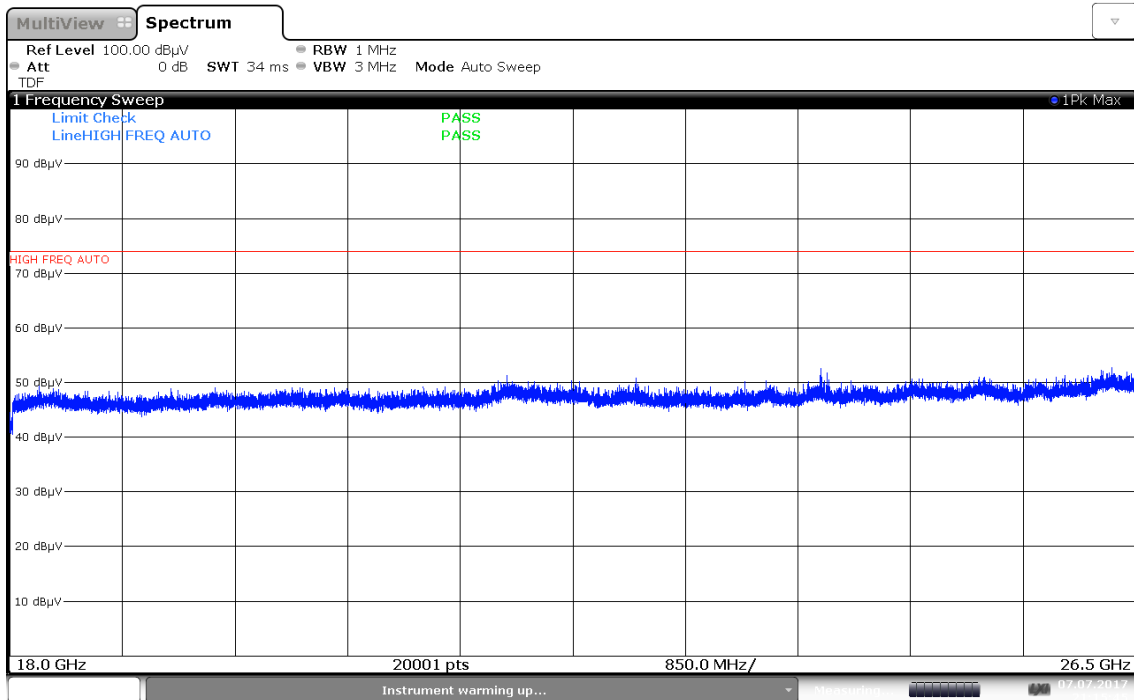
Plot 7-178. Radiated Spurious Plot above 1GHz (2.4GHz – 5GHz, Ant. Pol. V)

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 142 of 221



21:11:58 07.07.2017

Plot 7-179. Radiated Spurious Plot 18GHz – 26.5GHz (2.4GHz – 5GHz, Ant. Pol. H)



21:15:46 07.07.2017

Plot 7-180. Radiated Spurious Plot 18GHz – 26.5GHz (2.4GHz – 5GHz, Ant. Pol. V)

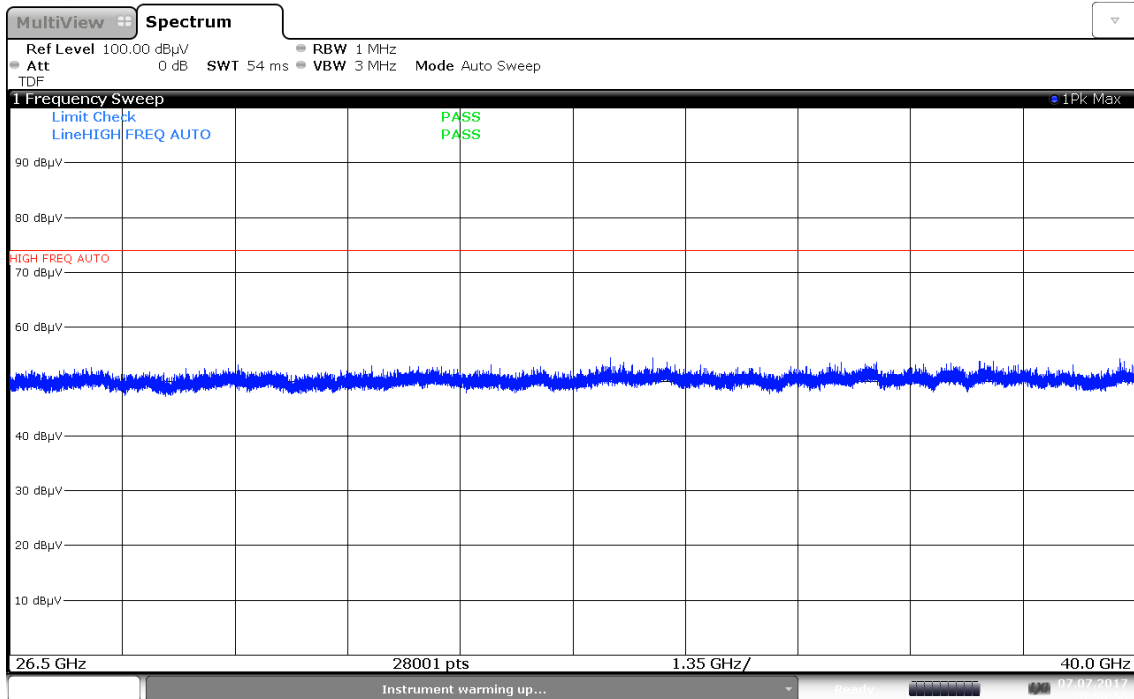
FCC ID: ZNFG011C	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 143 of 221

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V 6.6

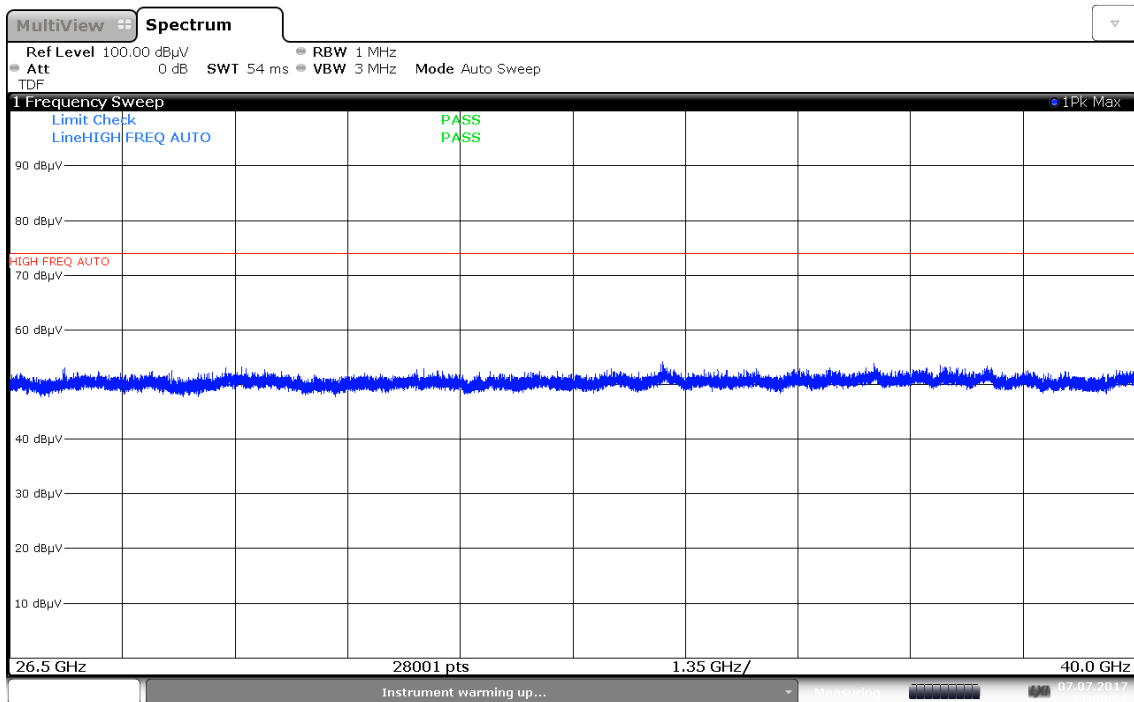
06/06/2017

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20:58:57 07.07.2017

Plot 7-181. Radiated Spurious Plot above 26.5GHz (2.4GHz – 5GHz, Ant. Pol. H)



21:03:57 07.07.2017

Plot 7-182. Radiated Spurious Plot above 26.5GHz (2.4GHz – 5GHz, Ant. Pol. V)

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 144 of 221

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Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
1001.00	Average	H	121	342	-55.86	-6.64	44.50	53.98	-9.48
1001.00	Peak	H	121	342	-44.78	-6.64	55.58	73.98	-18.40
* 4824.00	Average	H	110	215	-57.18	-0.02	49.80	53.98	-4.18
* 4824.00	Peak	H	110	215	-52.16	-0.02	54.82	73.98	-19.16

Table 7-54. Radiated Measurements (ANT1 2.4GHz – ANT2 5GHz)

FCC ID: ZNFG011C		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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7.7.4 Antenna-1 Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

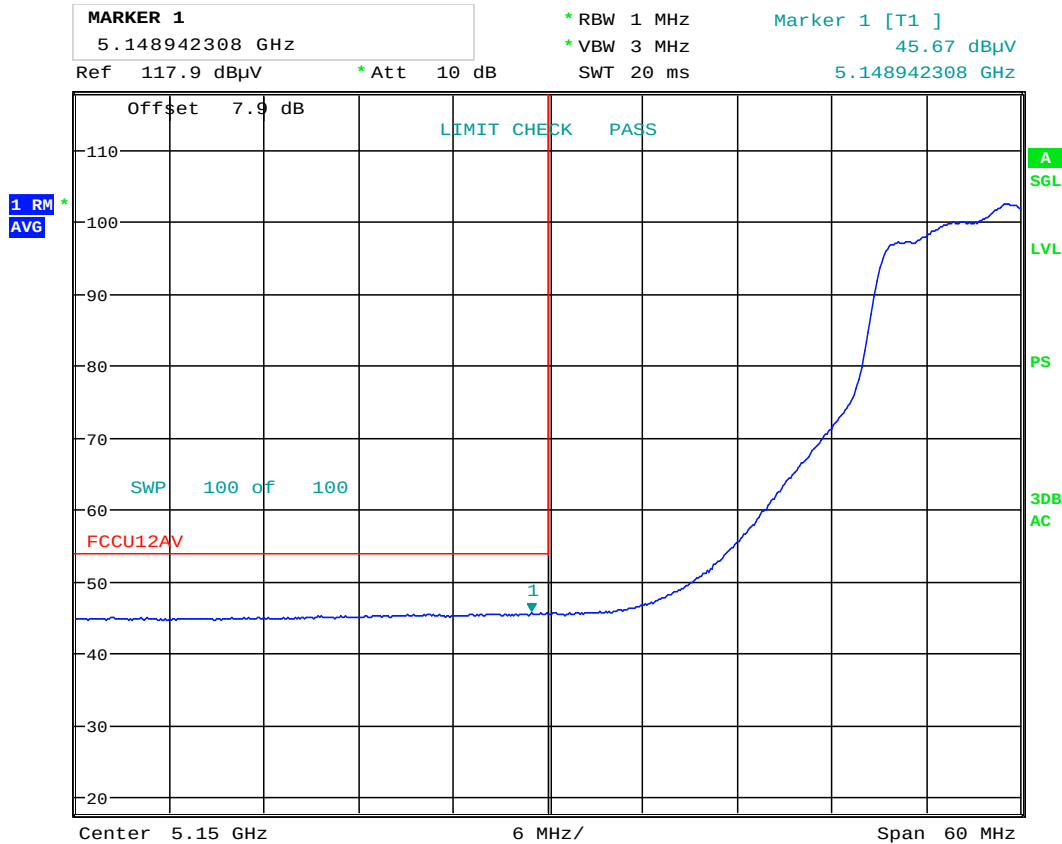
Worst Case Mode: 802.11a

Worst Case Transfer Rate: 6 Mbps

Distance of Measurements: 3 Meters

Operating Frequency: 5180MHz

Channel: 36



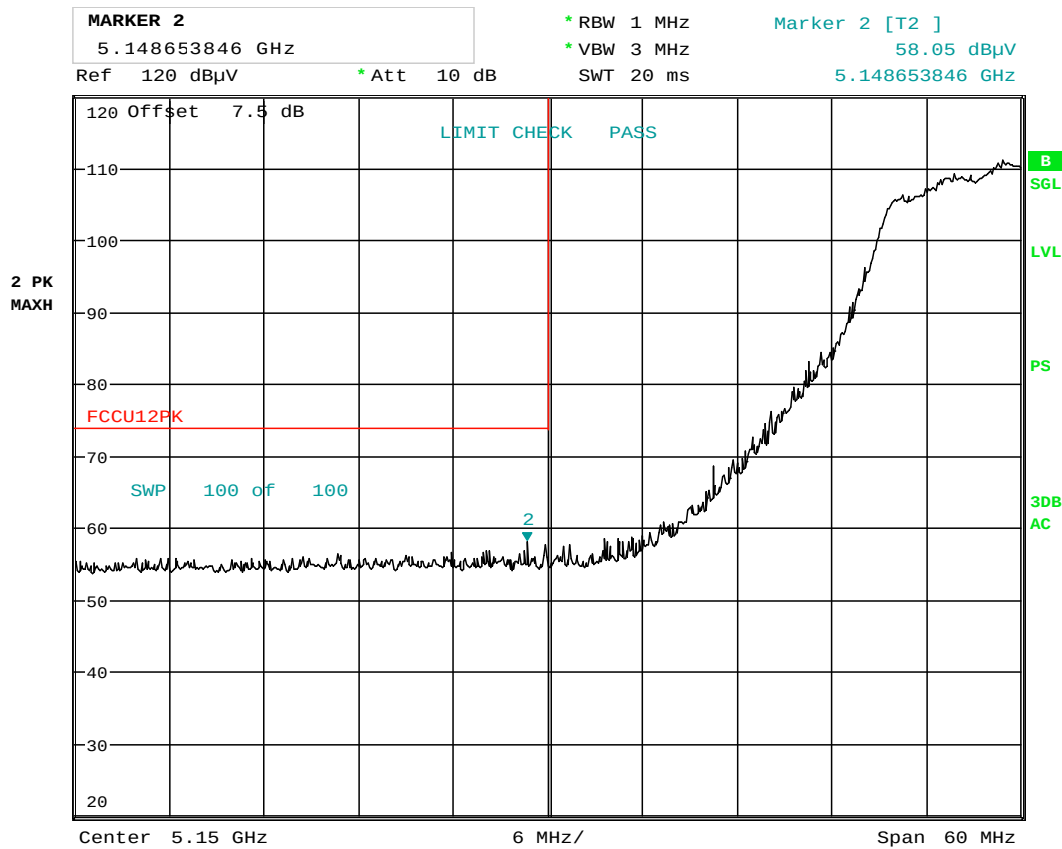
Date: 5.JUL.2017 20:35:05

Plot 7-183. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 146 of 221

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

§15.407(b.1)(b.2) §15.205 §15.209



Date: 5.JUL.2017 20:33:41

Plot 7-184. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 147 of 221

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

§15.407(b.1)(b.2) §15.205 §15.209

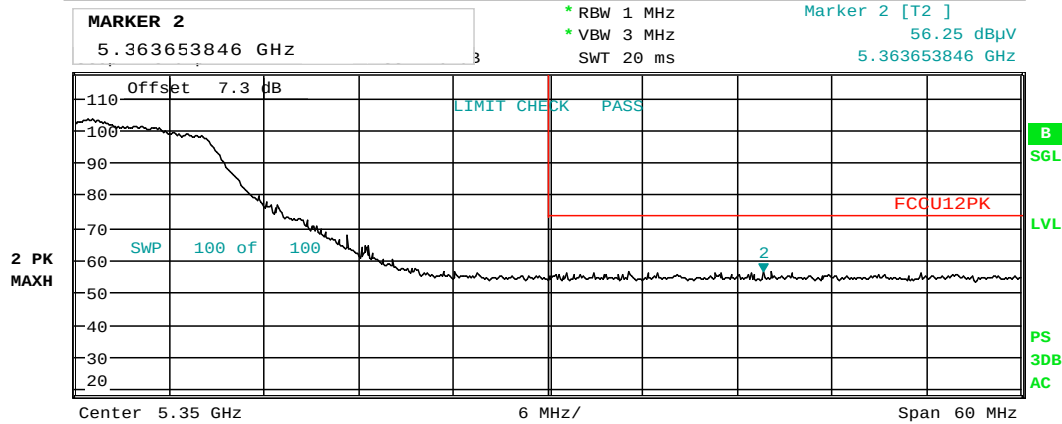
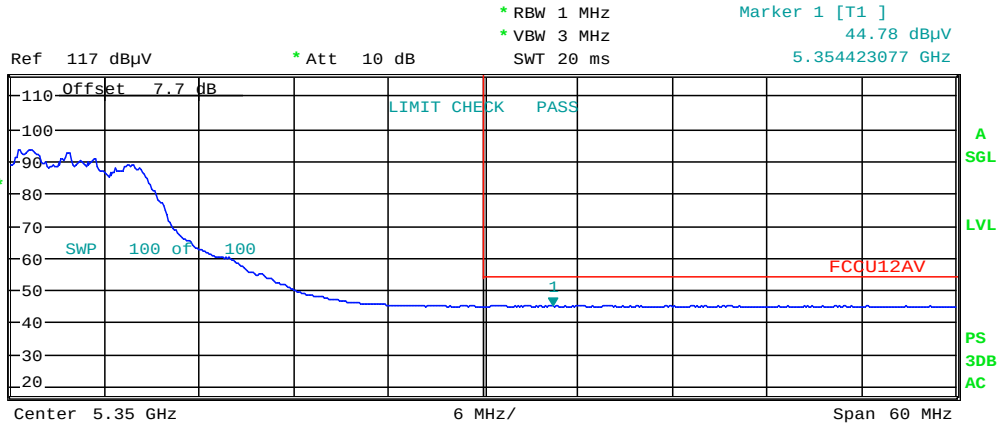
Worst Case Mode: 802.11a

Worst Case Transfer Rate: 6 Mbps

Distance of Measurements: 3 Meters

Operating Frequency: 5320MHz

Channel: 64



Date: 6.JUL.2017 13:19:24

Plot 7-185. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

FCC ID: ZNFG011C	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 148 of 221

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

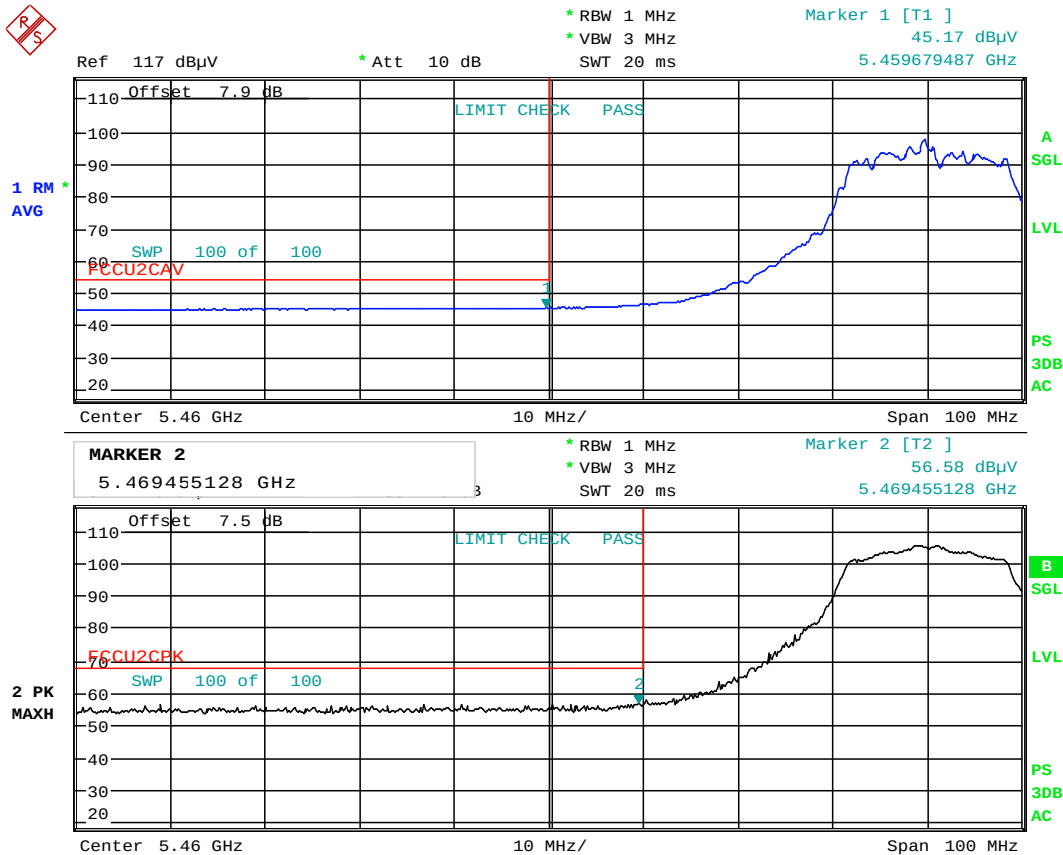
Worst Case Mode: 802.11a

Worst Case Transfer Rate: 6 Mbps

Distance of Measurements: 3 Meters

Operating Frequency: 5500MHz

Channel: 100



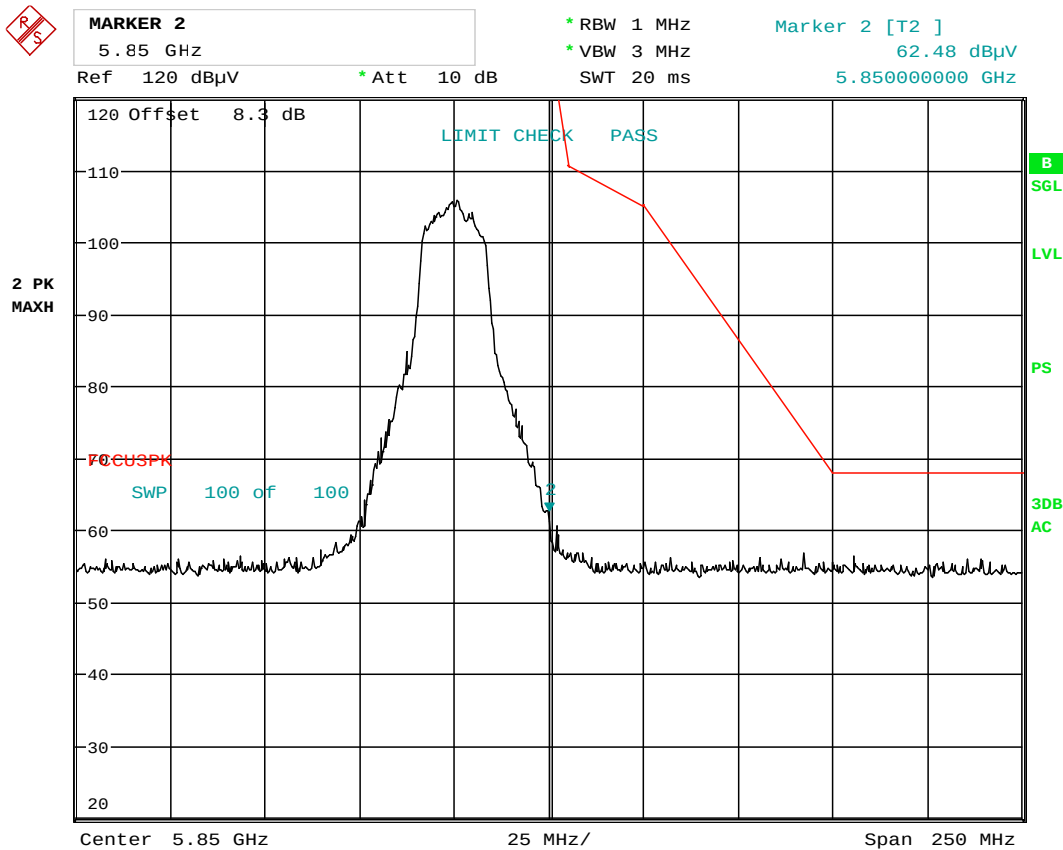
Date: 6.JUL.2017 13:38:45

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

FCC ID: ZNFG011C	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 149 of 221

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: 6.JUL.2017 13:49:07

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

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 150 of 221

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

§15.407(b.1)(b.2) §15.205 §15.209

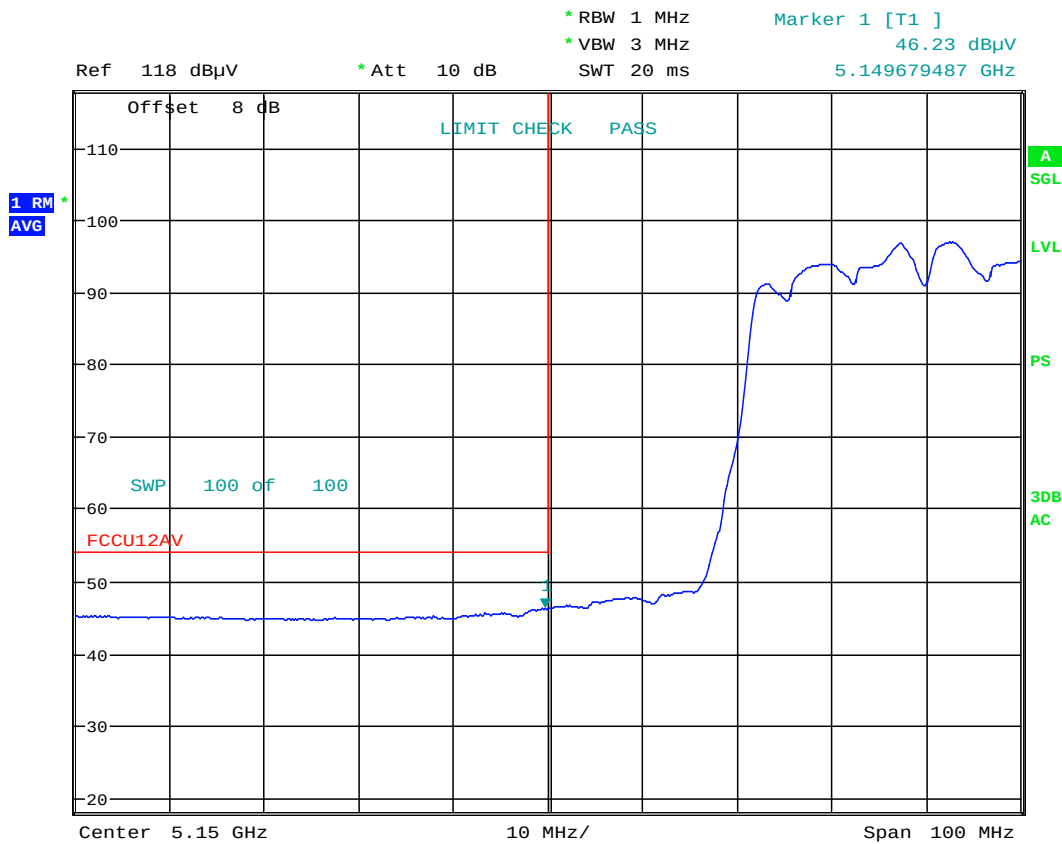
Worst Case Mode: 802.11n (40MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5190MHz

Channel: 38



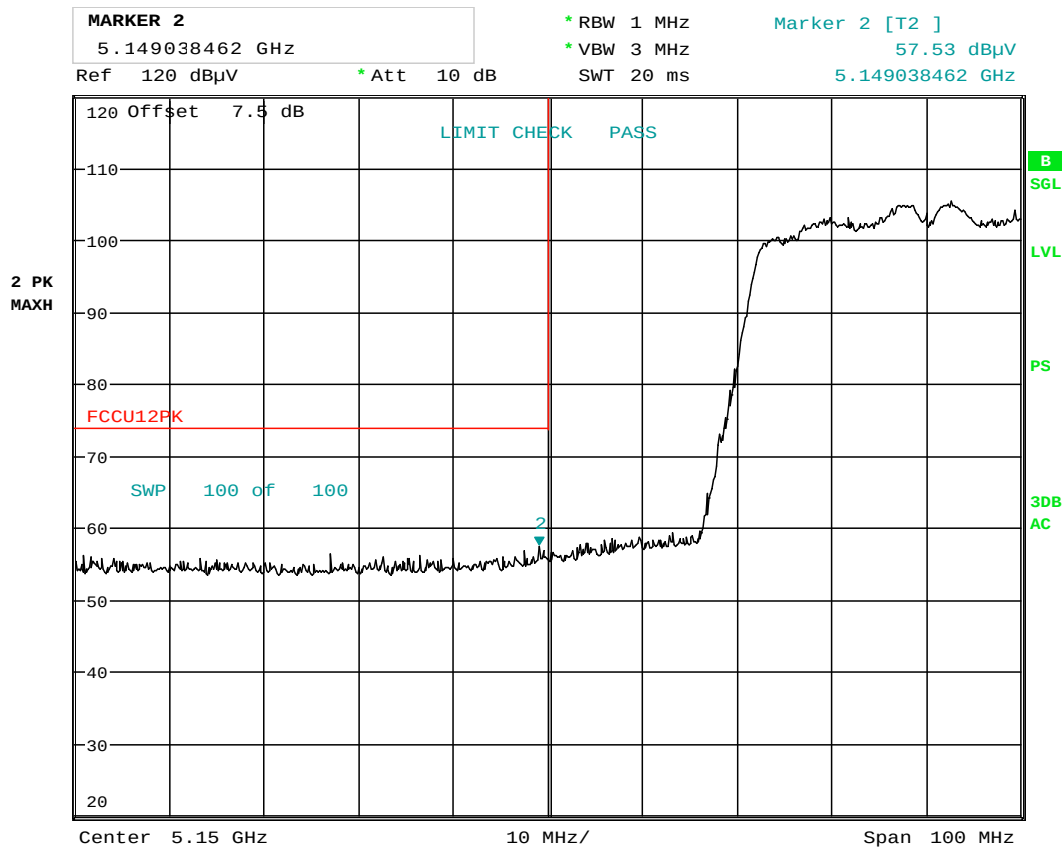
Date: 5.JUL.2017 20:43:58

Plot 7-188. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 151 of 221

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

§15.407(b.1)(b.2) §15.205 §15.209



Date: 5.JUL.2017 20:42:07

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

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 152 of 221

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: 5230MHz
Channel: 46



MARKER 1
5.053525641 GHz

* RBW 1 MHz

Marker 1 [T1]

