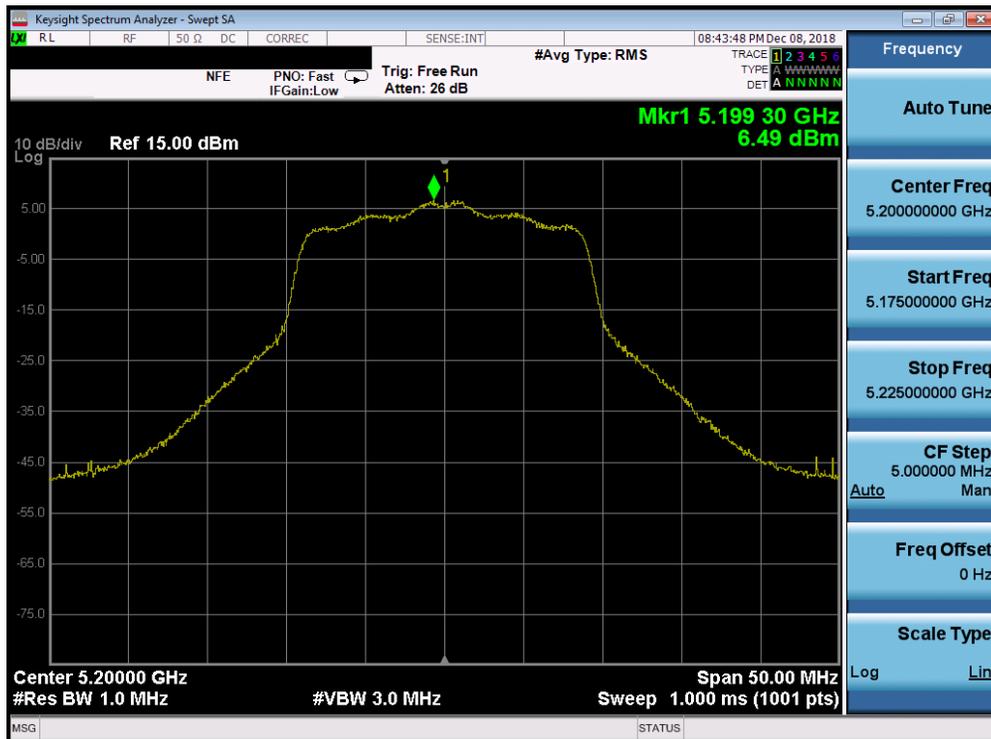
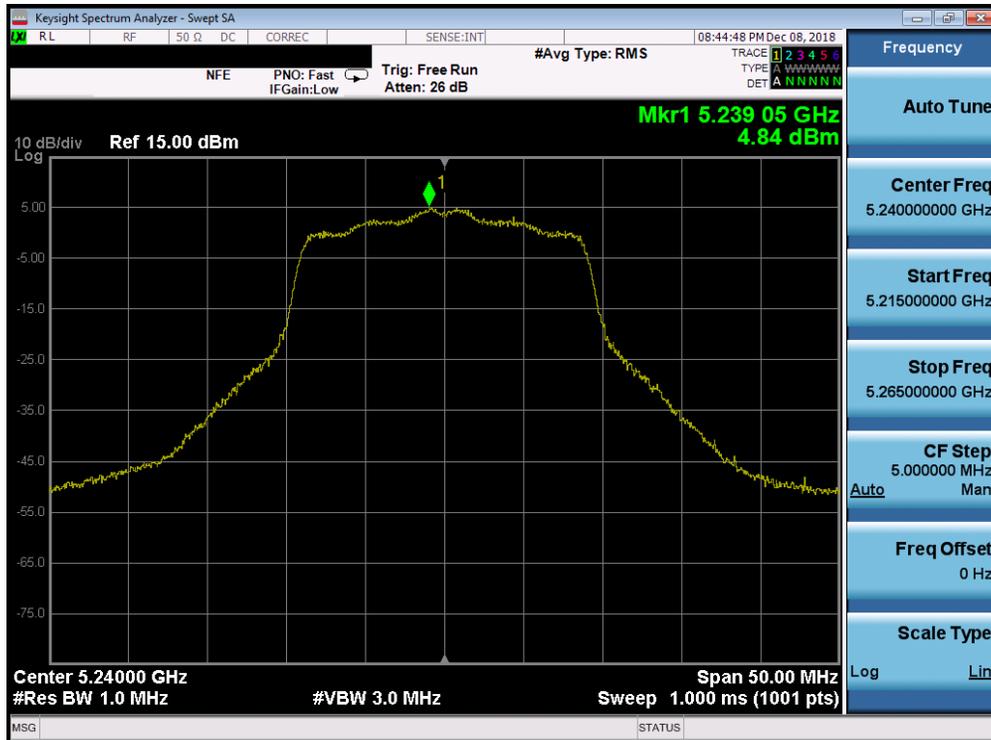


Plot 7-82. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 36)

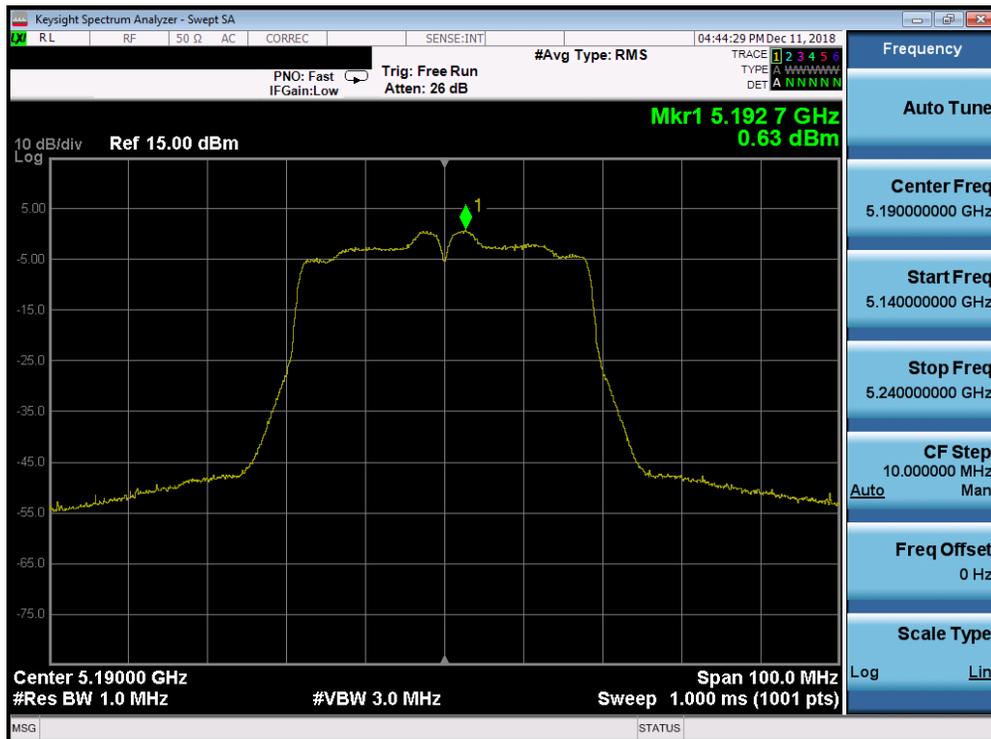


Plot 7-83. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 40)

FCC ID: ZNFG820UM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset		Page 68 of 188

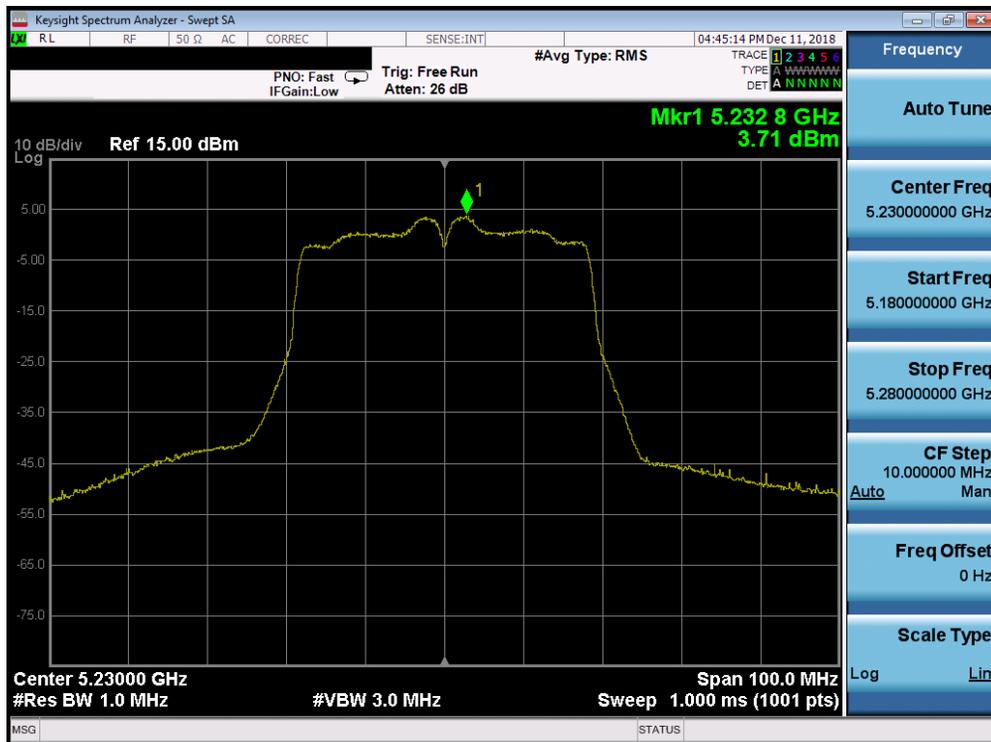


Plot 7-84. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 48)

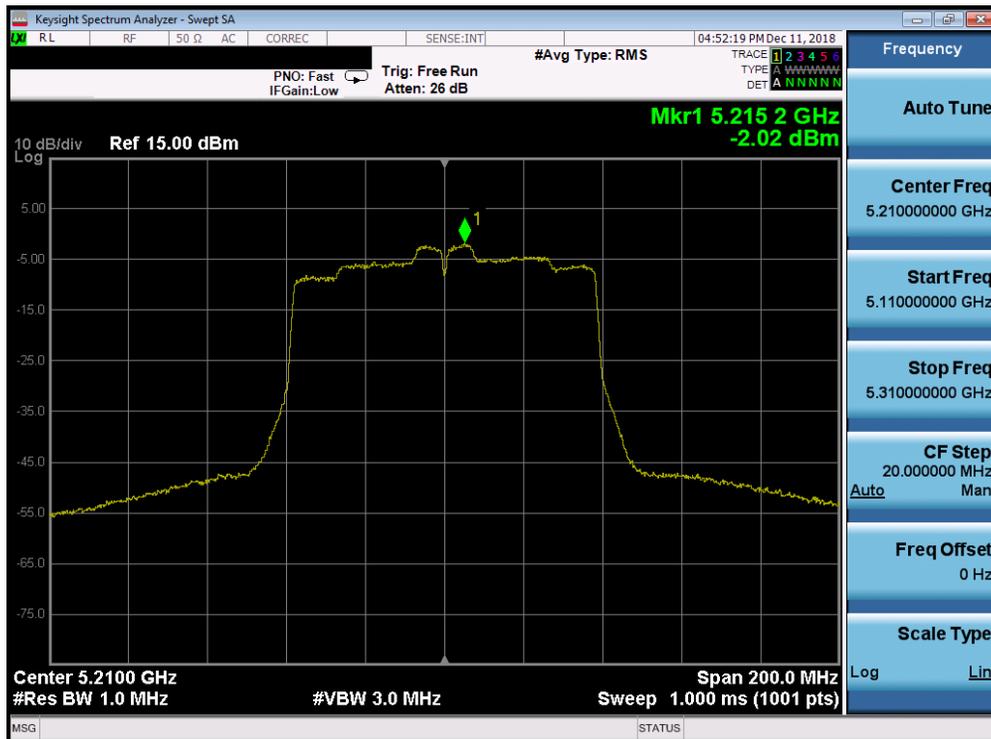


Plot 7-85. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 1) – Ch. 38)

FCC ID: ZNFG820UM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset		Page 69 of 188

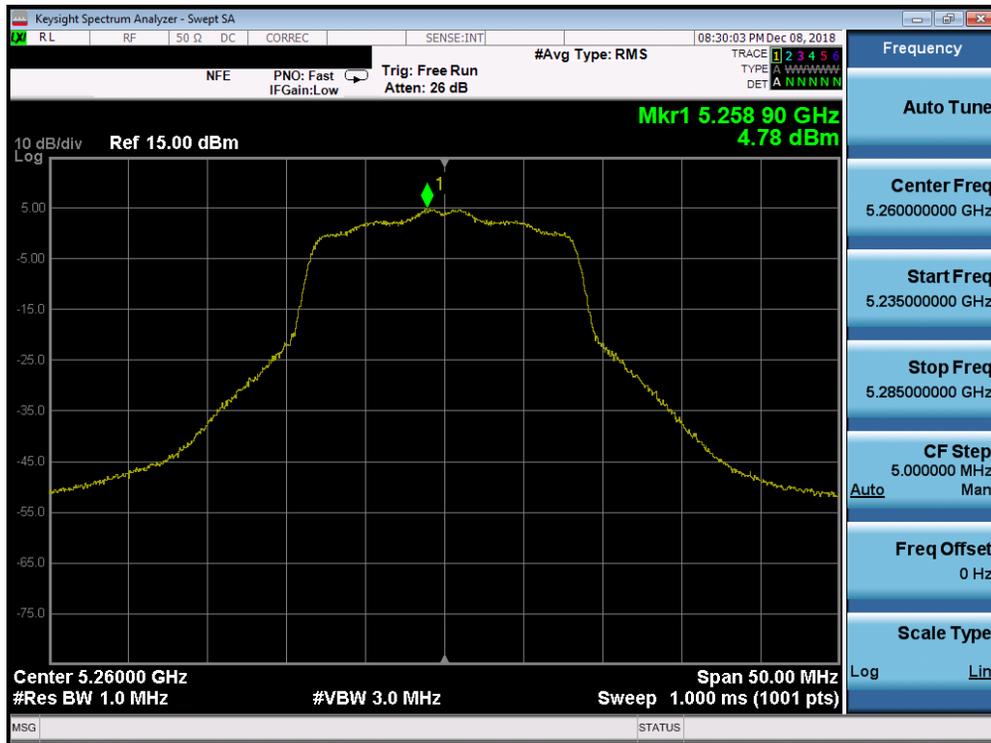


Plot 7-86. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 1) – Ch. 46)

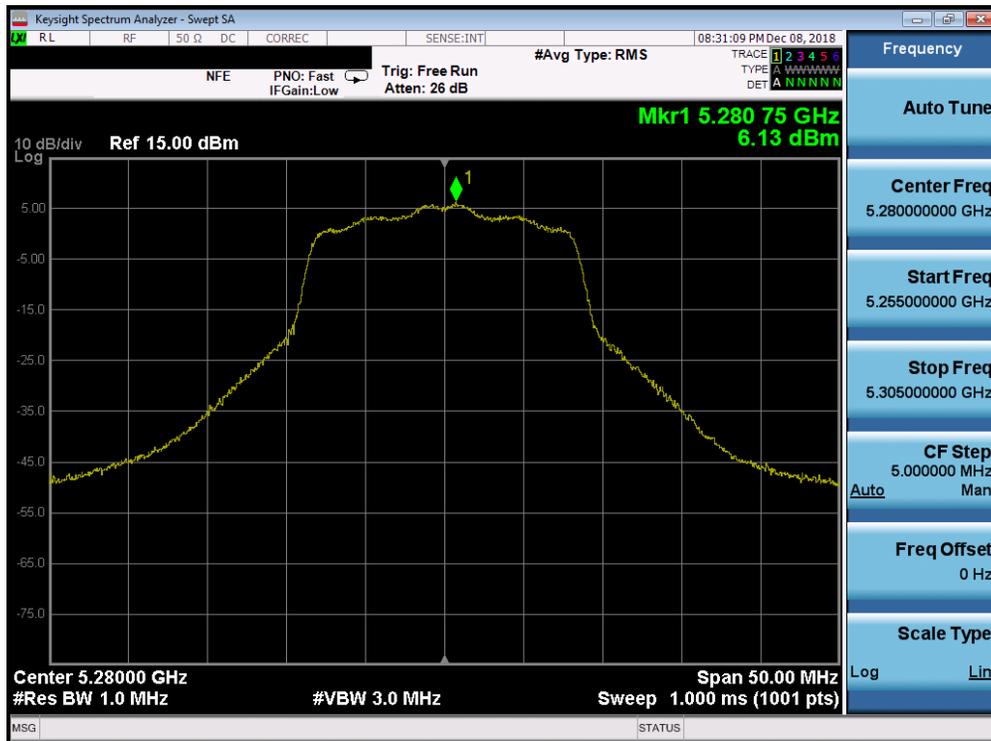


Plot 7-87. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 1) – Ch. 42)

FCC ID: ZNFG820UM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset		Page 70 of 188

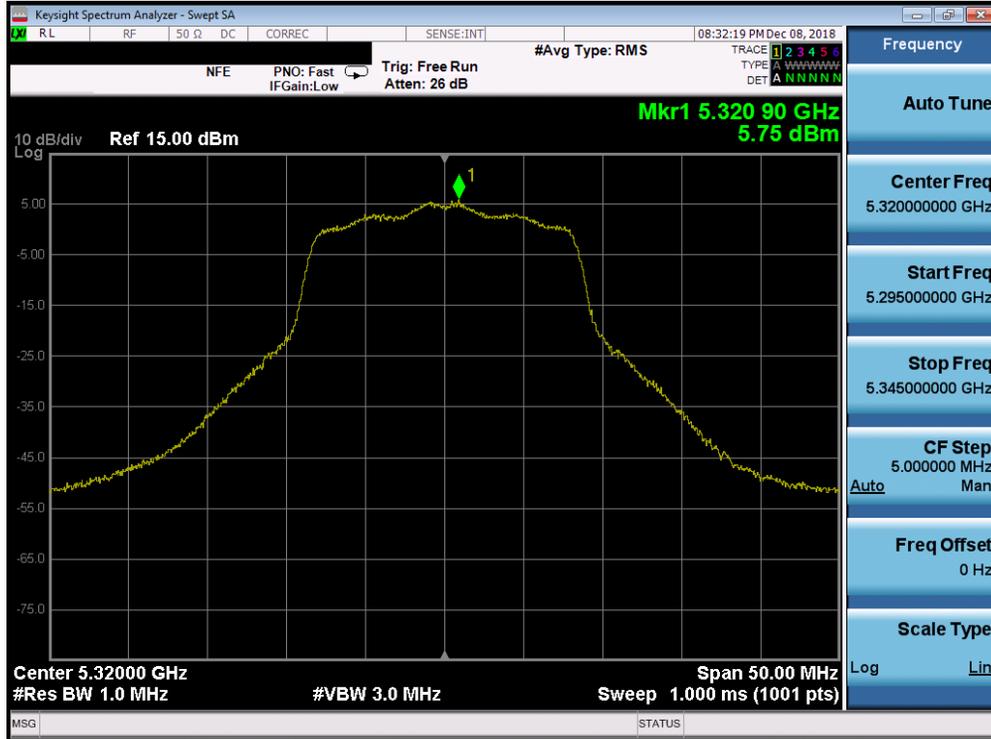


Plot 7-88. Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 52)

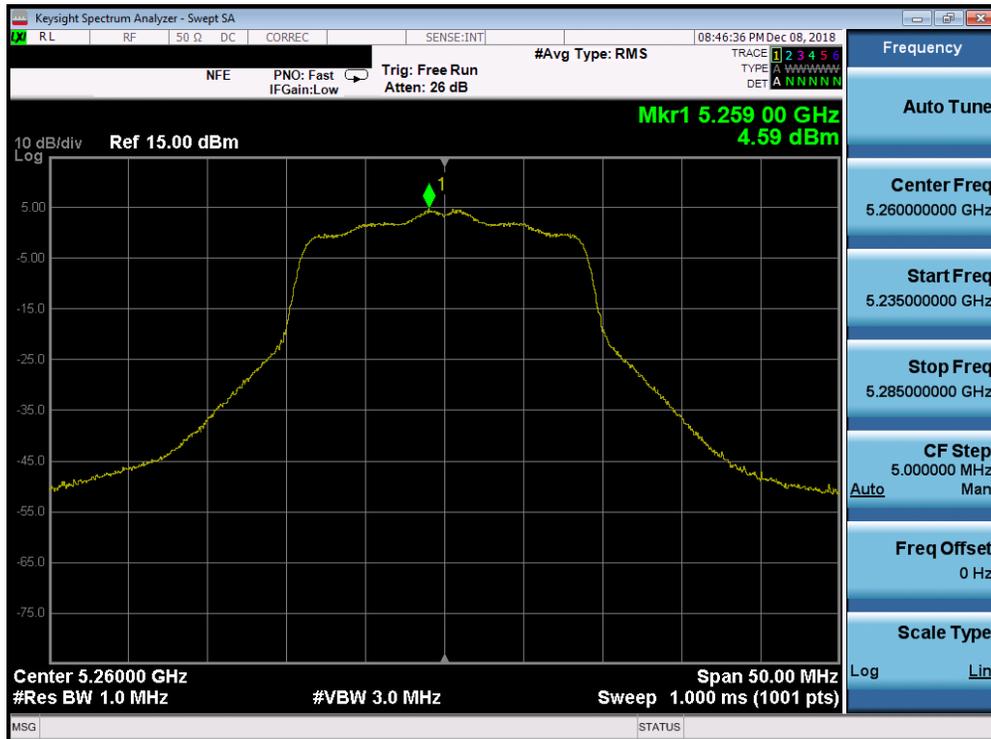


Plot 7-89. Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 56)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset		Page 71 of 188

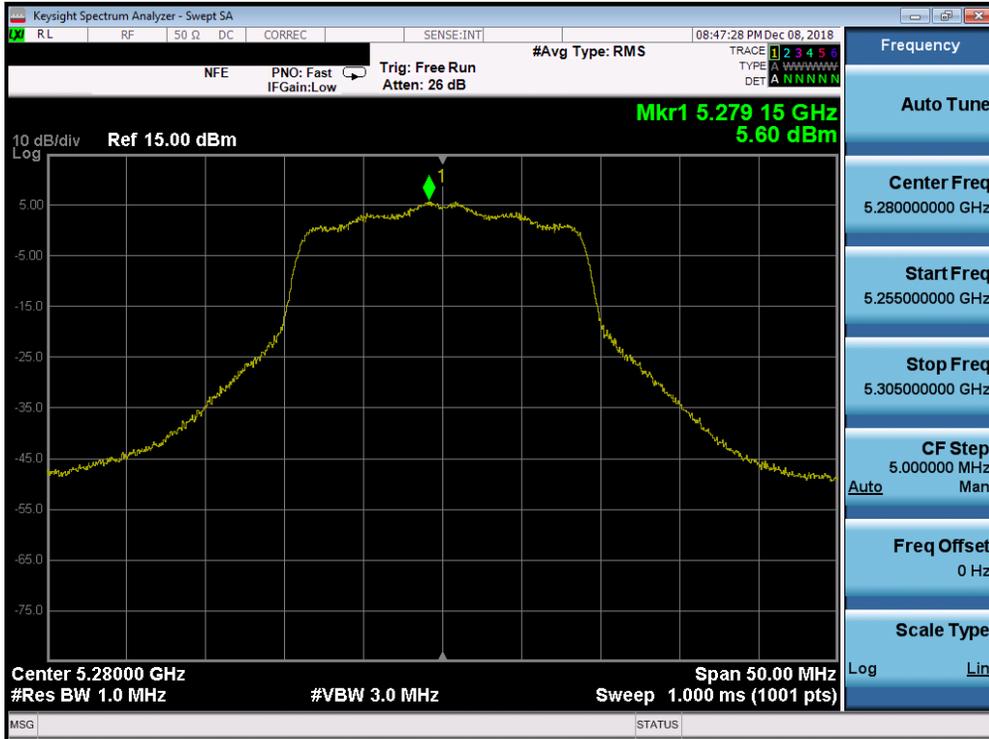


Plot 7-90. Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 64)

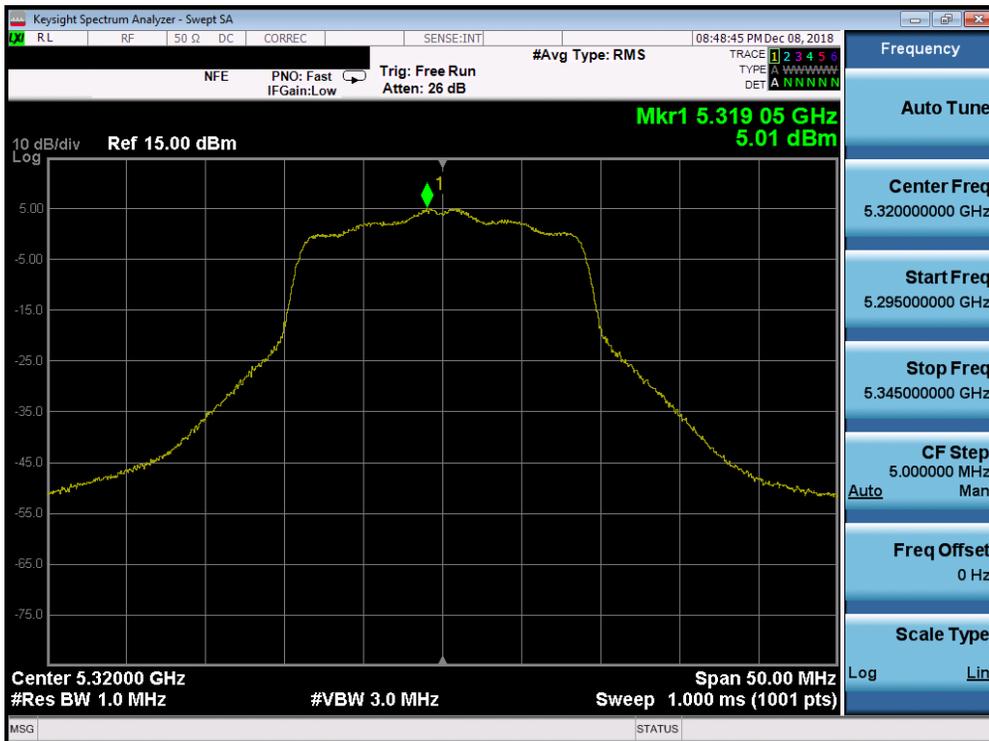


Plot 7-91. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 52)