* VBW 3 MHz

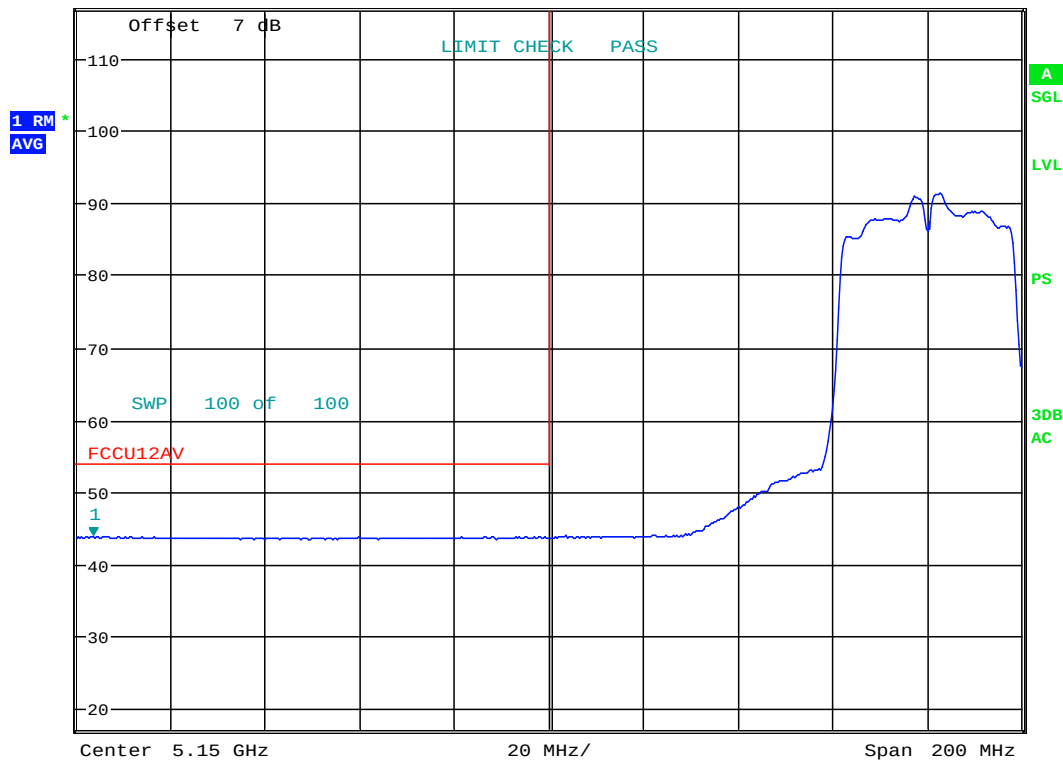
43.83 dBμV

Ref 117 dBμV

* Att 10 dB

SWT 20 ms

5.053525641 GHz



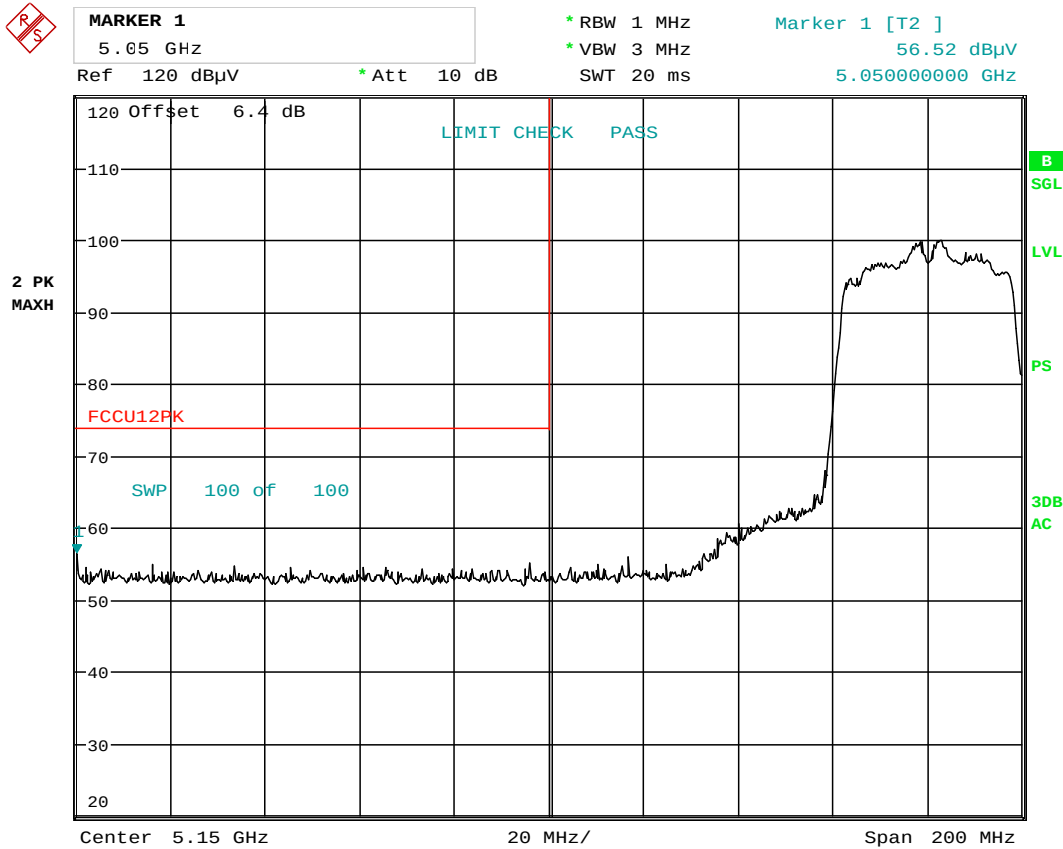
Date: 1.AUG.2017 12:54:43

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

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 153 of 221

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

§15.407(b.1)(b.2) §15.205 §15.209



Date: 1.AUG.2017 12:52:23

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

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 154 of 221

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

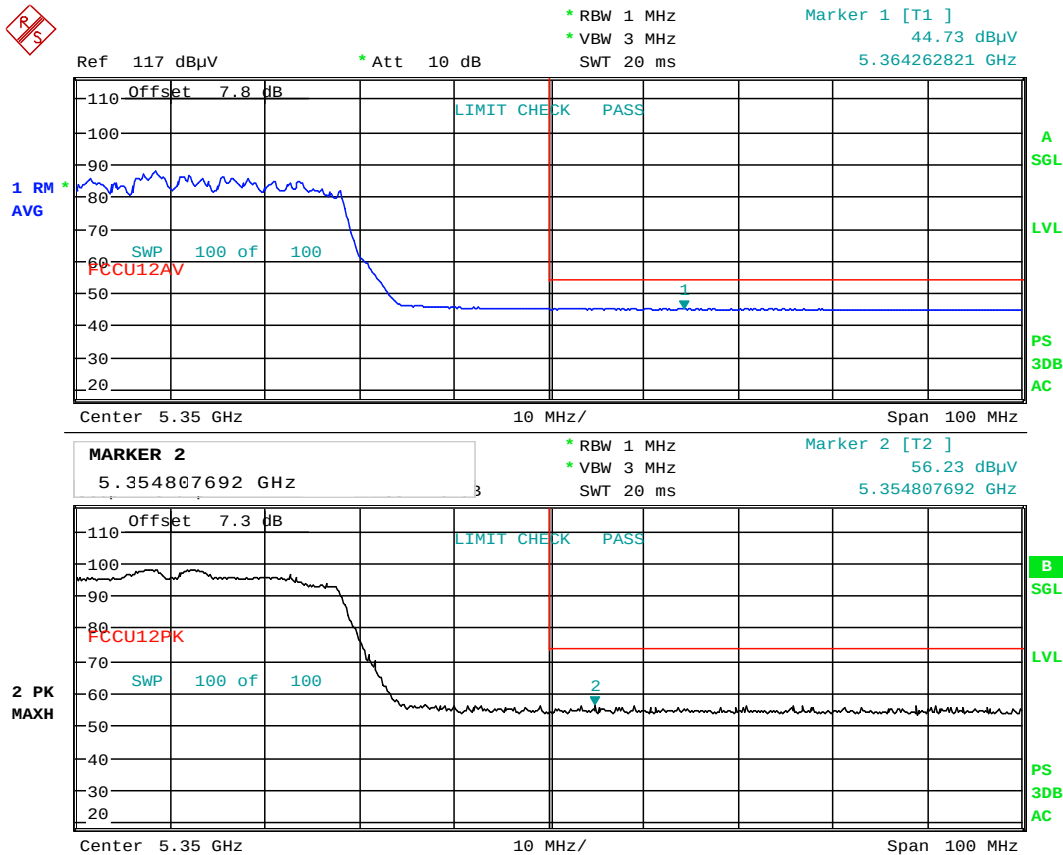
Worst Case Mode: 802.11n (40MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5310MHz

Channel: 62



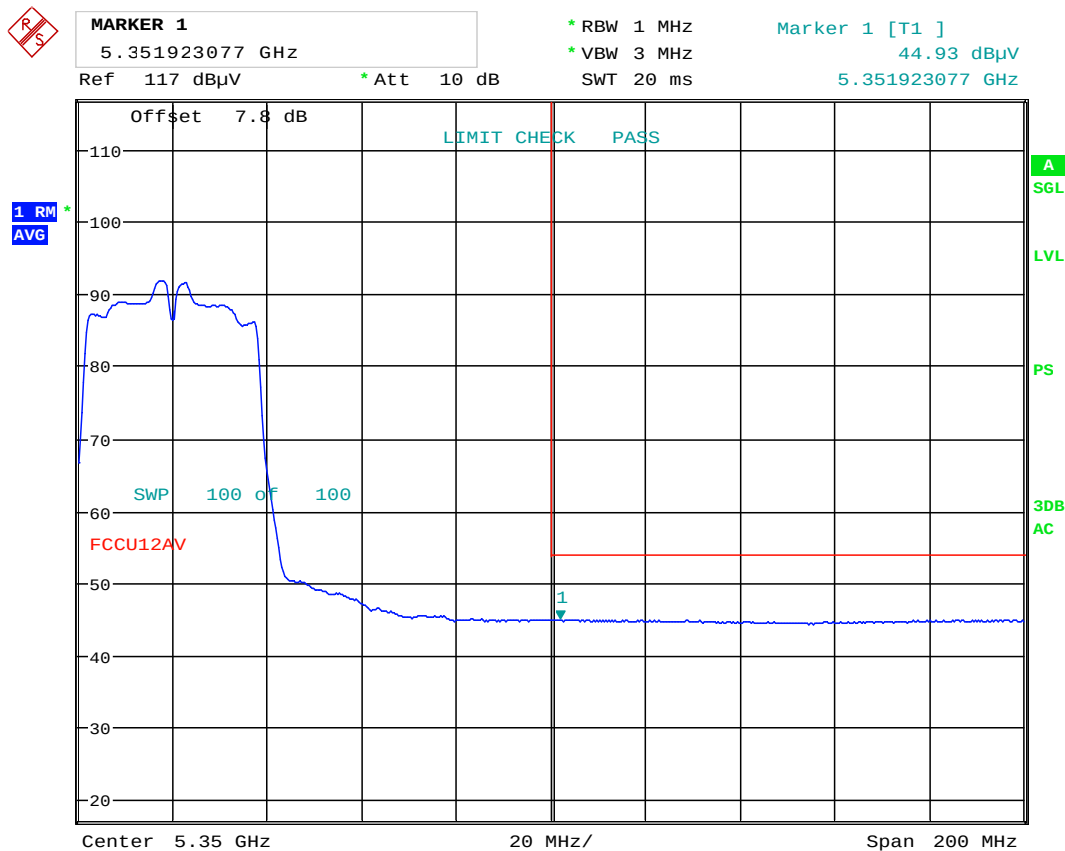
Date: 6.JUL.2017 13:22:26

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

FCC ID: ZNFG011C	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 155 of 221

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

Worst Case Mode:	<u>802.11n (40MHz)</u>
Worst Case Transfer Rate:	<u>MCS0</u>
Distance of Measurements:	<u>3 Meters</u>
Operating Frequency:	<u>5270MHz</u>
Channel:	<u>54</u>



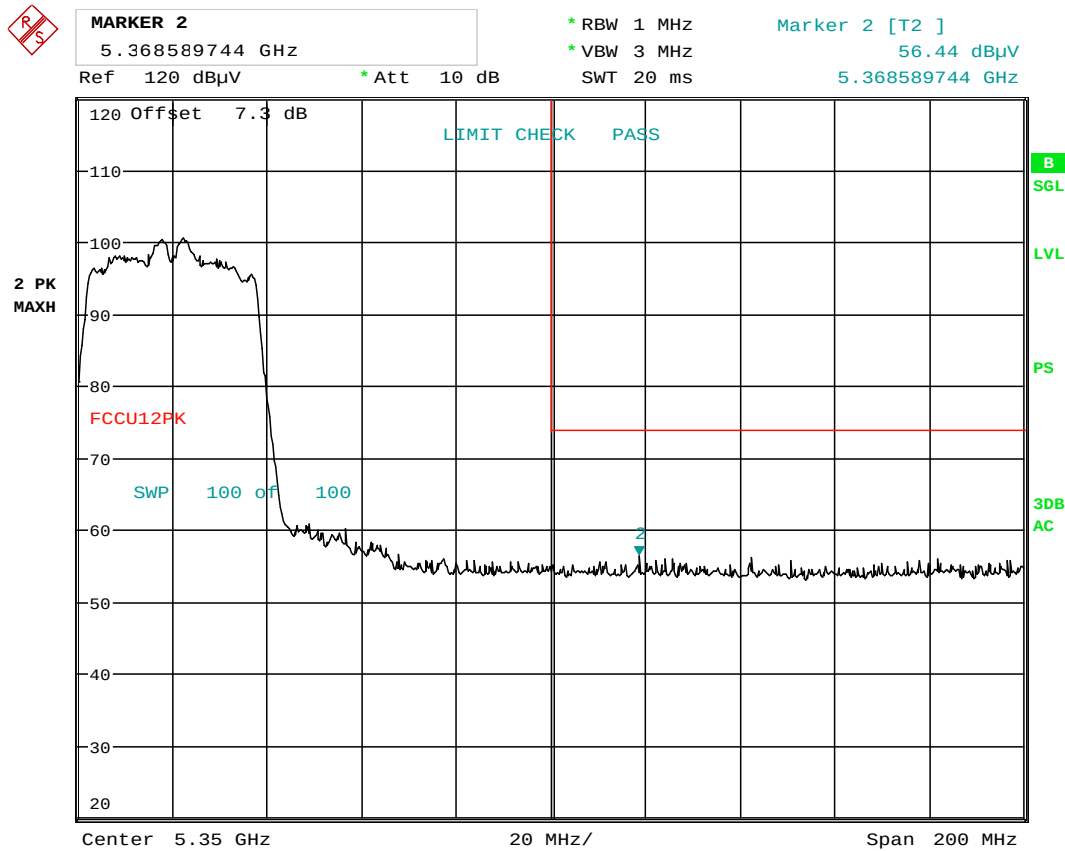
Date: 1.AUG.2017 13:00:36

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

FCC ID: ZNFG011C	 FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset	Page 156 of 221

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

§15.407(b.1)(b.2) §15.205 §15.209



Date: 1.AUG.2017 12:59:32

Plot 7-194. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

FCC ID: ZNFG011C	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 157 of 221

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

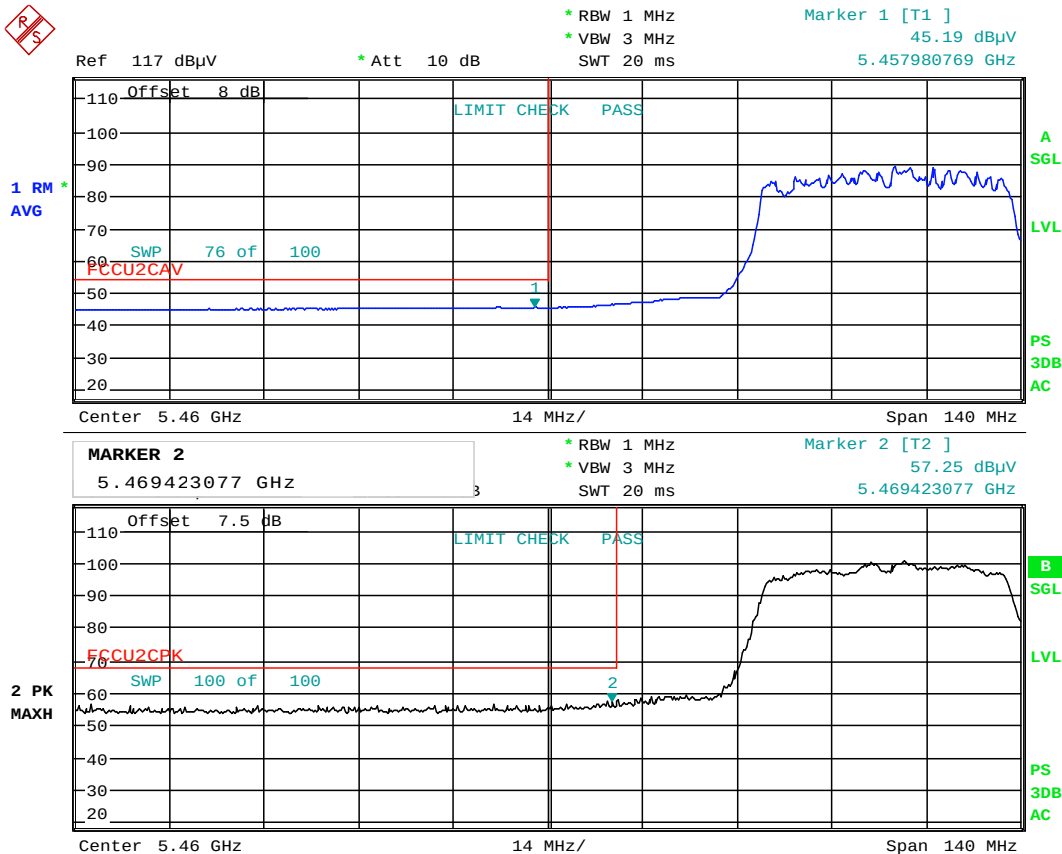
Worst Case Mode: 802.11n (40MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5510MHz

Channel: 102



Date: 6.JUL.2017 13:41:11

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

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 158 of 221

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: 5550MHz
Channel: 110



MARKER 1
5.451987179 GHz

* RBW 1 MHz

Marker 1 [T1]

* VBW 3 MHz

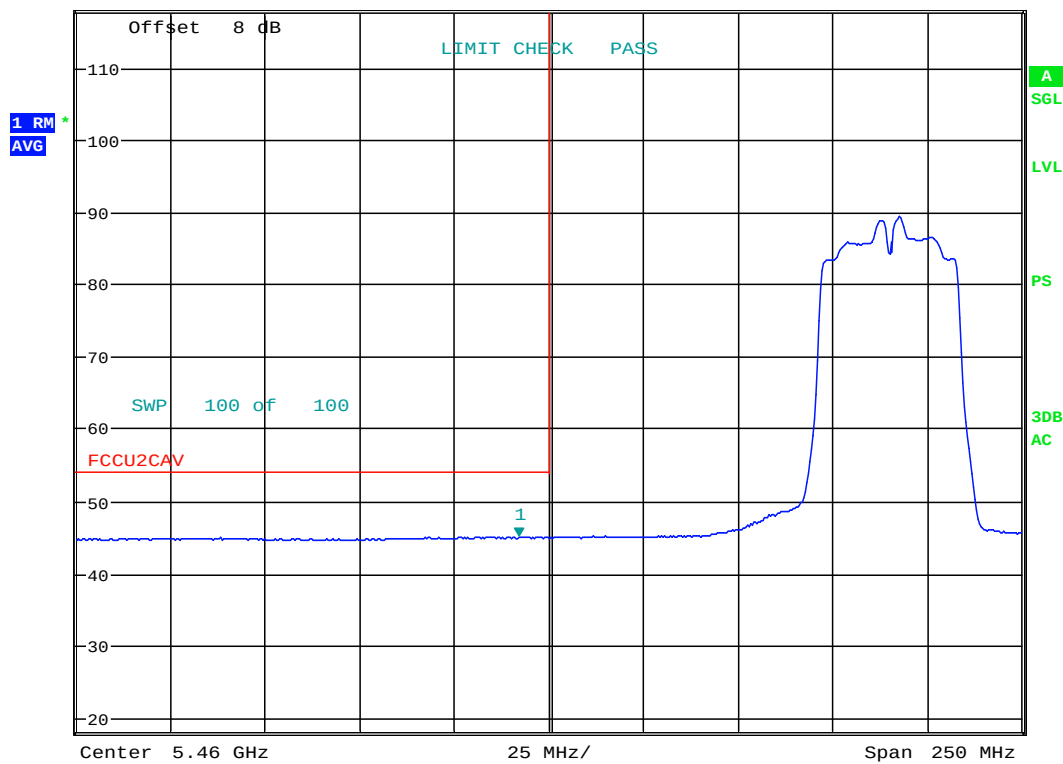
45.07 dBμV

Ref 118 dBμV

* Att 10 dB

SWT 20 ms

5.451987179 GHz



Date: 1.AUG.2017 13:21:31

Plot 7-196. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 159 of 221

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

§15.407(b.1)(b.2) §15.205 §15.209



MARKER 2
5.446378205 GHz
Ref 117.5 dBμV * Att 10 dB

* RBW 1 MHz

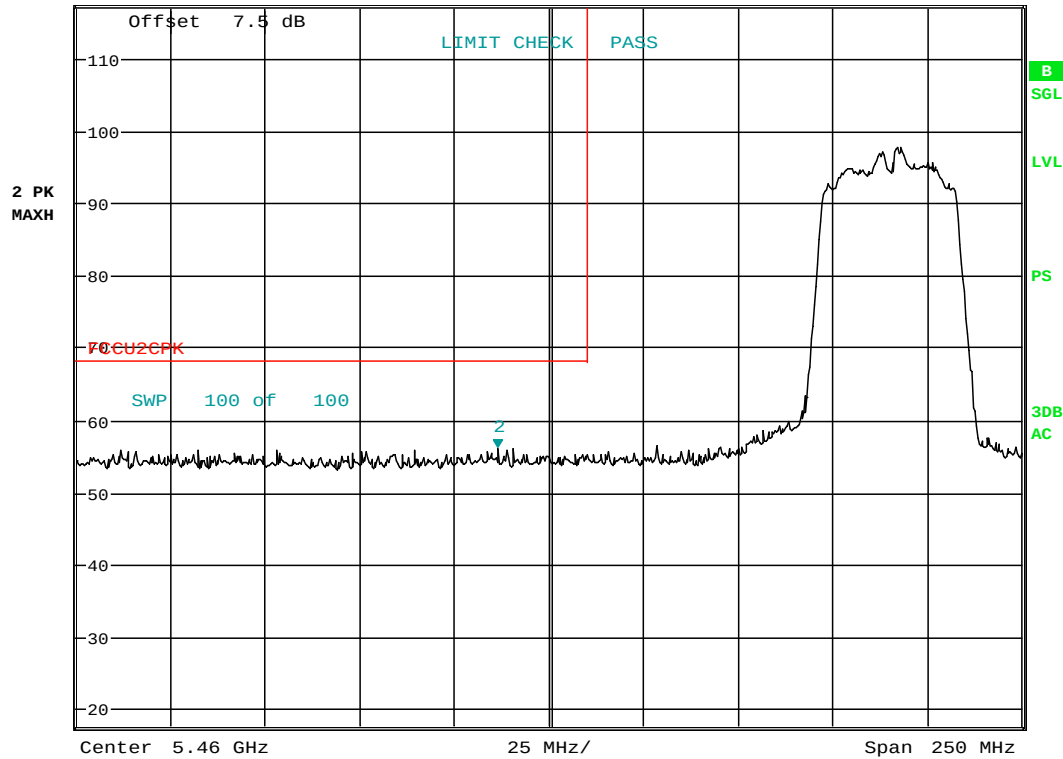
* VBW 3 MHz

SWT 20 ms

Marker 2 [T2]

56.11 dBμV

5.446378205 GHz



Date: 1.AUG.2017 13:20:20

Plot 7-197. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

FCC ID: ZNFG011C	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset	Page 160 of 221

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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



MARKER 1

5.929727564 GHz

Ref 120 dBμV

* Att 10 dB

* RBW 1 MHz

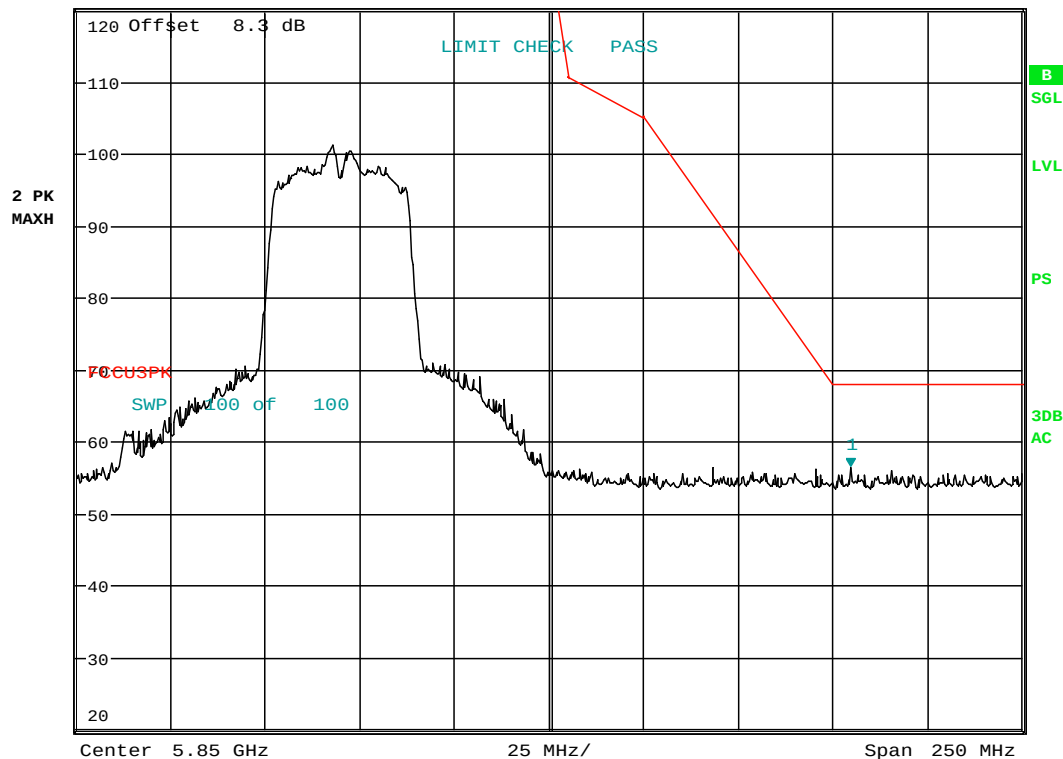
* VBW 3 MHz

SWT 20 ms

Marker 1 [T2]

56.52 dBμV

5.929727564 GHz



Date: 1.AUG.2017 13:26:11

Plot 7-198. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 161 of 221

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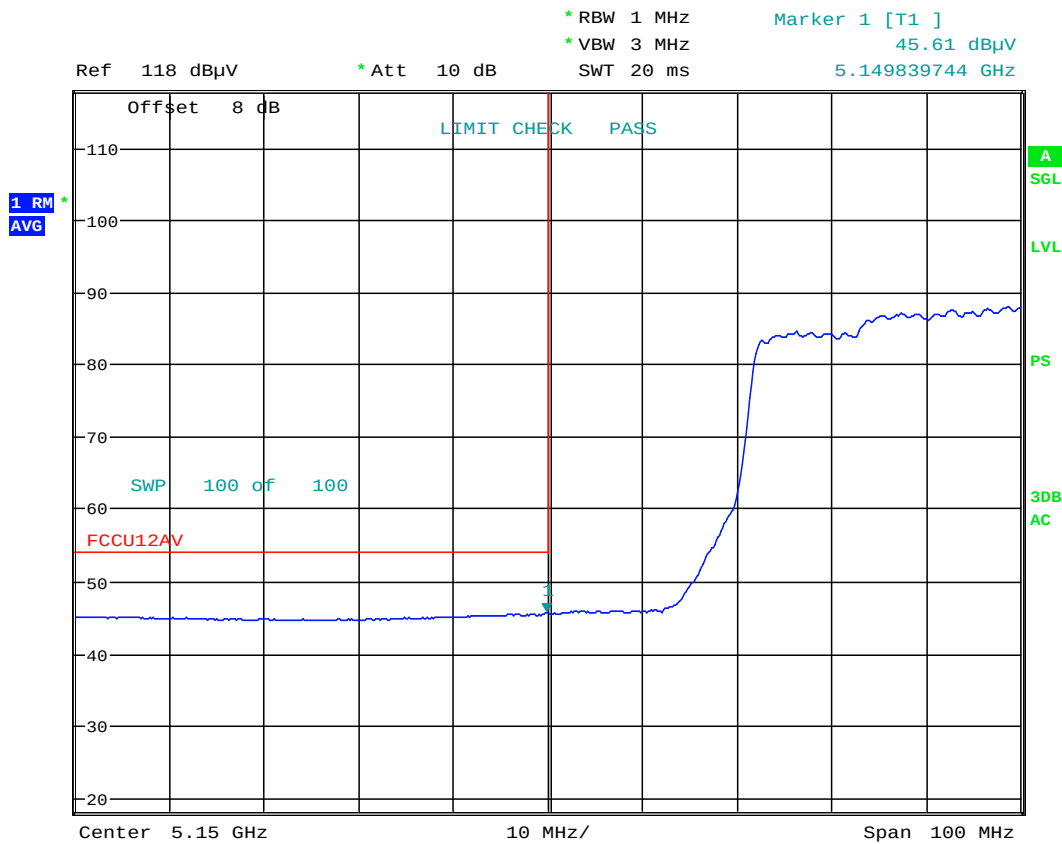
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7.7.6 Antenna-1 Radiated Band Edge Measurements (80MHz BW) §15.407(b.1)(b.2) §15.205 §15.209

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



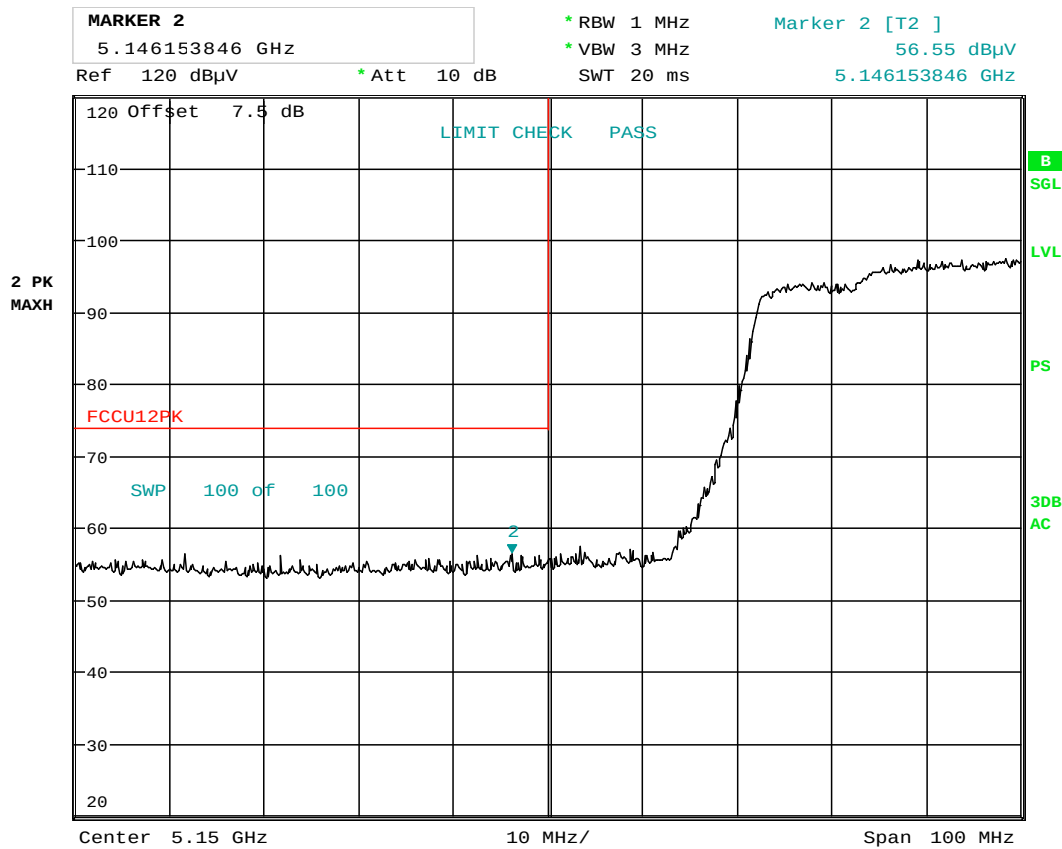
Date: 5.JUL.2017 21:03:34

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

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 162 of 221

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

§15.407(b.1)(b.2) §15.205 §15.209



Date: 5.JUL.2017 20:53:35

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

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 163 of 221

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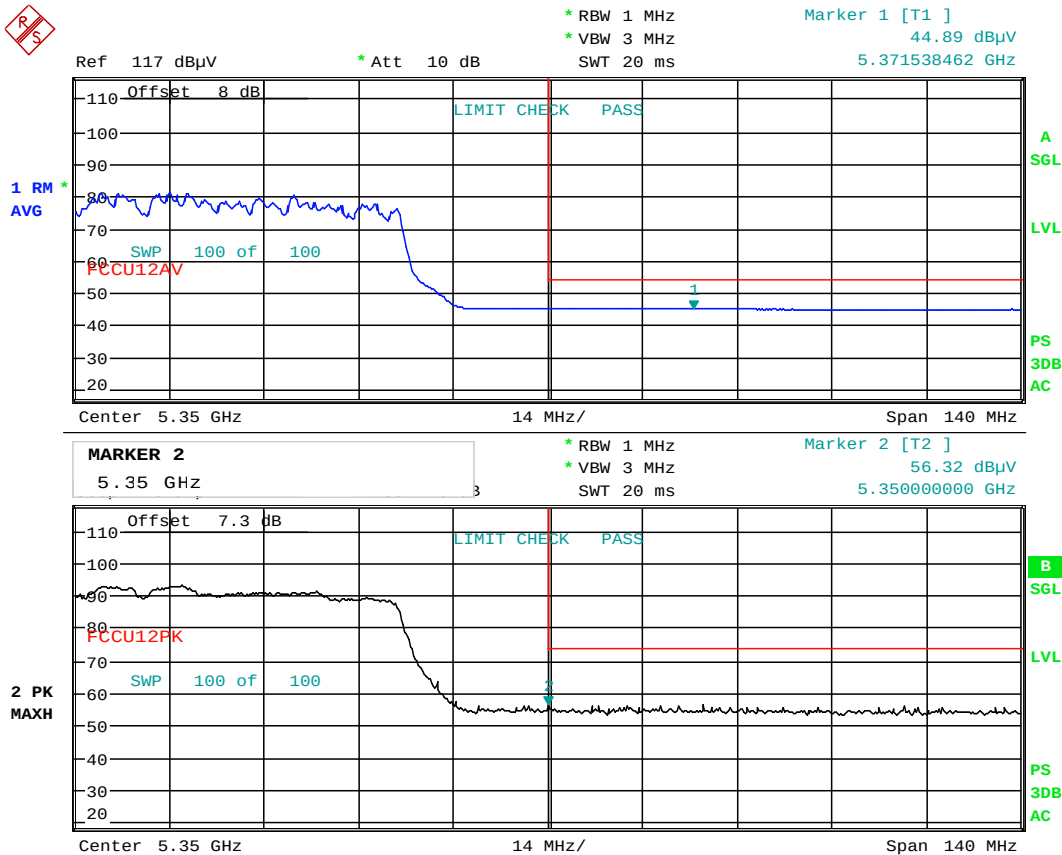
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Antenna-1 Radiated Band Edge Measurements (80MHz BW) §15.407(b.1)(b.2) §15.205 §15.209

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



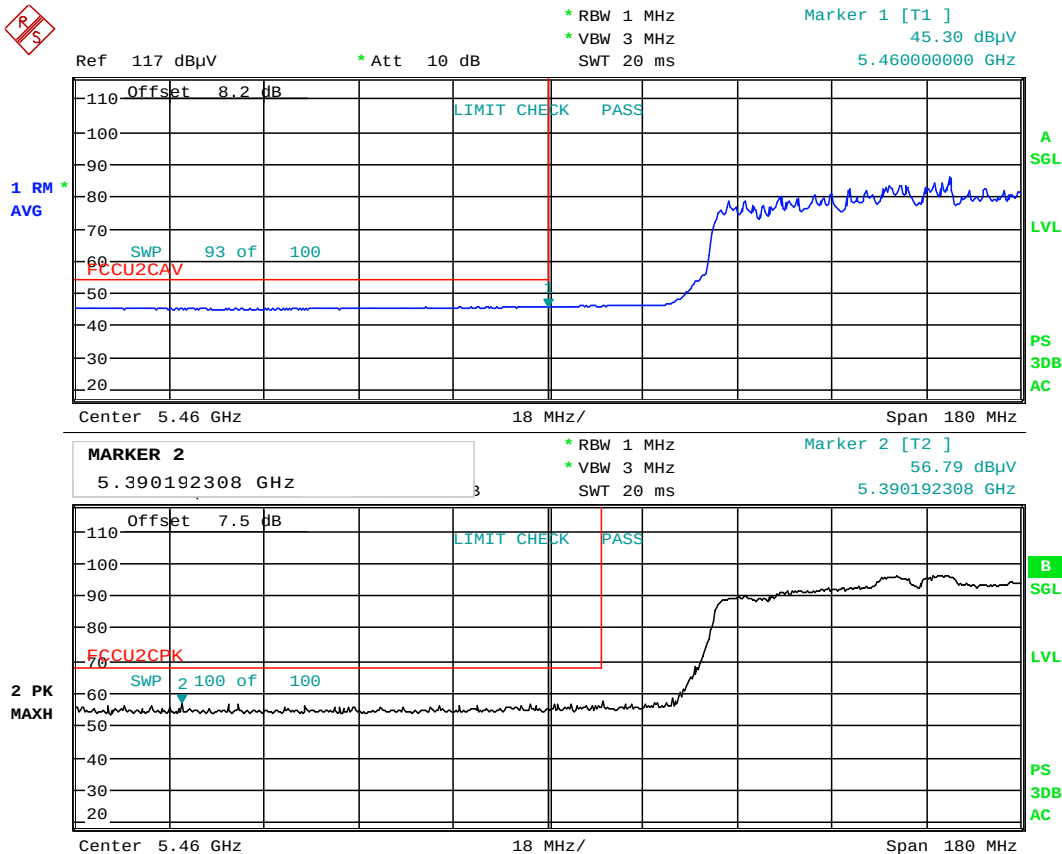
Date: 6.JUL.2017 13:25:18

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

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 164 of 221

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: 6.JUL.2017 13:45:02

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

FCC ID: ZNFG011C	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 165 of 221

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

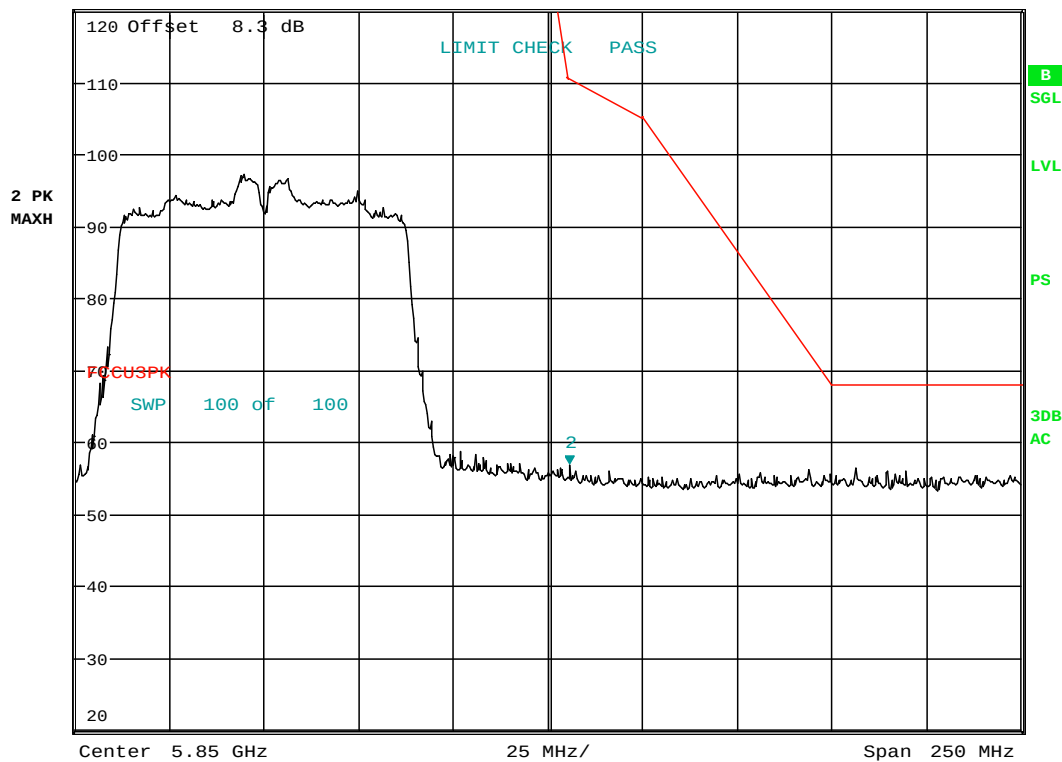
Worst Case Mode: 802.11ac (80MHz)
Worst Case Transfer Rate: MCS0
Distance of Measurements: 3 Meters
Operating Frequency: 5775MHz
Channel: 155



MARKER 2
5.855608974 GHz
Ref 120 dBμV * Att 10 dB

* RBW 1 MHz
* VBW 3 MHz
SWT 20 ms

Marker 2 [T2]
56.96 dBμV
5.855608974 GHz



Date: 6.JUL.2017 13:52:42

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

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 166 of 221

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

§15.407(b.1)(b.2) §15.205 §15.209

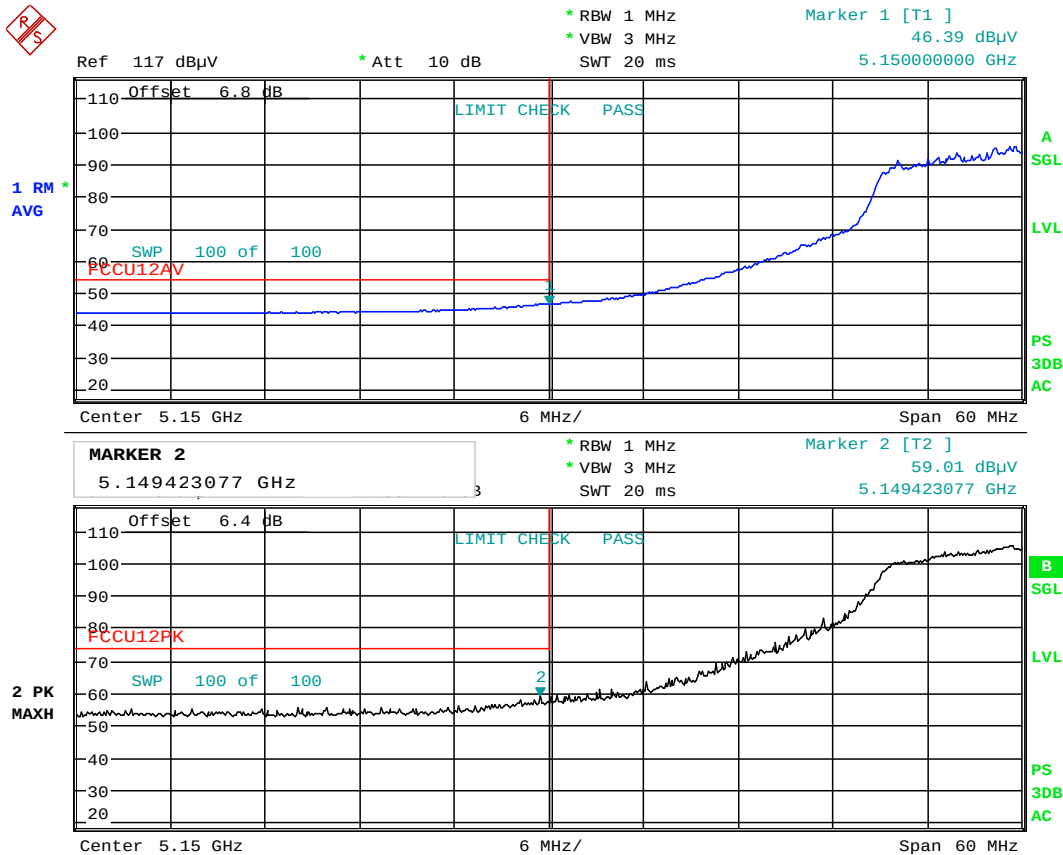
Worst Case Mode: 802.11a

Worst Case Transfer Rate: 6 Mbps

Distance of Measurements: 3 Meters

Operating Frequency: 5180MHz

Channel: 36



Date: 6.JUL.2017 15:36:24

Plot 7-204. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

FCC ID: ZNFG011C	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 167 of 221

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

\$15.407(b.1)(b.2) \$15.205 \$15.209

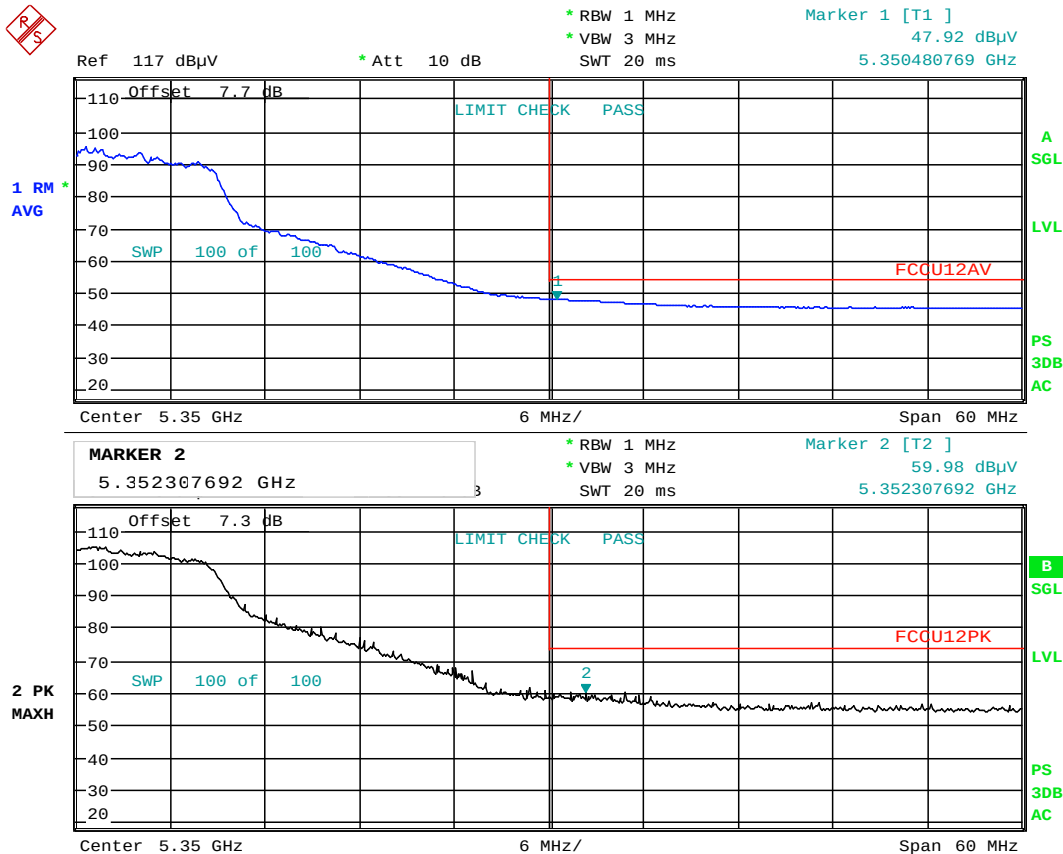
Worst Case Mode: 802.11a

Worst Case Transfer Rate: 6 Mbps

Distance of Measurements: 3 Meters

Operating Frequency: 5320MHz

Channel: 64



Date: 6.JUL.2017 16:04:19

Plot 7-205. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 168 of 221

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06/06/2017

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

\$15.407(b.1)(b.2) \$15.205 \$15.209

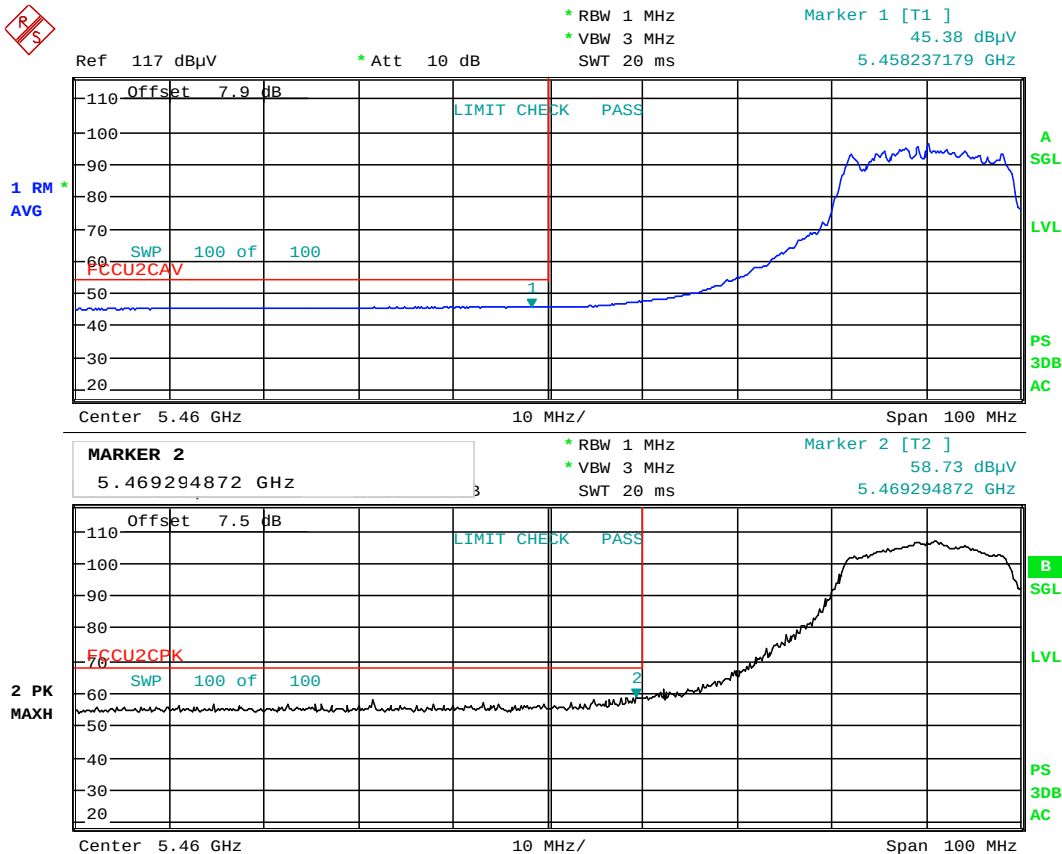
Worst Case Mode: 802.11a

Worst Case Transfer Rate: 6 Mbps

Distance of Measurements: 3 Meters

Operating Frequency: 5500MHz

Channel: 100



Date: 6.JUL.2017 16:20:32

Plot 7-206. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 169 of 221

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

§15.407(b.1)(b.2) §15.205 §15.209

Worst Case Mode: 802.11a

Worst Case Transfer Rate: 6 Mbps

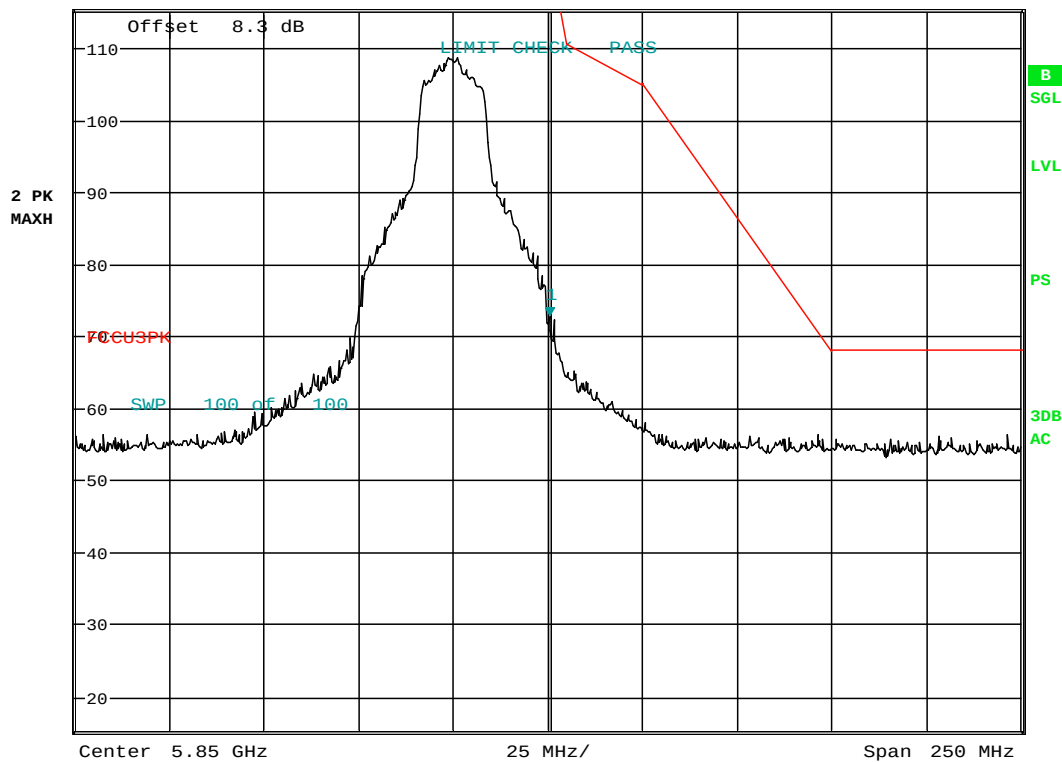
Distance of Measurements: 3 Meters

Operating Frequency: 5825MHz

Channel: 165



MARKER 1
5.850400641 GHz
Ref 115.3 dBμV * Att 10 dB
* RBW 1 MHz * VBW 3 MHz
SWT 20 ms
Marker 1 [T2]
72.85 dBμV
5.850400641 GHz



Date: 6.JUL.2017 16:41:38

Plot 7-207. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 170 of 221

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

§15.407(b.1)(b.2) §15.205 §15.209

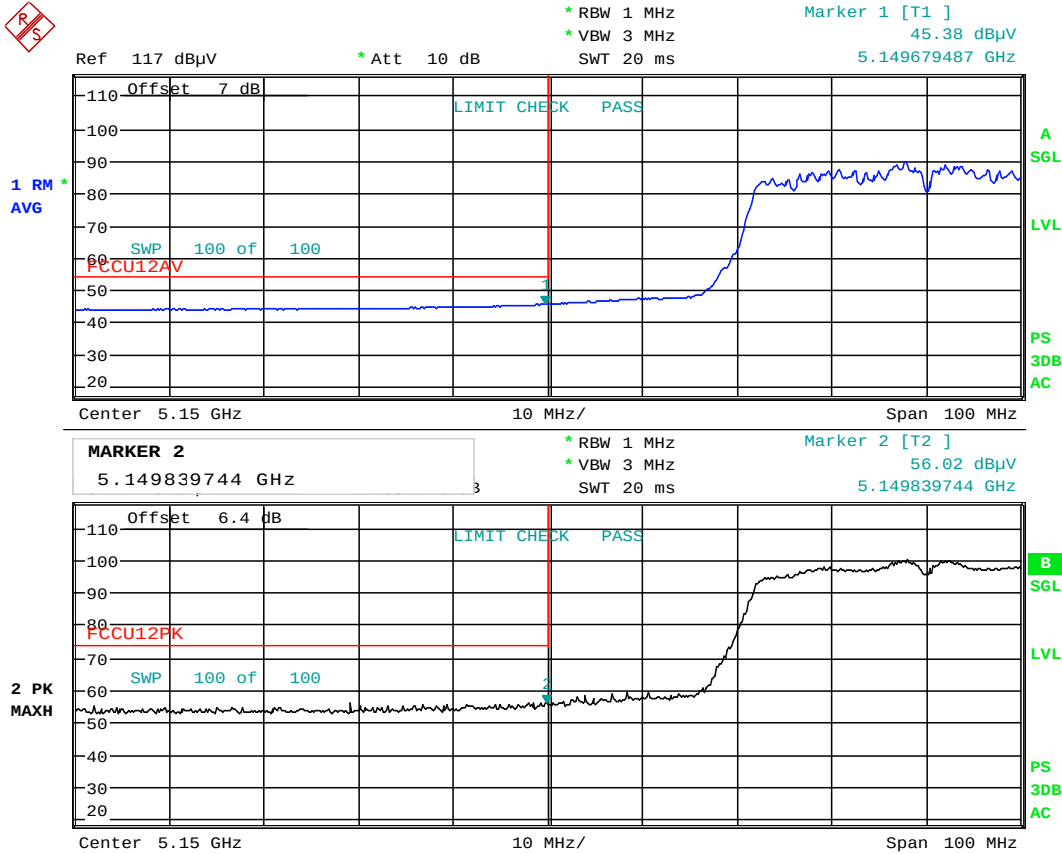
Worst Case Mode: 802.11n (40MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5190MHz

Channel: 38



Date: 6.JUL.2017 15:41:00

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

FCC ID: ZNFG011C	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 171 of 221

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: 5230MHz

Channel: 46



MARKER 1
5.148397436 GHz

* RBW 1 MHz

Marker 1 [T1]

* VBW 3 MHz

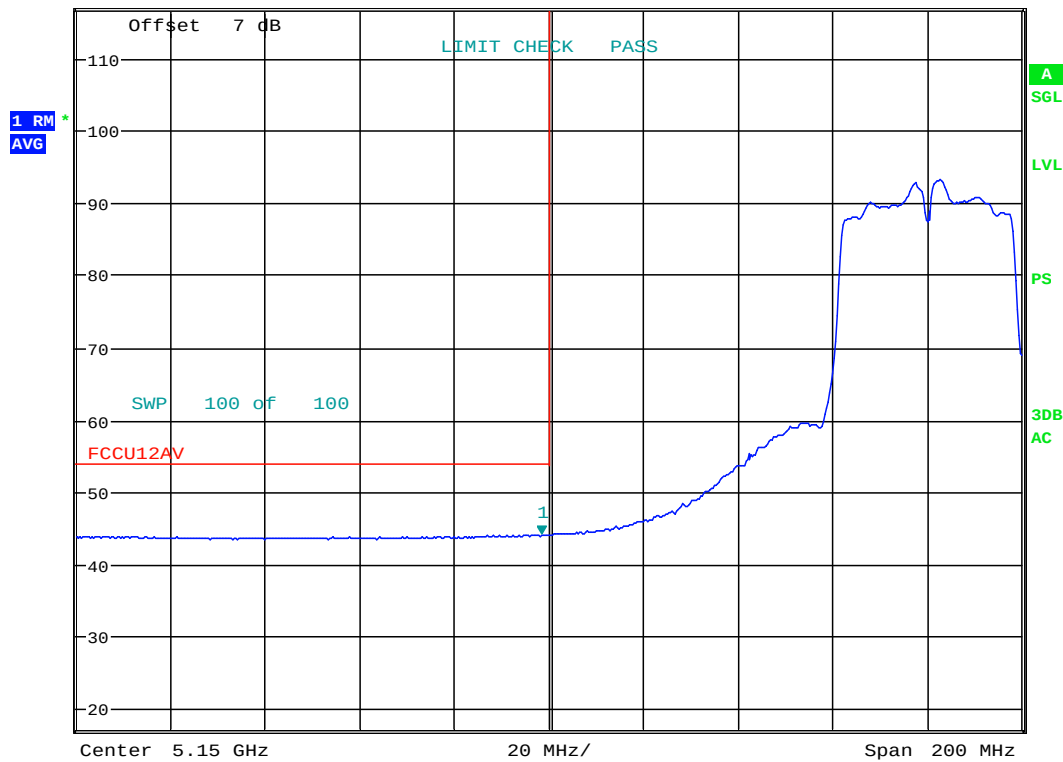
44.08 dBμV

Ref 117 dBμV

* Att 10 dB

SWT 20 ms

5.148397436 GHz



Date: 1.AUG.2017 14:07:24

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

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 172 of 221

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

§15.407(b.1)(b.2) §15.205 §15.209



MARKER 2

5.15 GHz

* RBW 1 MHz

Marker 2 [T2]