FCC ID: ZNFG820UM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset		Page 72 of 188

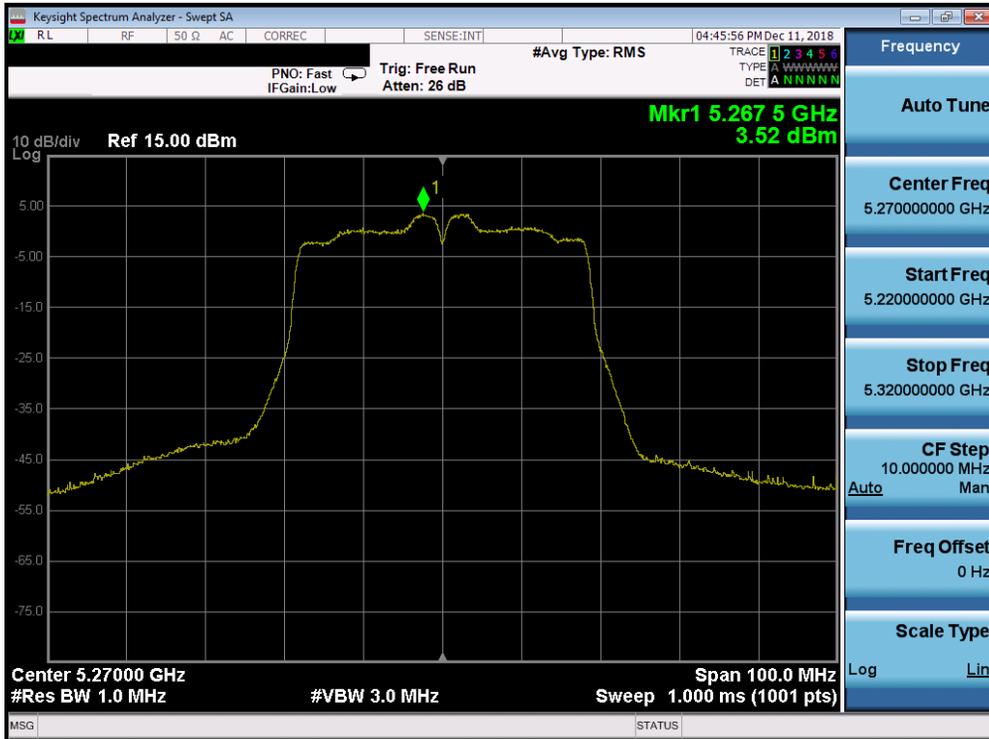


Plot 7-92. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 56)

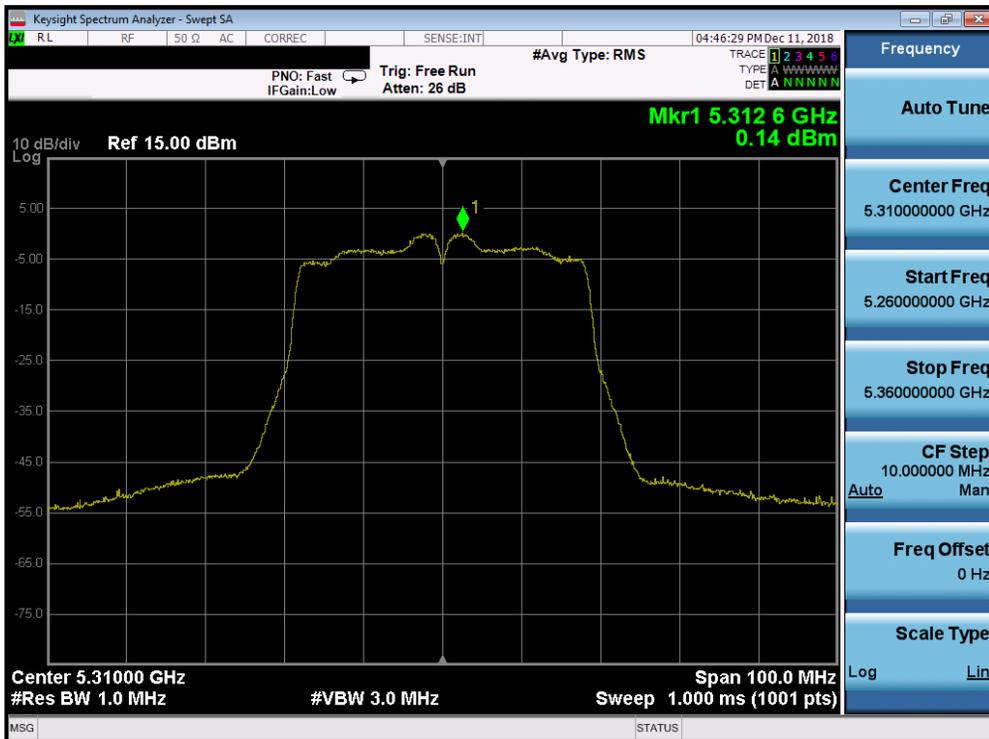


Plot 7-93. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 64)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset		Page 73 of 188

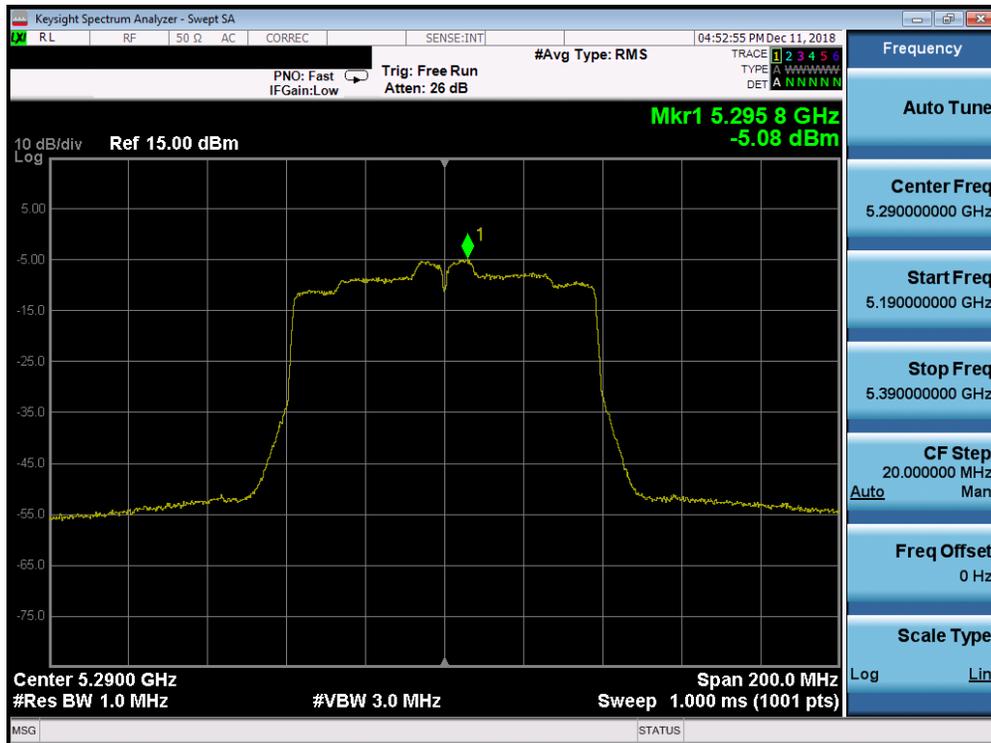


Plot 7-94. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2A) – Ch. 54)

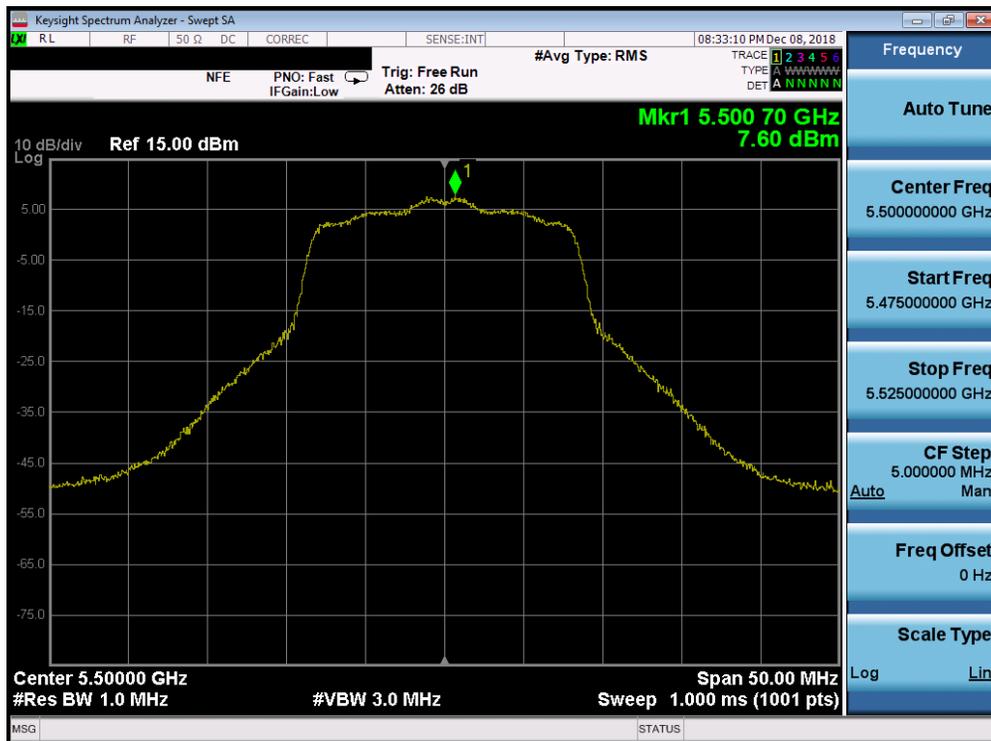


Plot 7-95. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2A) – Ch. 62)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset		Page 74 of 188

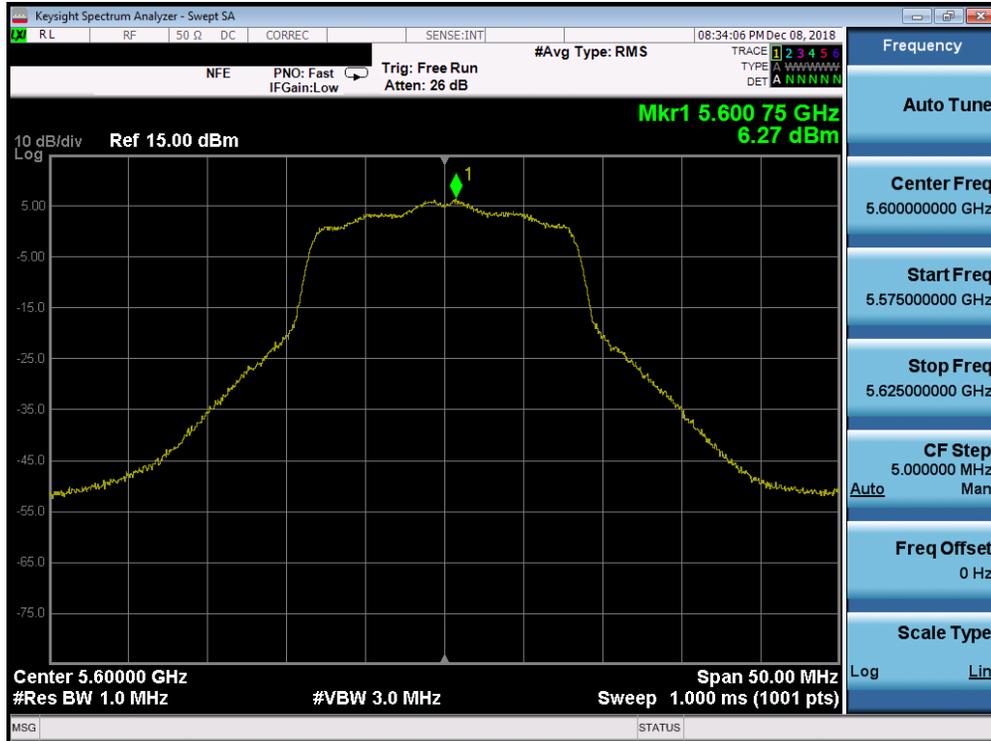


Plot 7-96. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2A) – Ch. 58)

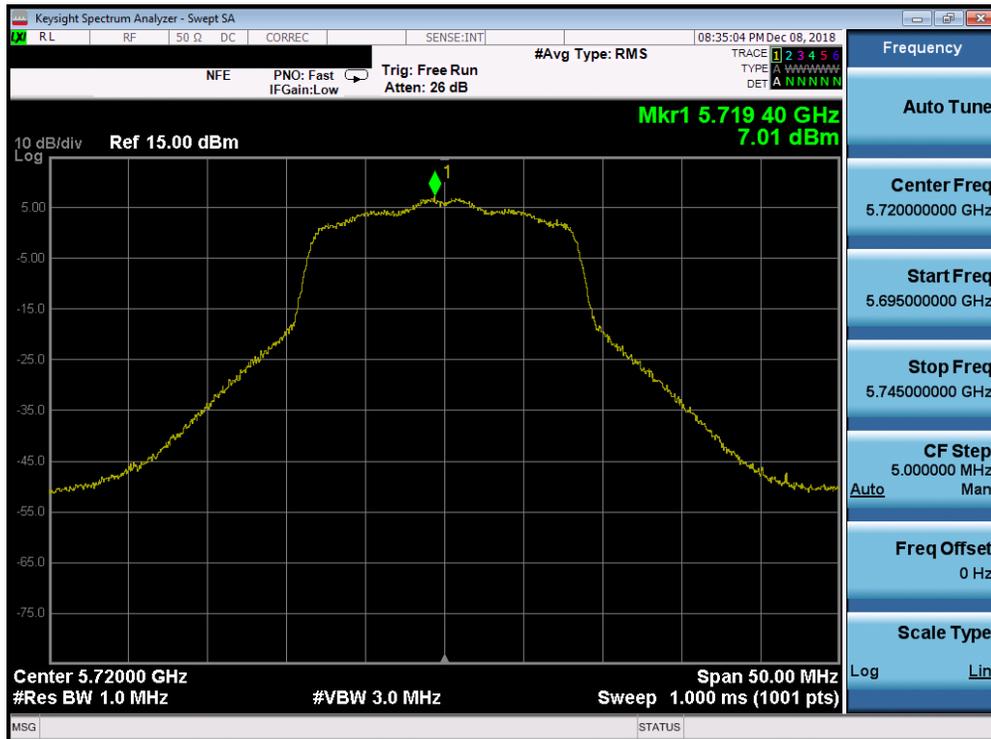


Plot 7-97. Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 100)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset		Page 75 of 188

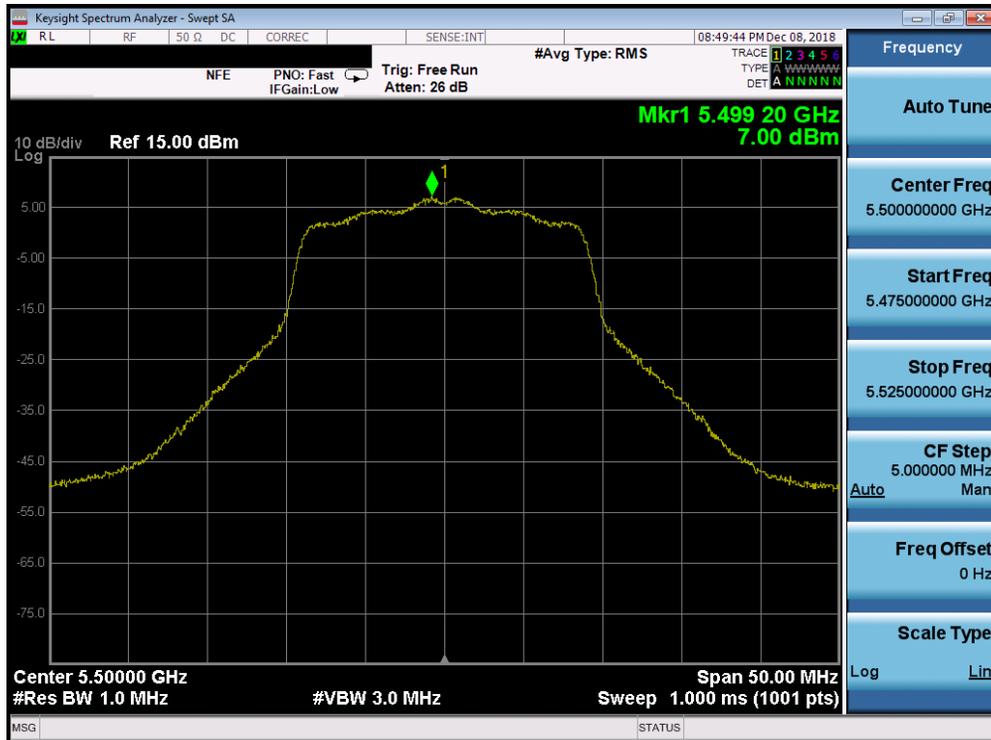


Plot 7-98. Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 120)

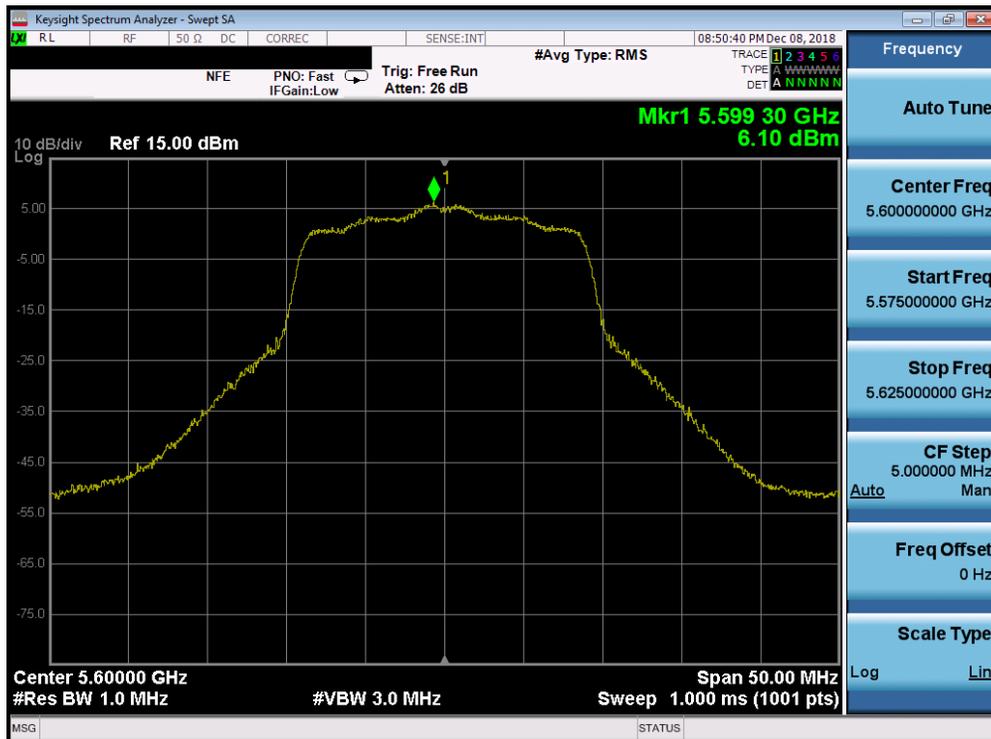


Plot 7-99. Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 144)

FCC ID: ZNFG820UM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset		Page 76 of 188

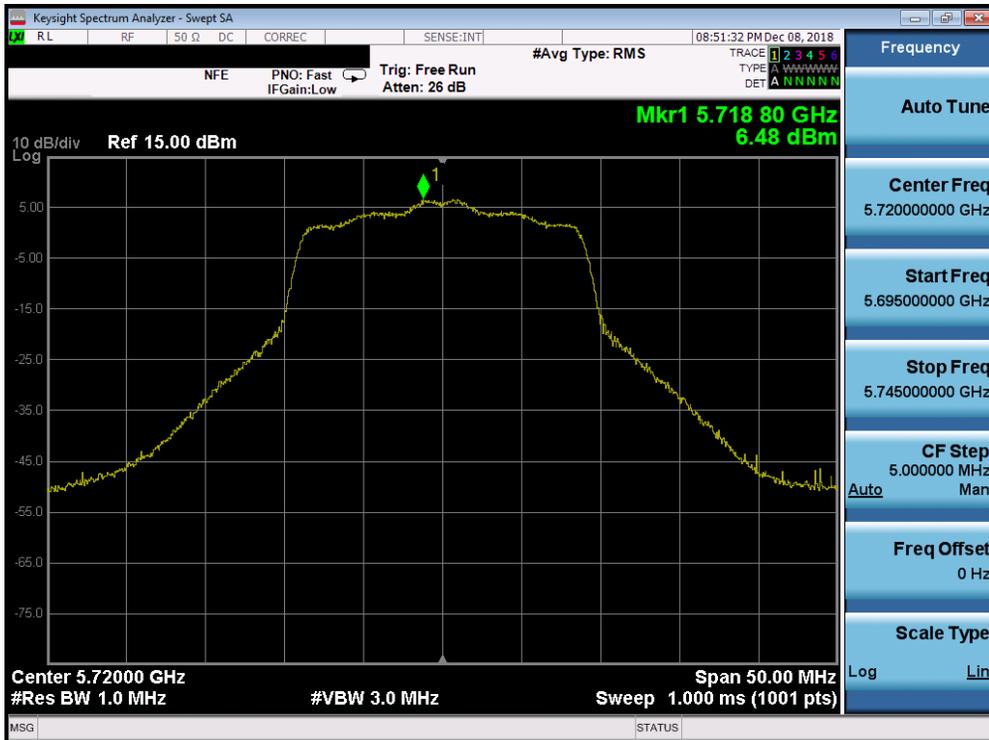


Plot 7-100. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 100)

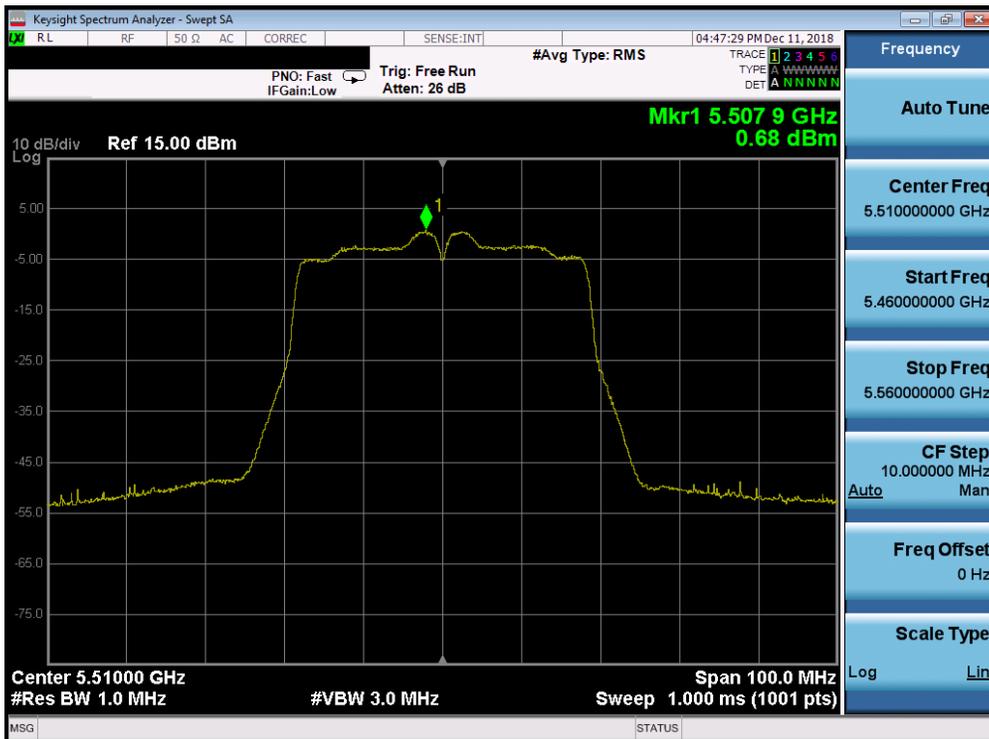


Plot 7-101. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 120)

FCC ID: ZNFG820UM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset		Page 77 of 188

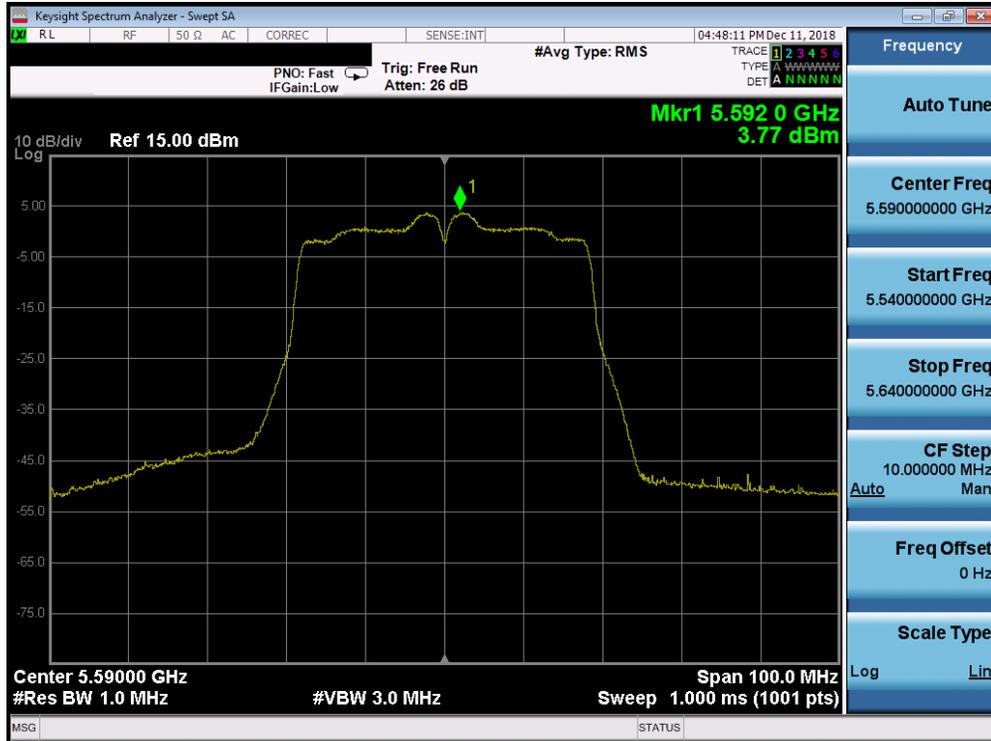


Plot 7-102. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 144)

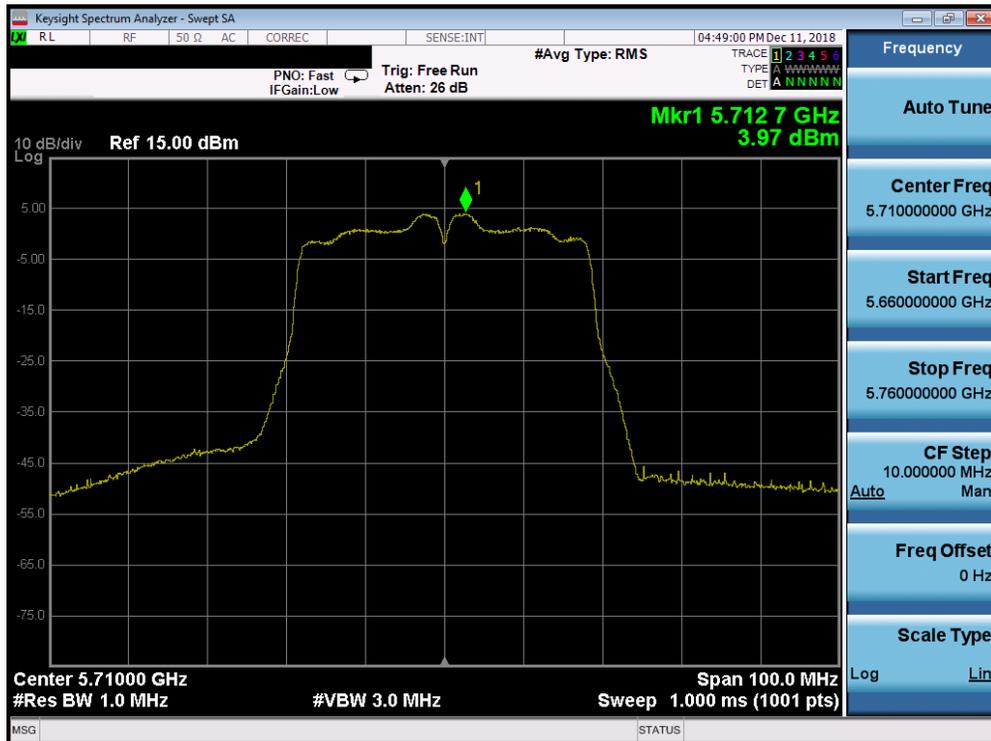


Plot 7-103. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 102)

FCC ID: ZNFG820UM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset		Page 78 of 188

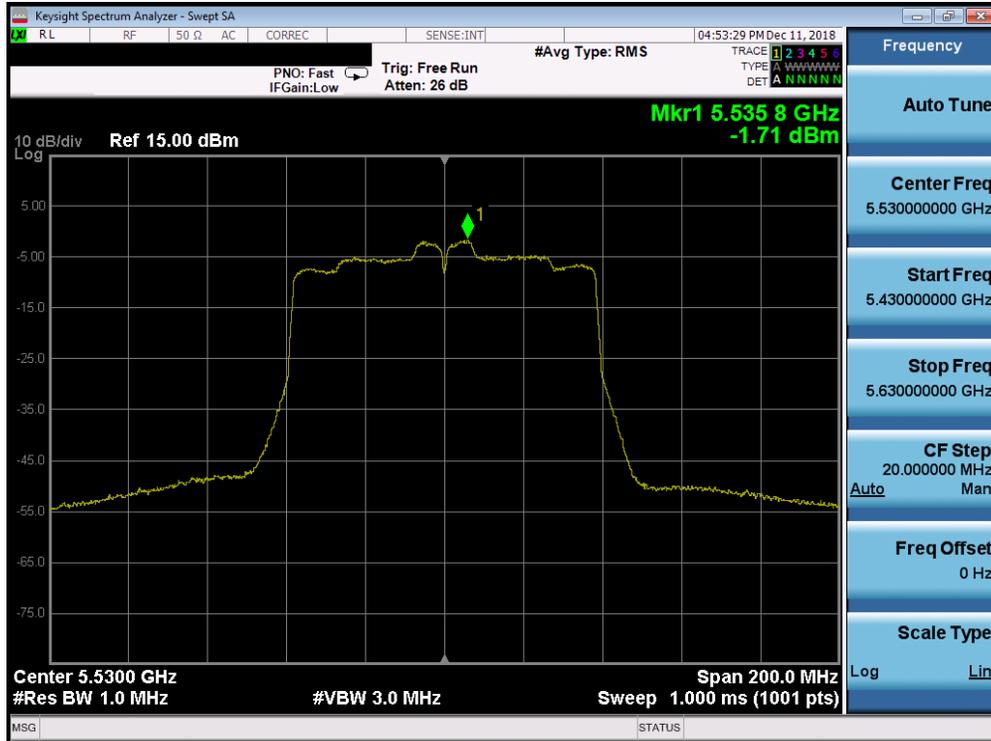


Plot 7-104. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 118)

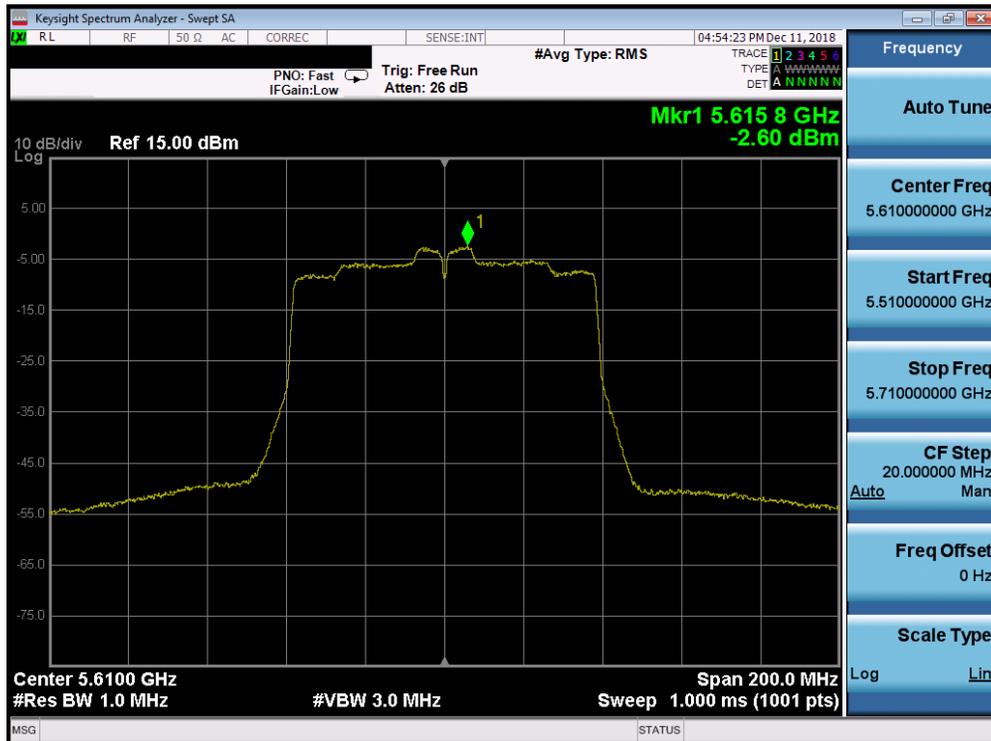


Plot 7-105. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 142)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset		Page 79 of 188

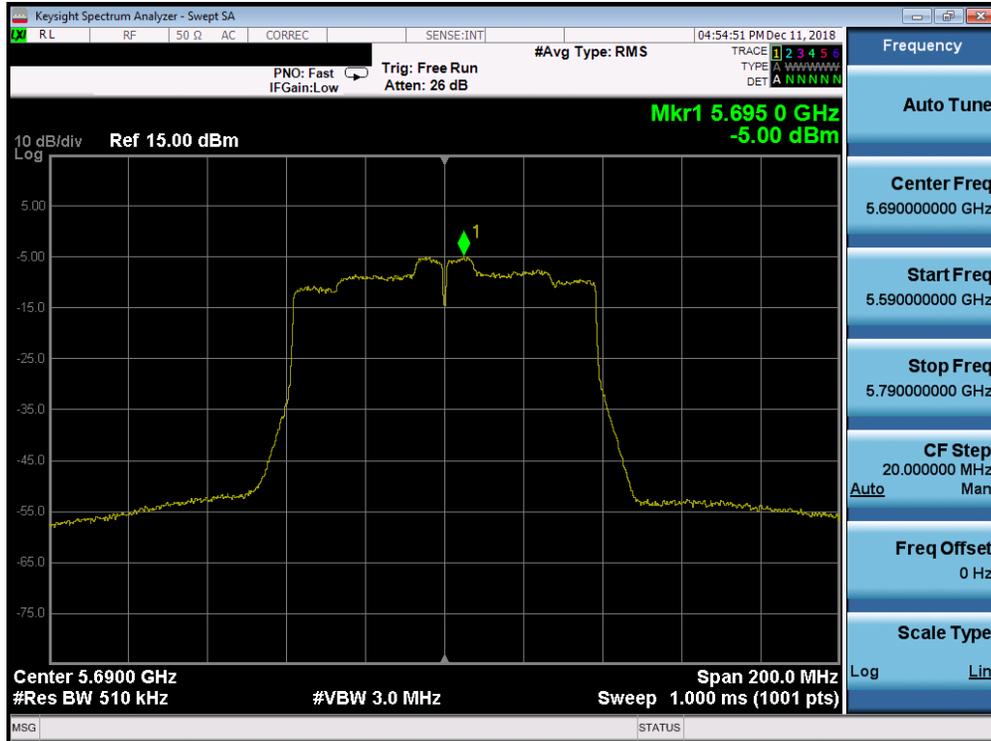


Plot 7-106. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2C) – Ch. 106)



Plot 7-107. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2C) – Ch. 122)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset		Page 80 of 188

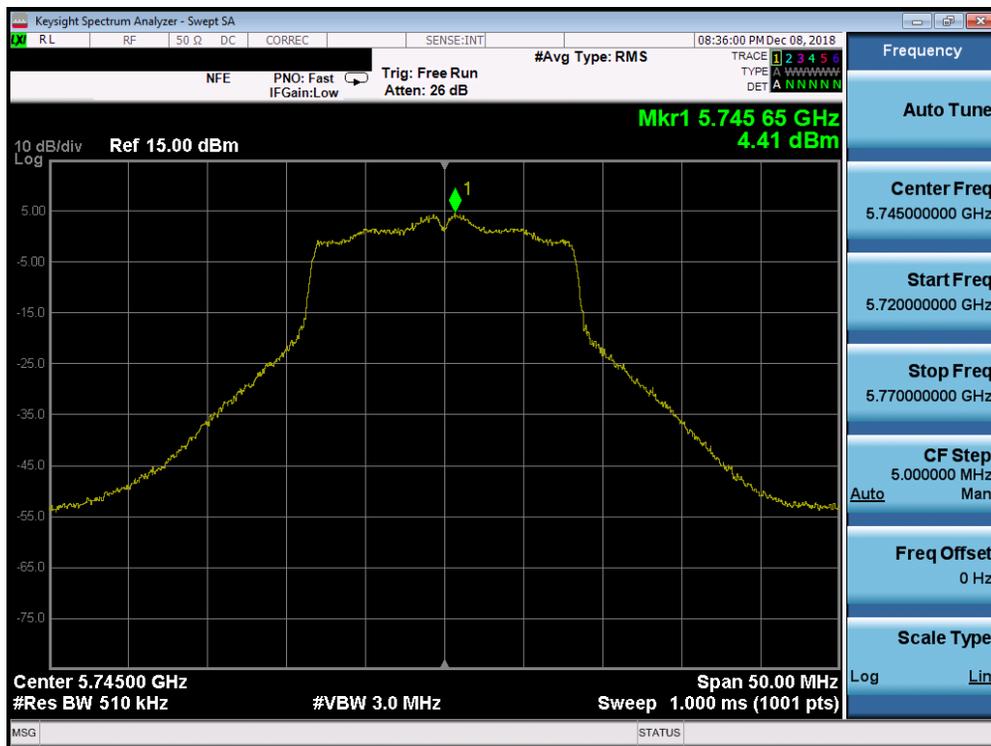


Plot 7-108. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2C) – Ch. 138)

FCC ID: ZNFG820UM	 MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset	Page 81 of 188	

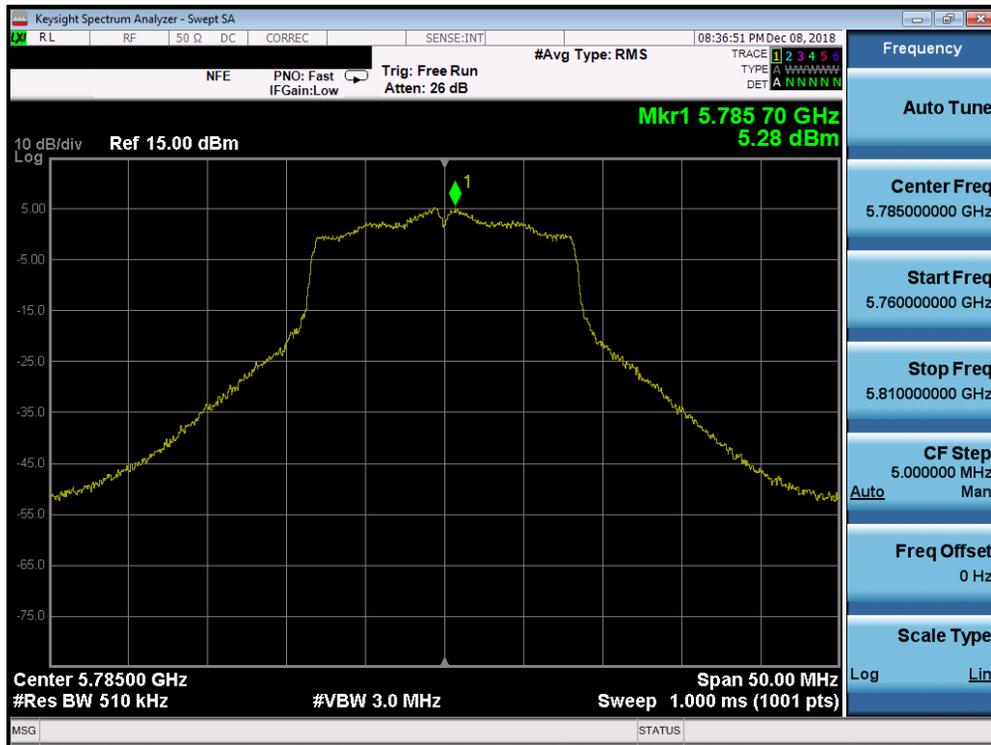
	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured Power Density [dBm]	Max Permissible Power Density [dBm/500kHz]	Margin [dB]
Band 3	5745	149	a	6	4.41	30.0	-25.59
	5785	157	a	6	5.28	30.0	-24.72
	5825	165	a	6	4.13	30.0	-25.87
	5745	149	n (20MHz)	6.5/7.2 (MCS0)	4.54	30.0	-25.46
	5785	157	n (20MHz)	6.5/7.2 (MCS0)	4.83	30.0	-25.17
	5825	165	n (20MHz)	6.5/7.2 (MCS0)	3.60	30.0	-26.41
	5755	151	n (40MHz)	13.5/15 (MCS0)	1.48	30.0	-28.52
	5795	159	n (40MHz)	13.5/15 (MCS0)	1.29	30.0	-28.71
	5775	155	ac (80MHz)	29.3/32.5 (MCS0)	-1.84	30.0	-31.84

Table 7-20. Band 3 Conducted Power Spectral Density Measurements ANT1

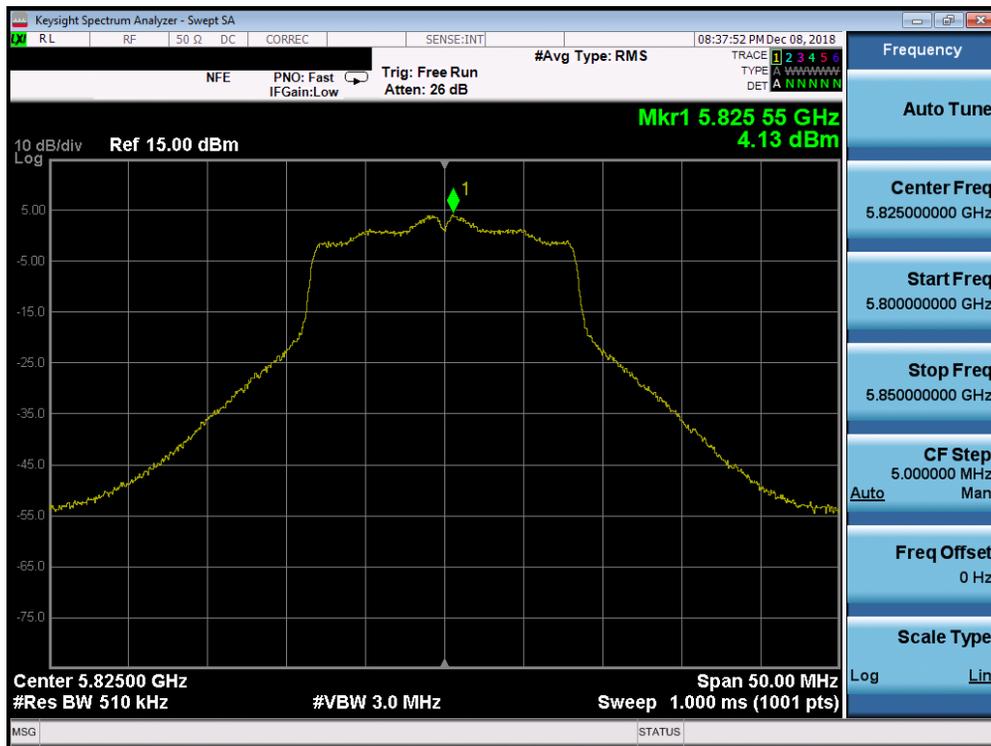


Plot 7-109. Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 149)

FCC ID: ZNFG820UM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset		Page 82 of 188

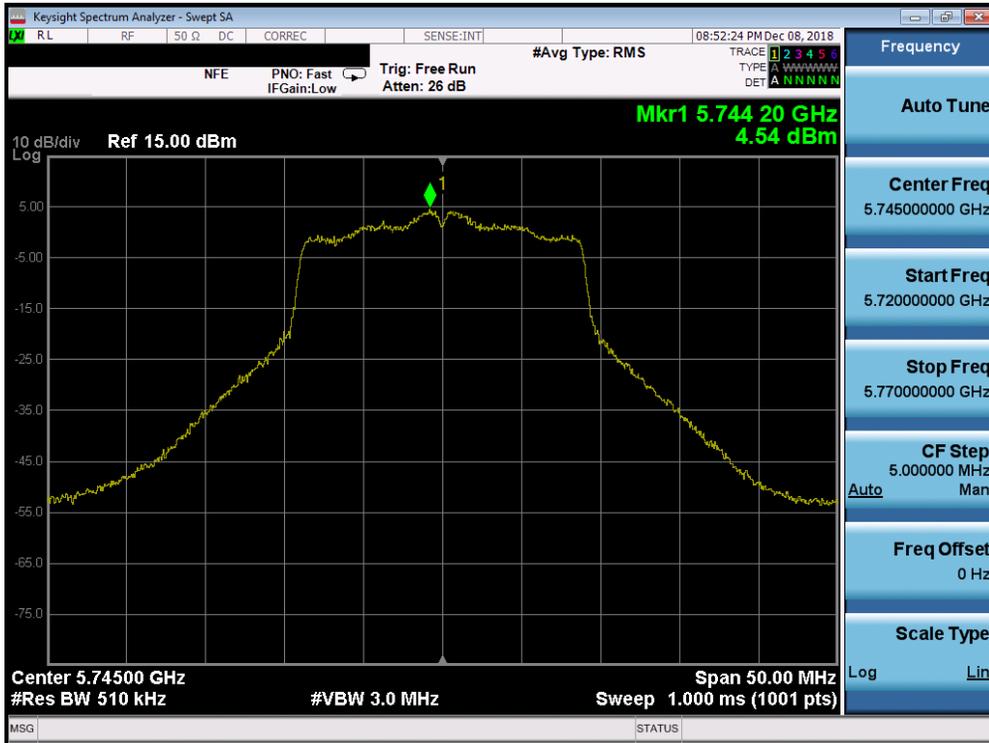


Plot 7-110. Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 157)

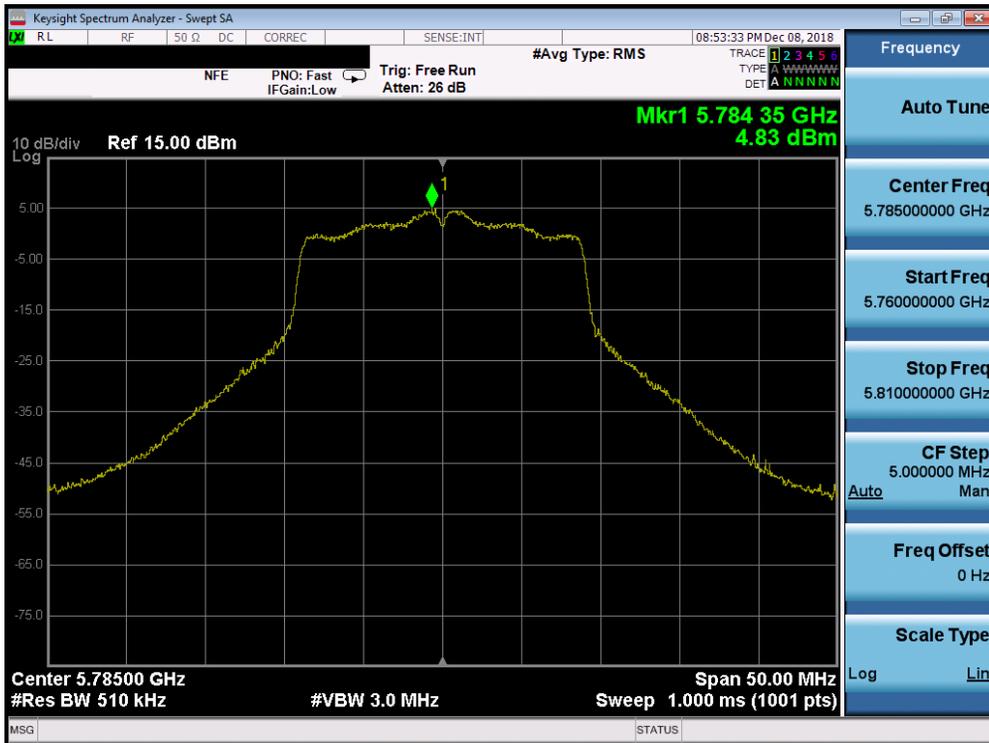


Plot 7-111. Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 165)

FCC ID: ZNFG820UM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset		Page 83 of 188