* VBW 3 MHz

54.78 dBμV

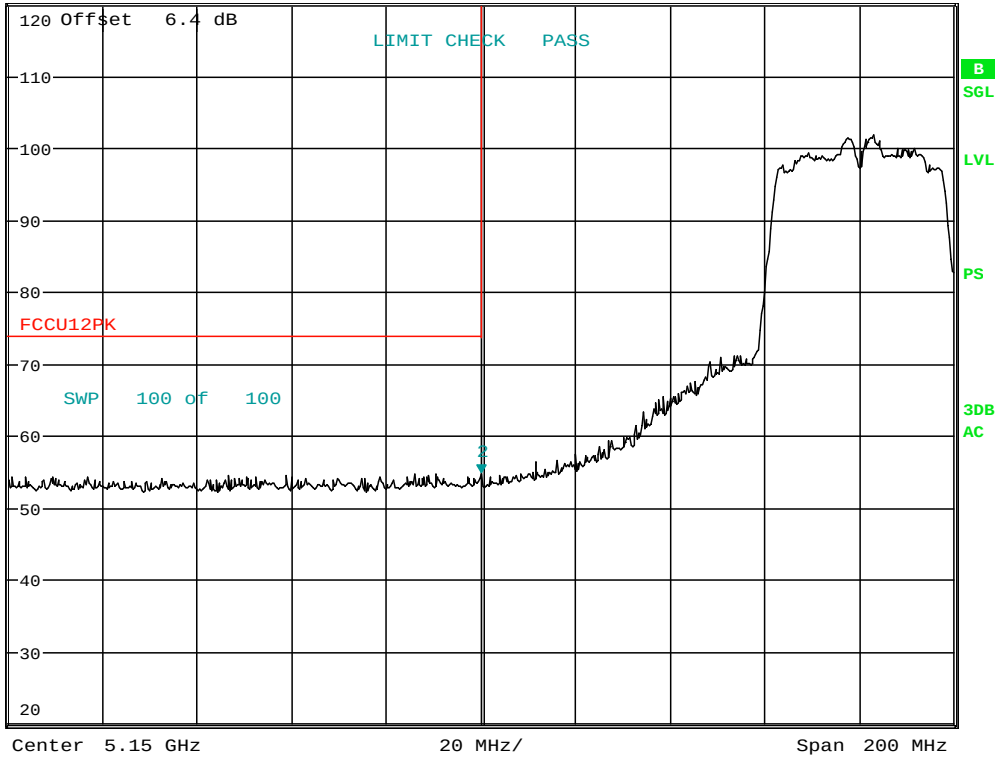
Ref 120 dBμV

* Att 10 dB

SWT 20 ms

5.150000000 GHz

2 PK
MAXH



Date: 1.AUG.2017 14:05:50

Plot 7-210. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)

FCC ID: ZNFG011C	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 173 of 221

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

§15.407(b.1)(b.2) §15.205 §15.209

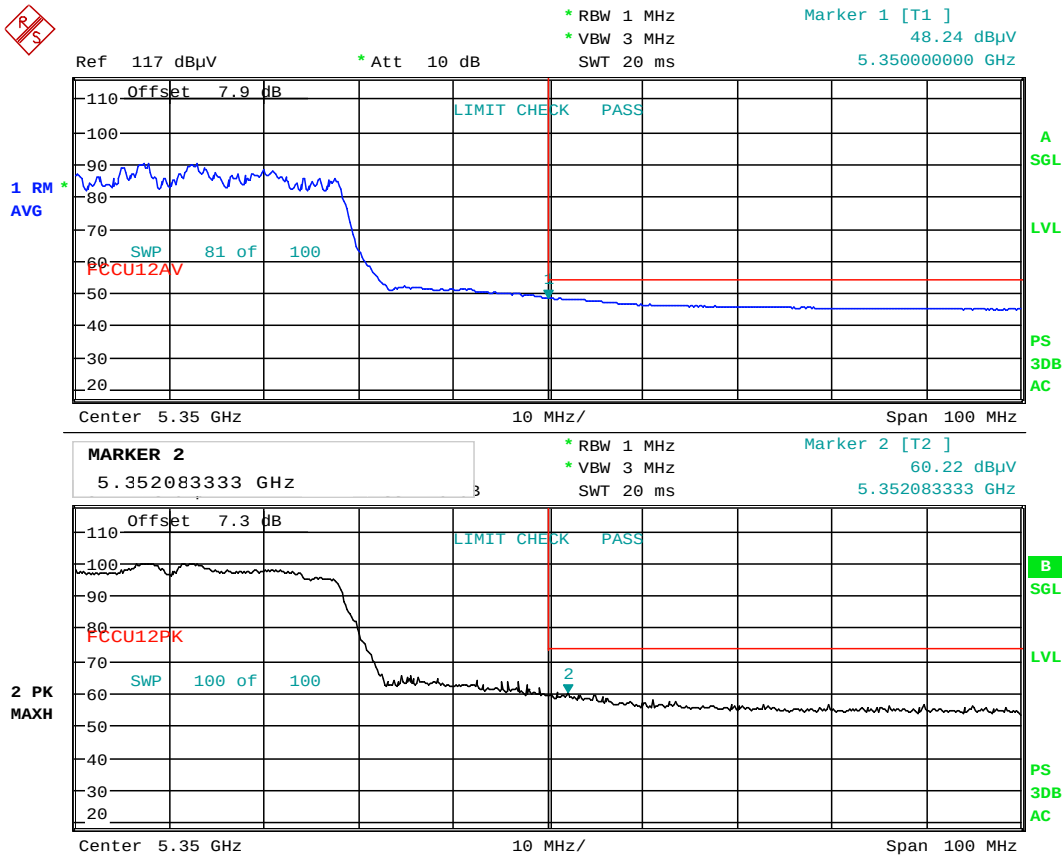
Worst Case Mode: 802.11n (40MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5310MHz

Channel: 62



Date: 6.JUL.2017 16:09:33

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

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 174 of 221

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: 5270MHz
Channel: 54



MARKER 1

5.350320513 GHz

Ref 117 dBμV

* Att 10 dB

* RBW 1 MHz

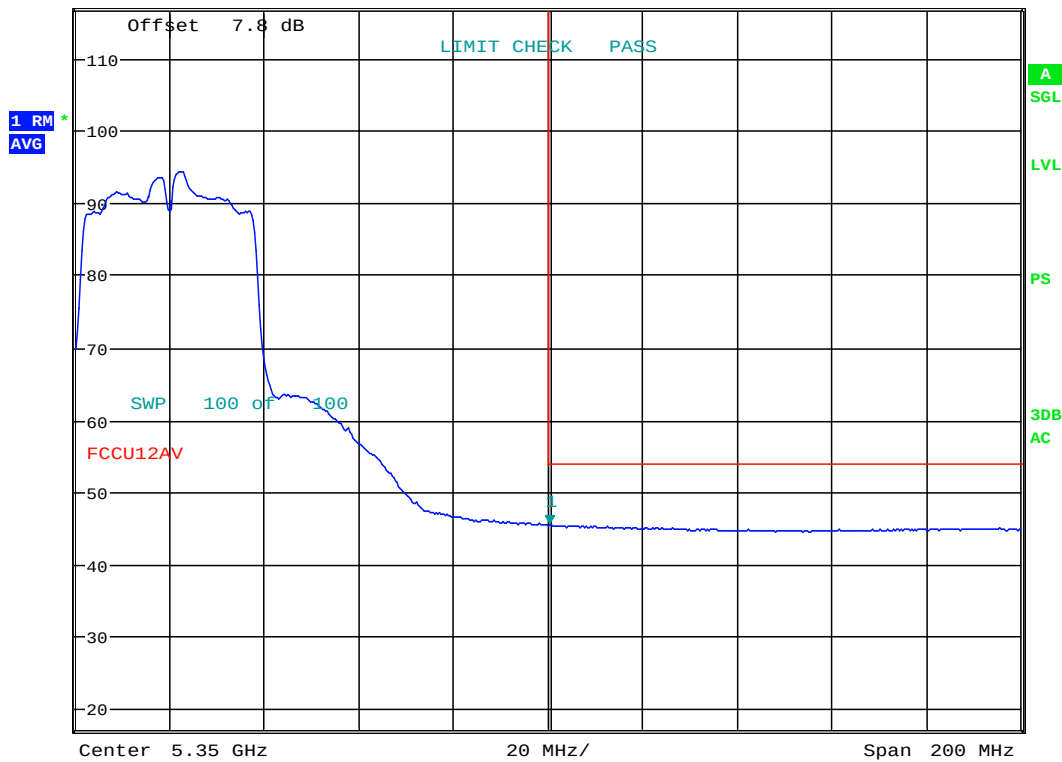
* VBW 3 MHz

SWT 20 ms

Marker 1 [T1]

45.38 dBμV

5.350320513 GHz



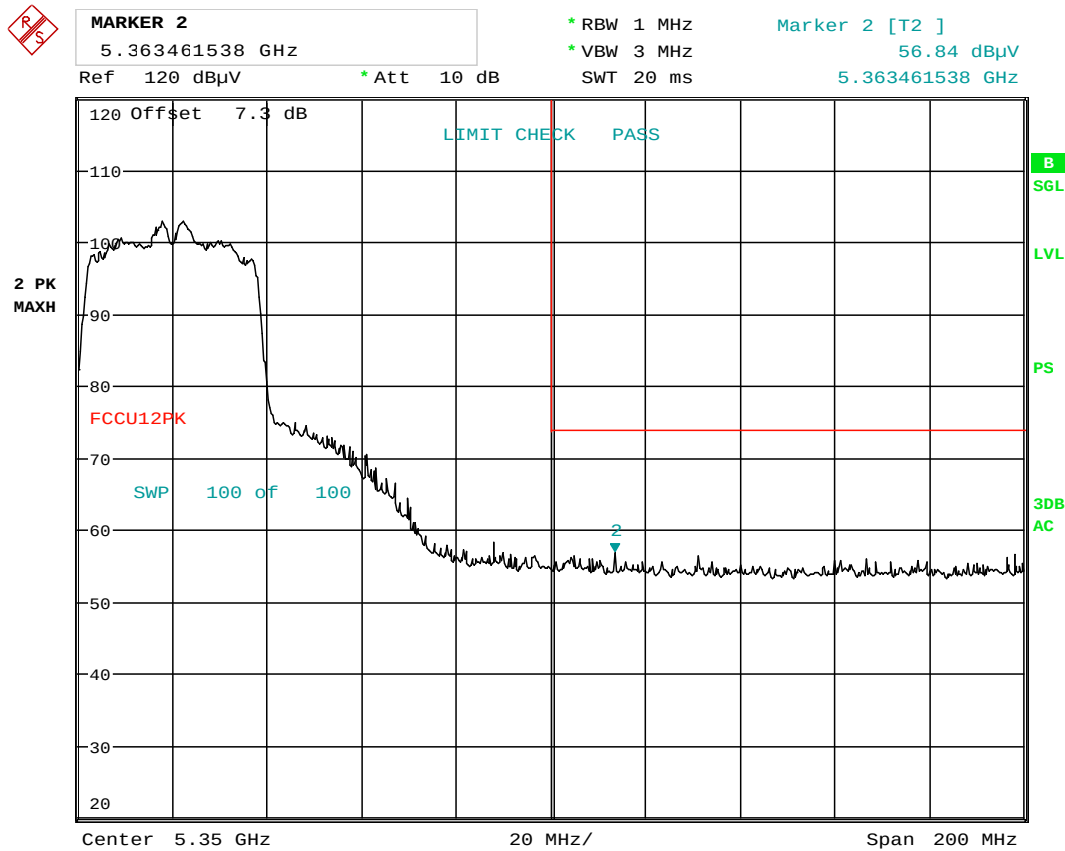
Date: 1.AUG.2017 14:14:19

Plot 7-212. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 175 of 221

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

§15.407(b.1)(b.2) §15.205 §15.209



Date: 1.AUG.2017 14:13:29

Plot 7-213. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 176 of 221

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

\$15.407(b.1)(b.2) \$15.205 \$15.209

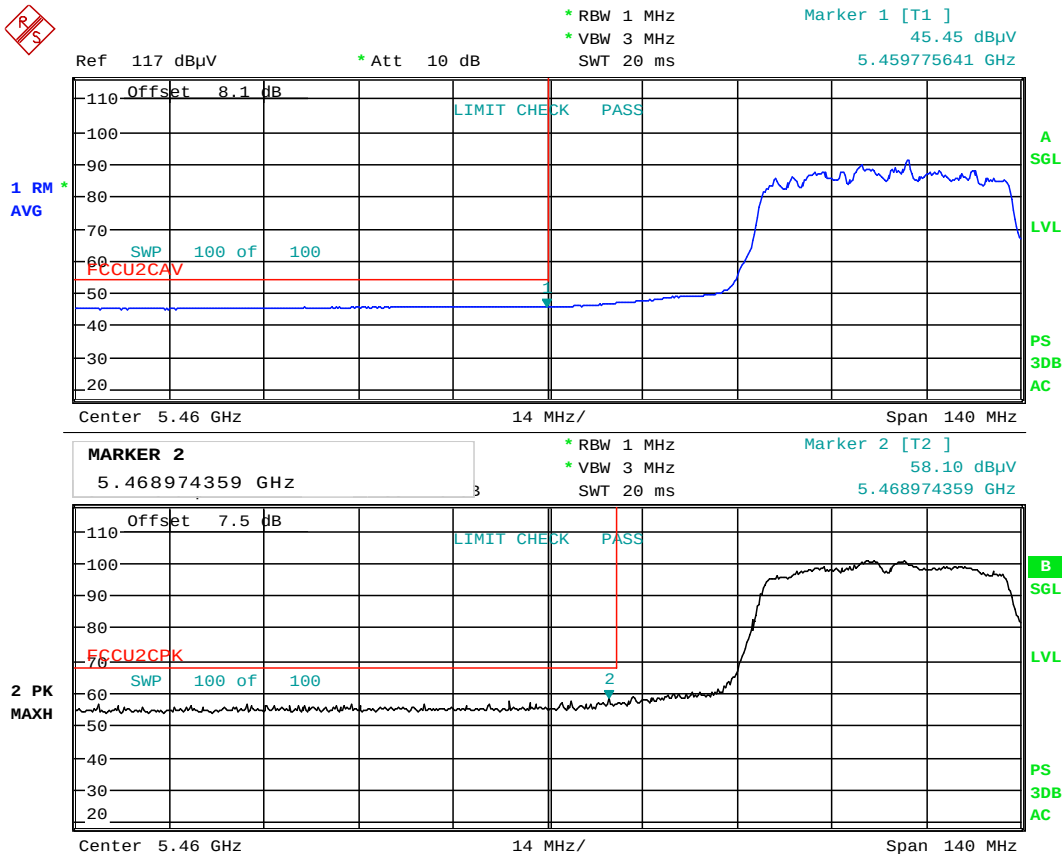
Worst Case Mode: 802.11n (40MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5510MHz

Channel: 102



Date: 6.JUL.2017 16:24:02

Plot 7-214. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

FCC ID: ZNFG011C	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 177 of 221

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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: 5550MHz
Channel: 110



MARKER 1
5.445977564 GHz

* RBW 1 MHz

Marker 1 [T1]

* VBW 3 MHz

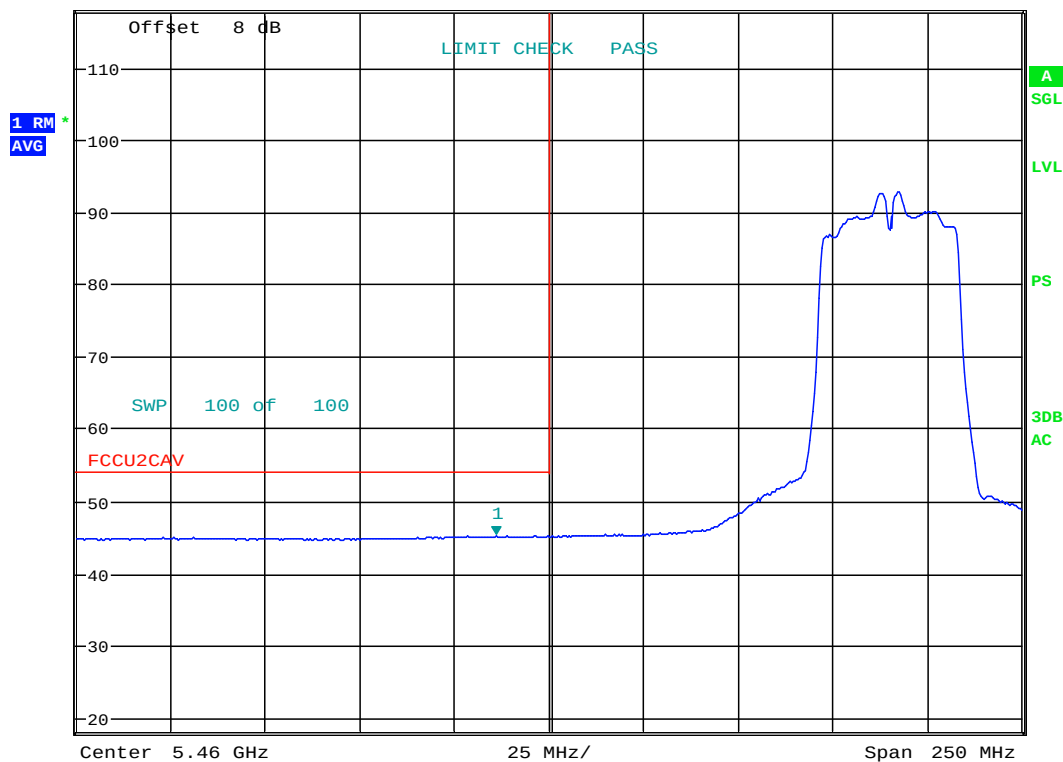
45.16 dBμV

Ref 118 dBμV

* Att 10 dB

SWT 20 ms

5.445977564 GHz



Date: 1.AUG.2017 14:17:32

Plot 7-215. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 178 of 221

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

§15.407(b.1)(b.2) §15.205 §15.209



MARKER 2

5.340208333 GHz

* RBW 1 MHz

Marker 2 [T2]

* VBW 3 MHz

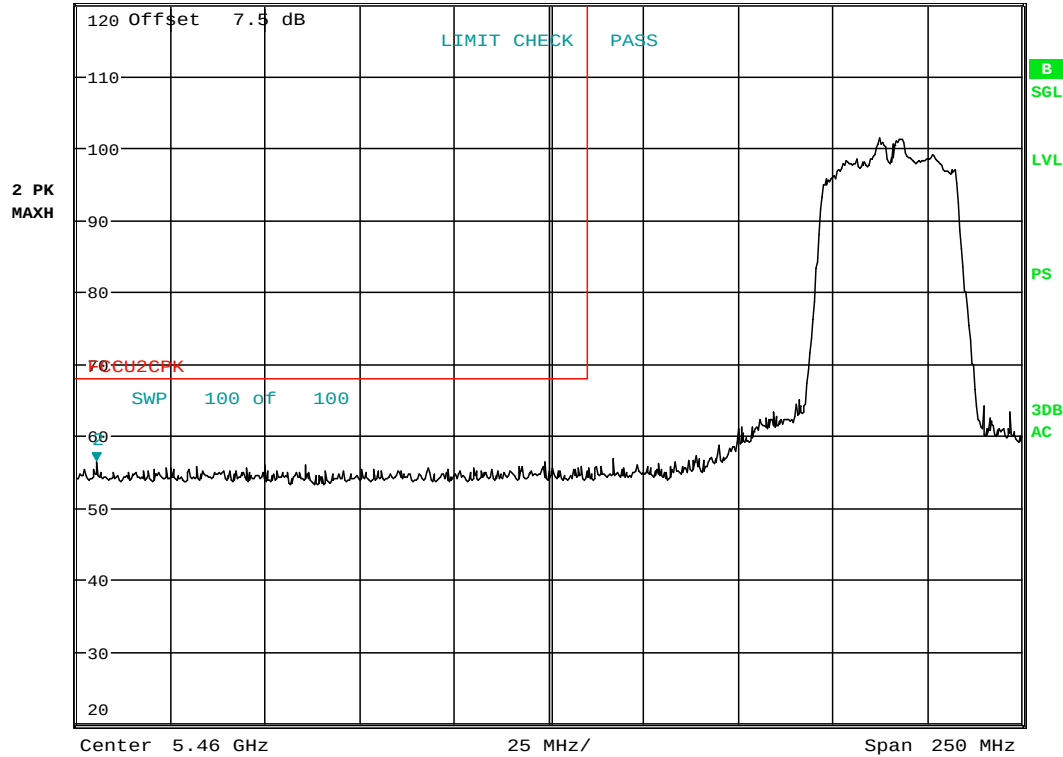
56.44 dBμV

Ref 120 dBμV

* Att 10 dB

SWT 20 ms

5.340208333 GHz



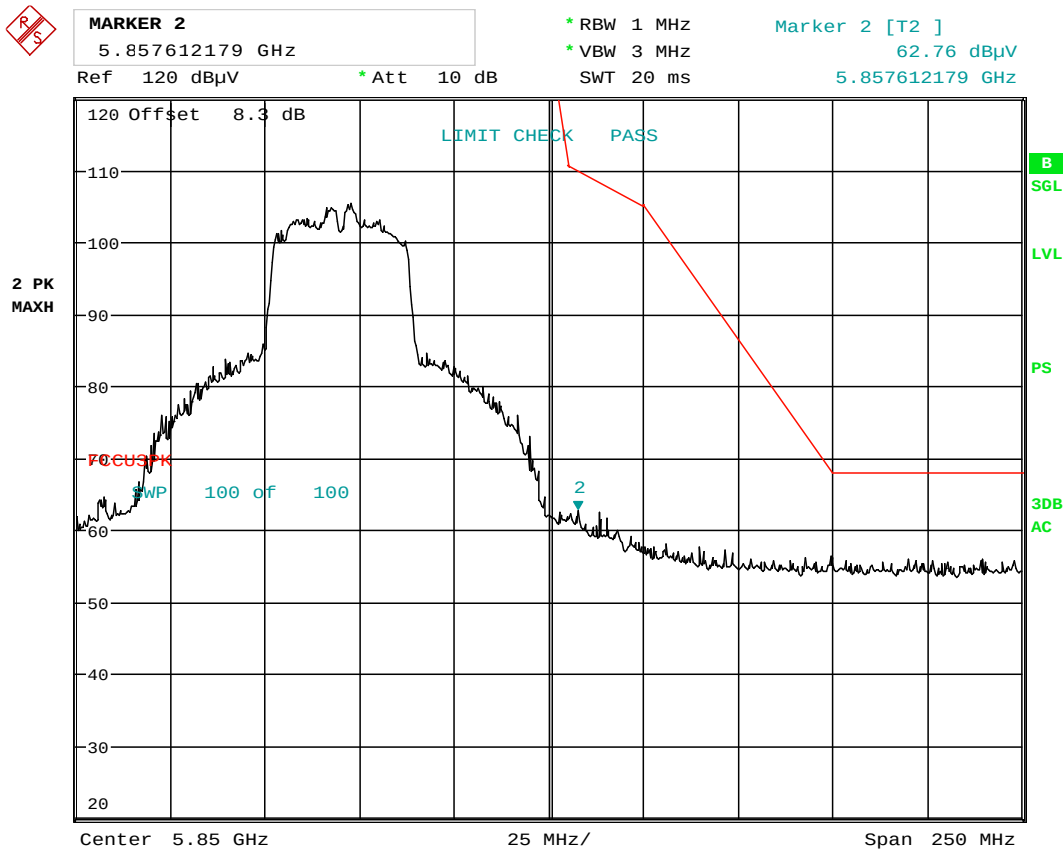
Date: 1.AUG.2017 14:16:49

Plot 7-216. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 179 of 221

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

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



Date: 1.AUG.2017 14:27:52

Plot 7-217. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 180 of 221

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

§15.407(b.1)(b.2) §15.205 §15.209

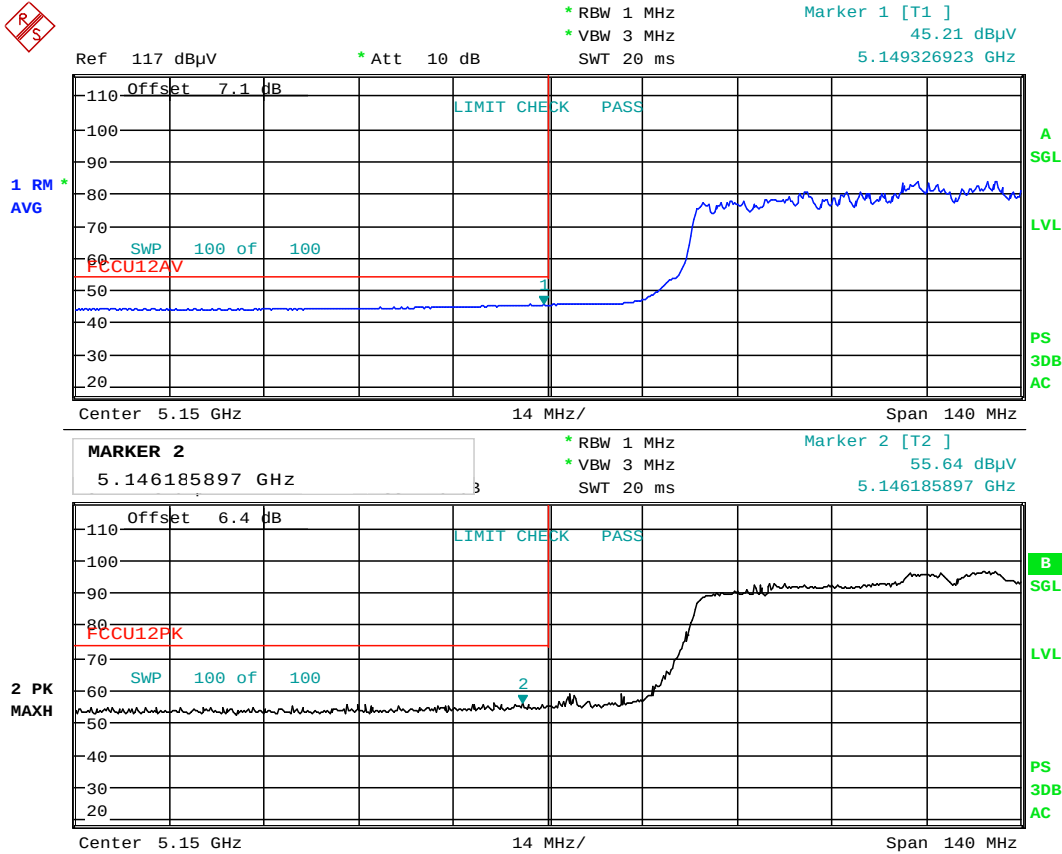
Worst Case Mode: 802.11ac (80MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5210MHz

Channel: 42



Date: 6.JUL.2017 15:45:45

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

FCC ID: ZNFG011C	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 181 of 221

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

\$15.407(b.1)(b.2) \$15.205 \$15.209

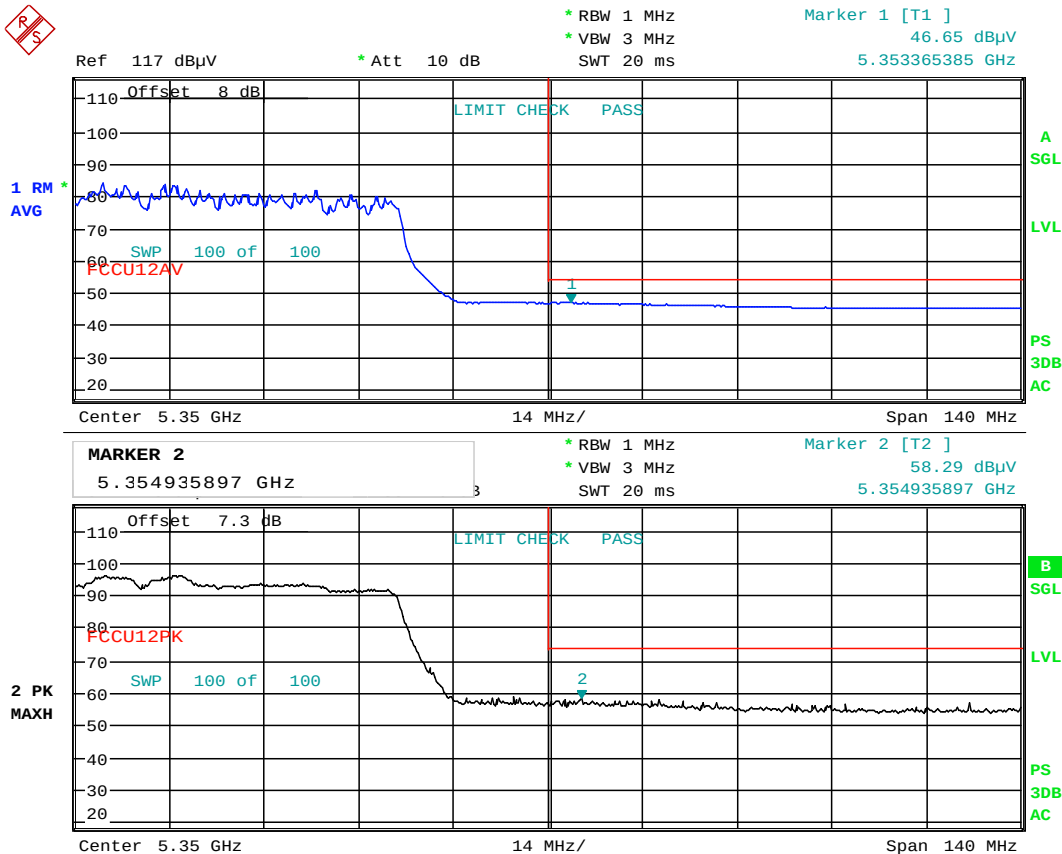
Worst Case Mode: 802.11ac (80MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5290MHz