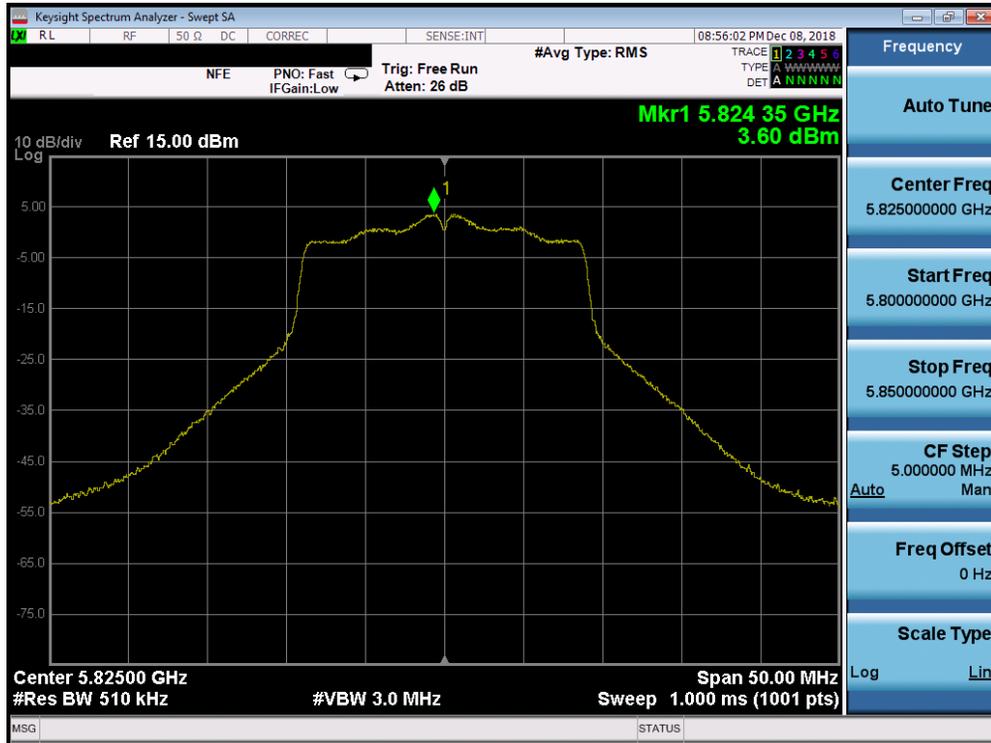


Plot 7-112. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 149)

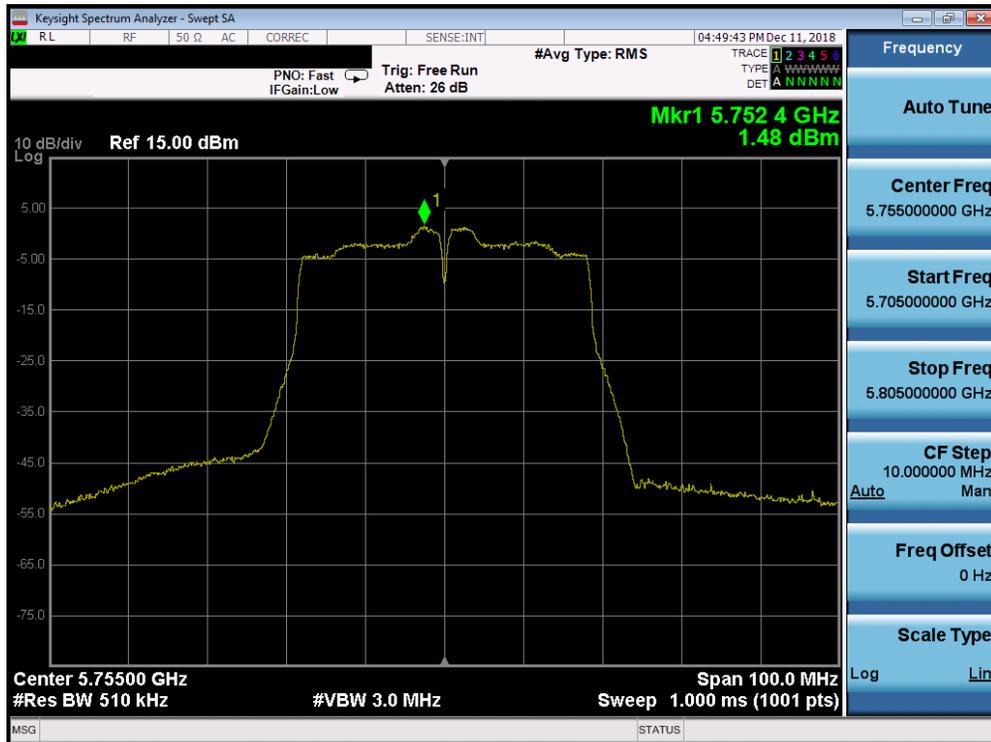


Plot 7-113. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 157)

FCC ID: ZNFG820UM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset		Page 84 of 188

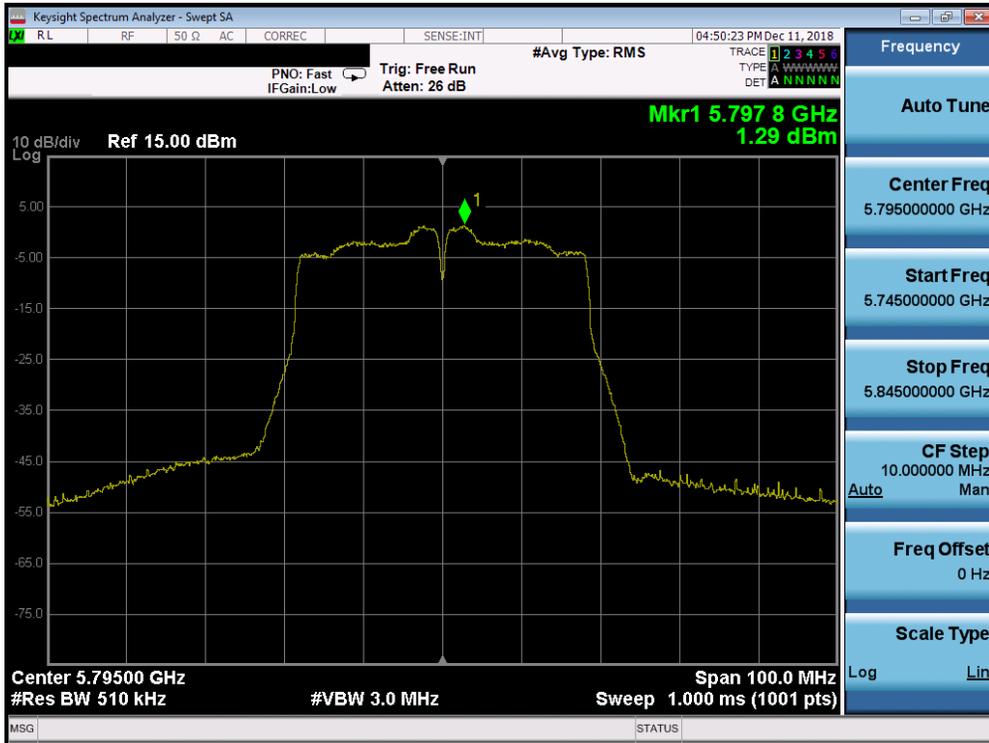


Plot 7-114. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 165)

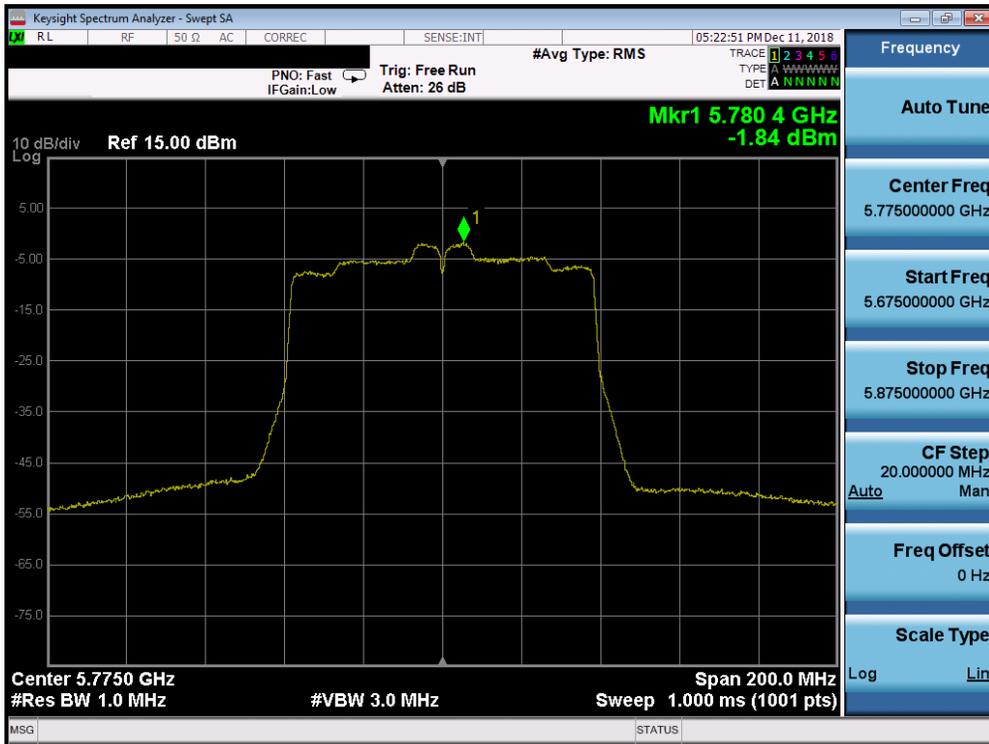


Plot 7-115. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 3) – Ch. 151)

FCC ID: ZNFG820UM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset		Page 85 of 188



Plot 7-116. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 3) – Ch. 159)



Plot 7-117. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 3) – Ch. 155)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset		Page 86 of 188

SISO Antenna-2 Power Spectral Density Measurements

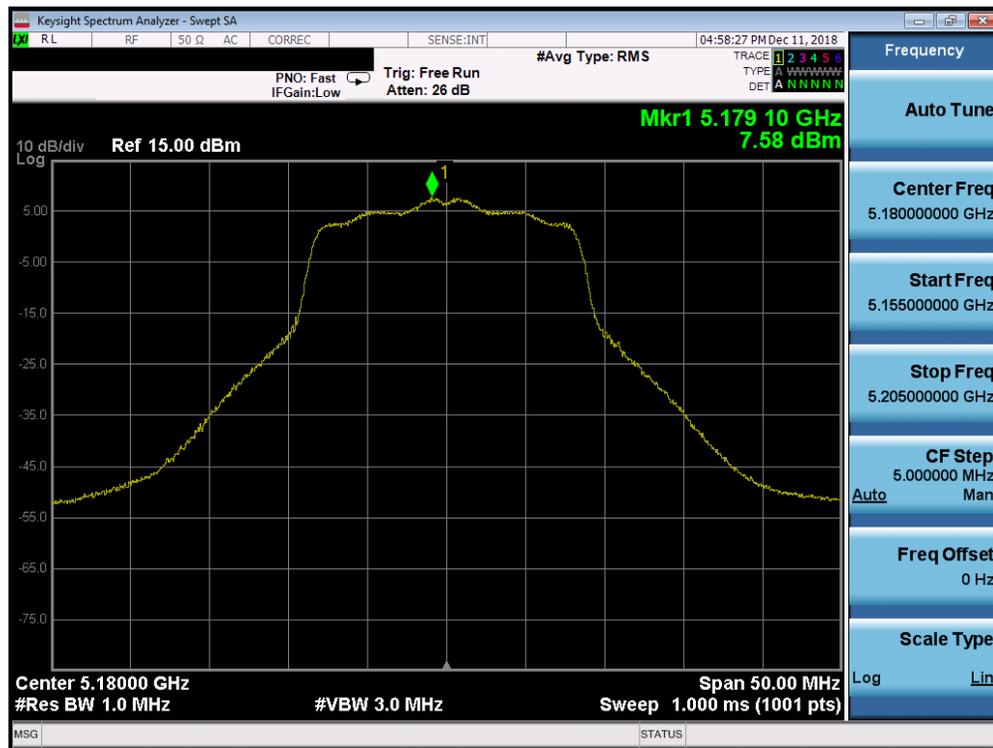
	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured Power Density [dBm]	Max Power Density [dBm/MHz]	Margin [dB]
Band 1	5180	36	a	6	7.58	11.0	-3.42
	5200	40	a	6	8.45	11.0	-2.55
	5240	48	a	6	7.16	11.0	-3.84
	5180	36	n (20MHz)	6.5/7.2 (MCS0)	7.21	11.0	-3.79
	5200	40	n (20MHz)	6.5/7.2 (MCS0)	7.92	11.0	-3.08
	5240	48	n (20MHz)	6.5/7.2 (MCS0)	6.93	11.0	-4.07
	5190	38	n (40MHz)	13.5/15 (MCS0)	0.79	11.0	-10.21
	5230	46	n (40MHz)	13.5/15 (MCS0)	3.84	11.0	-7.16
	5210	42	ac (80MHz)	29.3/32.5 (MCS0)	-1.72	11.0	-12.72
Band 2A	5260	52	a	6	7.29	11.0	-3.71
	5280	56	a	6	8.09	11.0	-2.91
	5320	64	a	6	7.26	11.0	-3.74
	5260	52	n (20MHz)	6.5/7.2 (MCS0)	6.83	11.0	-4.17
	5280	56	n (20MHz)	6.5/7.2 (MCS0)	8.15	11.0	-2.85
	5320	64	n (20MHz)	6.5/7.2 (MCS0)	6.94	11.0	-4.06
	5270	54	n (40MHz)	13.5/15 (MCS0)	3.75	11.0	-7.25
	5310	62	n (40MHz)	13.5/15 (MCS0)	0.44	11.0	-10.56
	5290	58	ac (80MHz)	29.3/32.5 (MCS0)	-5.05	11.0	-16.05
Band 2C	5500	100	a	6	7.64	11.0	-3.37
	5600	120	a	6	8.02	11.0	-2.98
	5720	144	a	6	7.78	11.0	-3.22
	5500	100	n (20MHz)	6.5/7.2 (MCS0)	7.41	11.0	-3.59
	5600	120	n (20MHz)	6.5/7.2 (MCS0)	7.55	11.0	-3.45
	5720	144	n (20MHz)	6.5/7.2 (MCS0)	7.54	11.0	-3.46
	5510	102	n (40MHz)	13.5/15 (MCS0)	0.00	11.0	-11.00
	5590	118	n (40MHz)	13.5/15 (MCS0)	3.81	11.0	-7.19
	5710	142	n (40MHz)	13.5/15 (MCS0)	3.90	11.0	-7.10
	5530	106	ac (80MHz)	29.3/32.5 (MCS0)	-2.81	11.0	-13.81
	5610	122	ac (80MHz)	29.3/32.5 (MCS0)	-2.36	11.0	-13.36
	5690	138	ac (80MHz)	29.3/32.5 (MCS0)	-5.15	11.0	-16.15

Table 7-21. Bands 1, 2A, 2C Conducted Power Spectral Density Measurements ANT2

FCC ID: ZNFG820UM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset	Page 87 of 188	

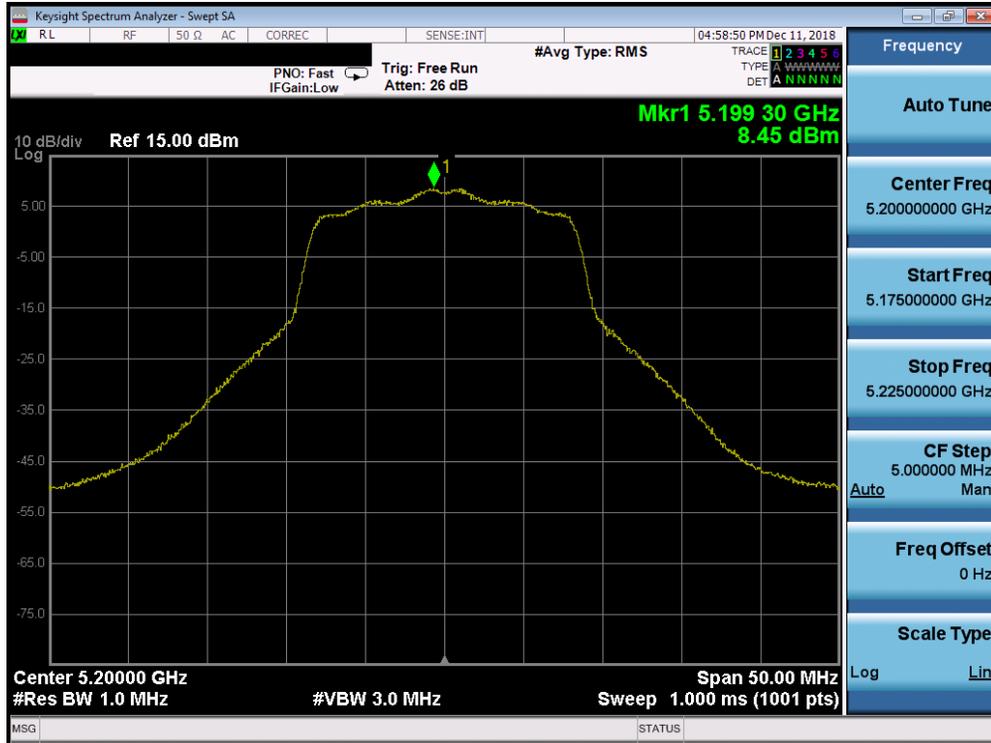
	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured Power Density [dBm]	Antenna Gain [dBi]	e.i.r.p. Power Density [dBm/MHz]	ISED Max e.i.r.p. Power Density [dBm/MHz]	Margin [dB]
Band 1	5180	36	a	6	-3.42	-12.10	-15.52	10.0	-25.52
	5200	40	a	6	-2.55	-12.10	-14.65	10.0	-24.65
	5240	48	a	6	-3.84	-12.10	-15.94	10.0	-25.94
	5180	36	n (20MHz)	6.5/7.2 (MCS0)	-3.79	-12.10	-15.89	10.0	-25.89
	5200	40	n (20MHz)	6.5/7.2 (MCS0)	-3.08	-12.10	-15.18	10.0	-25.18
	5240	48	n (20MHz)	6.5/7.2 (MCS0)	-4.07	-12.10	-16.17	10.0	-26.17
	5190	38	n (40MHz)	13.5/15 (MCS0)	-10.21	-12.10	-22.31	10.0	-32.31
	5230	46	n (40MHz)	13.5/15 (MCS0)	-7.16	-12.10	-19.26	10.0	-29.26
	5210	42	ac (80MHz)	29.3/32.5 (MCS0)	-12.72	-12.10	-24.82	10.0	-34.82

Table 7-22. Band 1 e.i.r.p. Conducted Power Spectral Density Measurements (ISED) ANT2

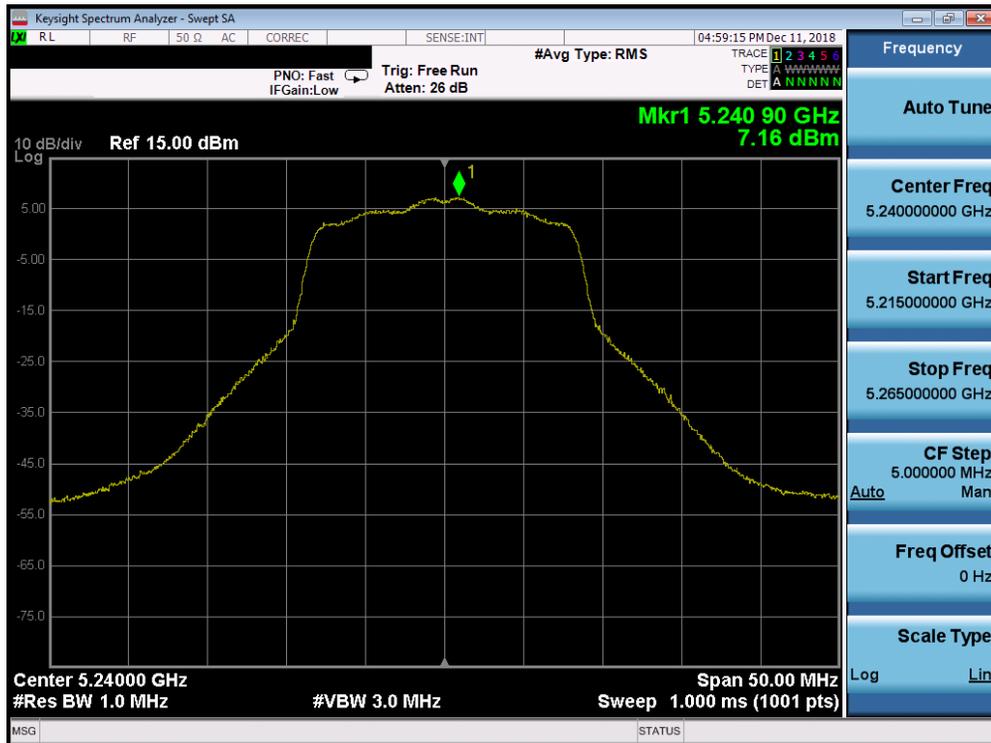


Plot 7-118. Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 36)

FCC ID: ZNFG820UM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset		Page 88 of 188

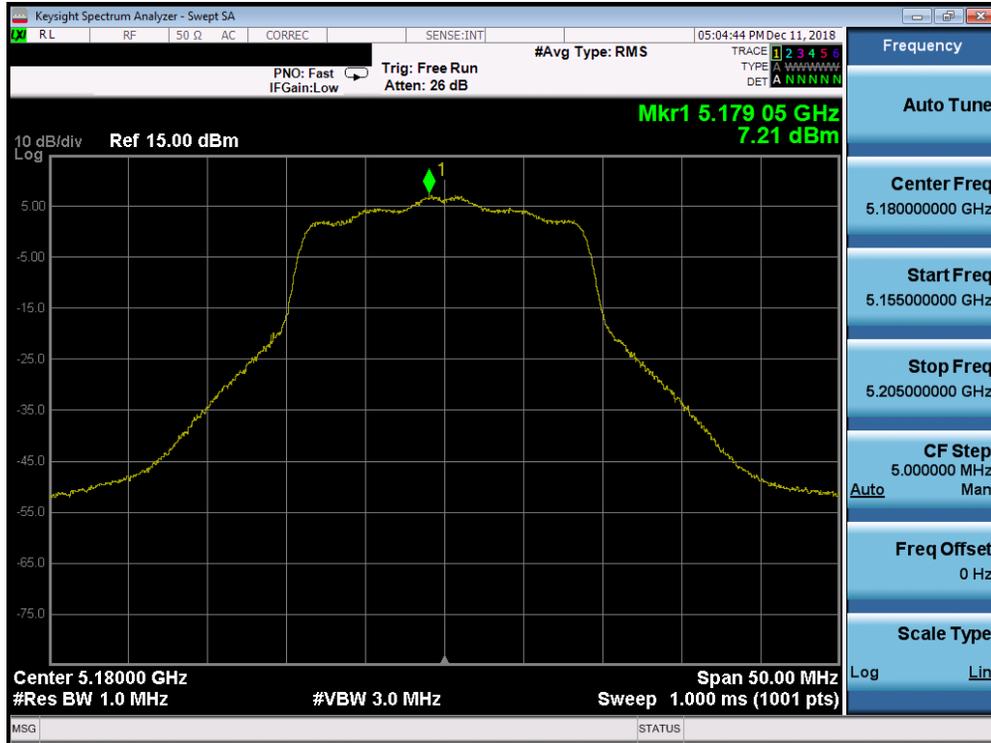


Plot 7-119. Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 40)

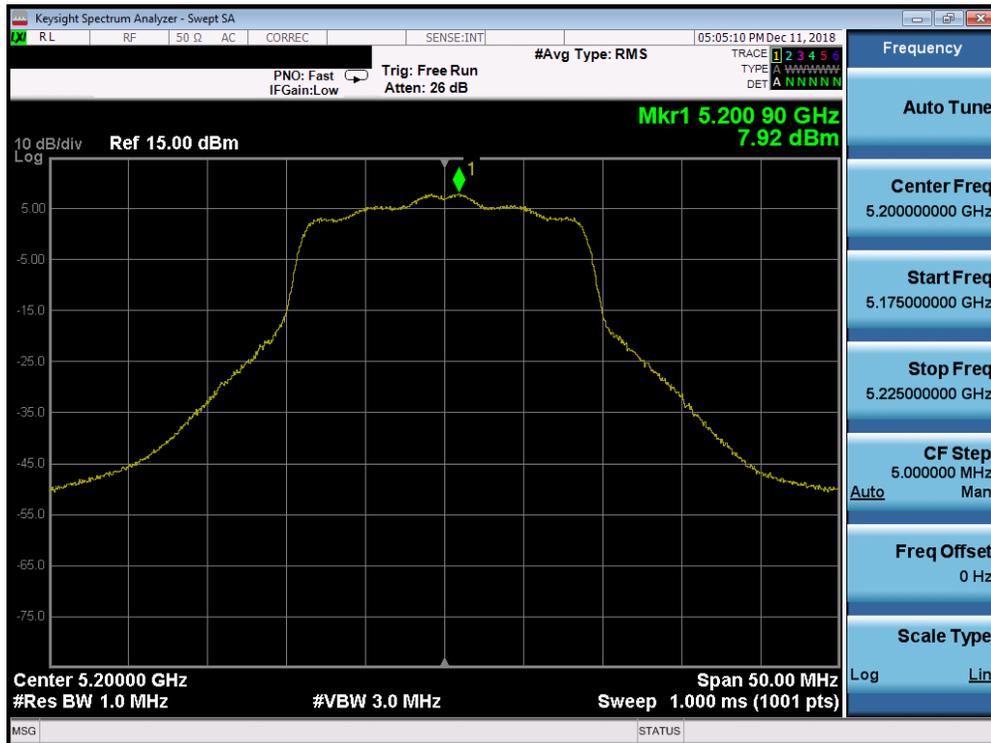


Plot 7-120. Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 48)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset		Page 89 of 188

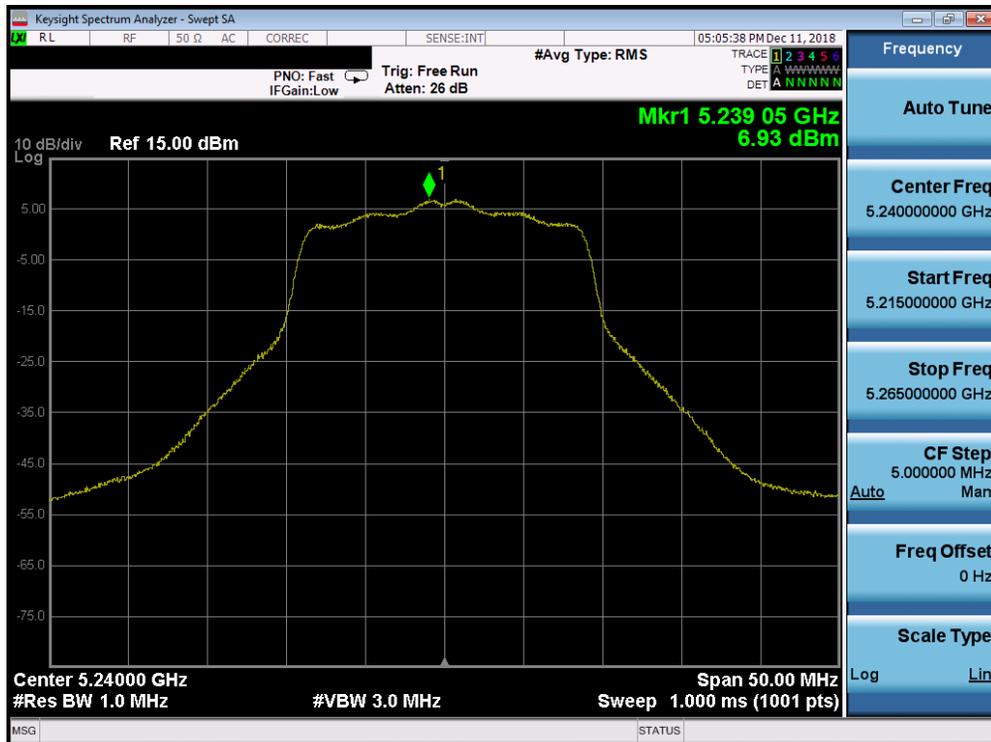


Plot 7-121. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 36)

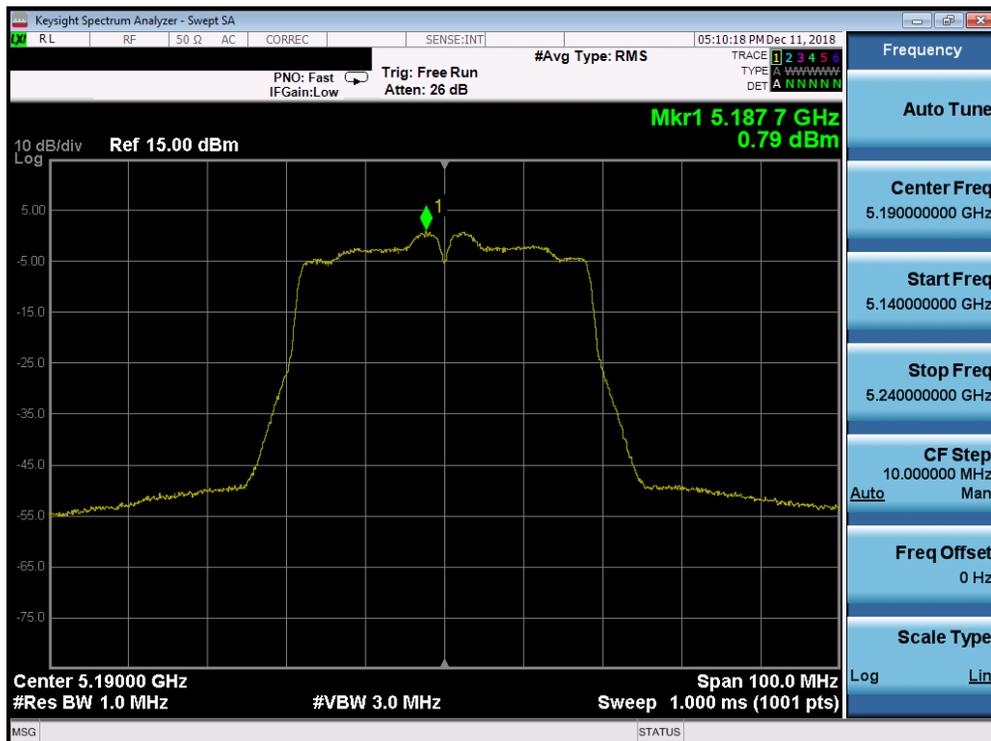


Plot 7-122. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 40)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset		Page 90 of 188

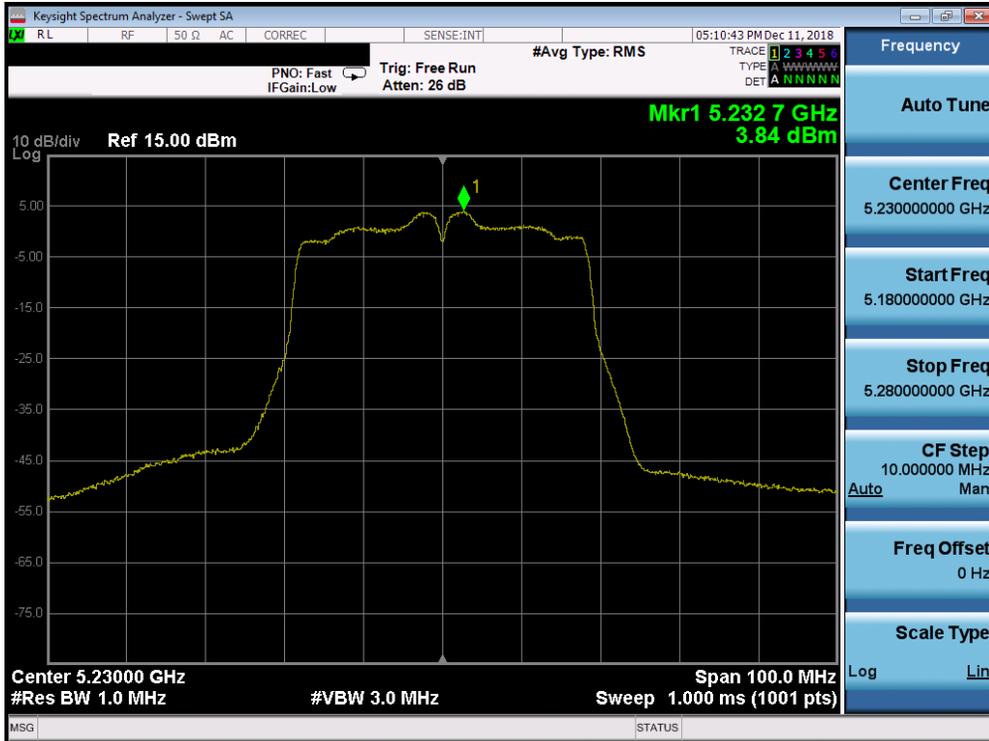


Plot 7-123. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 48)

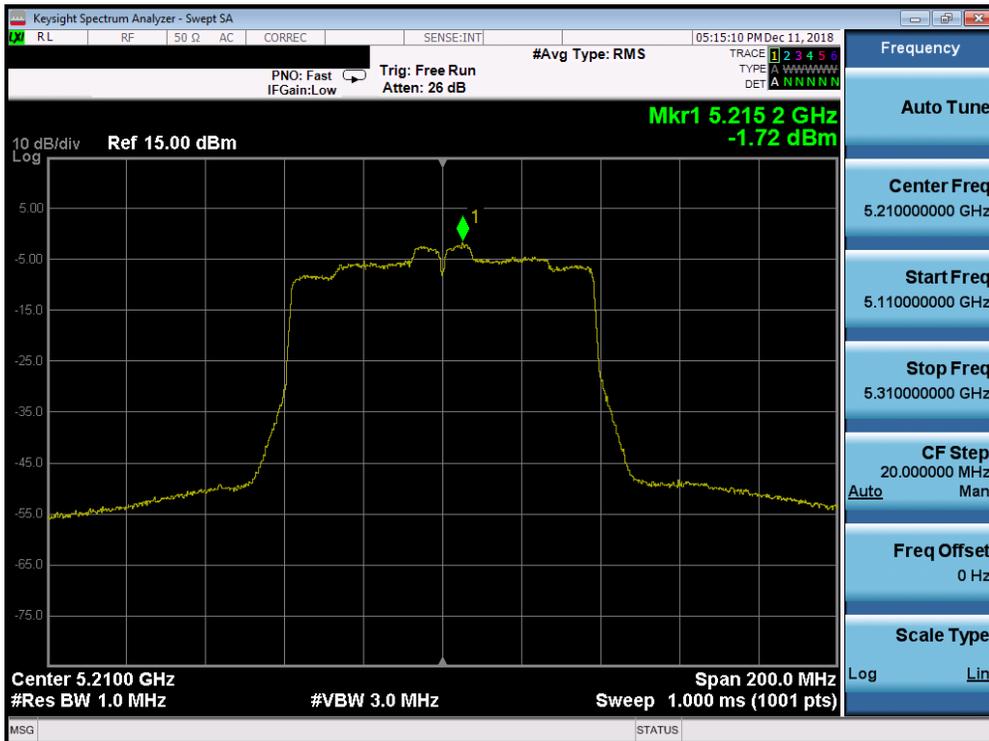


Plot 7-124. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 1) – Ch. 38)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset		Page 91 of 188

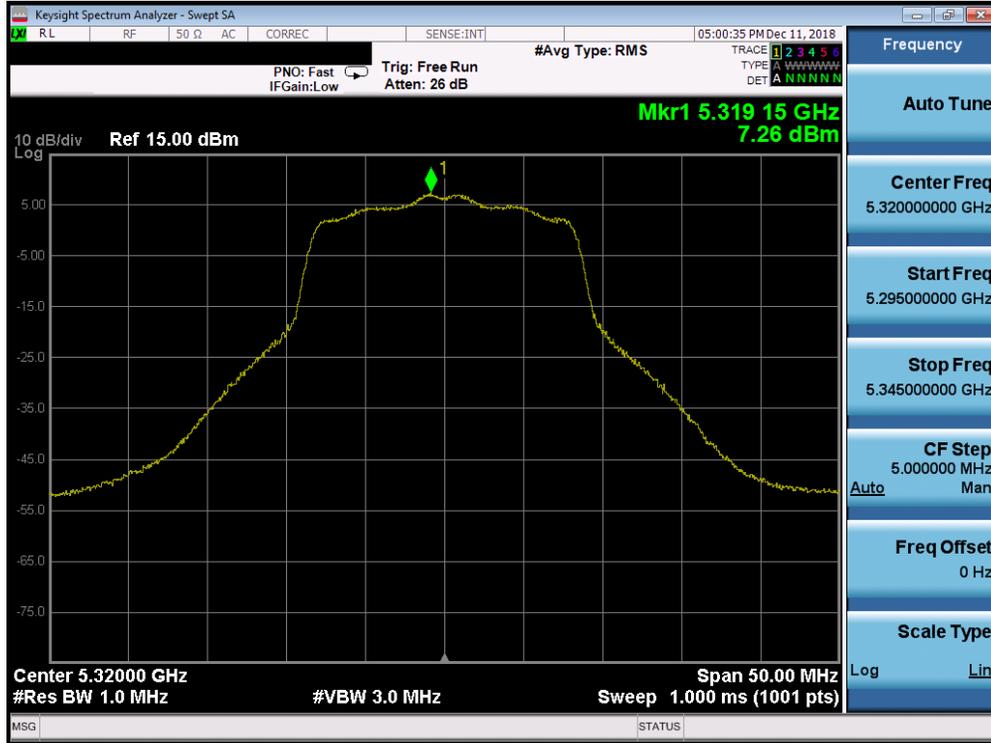


Plot 7-125. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 1) – Ch. 46)

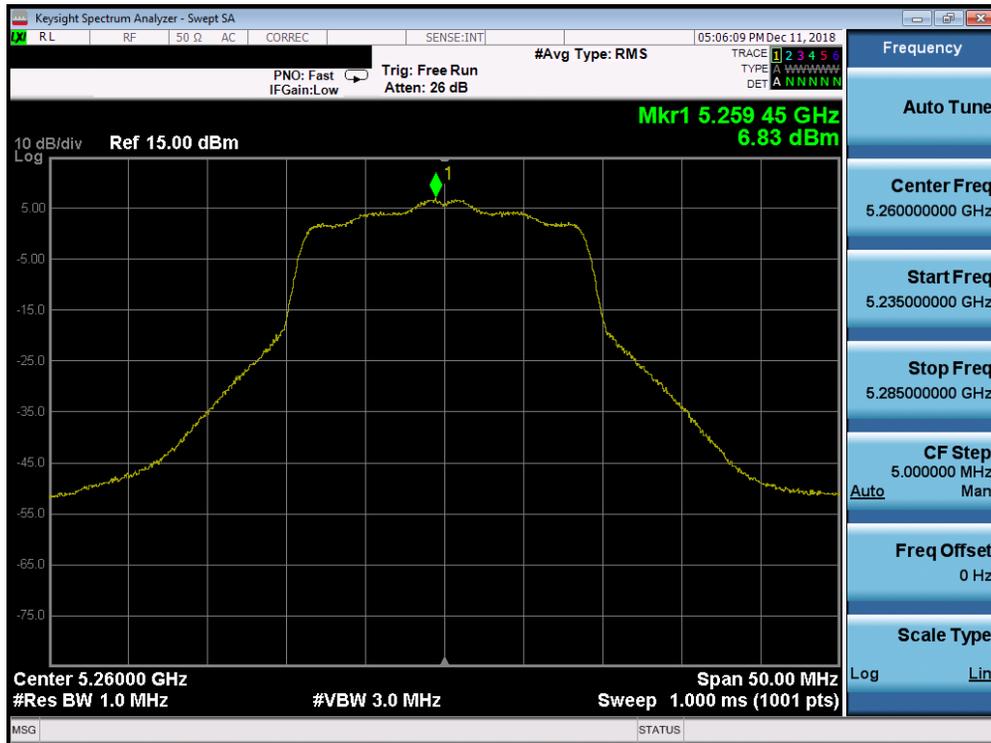


Plot 7-126. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 1) – Ch. 42)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset		Page 92 of 188

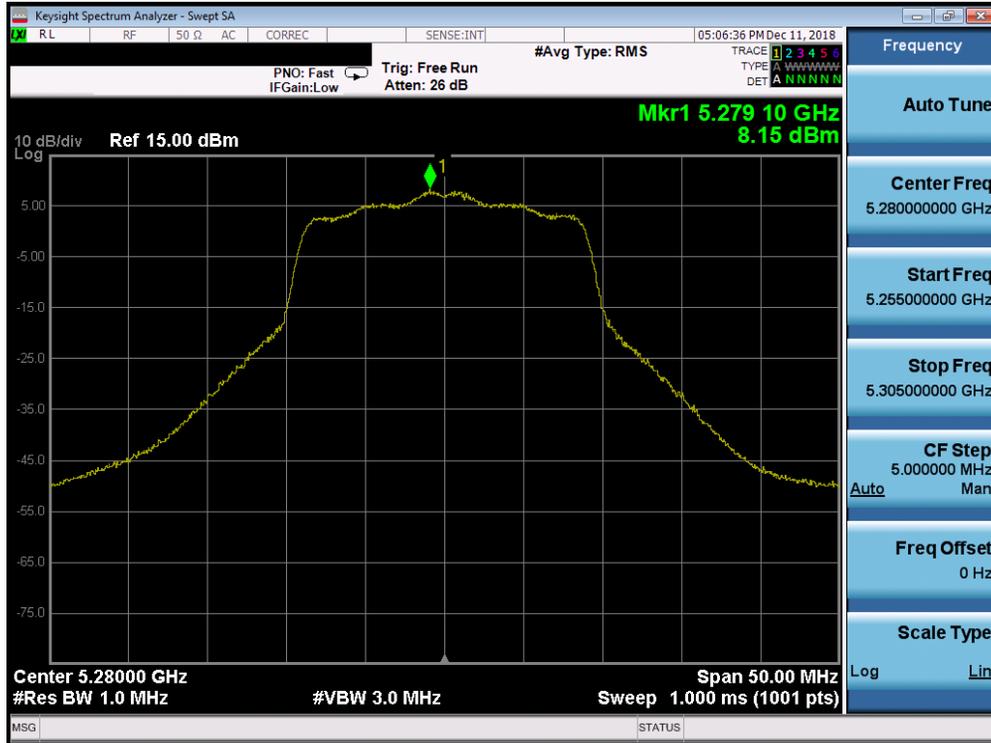


Plot 7-129. Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 64)

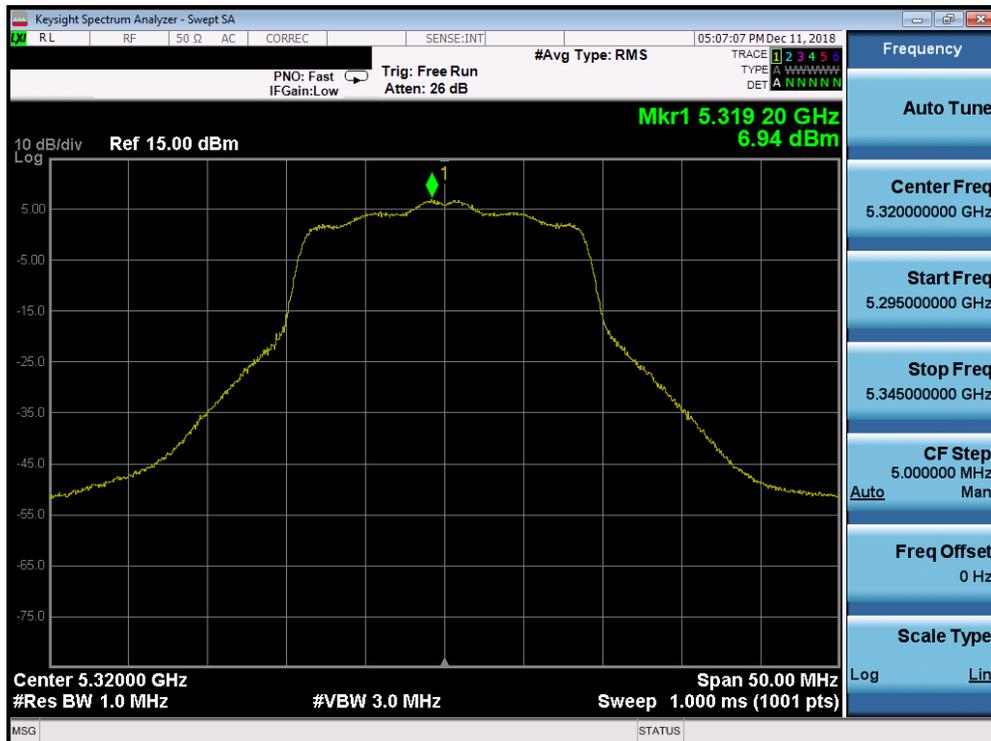


Plot 7-130. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 52)

FCC ID: ZNFG820UM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset		Page 94 of 188

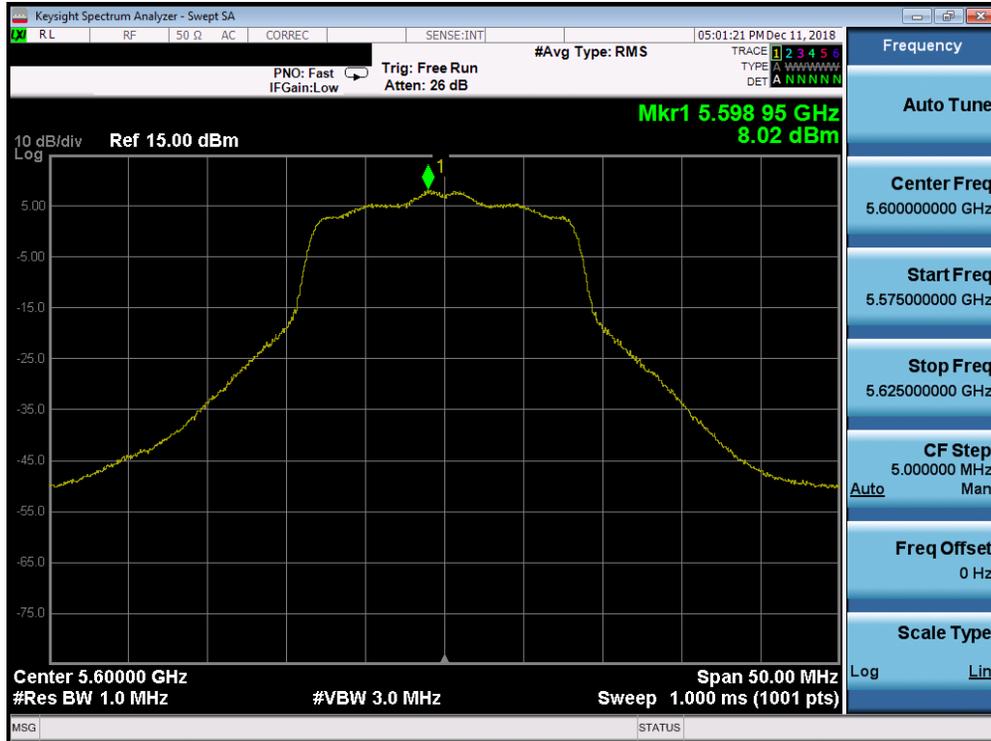


Plot 7-131. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 56)

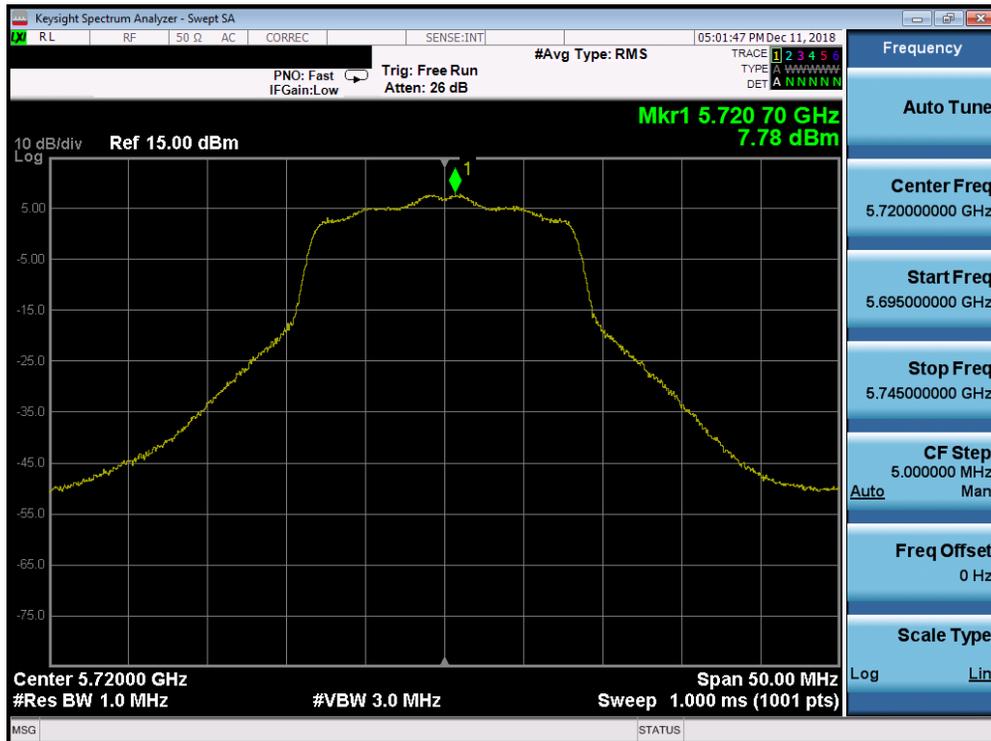


Plot 7-132. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 64)

FCC ID: ZNFG820UM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset		Page 95 of 188

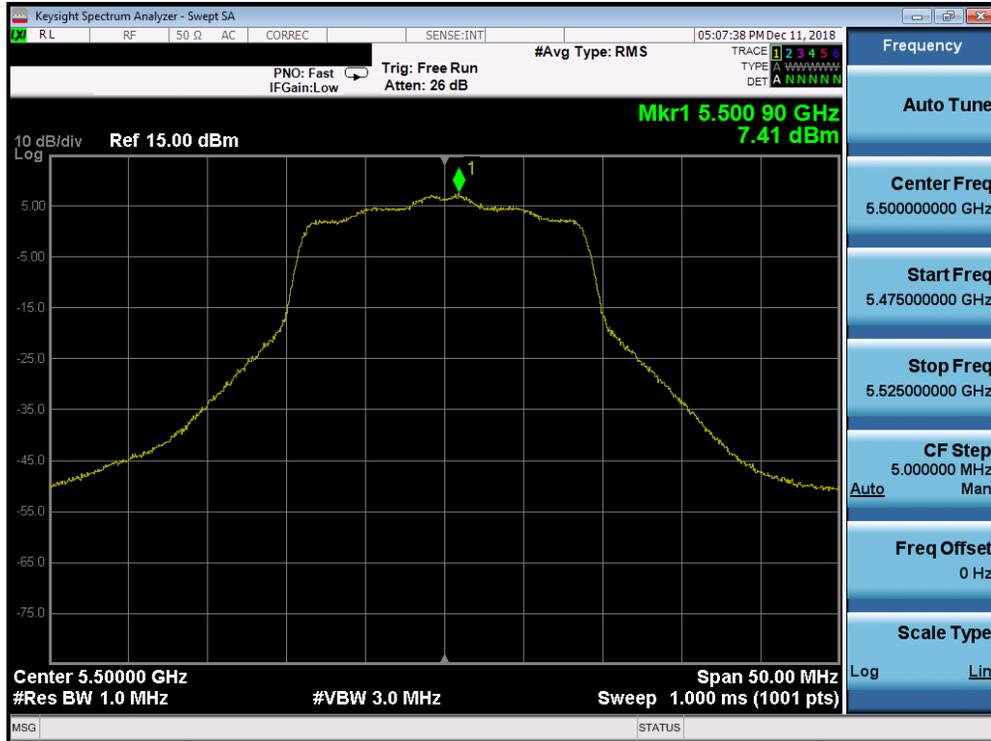


Plot 7-137. Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 120)