Channel: 58



Date: 6.JUL.2017 16:12:49

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

FCC ID: ZNFG011C	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 182 of 221

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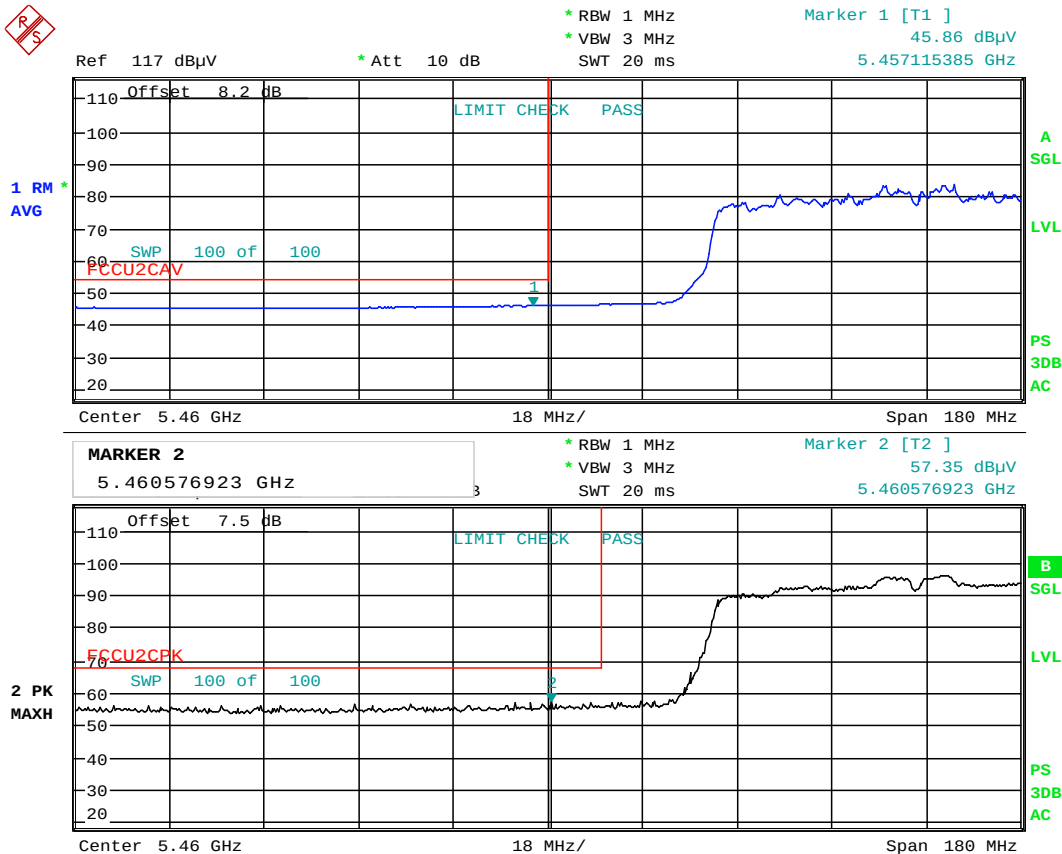
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Antenna-2 Radiated Band Edge Measurements (80MHz BW) **\$15.407(b.1)(b.2) \$15.205 \$15.209**

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



Date: 6.JUL.2017 16:27:07

Plot 7-220. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

FCC ID: ZNFG011C	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 183 of 221

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

§15.407(b.1)(b.2) §15.205 §15.209

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



MARKER 1

5.85 GHz

Ref 115.3 dBμV

* Att 10 dB

* RBW 1 MHz

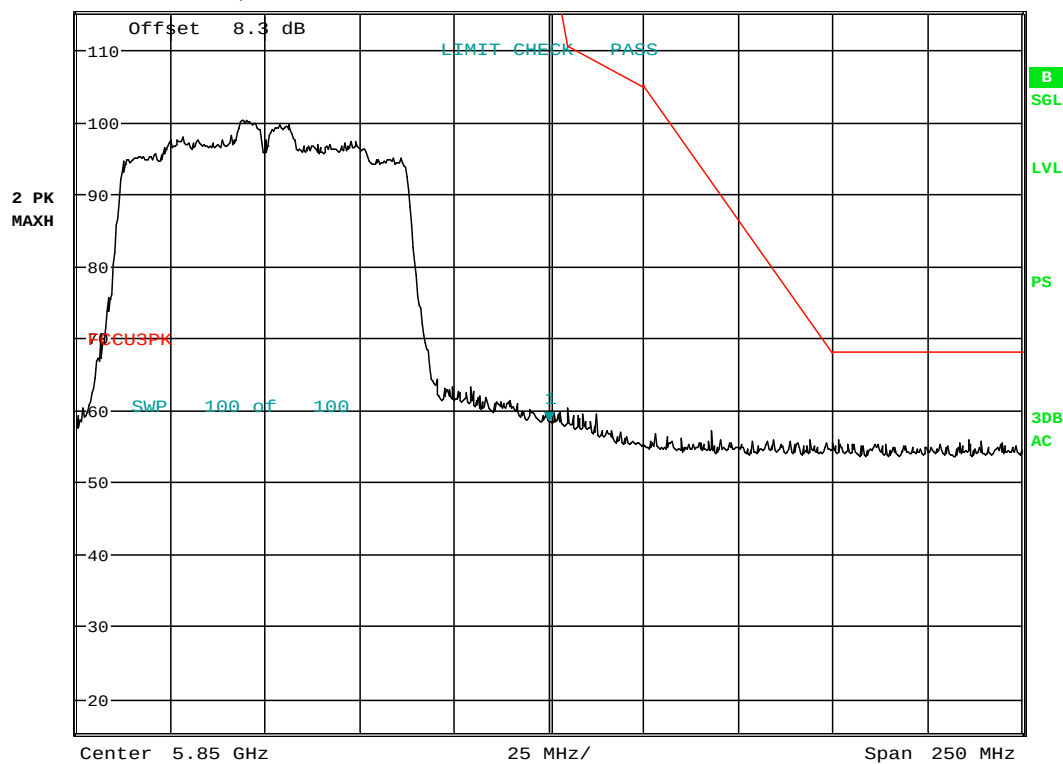
* VBW 3 MHz

SWT 20 ms

Marker 1 [T2]

58.56 dBμV

5.850000000 GHz



Date: 6.JUL.2017 16:47:15

Plot 7-221. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 184 of 221

7.7.10 MIMO Radiated Band Edge Measurements (20MHz BW) (SDM)

§15.407(b.1)(b.2) §15.205 §15.209

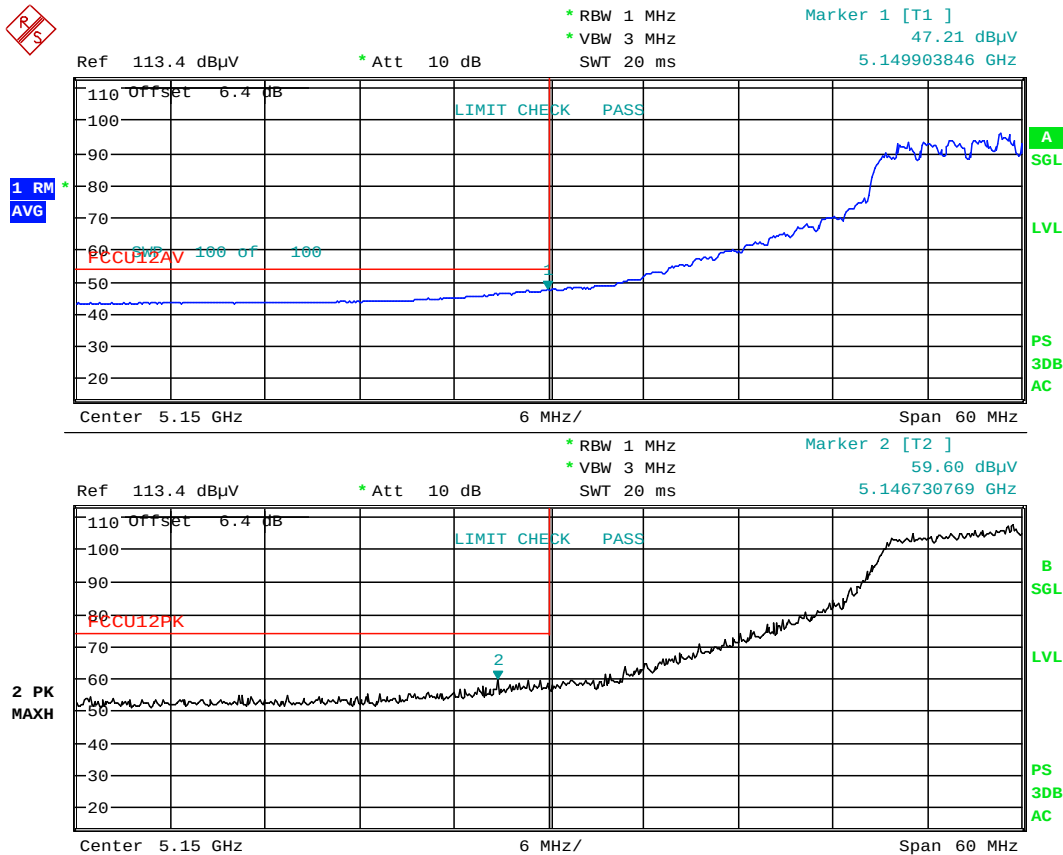
Worst Case Mode: 802.11n (20MHz)

Worst Case Transfer Rate: MCS8

Distance of Measurements: 3 Meters

Operating Frequency: 5180MHz

Channel: 36



Date: 23.JUN.2017 17:12:17

Plot 7-222. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 185 of 221

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

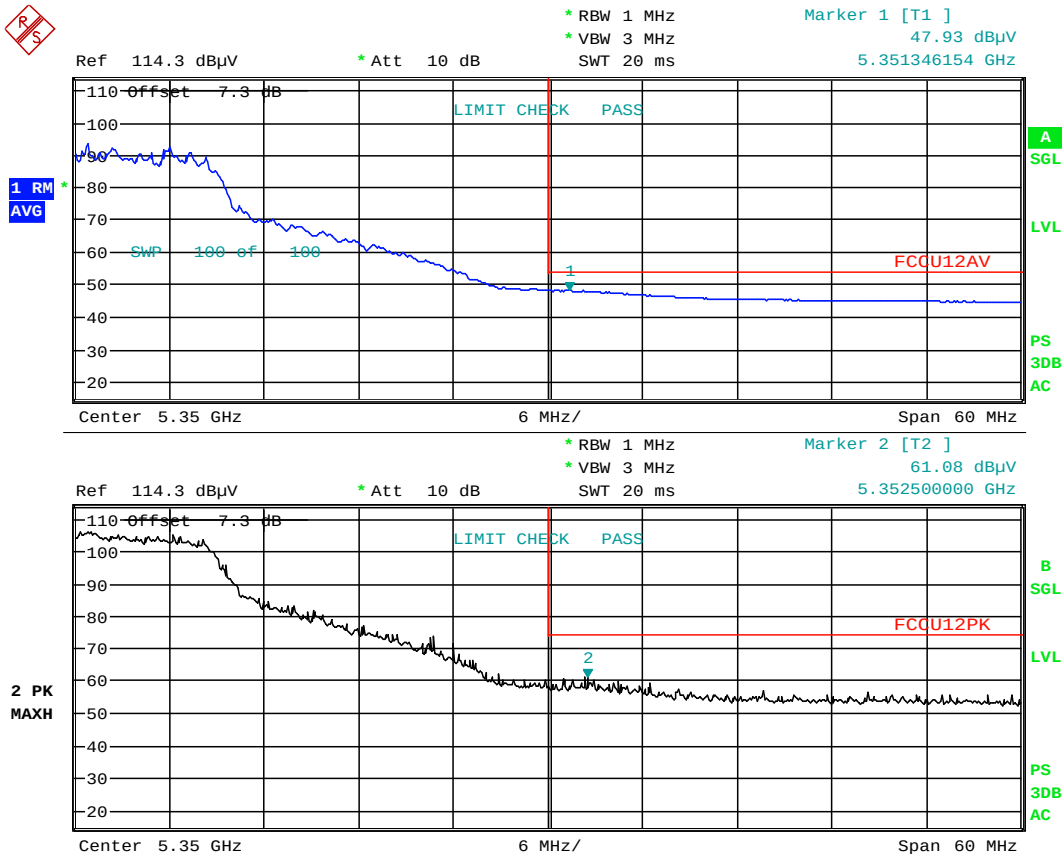
Worst Case Mode: 802.11n (20MHz)

Worst Case Transfer Rate: MCS8

Distance of Measurements: 3 Meters

Operating Frequency: 5320MHz

Channel: 64



Date: 23.JUN.2017 17:16:41

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

FCC ID: ZNFG011C	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 186 of 221

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

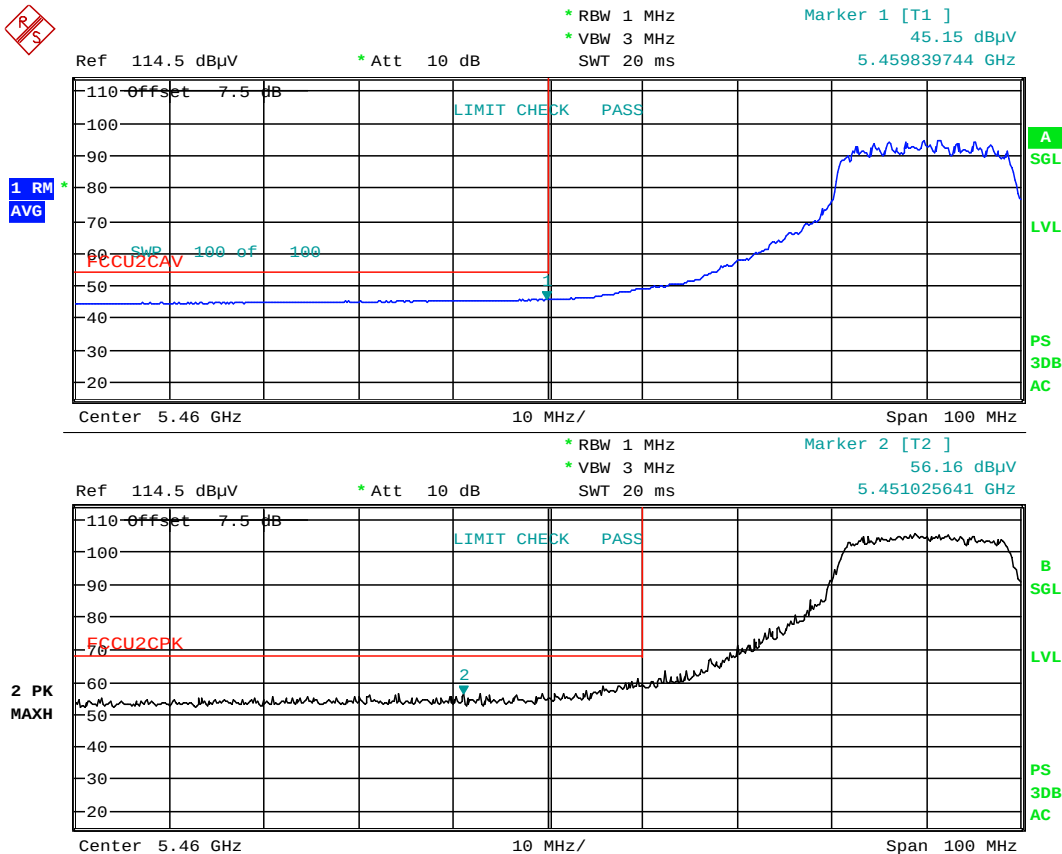
Worst Case Mode: 802.11n (20MHz)

Worst Case Transfer Rate: MCS8

Distance of Measurements: 3 Meters

Operating Frequency: 5500MHz

Channel: 100



Date: 23.JUN.2017 17:22:40

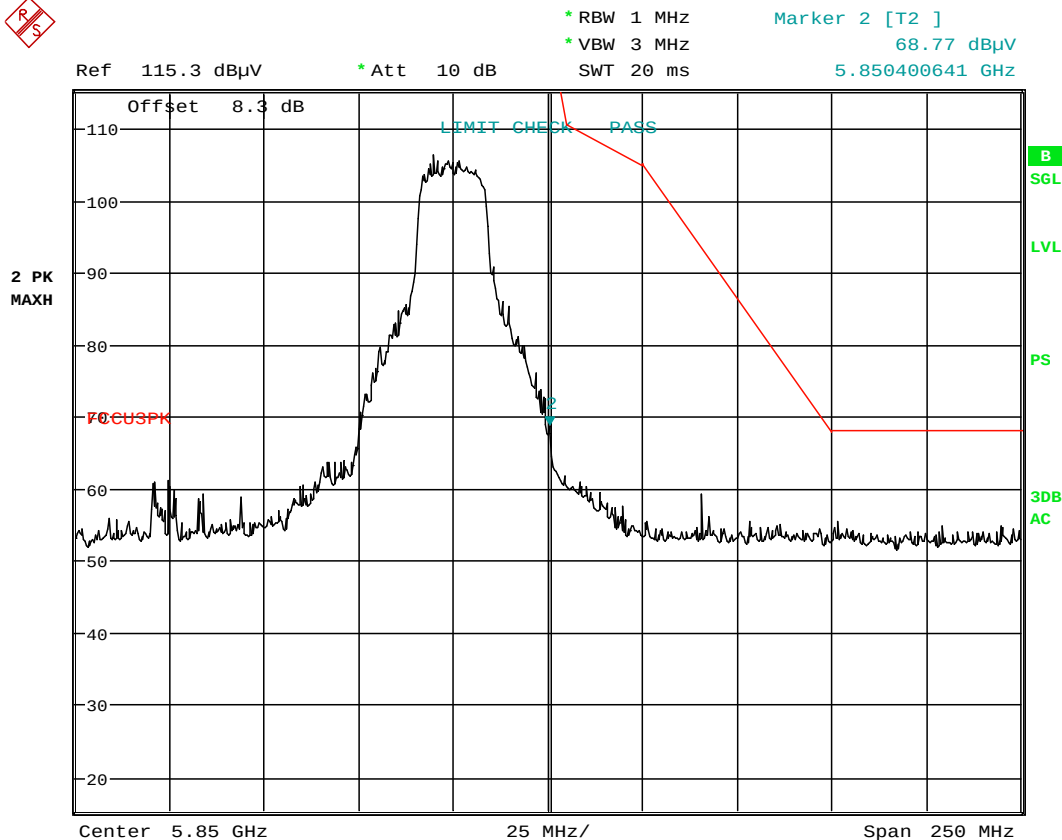
Plot 7-224. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 187 of 221

MIMO Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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



Date: 23.JUN.2017 17:26:39

Plot 7-225. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 188 of 221

7.7.11 MIMO Radiated Band Edge Measurements (20MHz BW) (CDD)

§15.407(b.1)(b.2) §15.205 §15.209

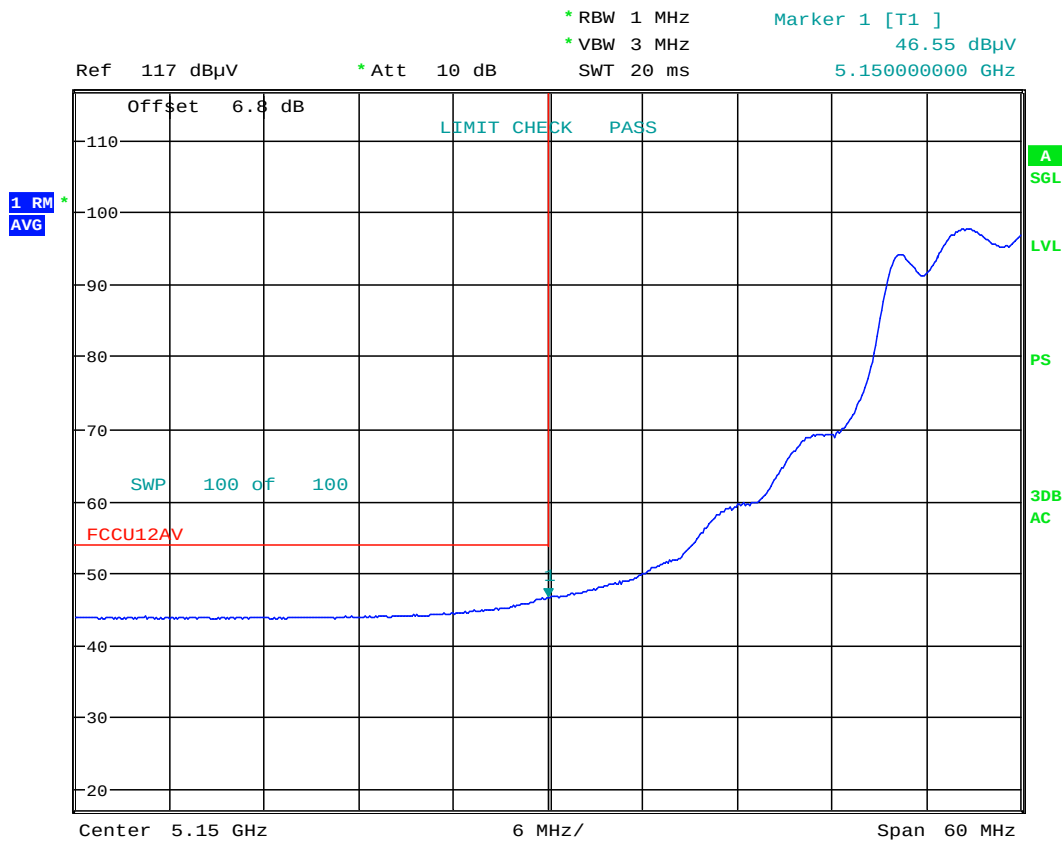
Worst Case Mode: 802.11a (20MHz)

Worst Case Transfer Rate: 6Mbps

Distance of Measurements: 3 Meters

Operating Frequency: 5180MHz

Channel: 36



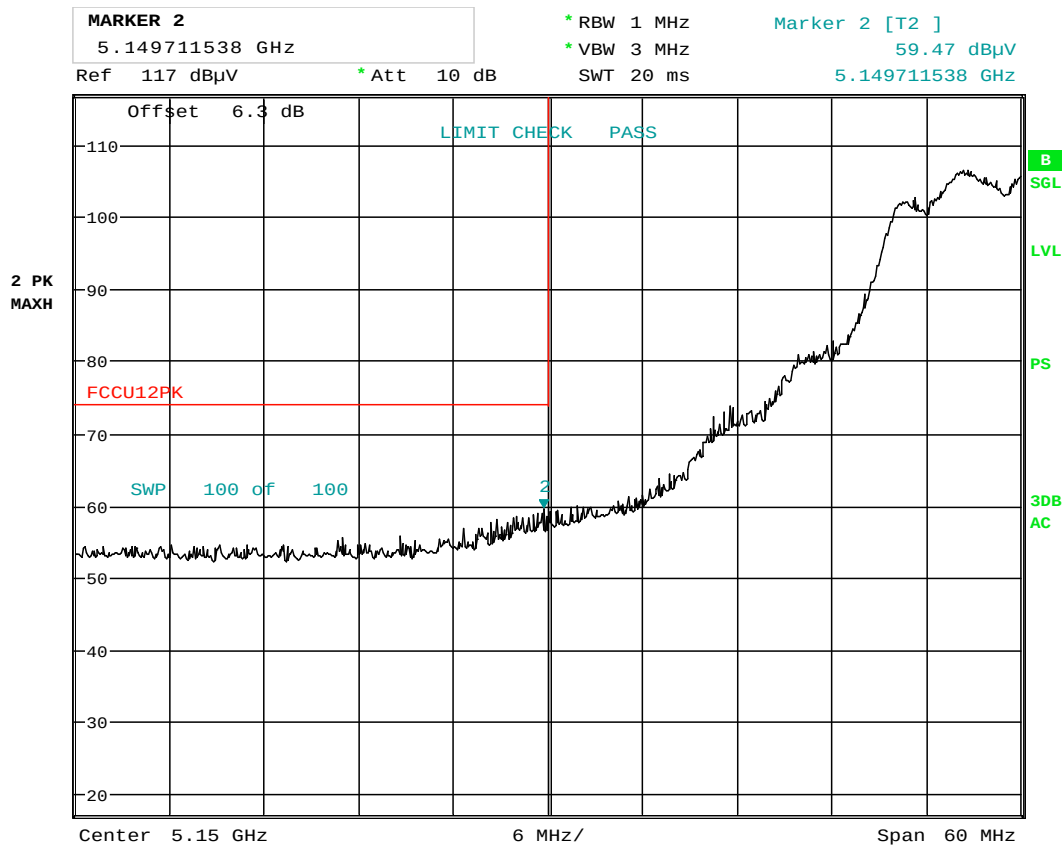
Date: 11.JUL.2017 19:04:22

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

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 189 of 221

MIMO Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



Date: 11.JUL.2017 19:03:48

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

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 190 of 221

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MIMO Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

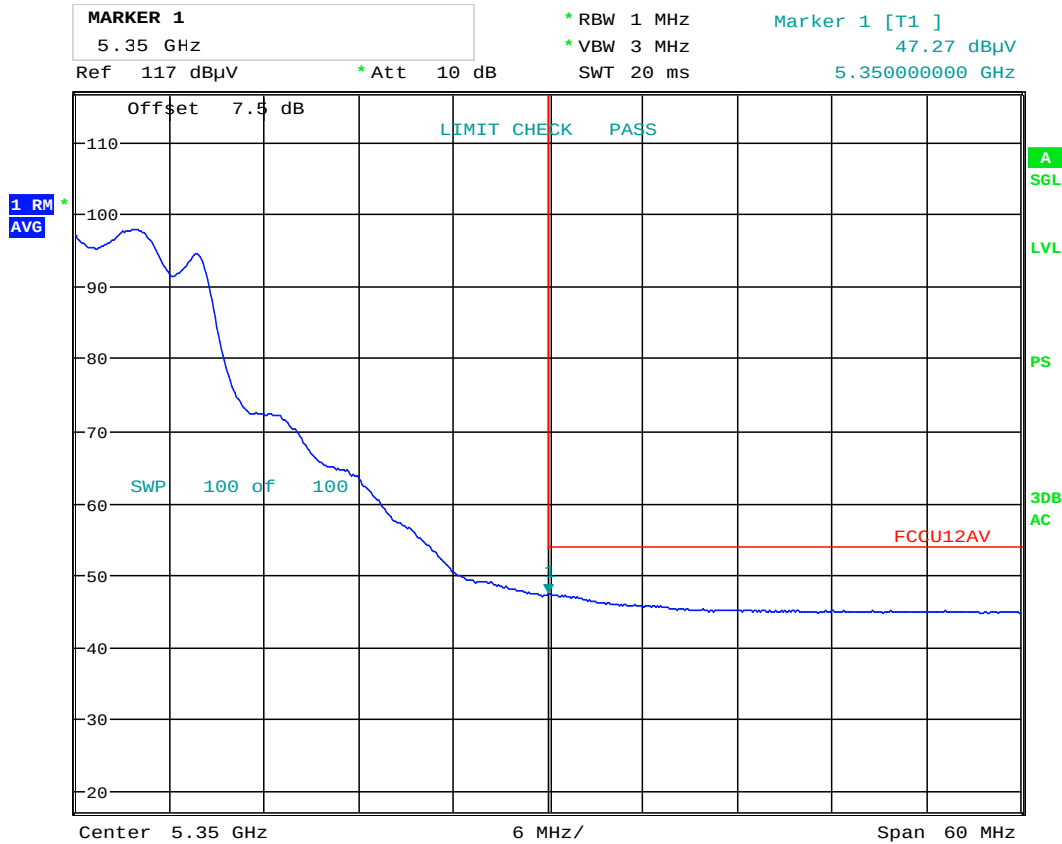
Worst Case Mode: 802.11a (20MHz)