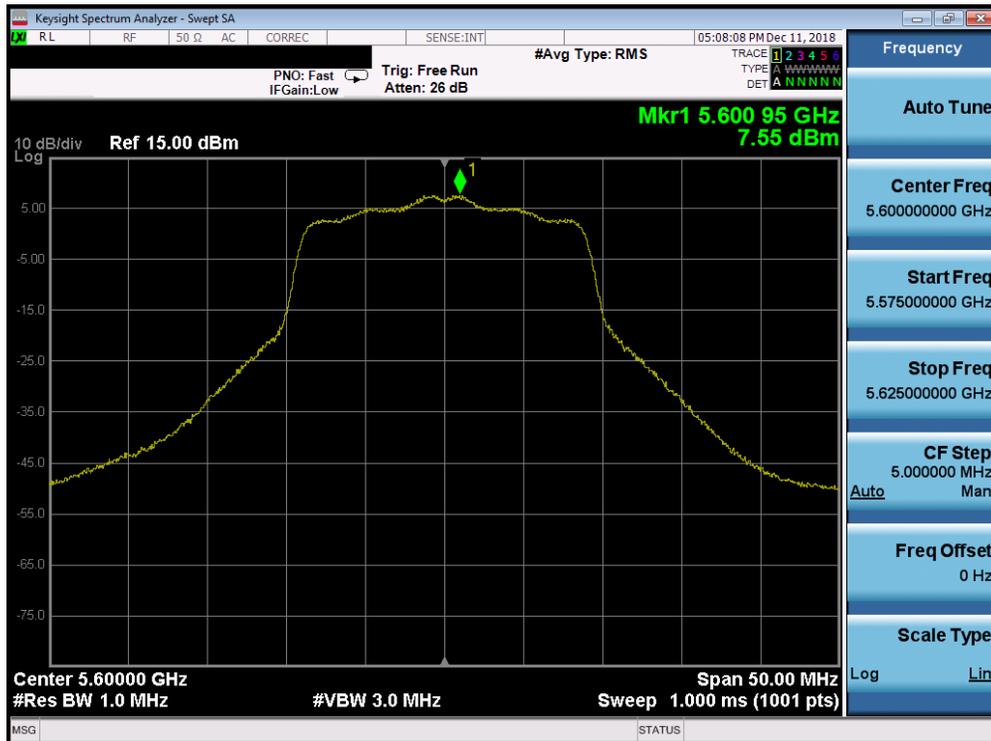


Plot 7-138. Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 144)

FCC ID: ZNFG820UM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset		Page 98 of 188

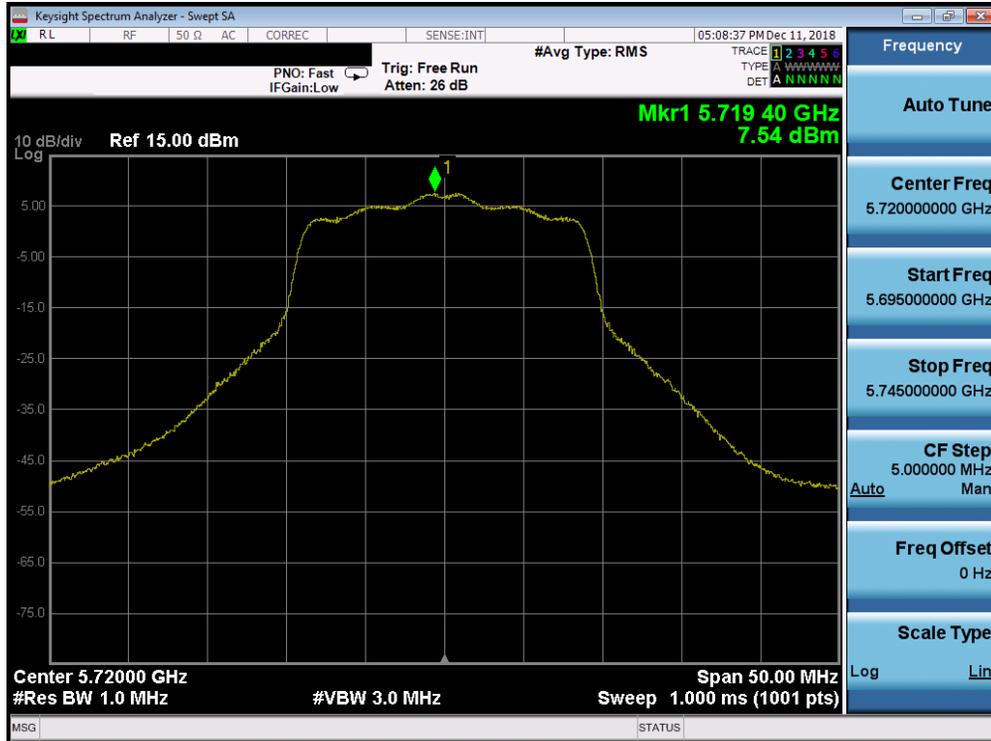


Plot 7-139. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 100)

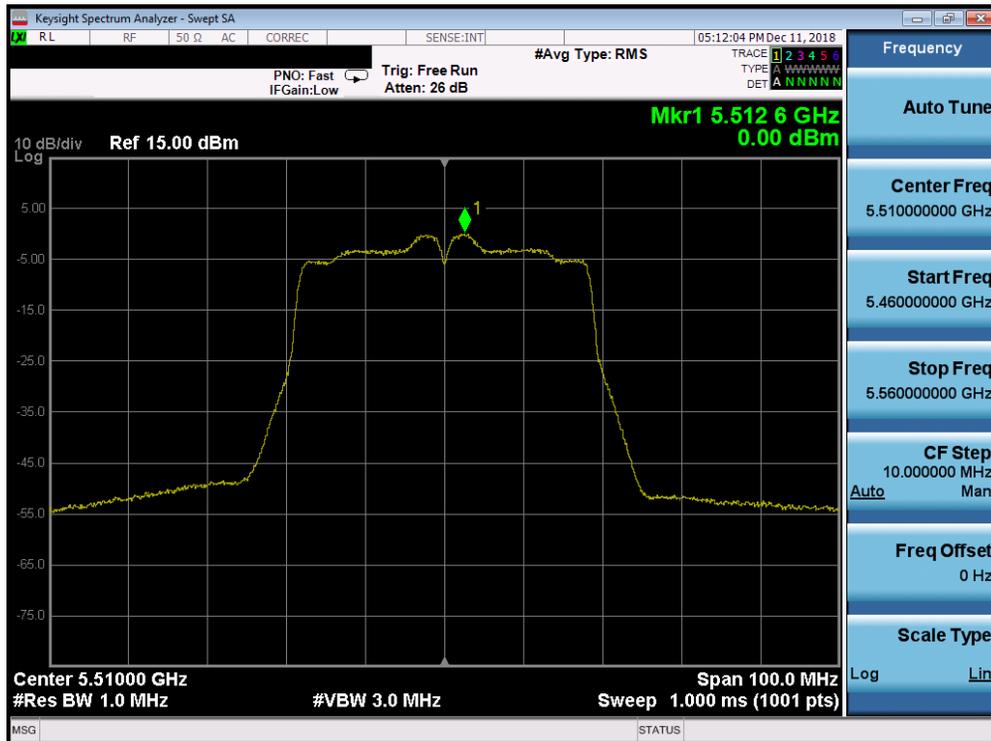


Plot 7-140. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 120)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset		Page 99 of 188

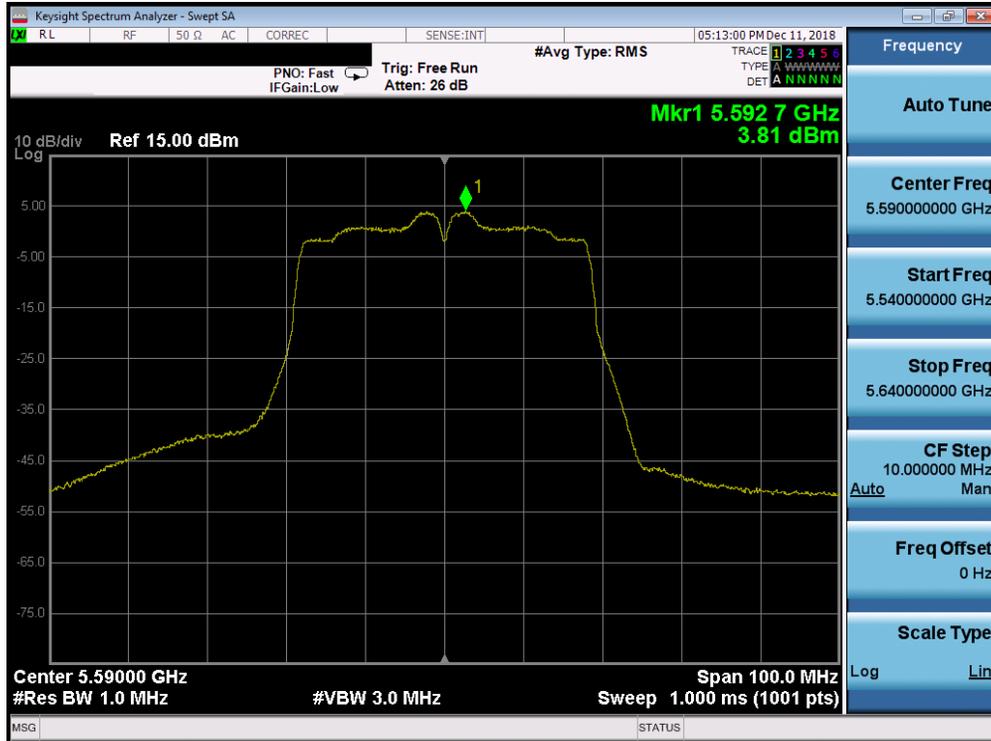


Plot 7-141. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 144)

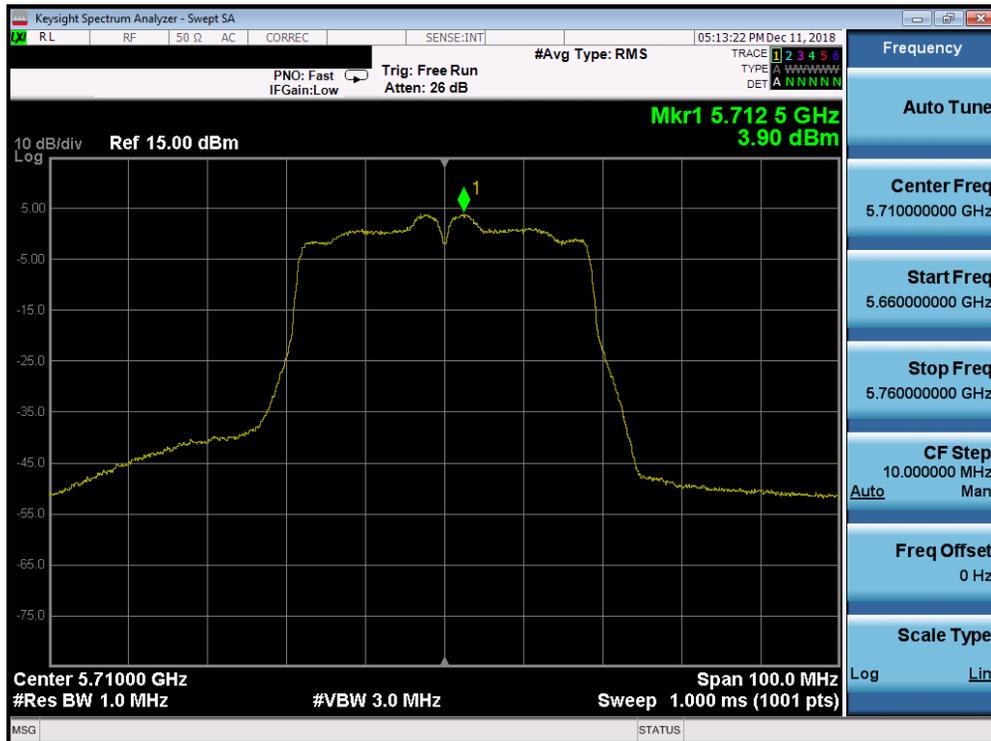


Plot 7-142. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 102)

FCC ID: ZNFG820UM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset		Page 100 of 188

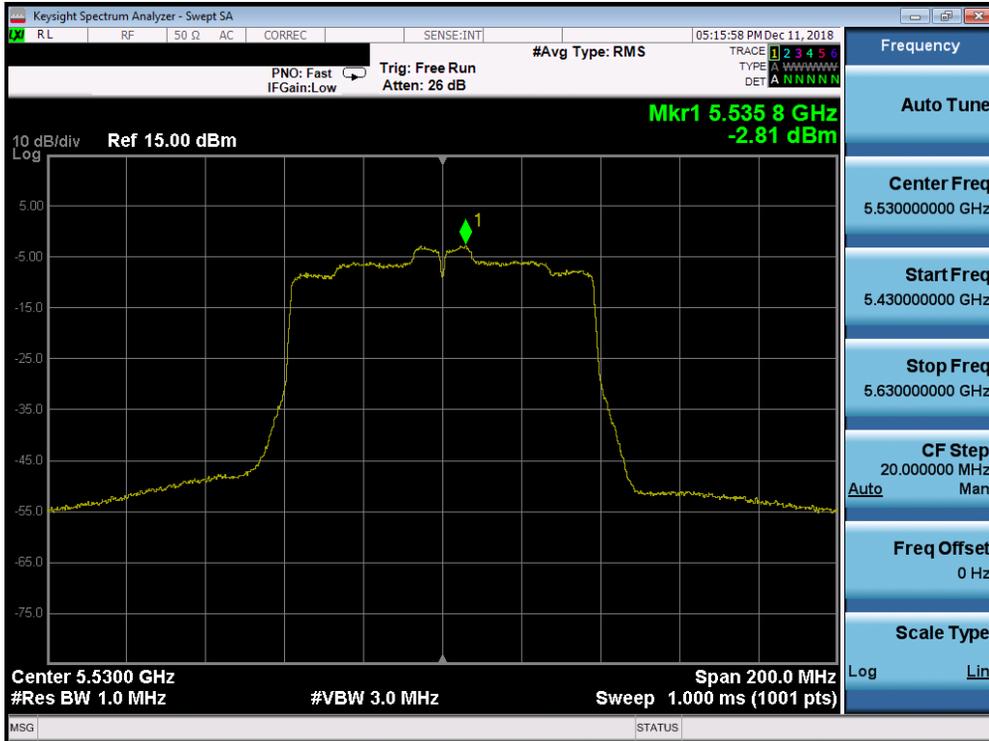


Plot 7-143. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 118)

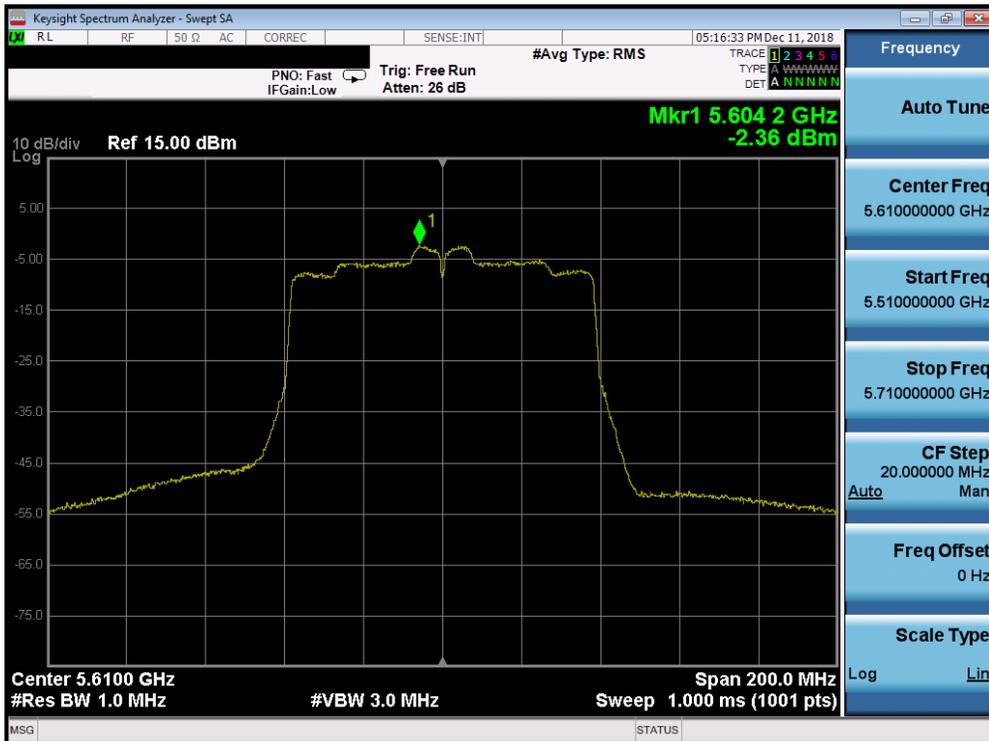


Plot 7-144. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 142)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset		Page 101 of 188

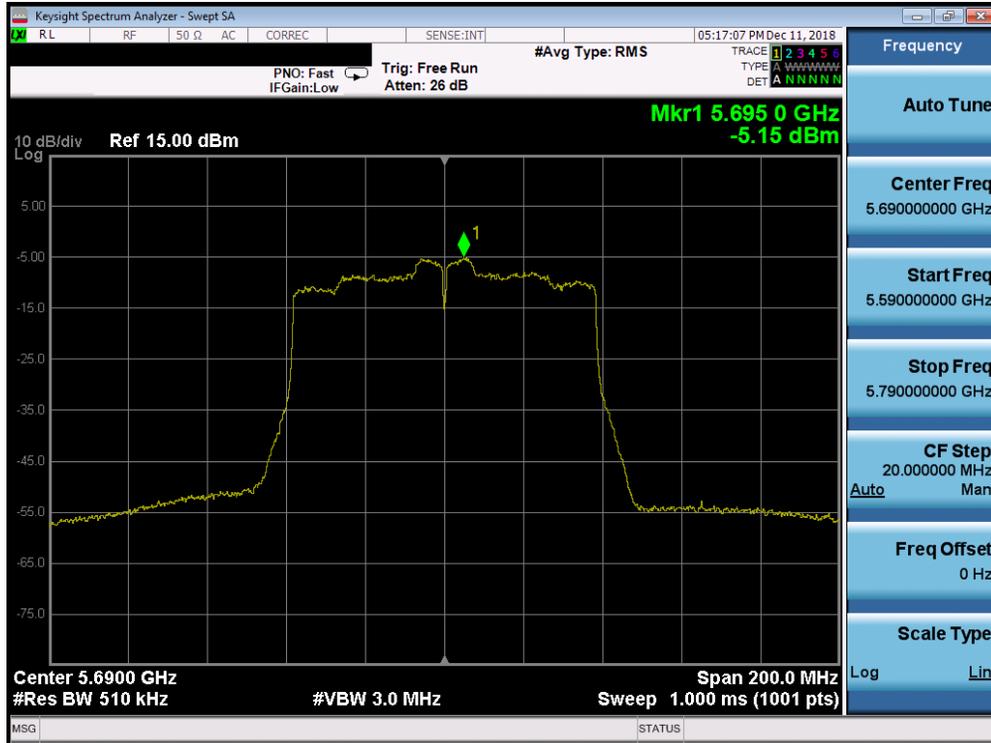


Plot 7-145. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2C) – Ch. 106)



Plot 7-146. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2C) – Ch. 122)

FCC ID: ZNFG820UM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset		Page 102 of 188

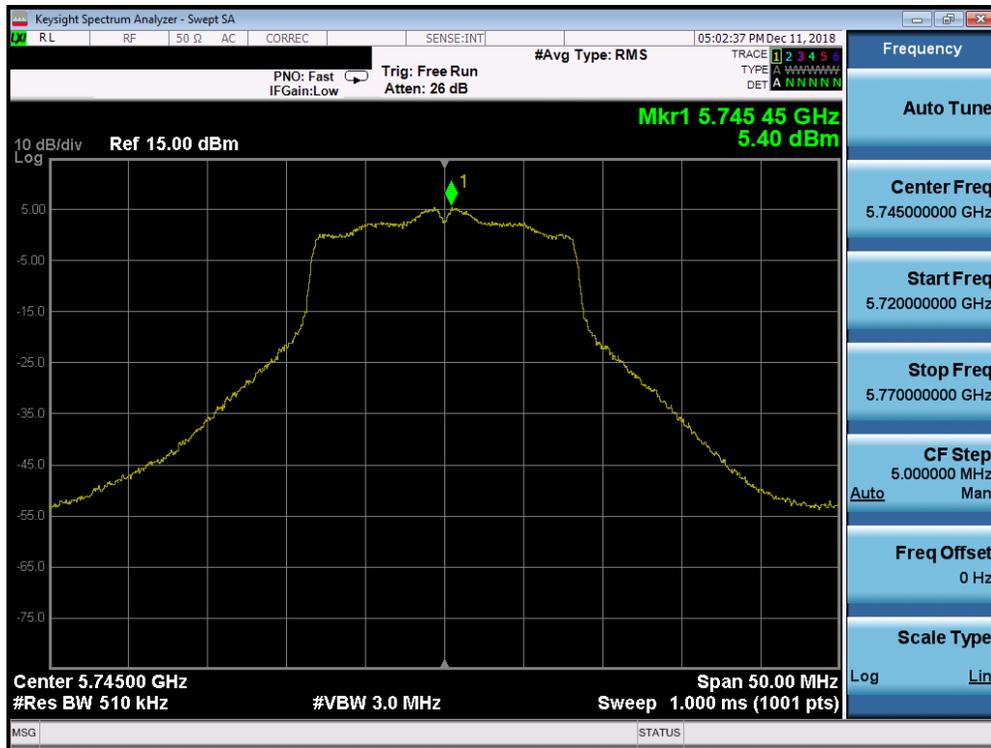


Plot 7-147. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2C) – Ch. 138)

FCC ID: ZNFG820UM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset		Page 103 of 188

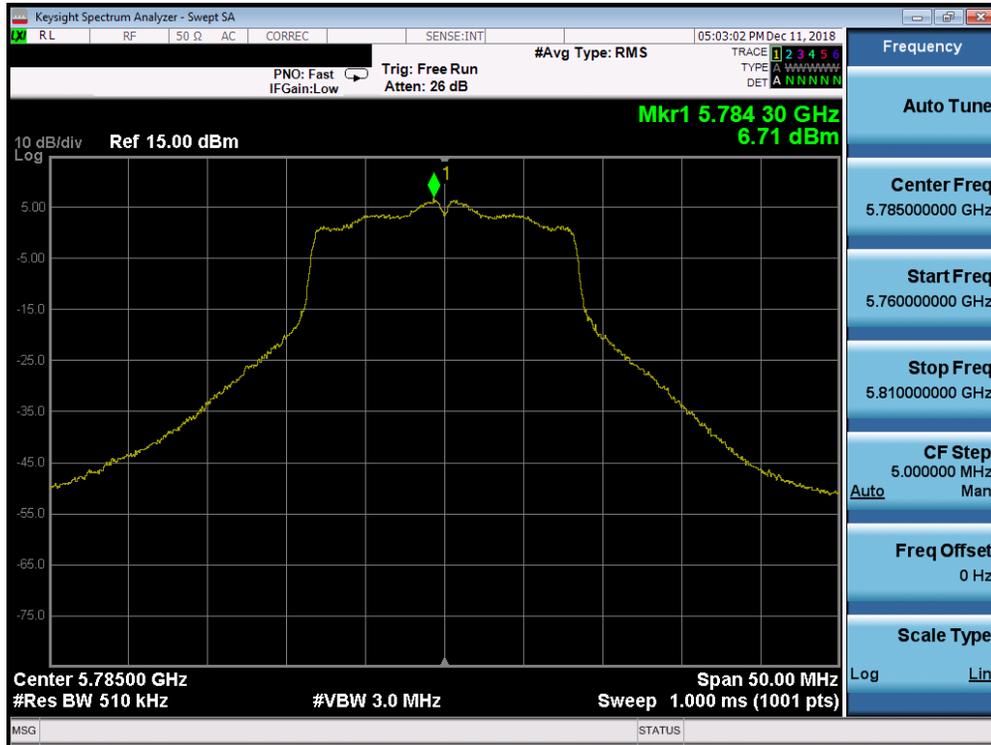
	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured Power Density [dBm]	Max Permissible Power Density [dBm/500kHz]	Margin [dB]
Band 3	5745	149	a	6	5.40	30.0	-24.60
	5785	157	a	6	6.71	30.0	-23.29
	5825	165	a	6	5.60	30.0	-24.40
	5745	149	n (20MHz)	6.5/7.2 (MCS0)	4.88	30.0	-25.12
	5785	157	n (20MHz)	6.5/7.2 (MCS0)	6.08	30.0	-23.92
	5825	165	n (20MHz)	6.5/7.2 (MCS0)	4.96	30.0	-25.04
	5755	151	n (40MHz)	13.5/15 (MCS0)	1.39	30.0	-28.62
	5795	159	n (40MHz)	13.5/15 (MCS0)	1.75	30.0	-28.25
	5775	155	ac (80MHz)	29.3/32.5 (MCS0)	-1.28	30.0	-31.28