Worst Case Transfer Rate: 6Mbps

Distance of Measurements: 3 Meters

Operating Frequency: 5320MHz

Channel: 64



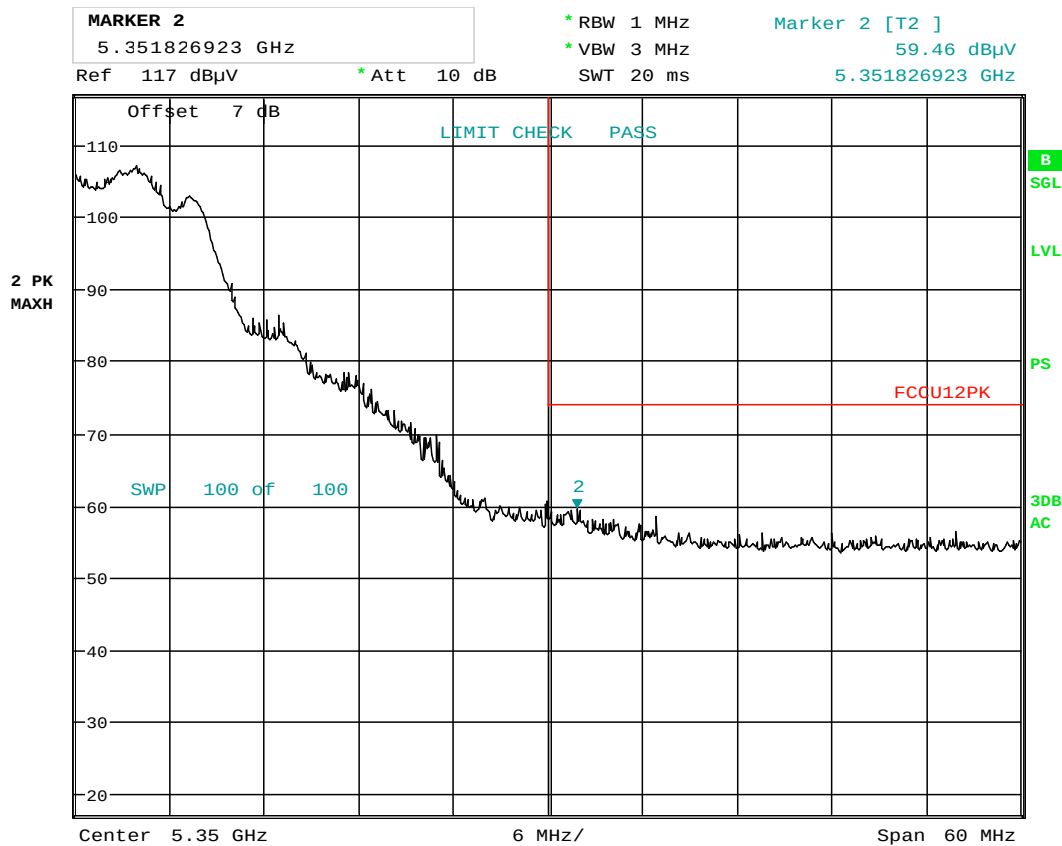
Date: 11.JUL.2017 19:07:07

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

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 191 of 221

MIMO Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



Date: 11.JUL.2017 19:05:58

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

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 192 of 221

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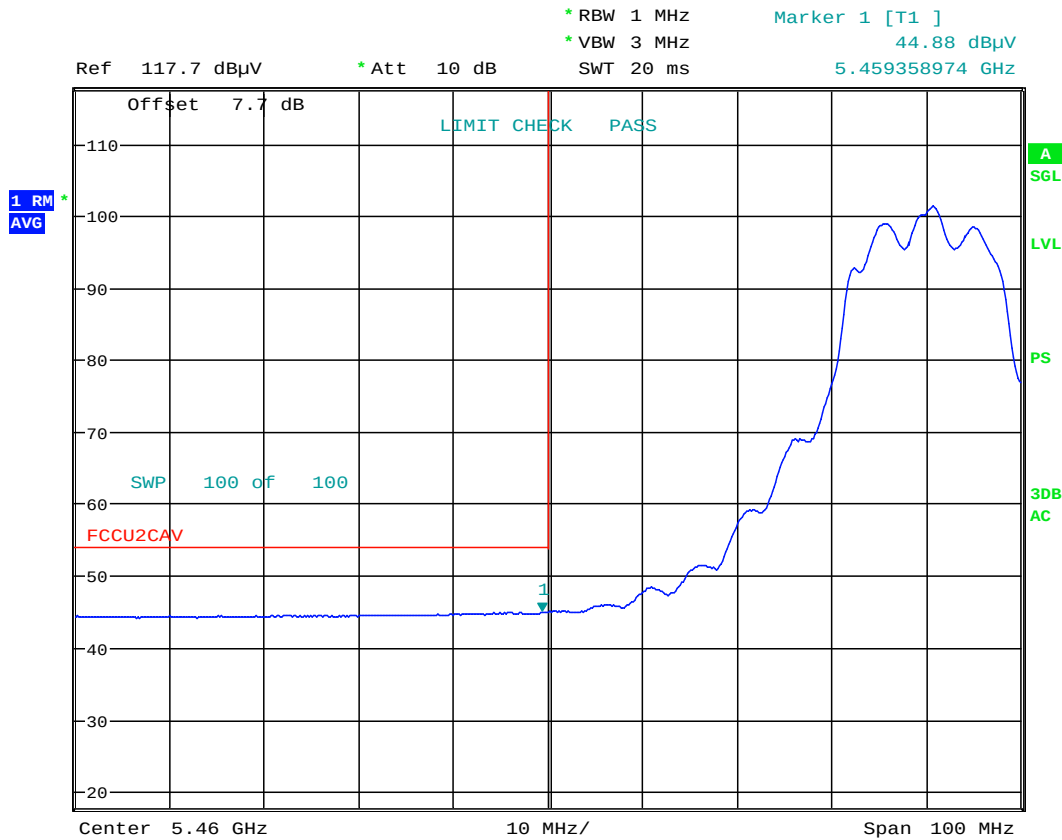
06/06/2017

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MIMO Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

Worst Case Mode: 802.11a (20MHz)
Worst Case Transfer Rate: 6Mbps
Distance of Measurements: 3 Meters
Operating Frequency: 5500MHz
Channel: 100



Date: 11.JUL.2017 19:09:06

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

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 193 of 221

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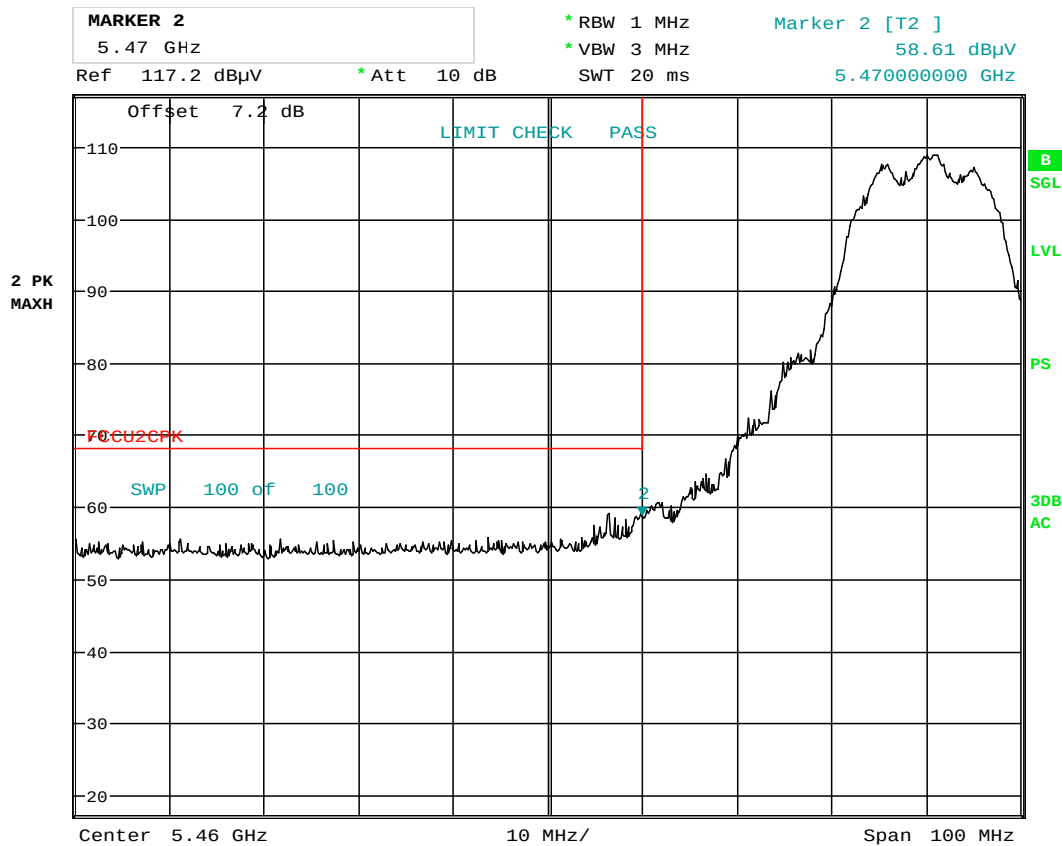
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MIMO Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



Date: 11.JUL.2017 19:08:32

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

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 194 of 221

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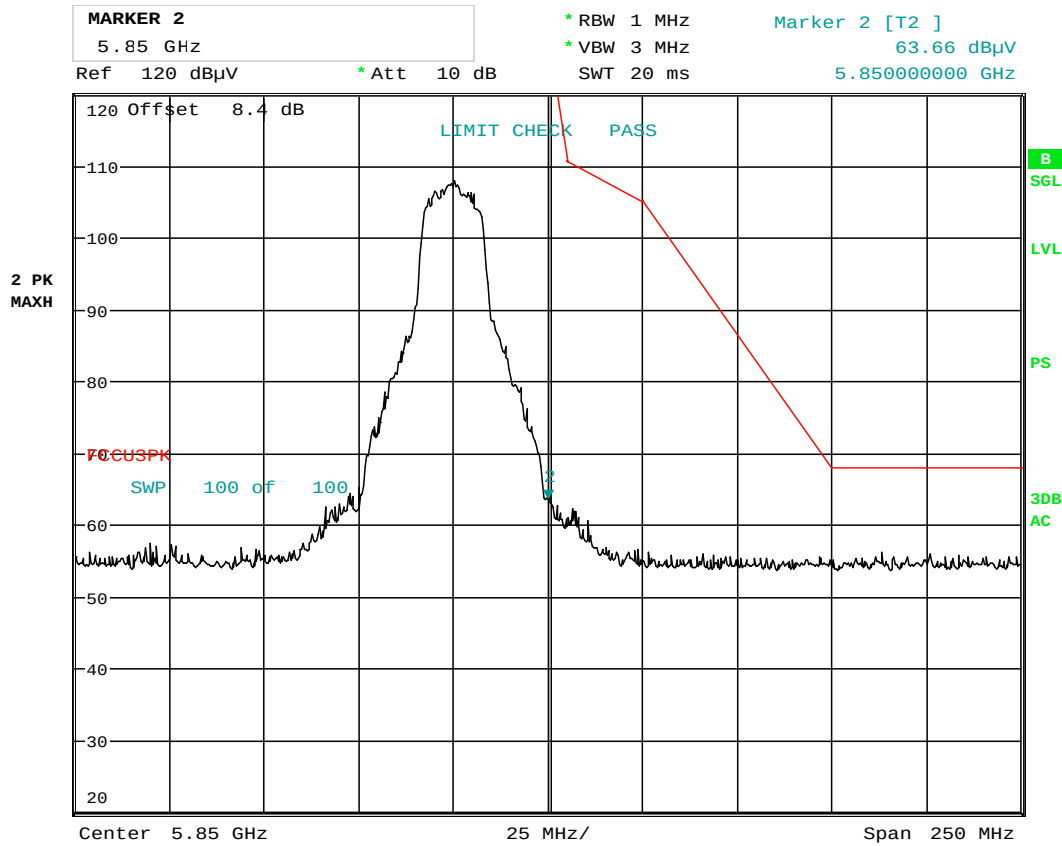
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MIMO Radiated Band Edge Measurements (20MHz BW) §15.407(b.1)(b.2) §15.205 §15.209

Worst Case Mode: 802.11a (20MHz)
Worst Case Transfer Rate: 6Mbps
Distance of Measurements: 3 Meters
Operating Frequency: 5825MHz
Channel: 165



Date: 11.JUL.2017 19:10:44

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

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 195 of 221

7.7.12 MIMO Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

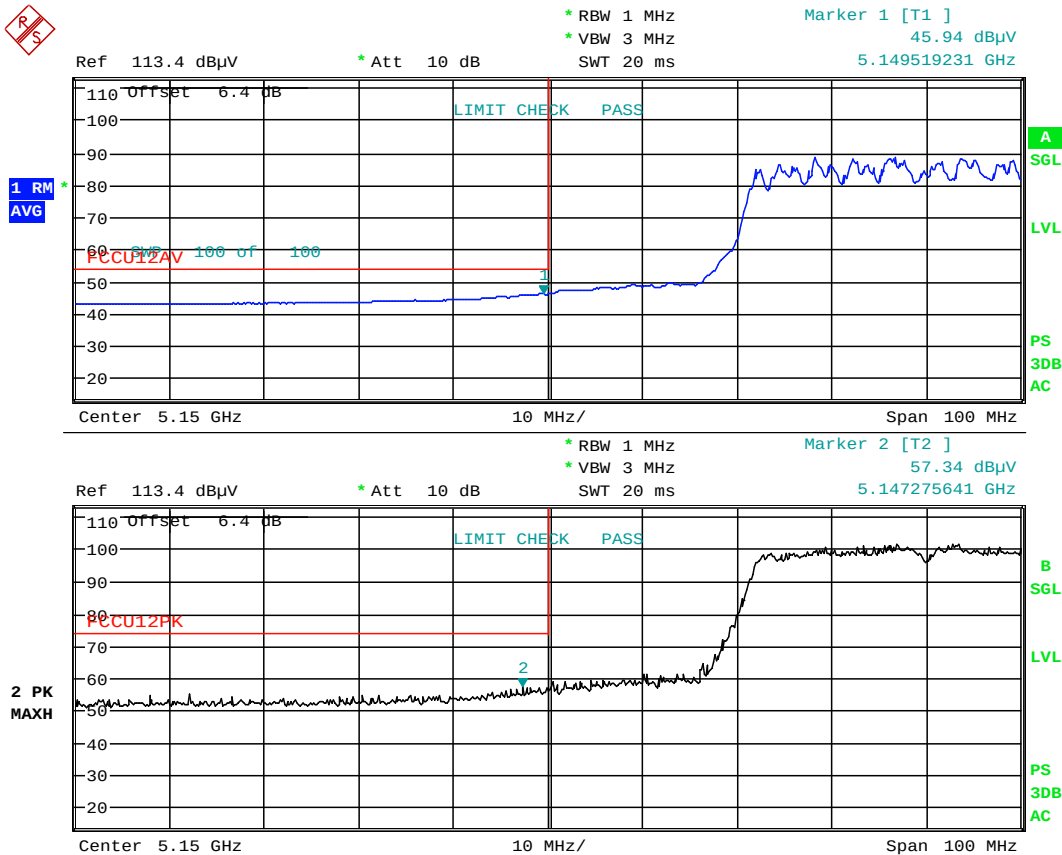
Worst Case Mode: 802.11n (40MHz)

Worst Case Transfer Rate: MCS8

Distance of Measurements: 3 Meters

Operating Frequency: 5190MHz

Channel: 38



Date: 23. JUN. 2017 16:46:57

Plot 7-233. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 196 of 221

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: MCS0
Distance of Measurements: 3 Meters
Operating Frequency: 5230MHz
Channel: 46



MARKER 1

5.15 GHz

* RBW 1 MHz

* VBW 3 MHz

SWT 20 ms

Marker 1 [T1]

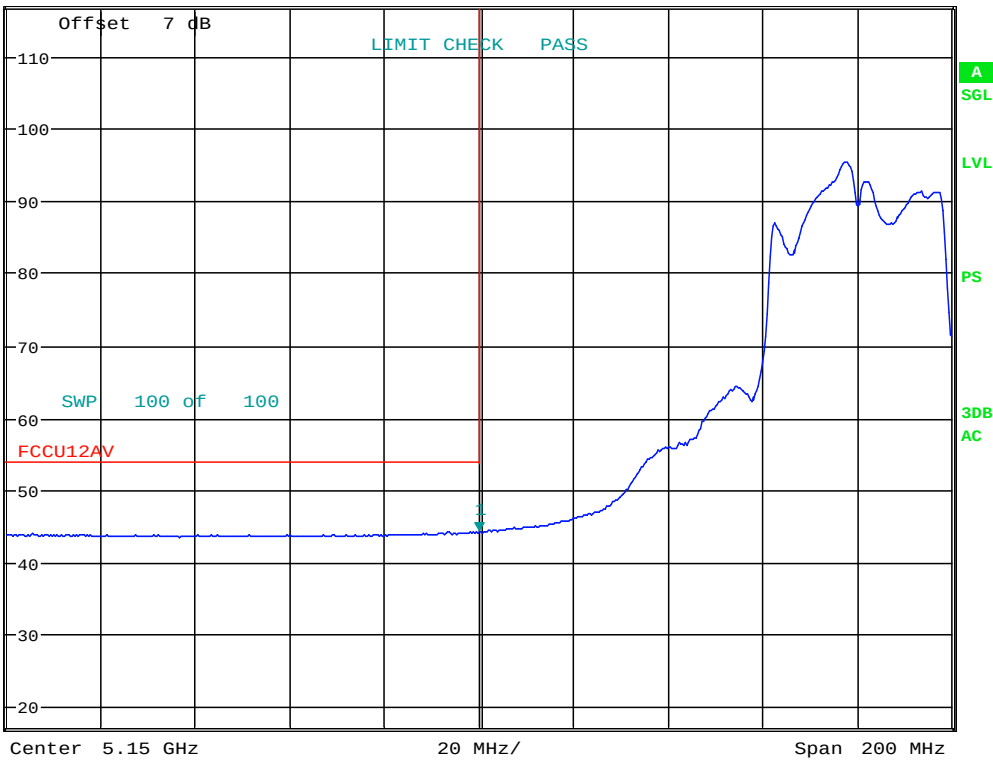
44.25 dBμV

5.150000000 GHz

Ref 117 dBμV

* Att 10 dB

1 RM
AVG



Date: 1.AUG.2017 14:53:33

Plot 7-234. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 197 of 221

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MIMO Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



MARKER 2

5.066666667 GHz

Ref 120 dBμV

* Att 10 dB

* RBW 1 MHz

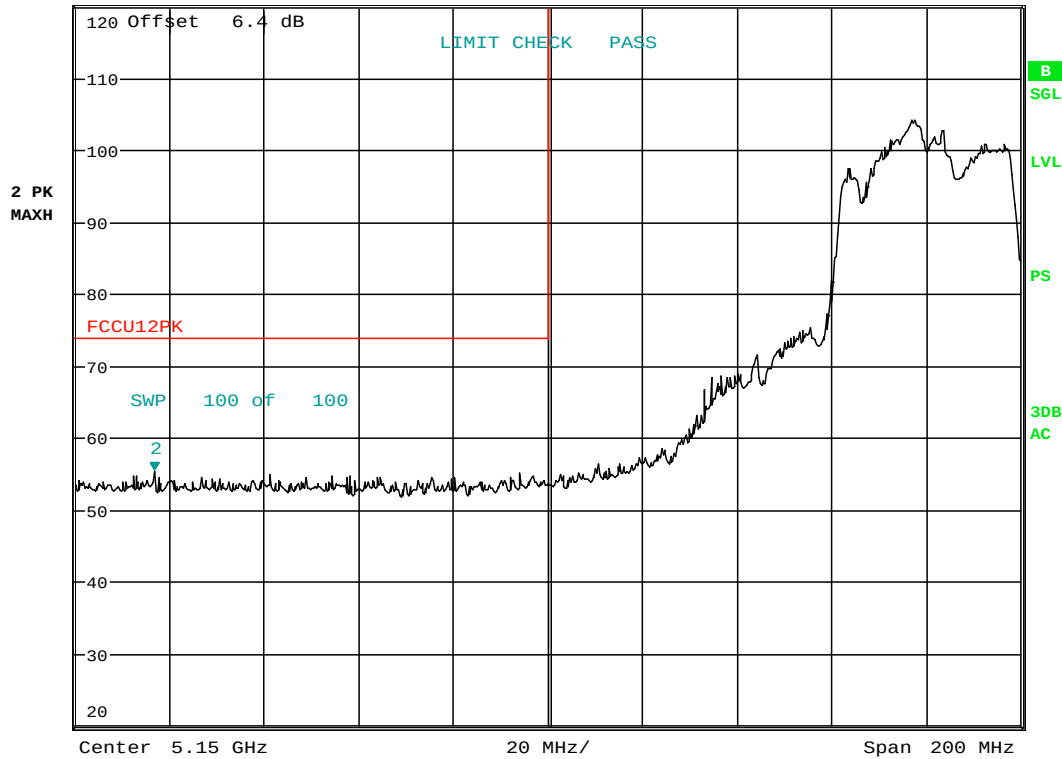
* VBW 3 MHz

* SWT 20 ms

Marker 2 [T2]

55.33 dBμV

5.066666667 GHz



Date: 1.AUG.2017 14:52:01

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

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 198 of 221

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MIMO Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

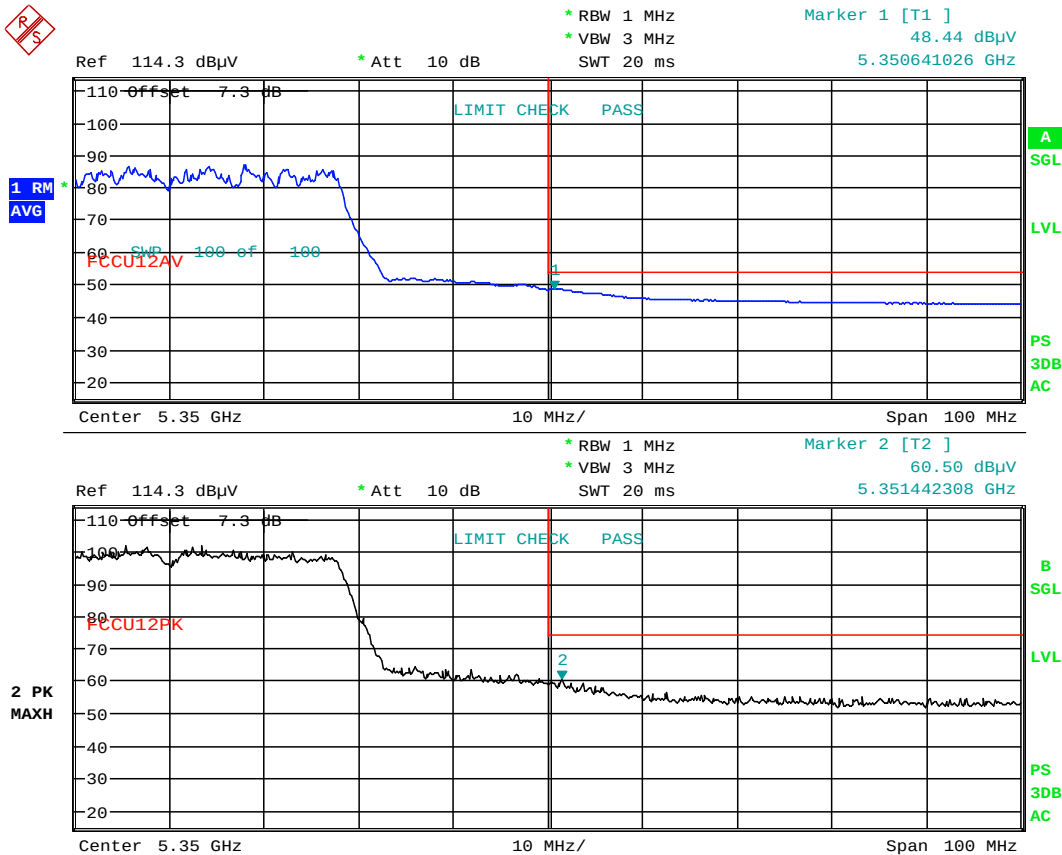
Worst Case Mode: 802.11n (40MHz)

Worst Case Transfer Rate: MCS8

Distance of Measurements: 3 Meters

Operating Frequency: 5310MHz

Channel: 62



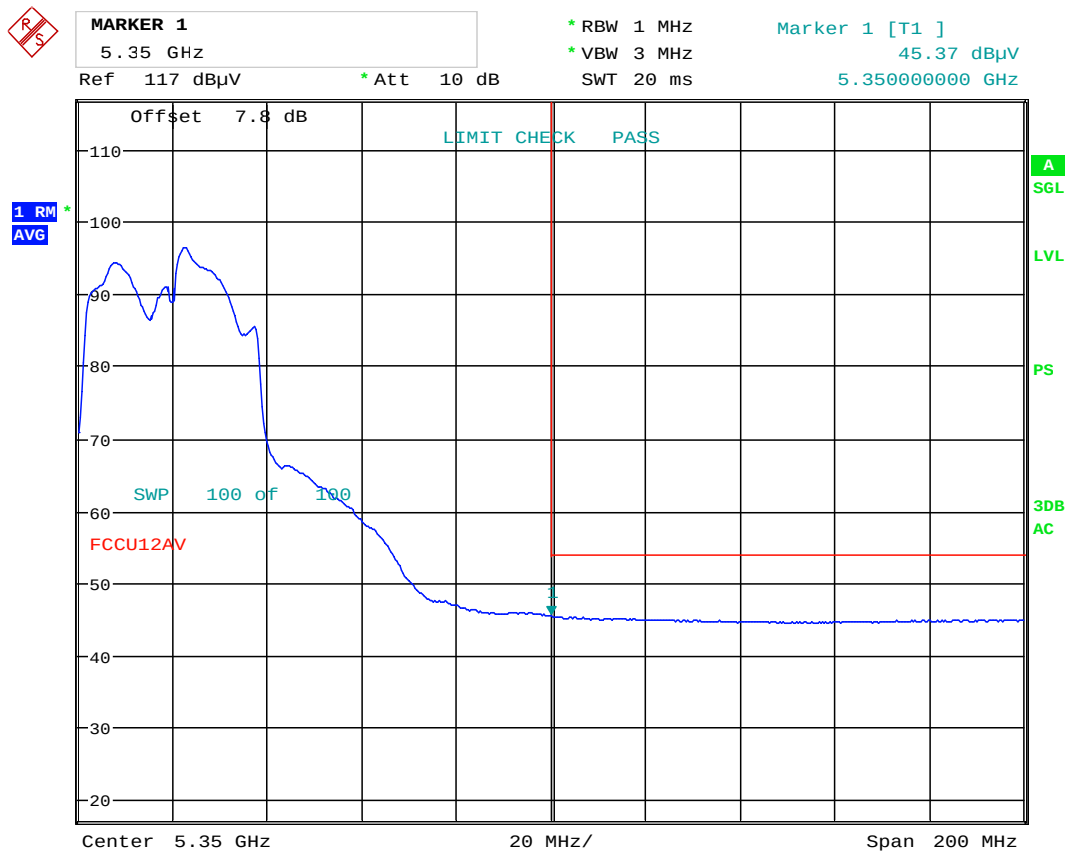
Date: 23. JUN. 2017 16:31:32

Plot 7-236. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 199 of 221

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

Worst Case Mode:	<u>802.11n (40MHz)</u>
Worst Case Transfer Rate:	<u>MCS0</u>
Distance of Measurements:	<u>3 Meters</u>
Operating Frequency:	<u>5270MHz</u>
Channel:	<u>54</u>



Date: 1.AUG.2017 15:07:41

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

FCC ID: ZNFG011C	 FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset	Page 200 of 221

MIMO Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



MARKER 2

5.445833333 GHz

* RBW 1 MHz

Marker 2 [T2]

* VBW 3 MHz

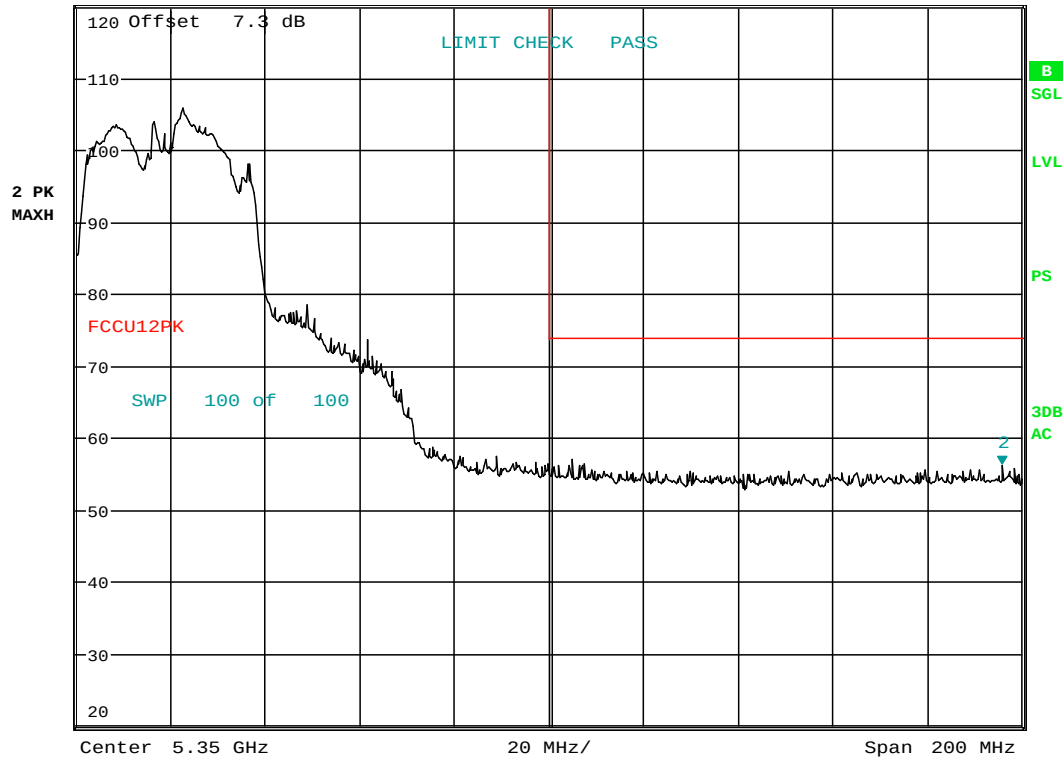
56.33 dBμV

Ref 120 dBμV

* Att 10 dB

SWT 20 ms

5.445833333 GHz



Date: 1.AUG.2017 15:06:00

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

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 201 of 221

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MIMO Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

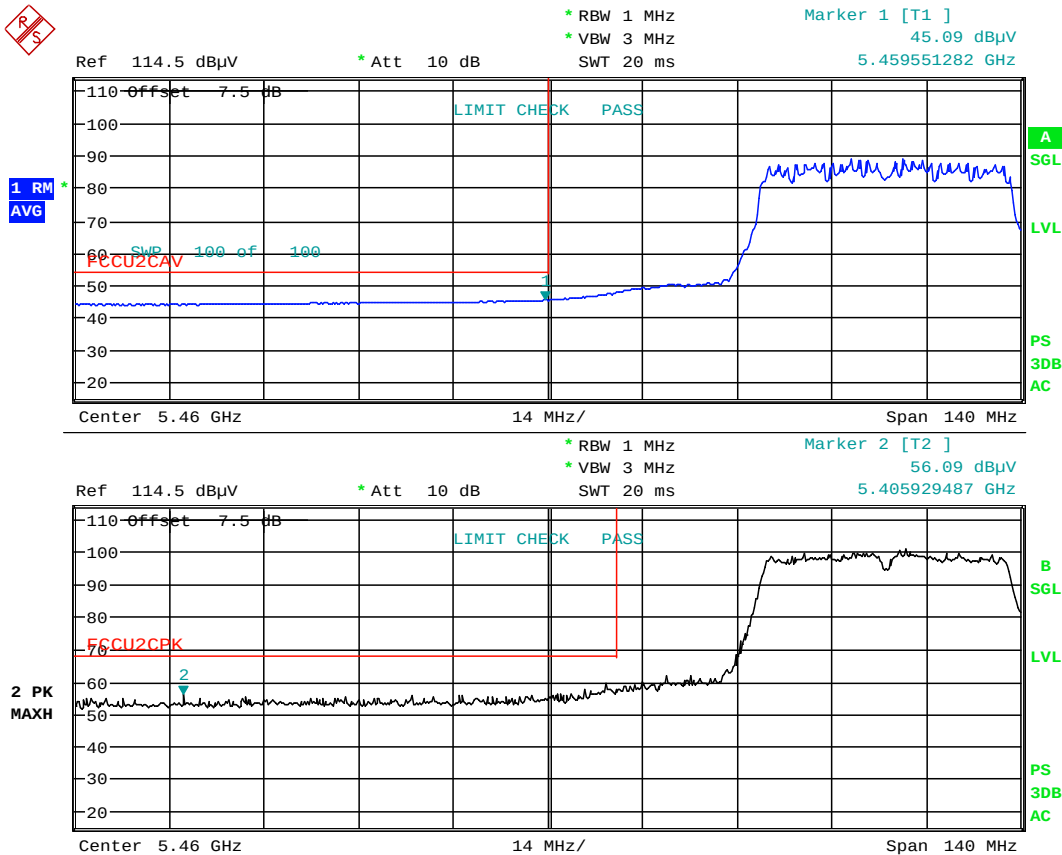
Worst Case Mode: 802.11n (40MHz)

Worst Case Transfer Rate: MCS8

Distance of Measurements: 3 Meters

Operating Frequency: 5510MHz

Channel: 102



Date: 23. JUN. 2017 17:00:12

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

FCC ID: ZNFG011C	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 202 of 221

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: MCS0
Distance of Measurements: 3 Meters
Operating Frequency: 5550MHz
Channel: 110



MARKER 1
5.450785256 GHz

* RBW 1 MHz

* VBW 3 MHz

SWT 20 ms

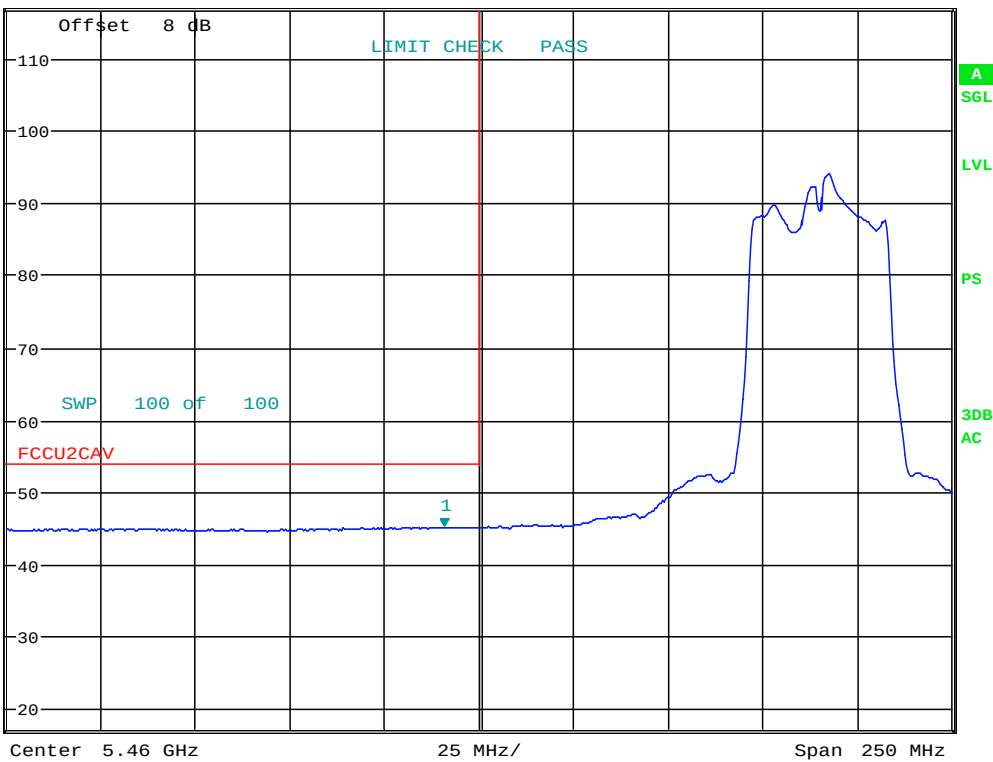
Marker 1 [T1]

45.13 dBμV

5.450785256 GHz

Ref 117 dBμV

* Att 10 dB



Date: 1.AUG.2017 15:11:11

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

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 203 of 221

MIMO Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



MARKER 2

5.445977564 GHz

* RBW 1 MHz

Marker 2 [T2]

* VBW 3 MHz

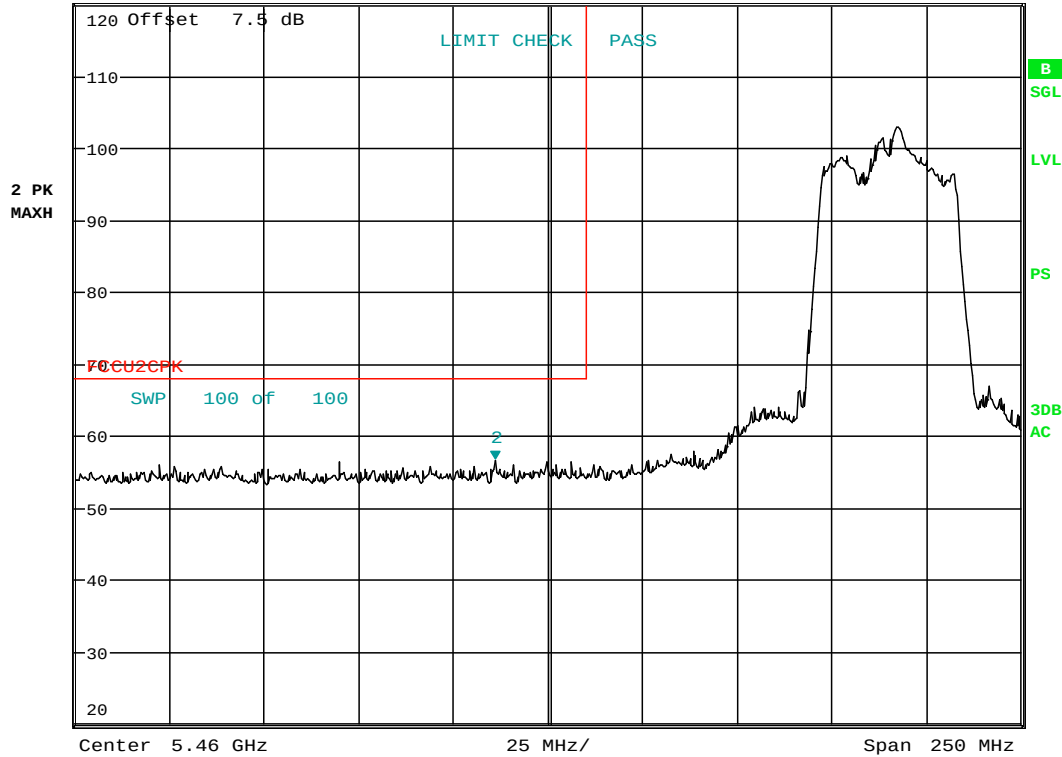
56.72 dBμV

Ref 120 dBμV

* Att 10 dB

SWT 20 ms

5.445977564 GHz



Date: 1.AUG.2017 15:10:20

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

FCC ID: ZNFG011C		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset	Page 204 of 221	

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MIMO Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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



MARKER 2

5.85 GHz

Ref 120 dBμV

* Att 10 dB

* RBW 1 MHz

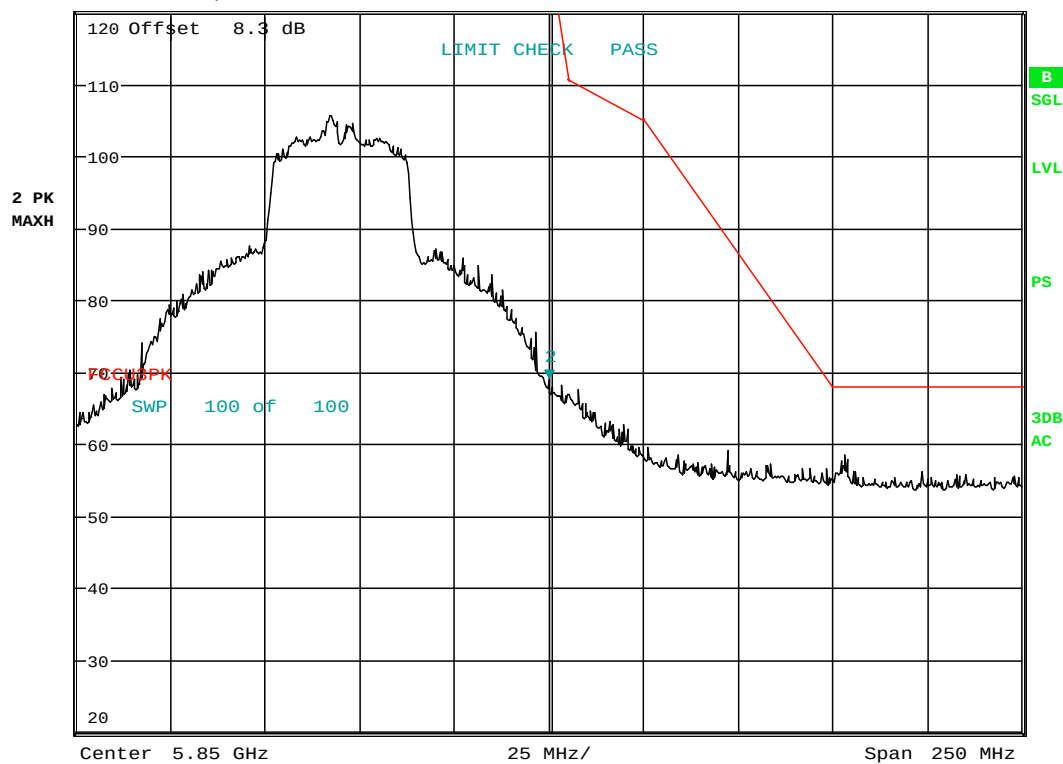
* VBW 3 MHz

SWT 20 ms

Marker 2 [T2]

69.00 dBμV

5.850000000 GHz



Date: 1.AUG.2017 15:14:32

Plot 7-242. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 205 of 221

7.7.13 MIMO Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

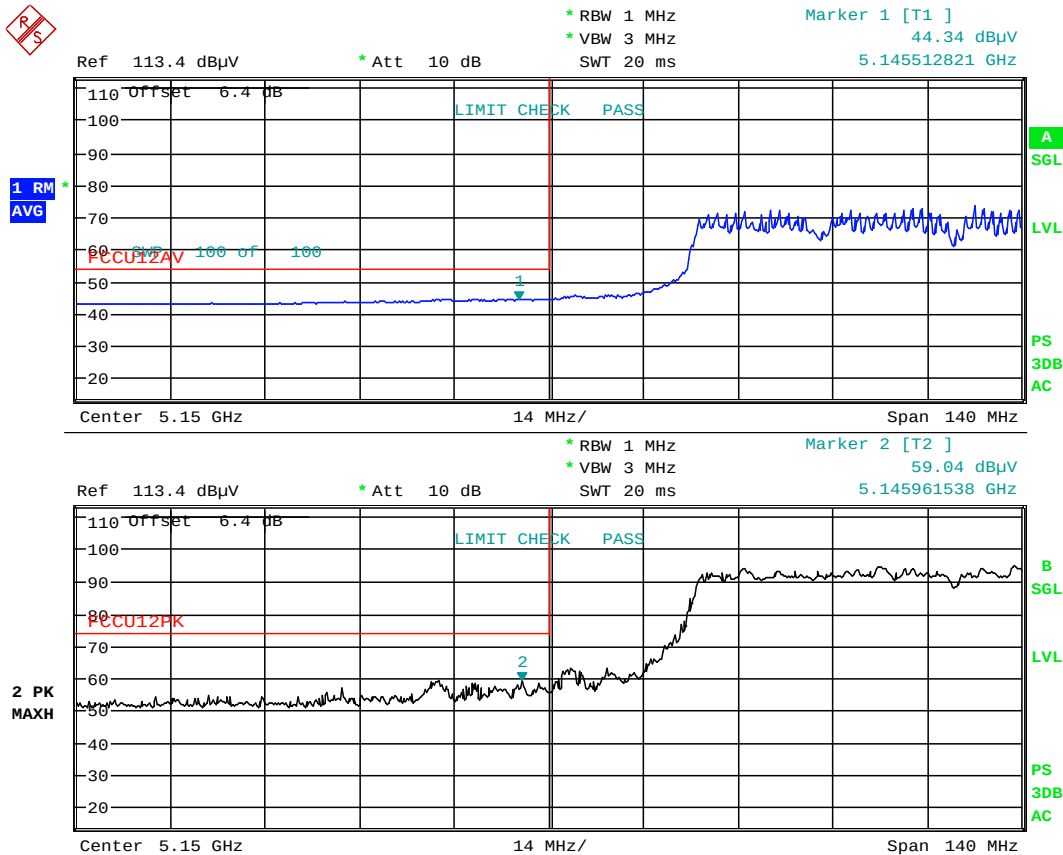
Worst Case Mode: 802.11ac (80MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5210MHz

Channel: 42



Date: 23. JUN. 2017 17:41:24

Plot 7-243. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 206 of 221

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

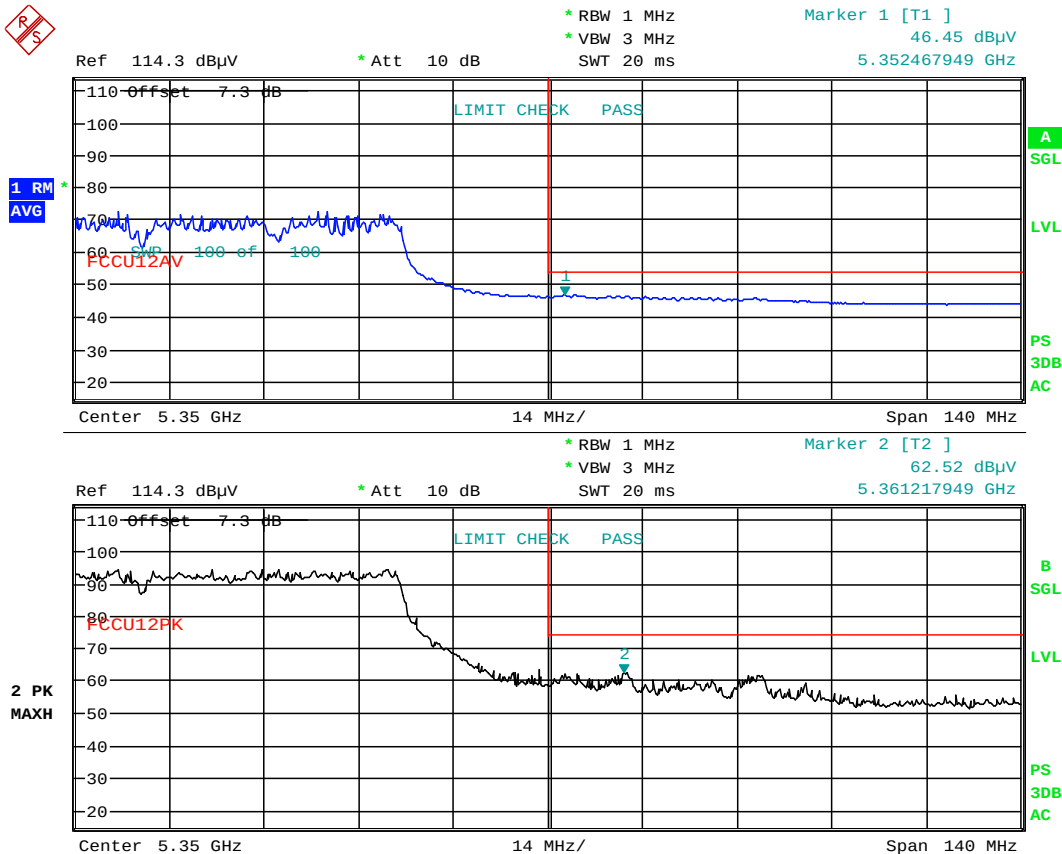
Worst Case Mode: 802.11ac (80MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5290MHz

Channel: 58



Date: 23.JUN.2017 17:36:58

Plot 7-244. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

FCC ID: ZNFG011C	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 207 of 221

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

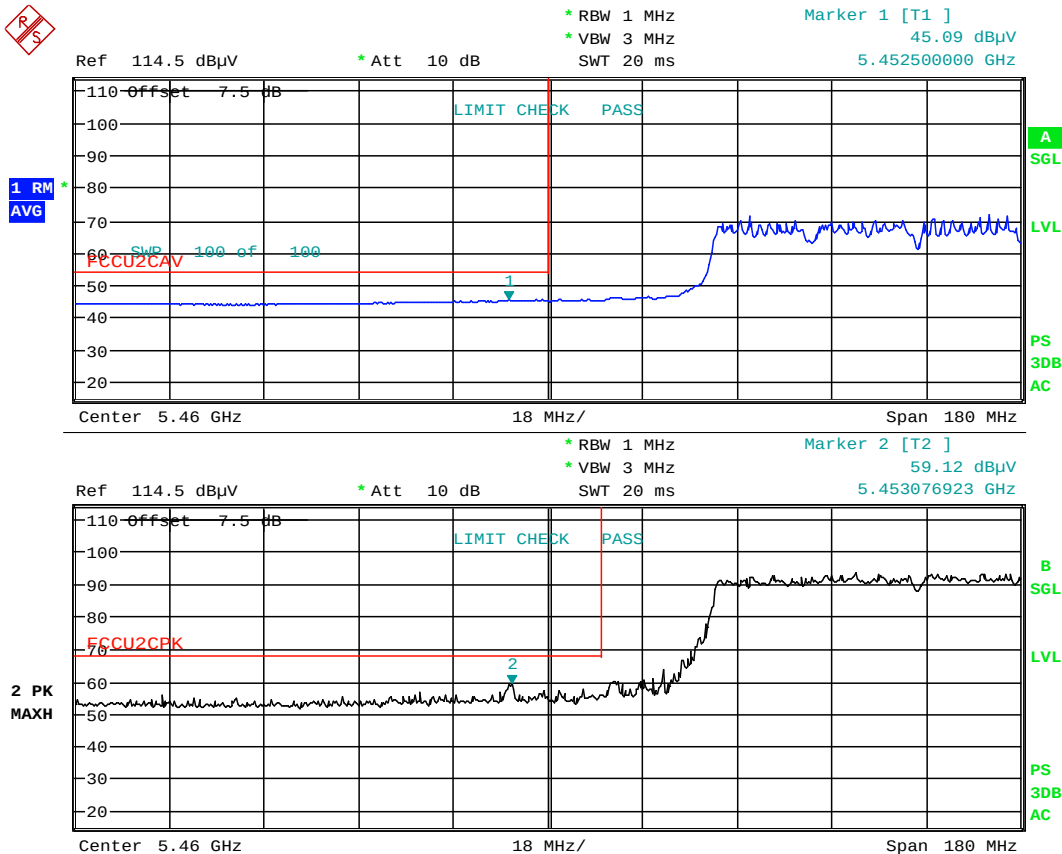
Worst Case Mode: 802.11ac (80MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5530MHz

Channel: 106



Date: 23.JUN.2017 17:45:33

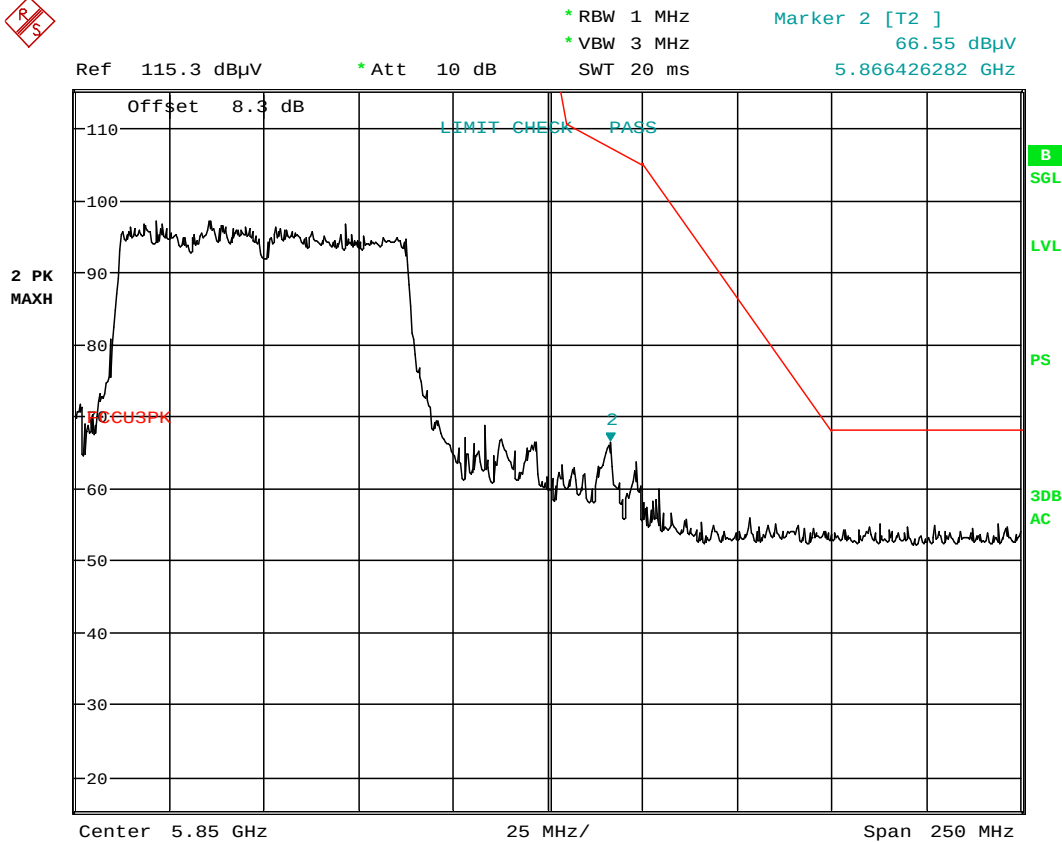
Plot 7-245. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

FCC ID: ZNFG011C	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 208 of 221

MIMO Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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



Date: 23.JUN.2017 17:49:49

Plot 7-246. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

FCC ID: ZNFG011C	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: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 209 of 221

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7.8 Radiated Spurious Emissions Measurements – Below 1GHz

§15.209

Test Overview and Limit

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

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Table 7-55 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 7-55. 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: ZNFG011C		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1706200200-05.ZNF	Test Dates: 06/21 - 08/1/2017	EUT Type: Portable Handset		Page 210 of 221

Test Setup

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

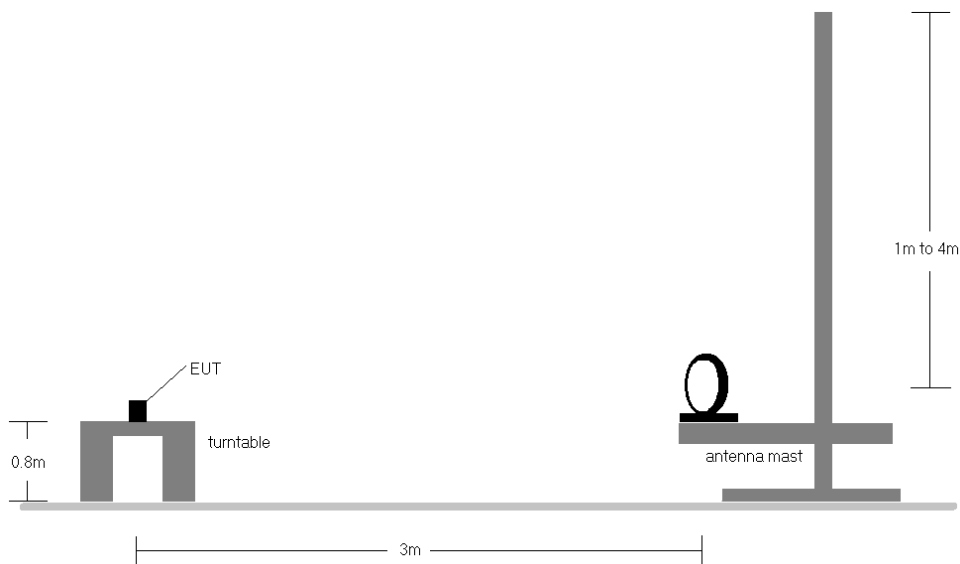


Figure 7-6. Radiated Test Setup < 30MHz

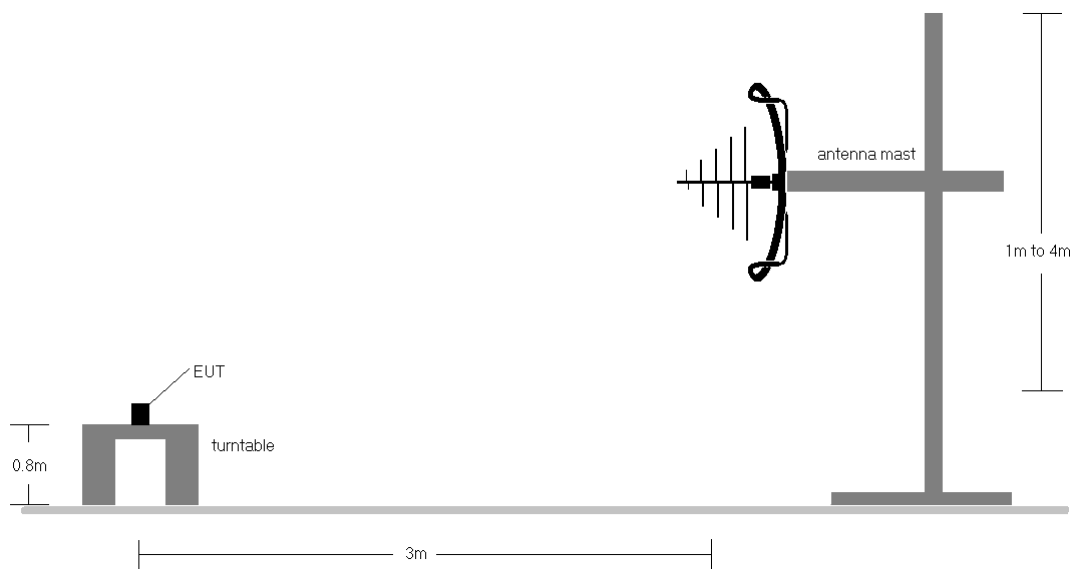


Figure 7-7. Radiated Test Setup < 1GHz

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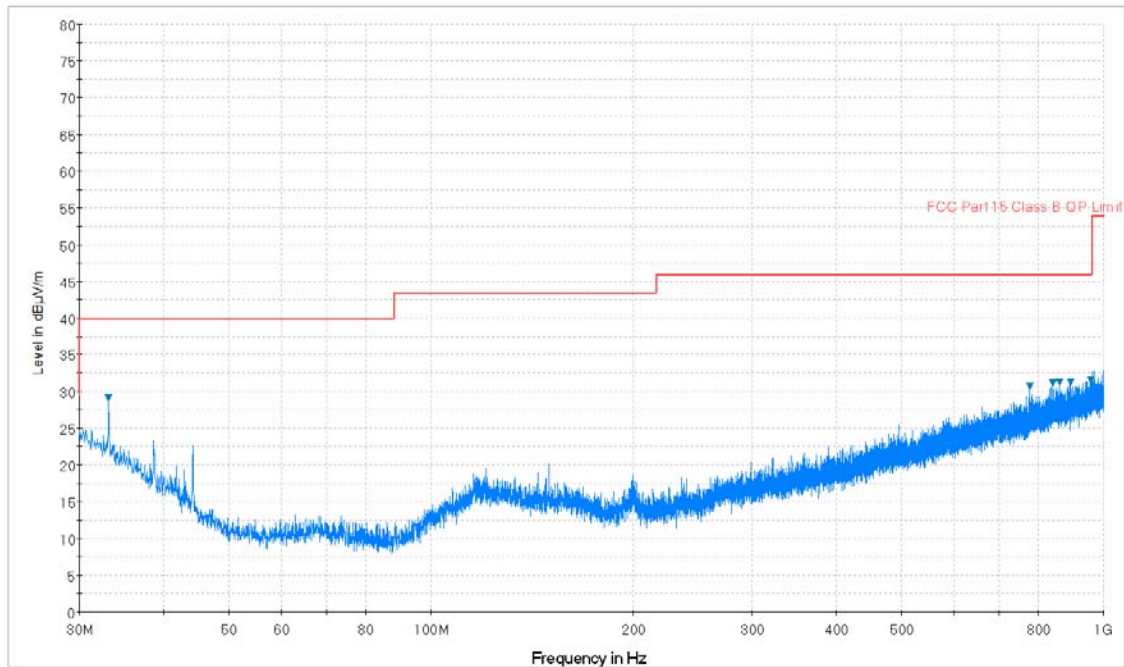
Test Notes

1. All emissions lying in restricted bands specified in §15.205 are below the limit shown in Table 7-55.
2. The broadband receive antenna is manipulated through vertical and horizontal polarizations during the tests. The EUT is manipulated through three orthogonal planes.
3. This unit was tested with its standard battery.
4. The spectrum is investigated using a peak detector and final measurements are recorded using CISPR quasi peak detector. The worst-case emissions are reported however emissions whose levels were not within 20dB of the respective limits were not reported.
5. Emissions were measured at a 3 meter test distance.
6. Emissions are investigated while operating on the center channel of the mode, band, and modulation that produced the worst case results during the transmitter spurious emissions testing.
7. No spurious emissions were detected within 20dB of the limit below 30MHz.
8. The results recorded using the broadband antenna is known to correlate with the results obtained by using a tuned dipole with an acceptable degree of accuracy. The VSWR for the measurement antenna was found to be less than 2:1.
9. The wide spectrum spurious emissions plots shown on the following pages are used only for the purpose of emission identification. There were no emissions detected in the 30MHz – 1GHz frequency range, as shown in the subsequent plots.