Table 7-23. Band 3 Conducted Power Spectral Density Measurements ANT2

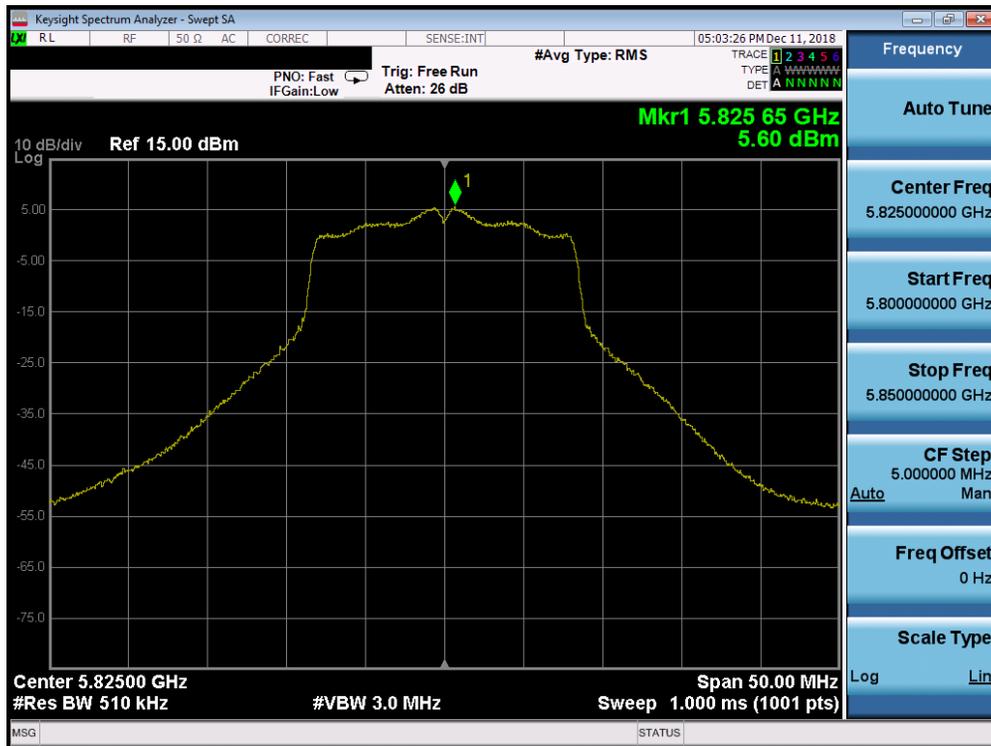


Plot 7-148. Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 149)

FCC ID: ZNFG820UM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset		Page 104 of 188

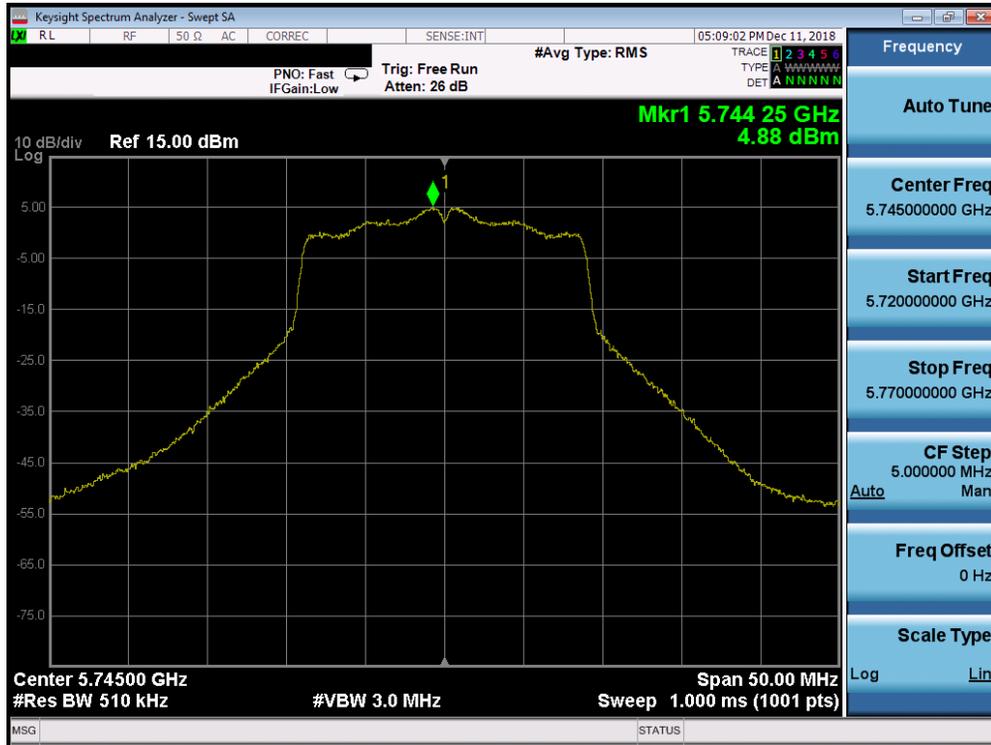


Plot 7-149. Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 157)

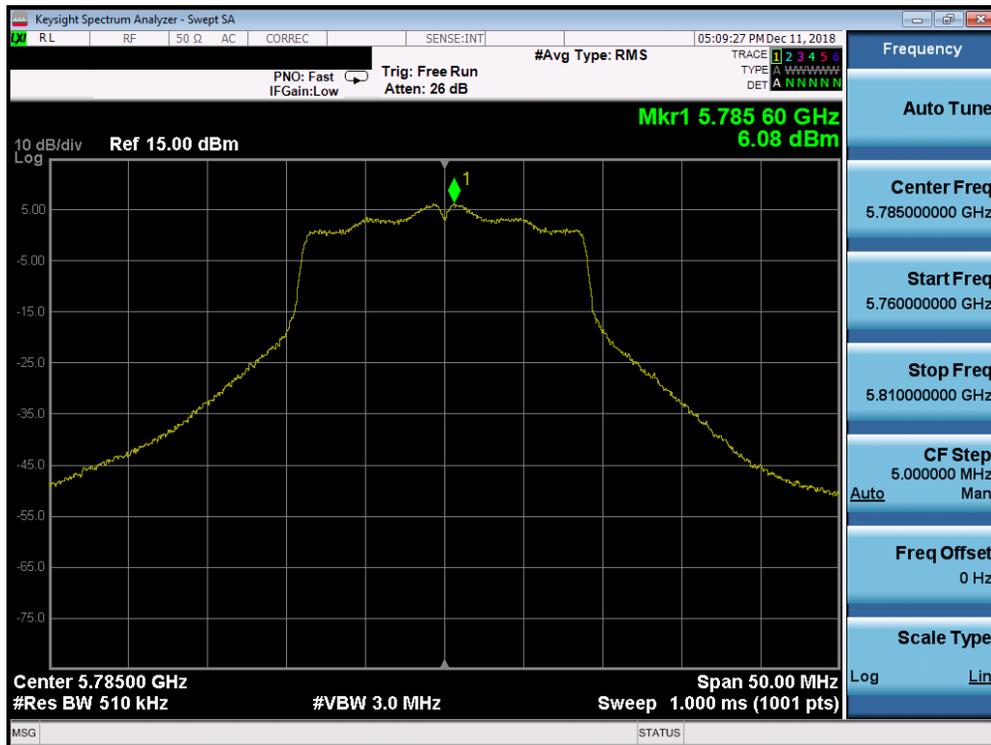


Plot 7-150. Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 165)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset		Page 105 of 188

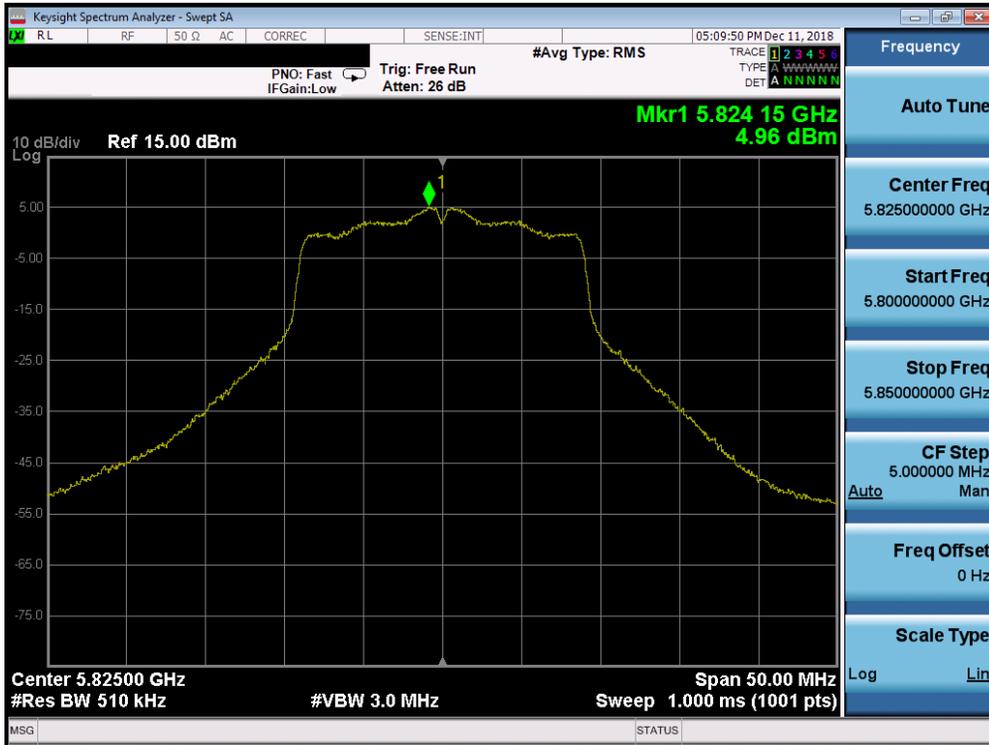


Plot 7-151. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 149)

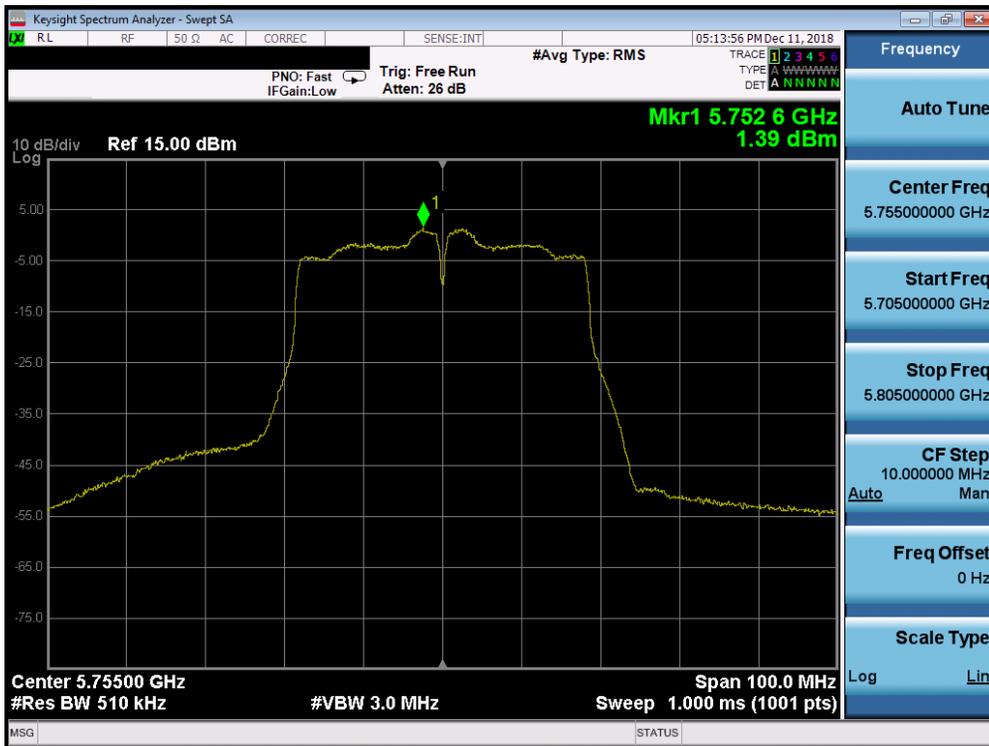


Plot 7-152. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 157)

FCC ID: ZNFG820UM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset		Page 106 of 188

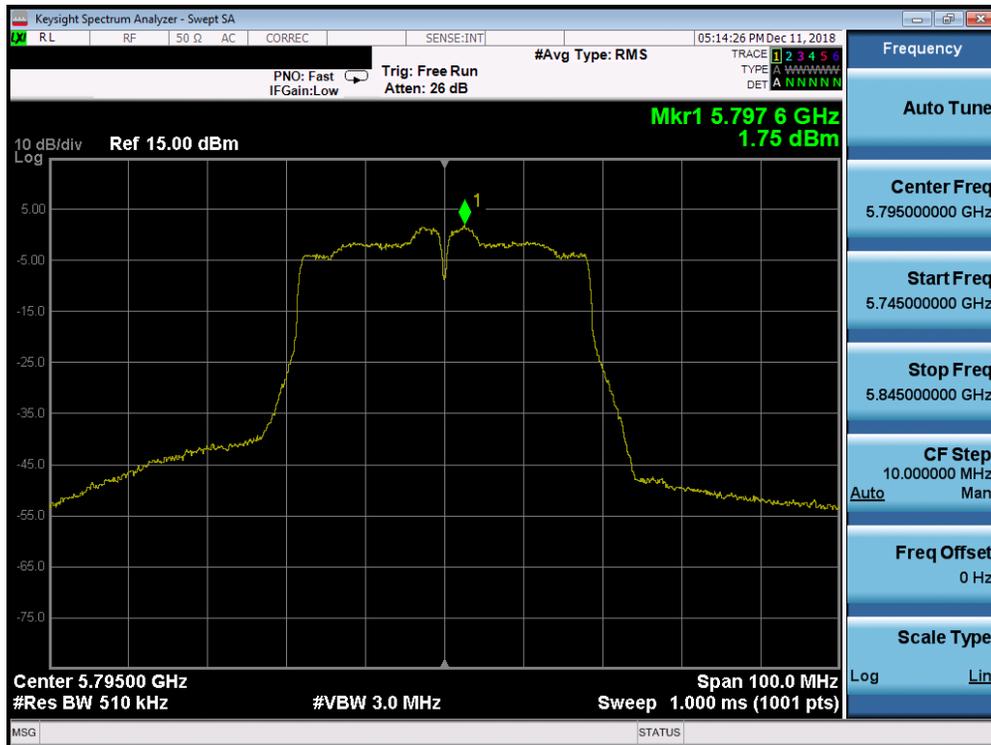


Plot 7-153. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 165)

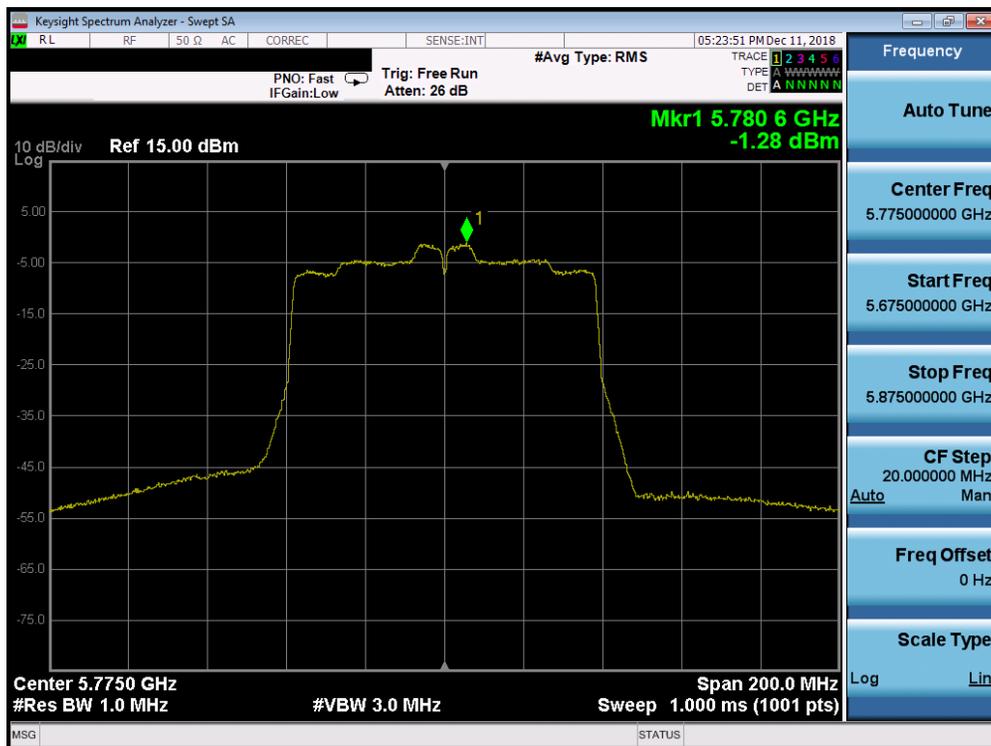


Plot 7-154. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 3) – Ch. 151)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset		Page 107 of 188



Plot 7-155. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 3) – Ch. 159)



Plot 7-156. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 3) – Ch. 155)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset		Page 108 of 188

7.6 Radiated Spurious Emission Measurements – Above 1GHz

§15.407(b) §15.205 §15.209; RSS-Gen [8.9]

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 ANSI C63.10-2013 and KDB 789033 D02 v02r01, 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 and Table 6 of RSS-Gen (8.10) must not exceed the limits shown in Table 7-18 per Section 15.209 and RSS-Gen (8.9).

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

Table 7-24. Radiated Limits

Test Procedures Used

ANSI C63.10-2013 – Sections 12.7.7.2, 12.7.6, 12.7.5
KDB 789033 D02 v02r01 – Section G

Test Settings

Average Measurements above 1GHz (Method AD)

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

FCC ID: ZNFG820UM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset	Page 109 of 188	

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.

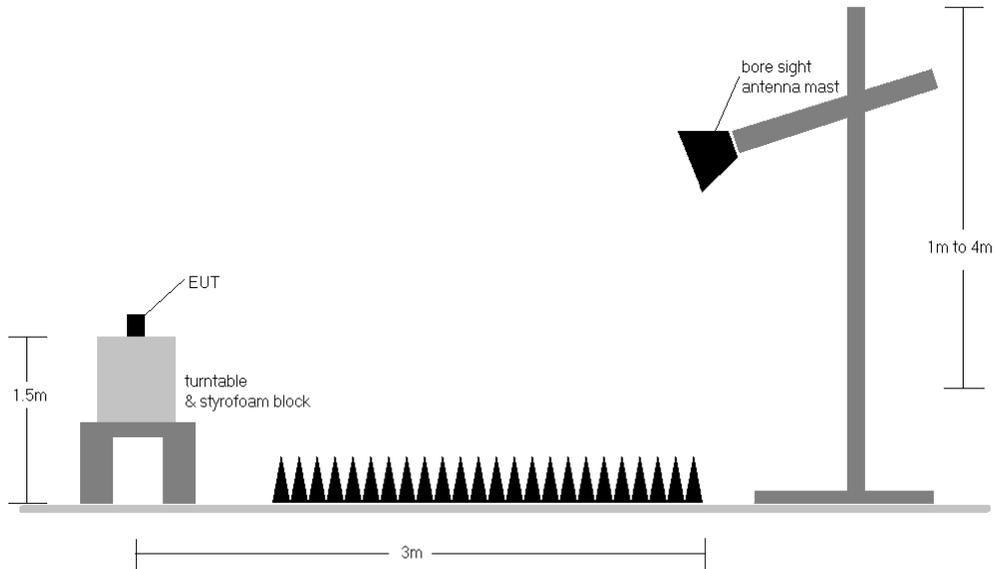


Figure 7-5. Test Instrument & Measurement Setup

FCC ID: ZNFG820UM	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset	Page 110 of 188

Test Notes

1. All emissions that lie in the restricted bands (denoted by a * next to the frequency) specified in §15.205 and Section 8.10 of RSS-Gen are below the limit shown in Table 7-30.
2. All spurious emissions lying in restricted bands specified in §15.205 and Section 8.10 of RSS-Gen are below the limit shown in Table 7-30. 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.
3. The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
4. This unit was tested with its standard battery.
5. 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.
6. 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.
7. 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.
8. The "-" shown in the following RSE tables are used to denote a noise floor measurement.

Sample Calculations

Determining Spurious Emissions Levels

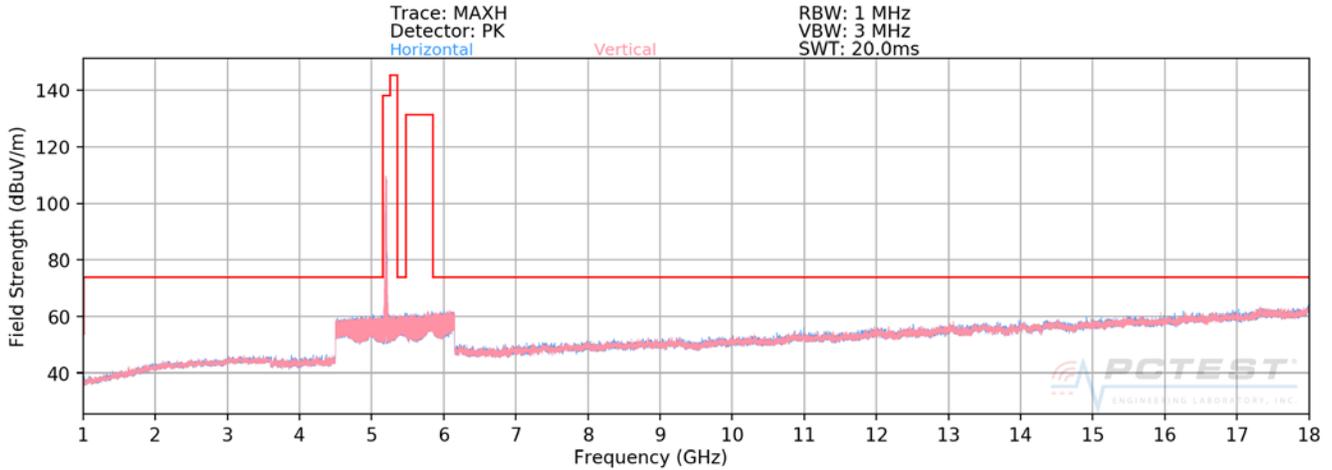
- Field Strength Level $_{[dB_{\mu V/m}]} = \text{Analyzer Level }_{[dBm]} + 107 + \text{AFCL }_{[dB/m]}$
- $\text{AFCL }_{[dB/m]} = \text{Antenna Factor }_{[dB/m]} + \text{Cable Loss }_{[dB]}$
- $\text{Margin }_{[dB]} = \text{Field Strength Level }_{[dB_{\mu V/m}]} - \text{Limit }_{[dB_{\mu V/m}]}$

Radiated Band Edge Measurement Offset

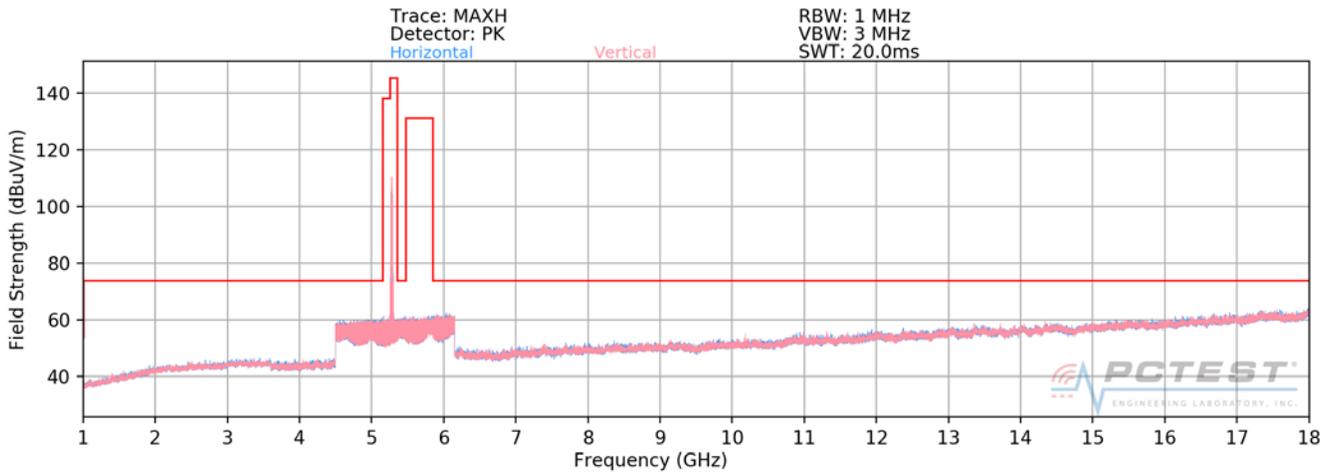
- The amplitude offset shown in the radiated restricted band edge plots in Section Radiated Spurious Emission Measurements – Above 1GHz was calculated using the formula:
 $\text{Offset (dB)} = (\text{Antenna Factor} + \text{Cable Loss} + \text{Attenuator}) - \text{Preamplifier Gain}$

FCC ID: ZNFG820UM	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset	Page 111 of 188