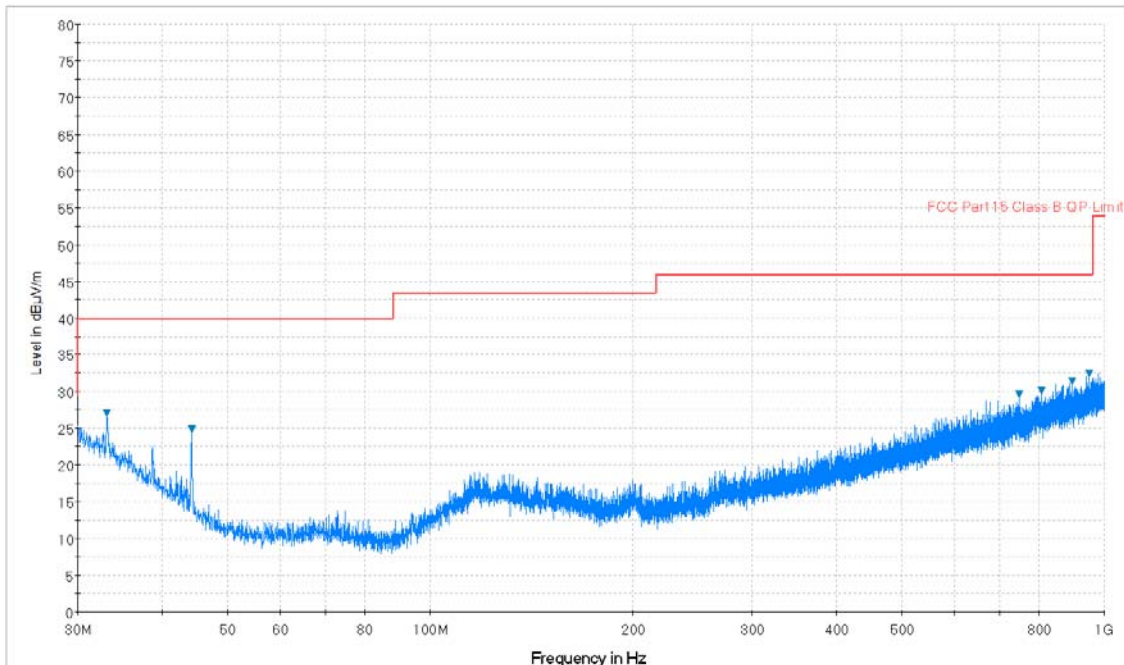
FCC ID: ZNFG011C		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Antenna-1 Radiated Spurious Emissions Measurements (Below 1GHz)

§15.209



Plot 7-247. Radiated Spurious Plot below 1GHz (802.11a – U3 Ch. 157, Ant. Pol. H)



Plot 7-248. Radiated Spurious Plot below 1GHz (802.11a – U3 Ch. 157, Ant. Pol. V)

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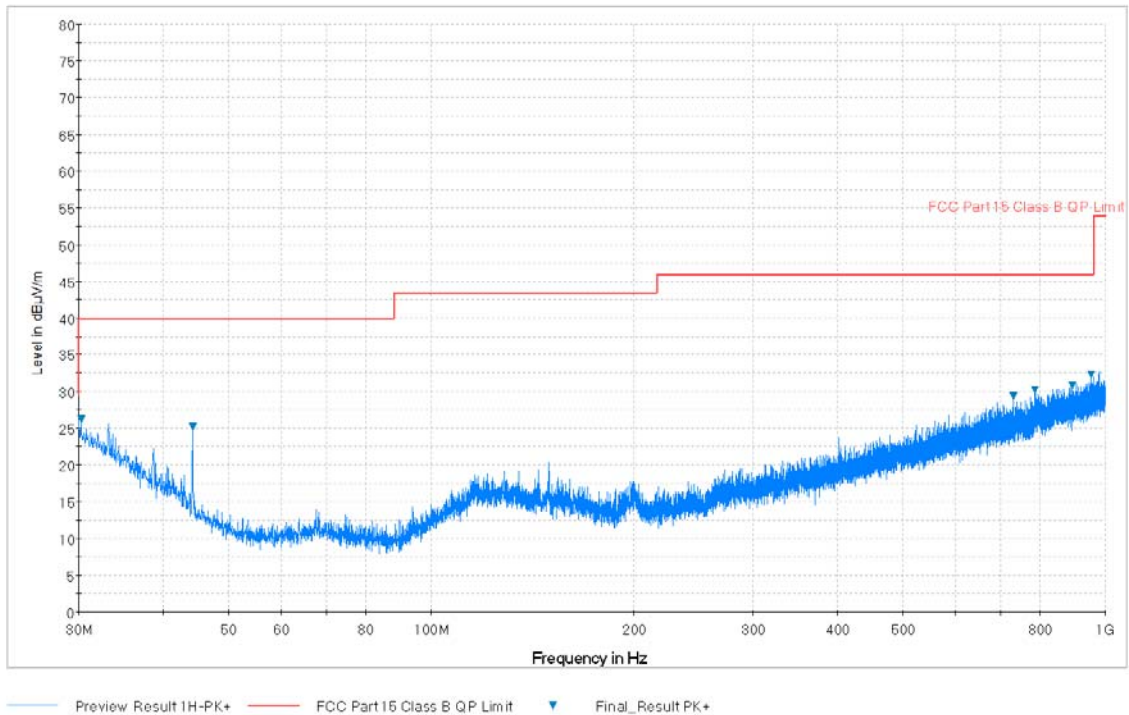
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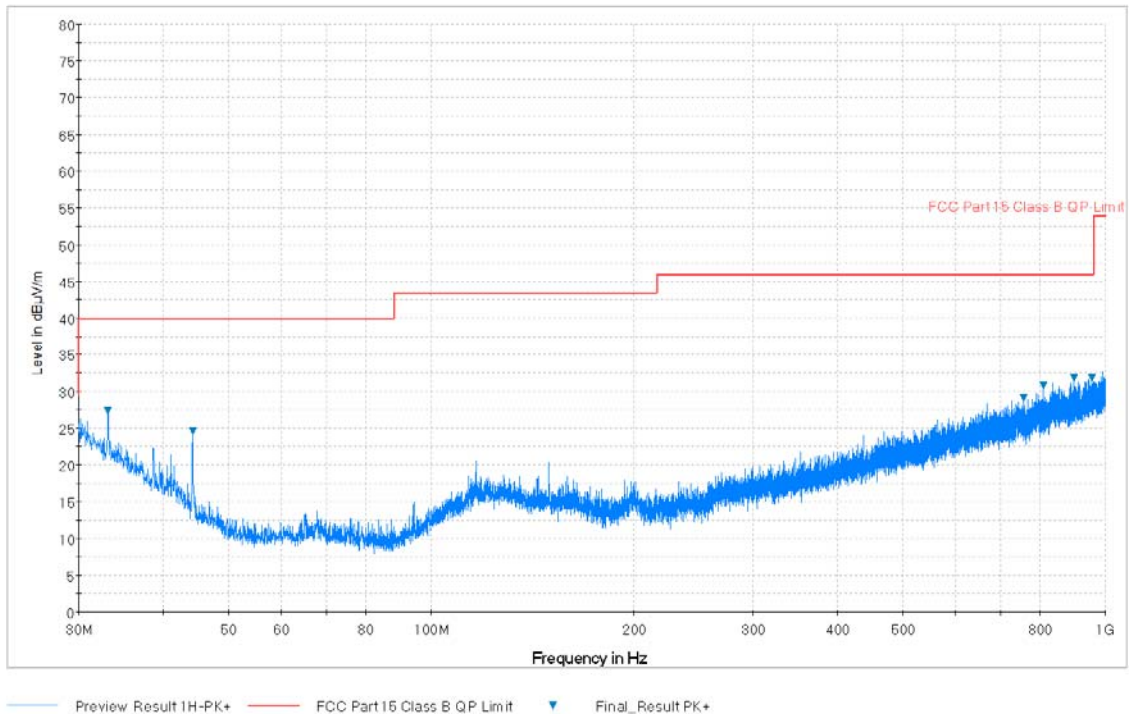
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Antenna-2 Radiated Spurious Emissions Measurements (Below 1GHz)

§15.209



Plot 7-249. Radiated Spurious Plot below 1GHz (802.11a – U3 Ch. 157, Ant. Pol. H)



Plot 7-250. Radiated Spurious Plot below 1GHz (802.11a – U3 Ch. 157, Ant. Pol. V)

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7.9 Line-Conducted Test Data

§15.407

Test Overview and Limit

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

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

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

Table 7-56. Conducted Limits

*Decreases with the logarithm of the frequency.

Test Procedures Used

ANSI C63.10-2013, Section 6.2

Test Settings

Quasi-Peak Field Strength Measurements

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

Average Field Strength Measurements

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

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Test Setup

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

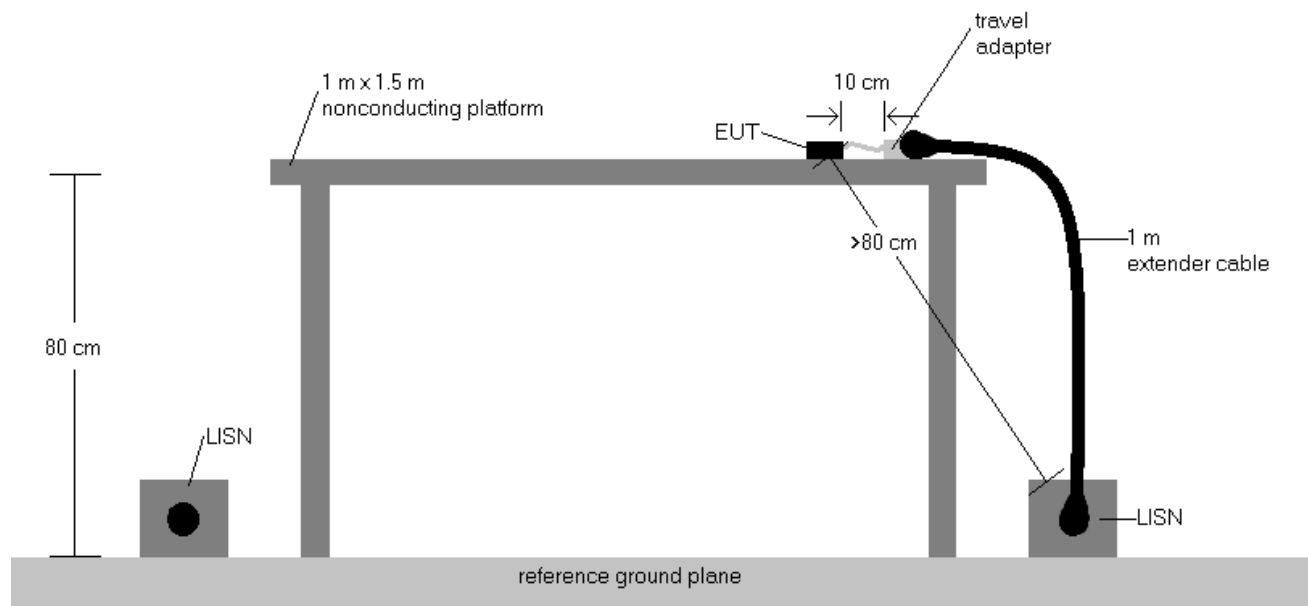
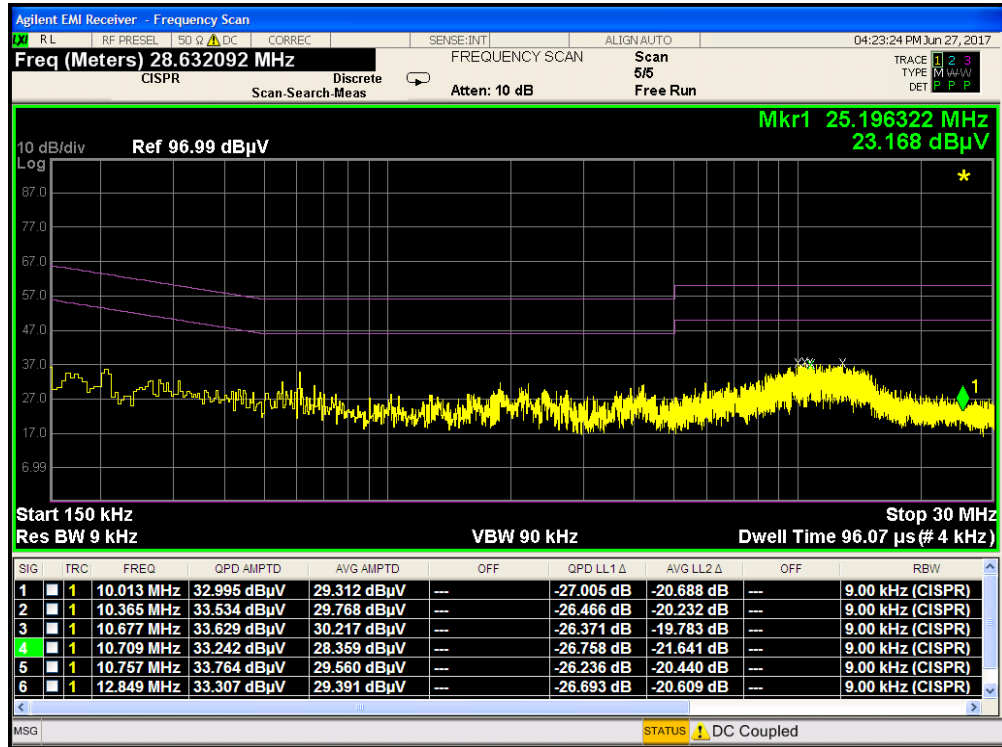


Figure 7-8. Test Instrument & Measurement Setup

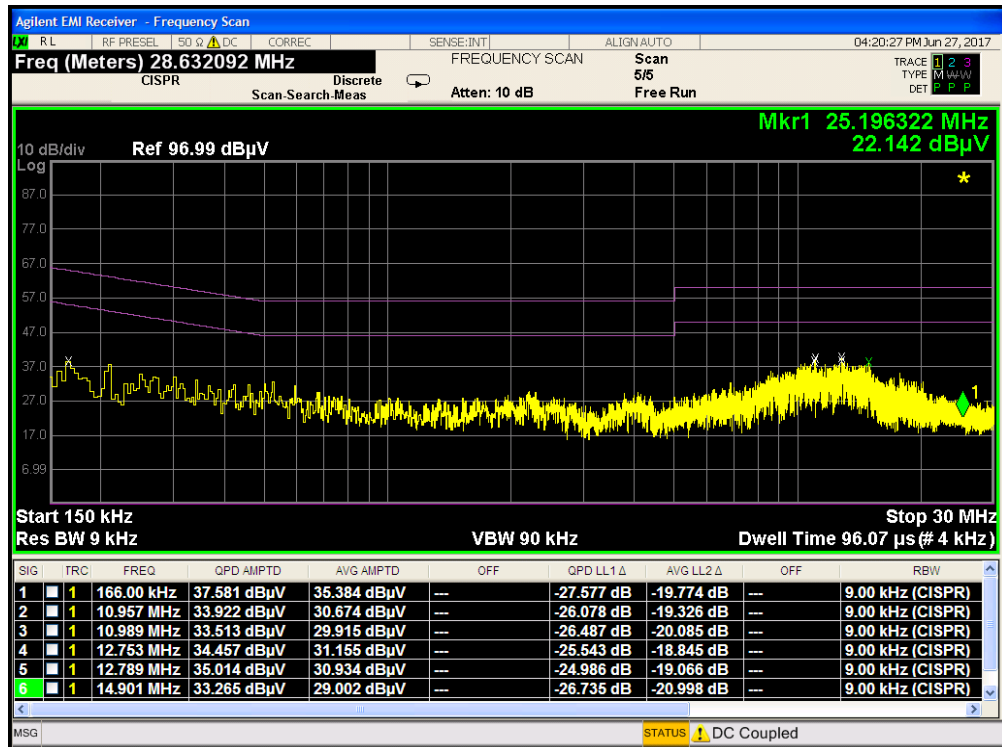
Test Notes

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

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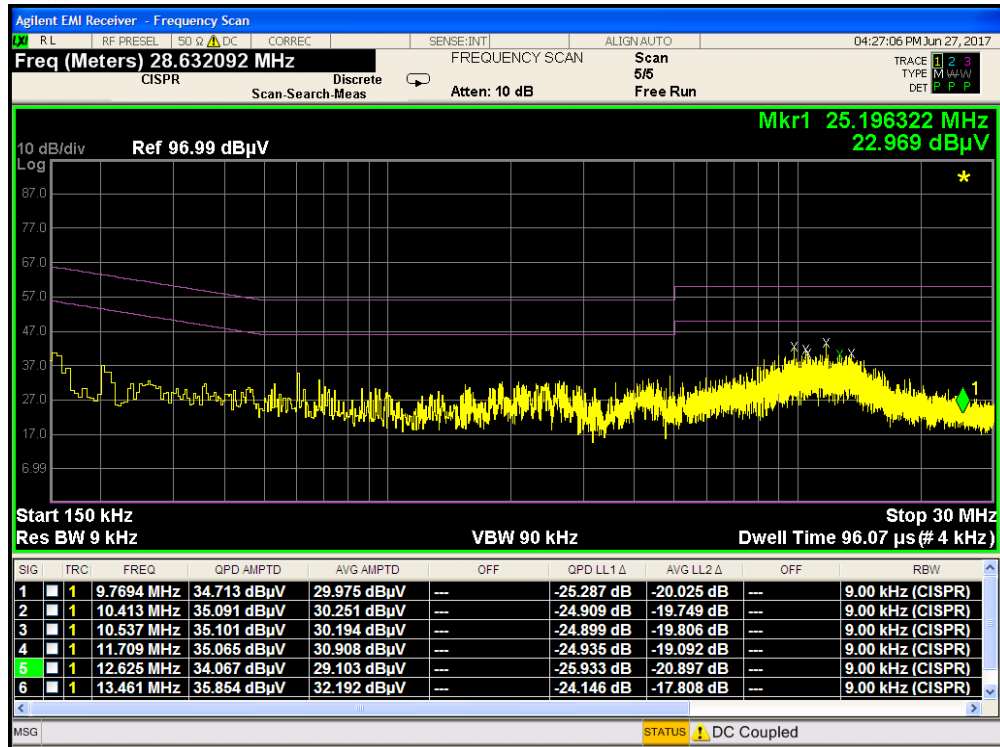


Plot 7-251. Line Conducted Plot with 802.11a UNII Band 1 (L1)

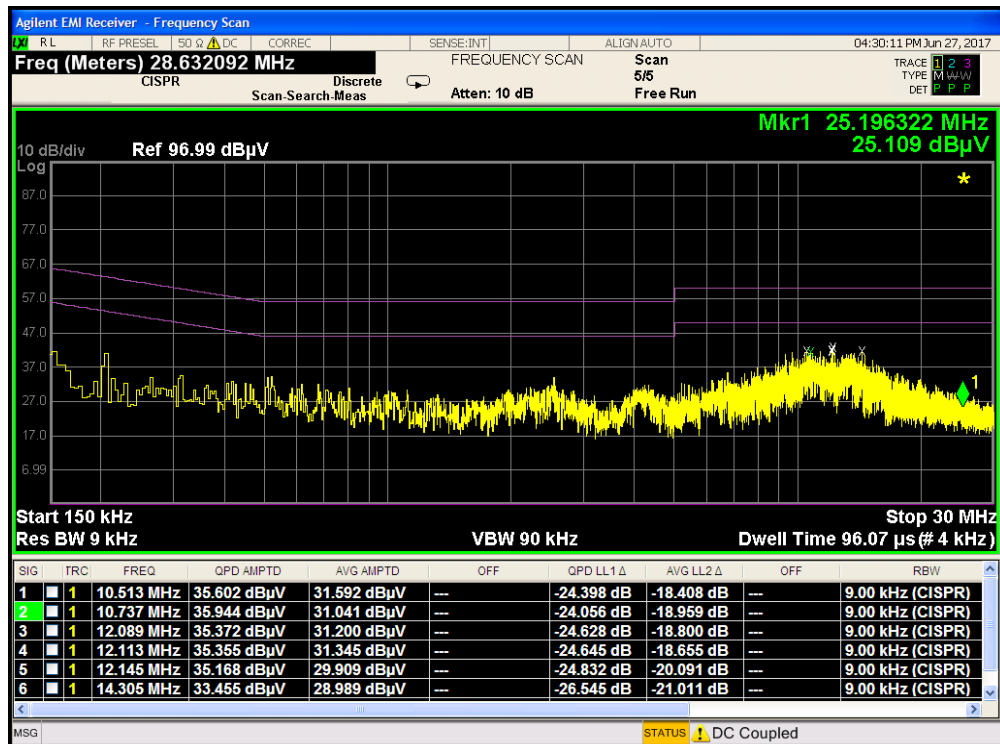


Plot 7-252. Line Conducted Plot with 802.11a UNII Band 1 (N)

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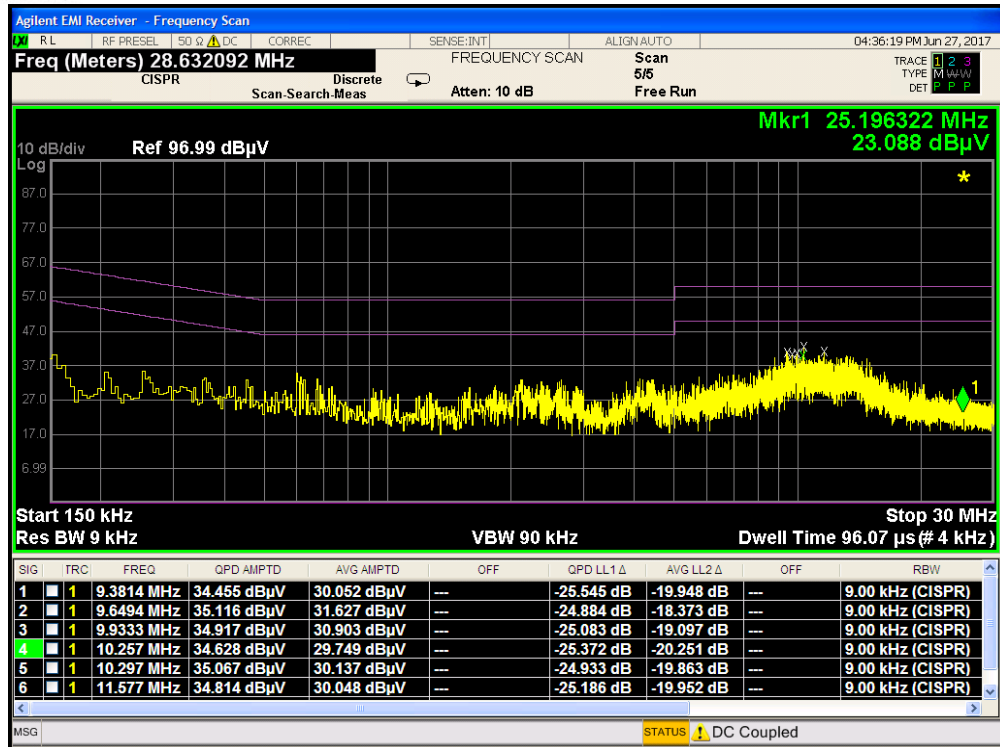


Plot 7-253. Line Conducted Plot with 802.11a UNII Band 2A (L1)

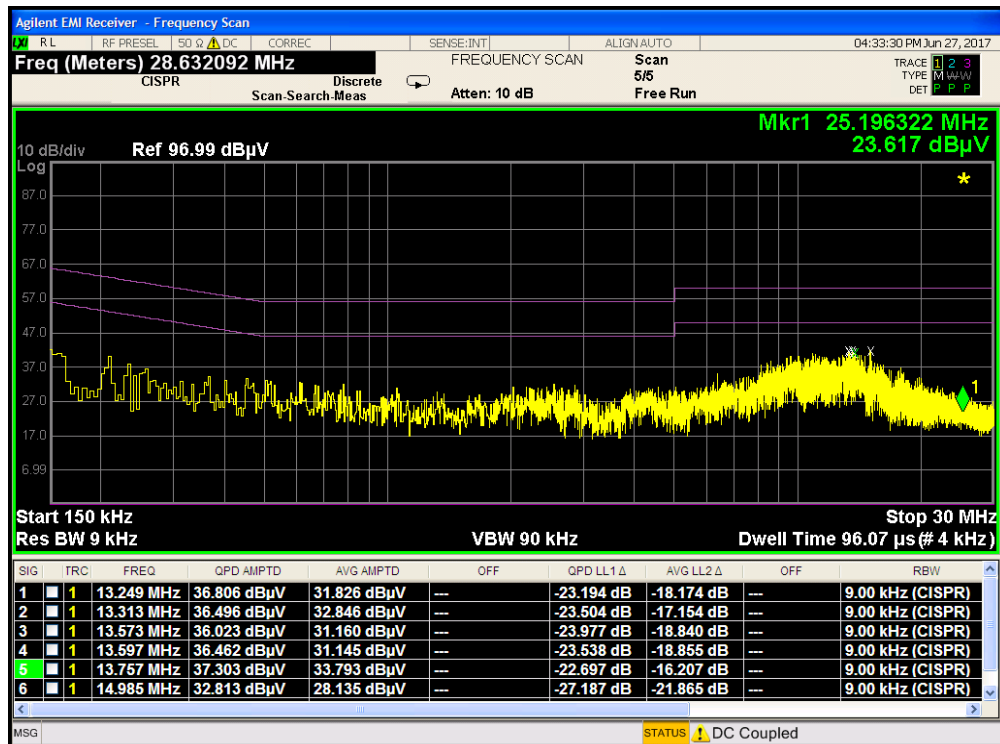


Plot 7-254. Line Conducted Plot with 802.11a UNII Band 2A (N)

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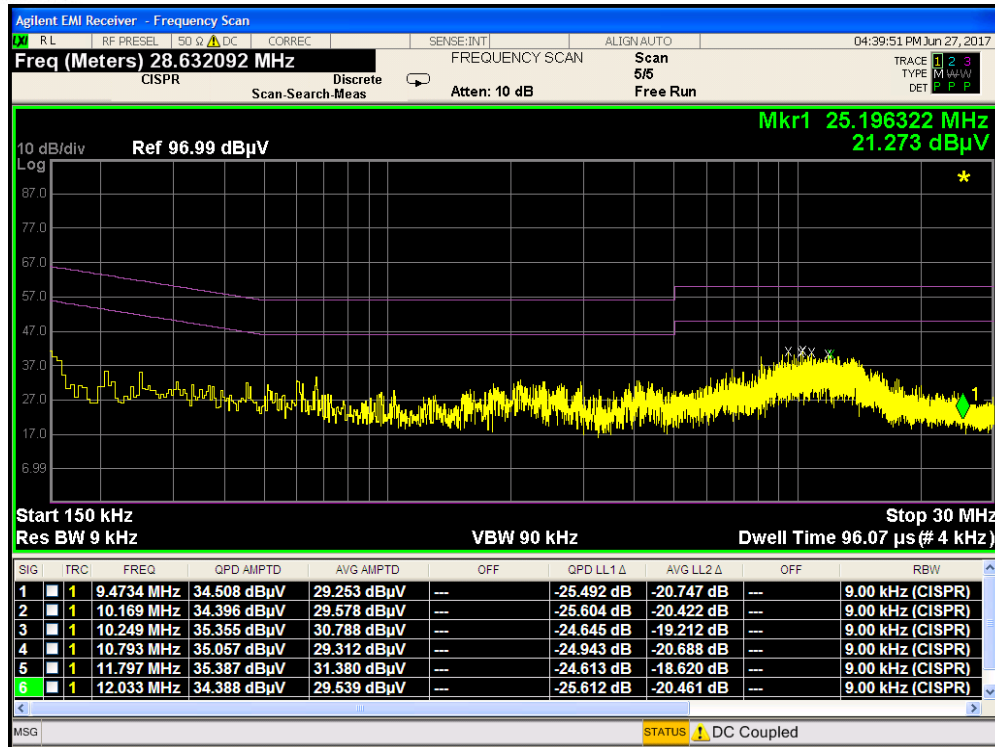


Plot 7-255. Line Conducted Plot with 802.11a UNII Band 2C (L1)

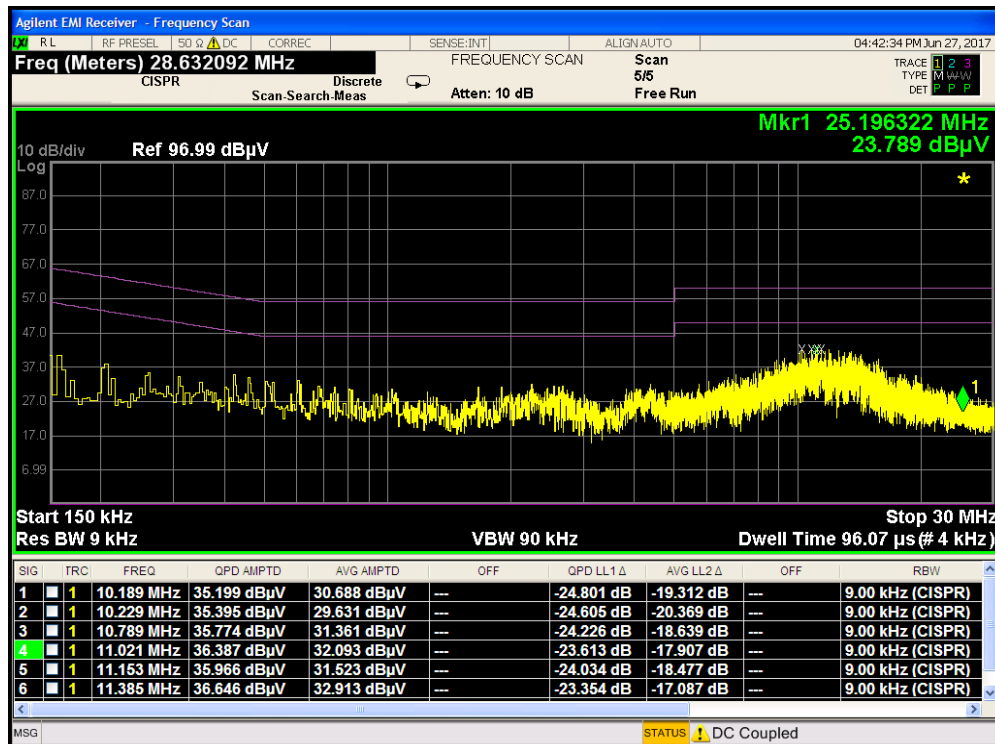


Plot 7-256. Line Conducted Plot with 802.11a UNII Band 2C (N)

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Plot 7-257. Line Conducted Plot with 802.11a UNII Band 3 (L1)



Plot 7-258. Line Conducted Plot with 802.11a UNII Band 3 (N)

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8.0 CONCLUSION

The data collected relate only the item(s) tested and show that the **LG Portable Handset FCC ID: ZNFG011C** is in compliance with Part 15E of the FCC Rules.

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