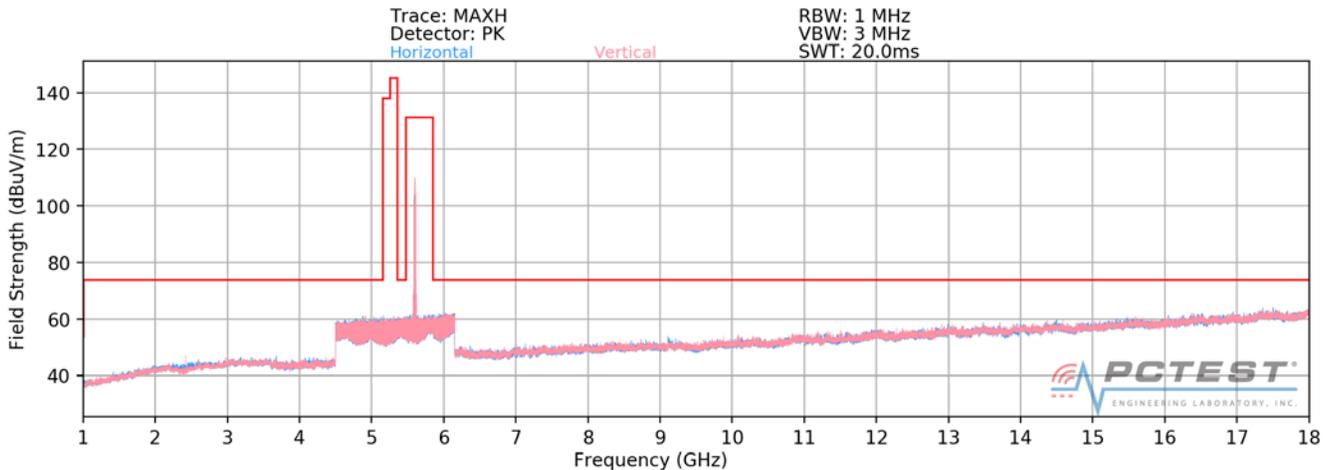
7.6.1 SISO Antenna-1 Radiated Spurious Emission Measurements



Plot 7-157. Radiated Spurious Plot above 1GHz (802.11a – U1 Ch. 40)

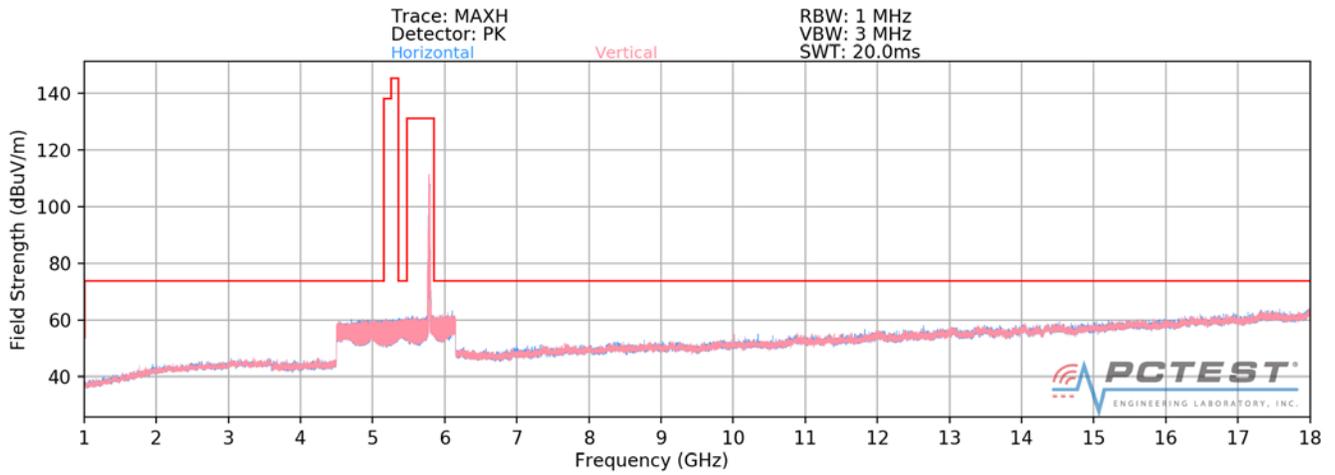


Plot 7-158. Radiated Spurious Plot above 1GHz (802.11a – U2A Ch. 56)



Plot 7-159. Radiated Spurious Plot above 1GHz (802.11a – U2C Ch. 120)

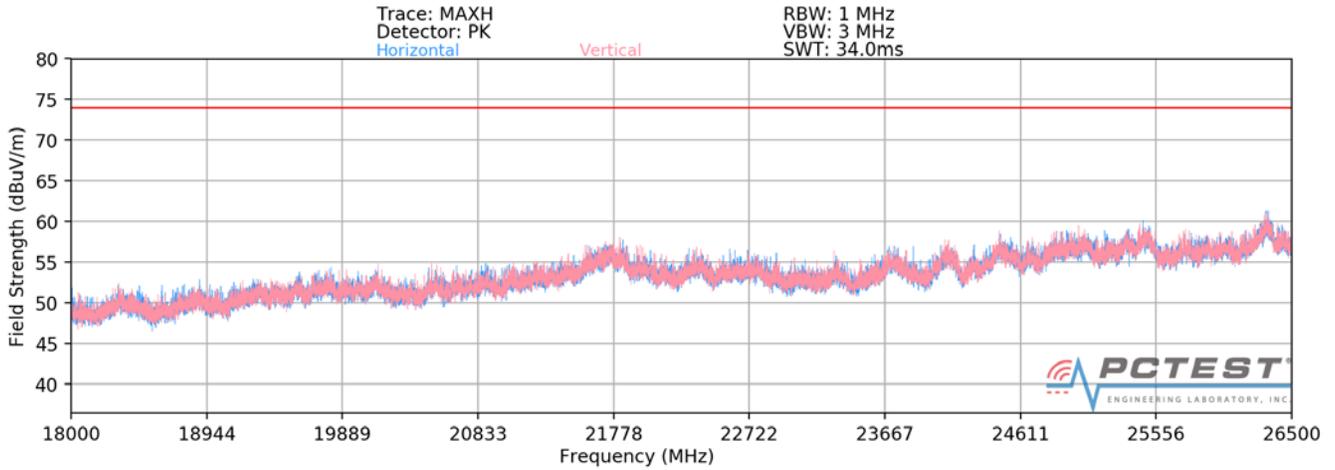
FCC ID: ZNFG820UM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset		Page 112 of 188



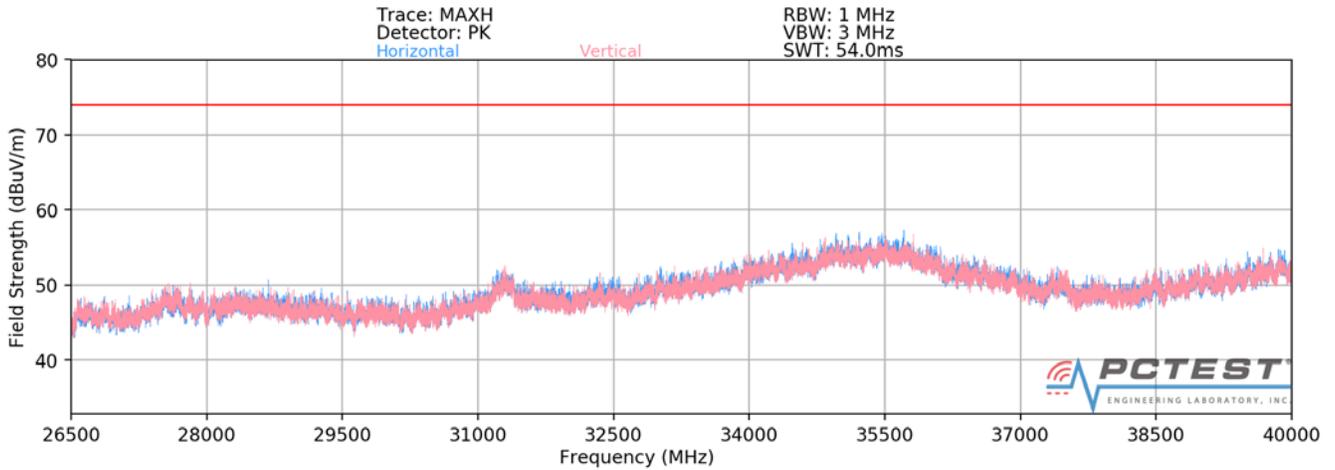
Plot 7-160. Radiated Spurious Plot above 1GHz (802.11a – U3 Ch. 157)

FCC ID: ZNFG820UM	 MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset	Page 113 of 188	

Radiated Spurious Emissions Measurements (Above 18GHz)



Plot 7-161. Radiated Spurious Plot 18GHz - 26.5GHz (802.11a)



Plot 7-162. Radiated Spurious Plot 26.5GHz - 40GHz (802.11a)

FCC ID: ZNFG820UM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset		Page 114 of 188

Radiated Spurious Emission Measurements

§15.407(b) §15.205 & §15.209; RSS-Gen [8.9]

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
10360.00	Peak	H	-	-	-69.42	12.97	0.00	50.55	68.20	-17.65
* 15540.00	Average	H	-	-	-82.15	15.88	0.00	40.73	53.98	-13.25
* 15540.00	Peak	H	-	-	-70.53	15.88	0.00	52.35	73.98	-21.63
* 20720.00	Average	V	-	-	-77.50	7.38	-9.54	27.34	53.98	-26.64
* 20720.00	Peak	V	-	-	-66.52	7.38	-9.54	38.32	73.98	-35.66
25900.00	Peak	V	-	-	-65.01	9.85	-9.54	42.30	68.20	-25.90

Table 7-25. Radiated Measurements ANT1

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
10400.00	Peak	H	-	-	-68.79	12.44	0.00	50.65	68.20	-17.55
* 15600.00	Average	H	-	-	-82.15	15.60	0.00	40.45	53.98	-13.53
* 15600.00	Peak	H	-	-	-70.77	15.60	0.00	51.83	73.98	-22.15
* 20800.00	Average	V	-	-	-77.51	7.85	-9.54	27.79	53.98	-26.18
* 20800.00	Peak	V	-	-	-67.07	7.85	-9.54	38.23	73.98	-35.74
26000.00	Peak	V	-	-	-65.58	10.44	-9.54	42.31	68.20	-25.89

Table 7-26. Radiated Measurements ANT1

FCC ID: ZNFG820UM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset		Page 115 of 188

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
10480.00	Peak	H	-	-	-69.44	12.95	0.00	50.51	68.20	-17.69
* 15720.00	Average	H	-	-	-82.20	16.00	0.00	40.80	53.98	-13.18
* 15720.00	Peak	H	-	-	-70.66	16.00	0.00	52.34	73.98	-21.64
* 20960.00	Average	V	-	-	-77.58	7.75	-9.54	27.63	53.98	-26.35
* 20960.00	Peak	V	-	-	-66.29	7.75	-9.54	38.92	73.98	-35.06
26200.00	Peak	V	-	-	-65.34	10.26	-9.54	42.38	68.20	-25.82

Table 7-27. Radiated Measurements ANT1

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
10480.00	Peak	H	-	-	-69.31	12.95	0.00	50.64	68.20	-17.56
* 15720.00	Average	H	-	-	-82.21	16.00	0.00	40.79	53.98	-13.19
* 15720.00	Peak	H	-	-	-69.95	16.00	0.00	53.05	73.98	-20.93
* 20960.00	Average	V	-	-	-77.84	7.75	-9.54	27.37	53.98	-26.61
* 20960.00	Peak	V	-	-	-66.93	7.75	-9.54	38.28	73.98	-35.70
26200.00	Peak	V	-	-	-66.37	10.26	-9.54	41.35	68.20	-26.85

Table 7-28. Radiated Measurements with WCP

FCC ID: ZNFG820UM		MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset		Page 116 of 188	

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
10520.00	Peak	H	-	-	-69.15	13.43	0.00	51.28	68.20	-16.92
* 15780.00	Average	H	-	-	-82.25	15.72	0.00	40.47	53.98	-13.51
* 15780.00	Peak	H	-	-	-71.03	15.72	0.00	51.69	73.98	-22.29
* 21040.00	Average	V	-	-	-77.41	7.78	-9.54	27.83	53.98	-26.15
* 21040.00	Peak	V	-	-	-66.40	7.78	-9.54	38.84	73.98	-35.14
26300.00	Peak	V	-	-	-64.40	10.58	-9.54	43.64	68.20	-24.56

Table 7-29. Radiated Measurements ANT1

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
10560.00	Peak	H	-	-	-69.42	13.44	0.00	51.02	68.20	-17.18
* 15840.00	Average	H	-	-	-81.85	15.30	0.00	40.45	53.98	-13.53
* 15840.00	Peak	H	-	-	-70.40	15.30	0.00	51.90	73.98	-22.08
* 21120.00	Average	V	-	-	-77.36	7.72	-9.54	27.82	53.98	-26.16
* 21120.00	Peak	V	-	-	-66.11	7.72	-9.54	39.07	73.98	-34.91
26400.00	Peak	V	-	-	-64.63	10.13	-9.54	42.96	68.20	-25.24

Table 7-30. Radiated Measurements ANT1

FCC ID: ZNFG820UM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset	Page 117 of 188	

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 10640.00	Average	H	-	-	-80.73	13.14	0.00	39.41	53.98	-14.57
* 10640.00	Peak	H	-	-	-69.42	13.14	0.00	50.72	73.98	-23.26
* 15960.00	Average	H	-	-	-82.34	16.05	0.00	40.71	53.98	-13.27
* 15960.00	Peak	H	-	-	-70.90	16.05	0.00	52.15	73.98	-21.83
* 21280.00	Average	V	-	-	-77.23	7.97	-9.54	28.20	53.98	-25.78
* 21280.00	Peak	V	-	-	-65.93	7.97	-9.54	39.50	73.98	-34.48
26600.00	Peak	V	-	-	-49.66	-8.10	-9.54	39.70	68.20	-28.50

Table 7-31. Radiated Measurements ANT1

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
10560.00	Peak	H	-	-	-68.74	13.14	0.00	51.40	68.20	-16.80
* 15840.00	Average	H	-	-	-82.60	16.05	0.00	40.45	53.98	-13.53
* 15840.00	Peak	H	-	-	-70.82	16.05	0.00	52.23	73.98	-21.75
* 21120.00	Average	V	-	-	-77.43	7.72	-9.54	27.75	53.98	-26.23
* 21120.00	Peak	V	-	-	-66.80	7.72	-9.54	38.38	73.98	-35.60
26400.00	Peak	V	-	-	-65.79	10.13	-9.54	41.80	68.20	-26.40

Table 7-32. Radiated Measurements with WCP

FCC ID: ZNFG820UM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset	Page 118 of 188	

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 11000.00	Average	H	-	-	-81.18	13.50	0.00	39.32	53.98	-14.66
* 11000.00	Peak	H	-	-	-68.93	13.50	0.00	51.57	73.98	-22.41
16500.00	Peak	H	-	-	-70.63	16.35	0.00	52.72	68.20	-15.48
22000.00	Peak	V	-	-	-66.67	8.71	-9.54	39.50	68.20	-28.70
27500.00	Peak	V	-	-	-48.06	-9.42	-9.54	39.98	68.20	-28.22

Table 7-33. Radiated Measurements ANT1

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

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	-	-	-81.26	13.26	0.00	39.00	53.98	-14.98
11160.00	Peak	H	-	-	-69.79	13.26	0.00	50.47	73.98	-23.51
16740.00	Peak	H	-	-	-69.92	17.87	0.00	54.95	68.20	-13.25
22320.00	Average	V	-	-	-77.42	9.46	-9.54	29.50	53.98	-24.48
22320.00	Peak	V	-	-	-66.33	9.46	-9.54	40.59	73.98	-33.39
27900.00	Peak	V	-	-	-48.37	-8.80	-9.54	40.28	68.20	-27.92

Table 7-34. Radiated Measurements ANT1

FCC ID: ZNFG820UM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset	Page 119 of 188	

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
11440.00	Average	H	-	-	-81.60	15.19	0.00	40.59	53.98	-13.39
11440.00	Peak	H	-	-	-69.10	15.19	0.00	53.09	73.98	-20.89
17160.00	Peak	H	-	-	-69.87	19.08	0.00	56.21	68.20	-11.99
22880.00	Average	V	-	-	-77.92	8.86	-9.54	28.40	53.98	-25.58
22880.00	Peak	V	-	-	-65.92	8.86	-9.54	40.40	73.98	-33.58
28600.00	Peak	V	-	-	-48.20	-9.13	-9.54	40.13	68.20	-28.07

Table 7-35. Radiated Measurements ANT1

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 11440.00	Average	H	-	-	-81.69	15.19	0.00	40.50	53.98	-13.48
* 11440.00	Peak	H	-	-	-69.70	15.19	0.00	52.49	73.98	-21.49
17160.00	Peak	H	-	-	-70.41	19.08	0.00	55.67	68.20	-12.53
* 22880.00	Average	H	-	-	-71.54	18.60	-9.54	44.51	53.98	-9.47
* 22880.00	Peak	H	-	-	-60.47	18.60	-9.54	55.58	73.98	-18.40
28600.00	Peak	H	-	-	-55.32	1.74	-9.54	43.87	68.20	-24.33

Table 7-36. Radiated Measurements with WCP

FCC ID: ZNFG820UM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset	Page 120 of 188	

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 11490.00	Average	H	-	-	-81.49	15.31	0.00	40.82	53.98	-13.16
* 11490.00	Peak	H	-	-	-69.89	15.31	0.00	52.42	73.98	-21.56
17235.00	Peak	H	-	-	-70.14	19.82	0.00	56.68	68.20	-11.52
* 22980.00	Average	V	-	-	-77.76	8.38	-9.54	28.08	53.98	-25.90
* 22980.00	Peak	V	-	-	-66.05	8.38	-9.54	39.79	73.98	-34.19
28725.00	Peak	V	-	-	-49.31	-8.87	-9.54	39.28	68.20	-28.92

Table 7-37. Radiated Measurements ANT1

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 11570.00	Average	H	-	-	-81.14	15.04	0.00	40.90	53.98	-13.08
* 11570.00	Peak	H	-	-	-68.66	15.04	0.00	53.38	73.98	-20.60
17355.00	Peak	H	-	-	-72.10	23.45	0.00	58.35	68.20	-9.85
23140.00	Peak	V	-	-	-67.16	8.78	-9.54	39.08	68.20	-29.12
28925.00	Peak	V	-	-	-49.31	-8.79	-9.54	39.36	68.20	-28.84

Table 7-38. Radiated Measurements ANT1

FCC ID: ZNFG820UM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset	Page 121 of 188	

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 11650.00	Average	H	-	-	-81.56	15.42	0.00	40.86	53.98	-13.12
* 11650.00	Peak	H	-	-	-69.97	15.42	0.00	52.45	73.98	-21.53
17475.00	Peak	H	-	-	-70.52	21.84	0.00	58.32	68.20	-9.88
23300.00	Peak	H	-	-	-66.28	9.23	-9.54	40.41	68.20	-27.79
29125.00	Peak	H	-	-	-48.56	-9.66	-9.54	39.24	68.20	-28.96

Table 7-39. Radiated Measurements ANT1

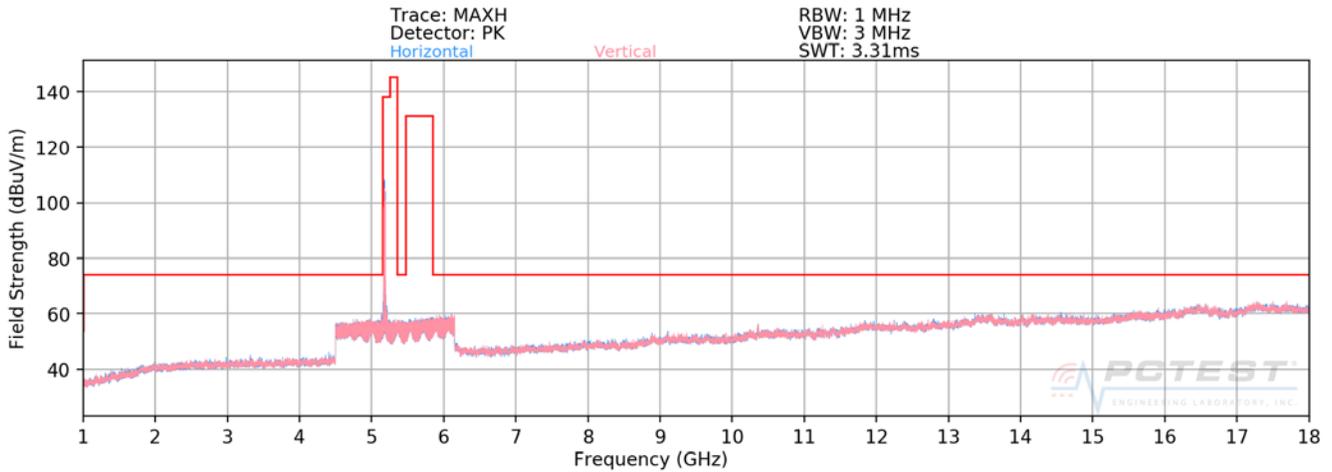
Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6Mbps
 Distance of Measurements: 1 & 3 Meters
 Operating Frequency: 5745MHz
 Channel: 149

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 11490.00	Average	H	-	-	-81.44	15.31	0.00	40.87	53.98	-13.11
* 11490.00	Peak	H	-	-	-69.36	15.31	0.00	52.95	73.98	-21.03
17235.00	Peak	H	-	-	-71.91	19.82	0.00	54.91	68.20	-13.29
22980.00	Average	V	-	-	-77.93	8.38	-9.54	27.91	53.98	-26.07
22980.00	Peak	V	-	-	-65.44	8.38	-9.54	40.40	73.98	-33.58
28725.00	Peak	V	-	-	-49.44	-8.87	-9.54	39.15	68.20	-29.05

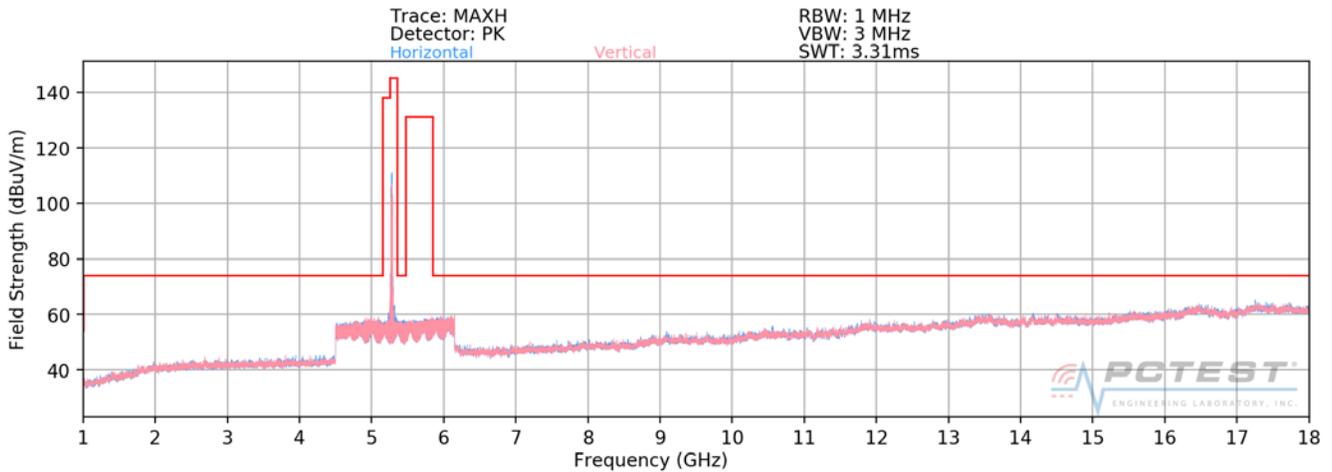
Table 7-40. Radiated Measurements with WCP

FCC ID: ZNFG820UM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset	Page 122 of 188	

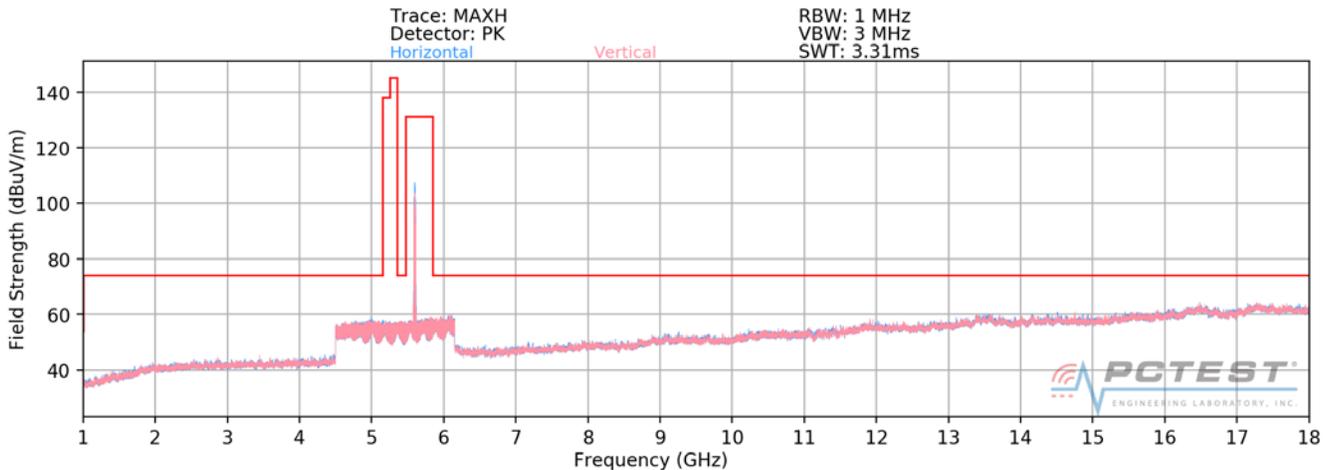
7.6.2 SISO Antenna-2 Radiated Spurious Emission Measurements



Plot 7-163. Radiated Spurious Plot above 1GHz (802.11a – U1 Ch. 40)

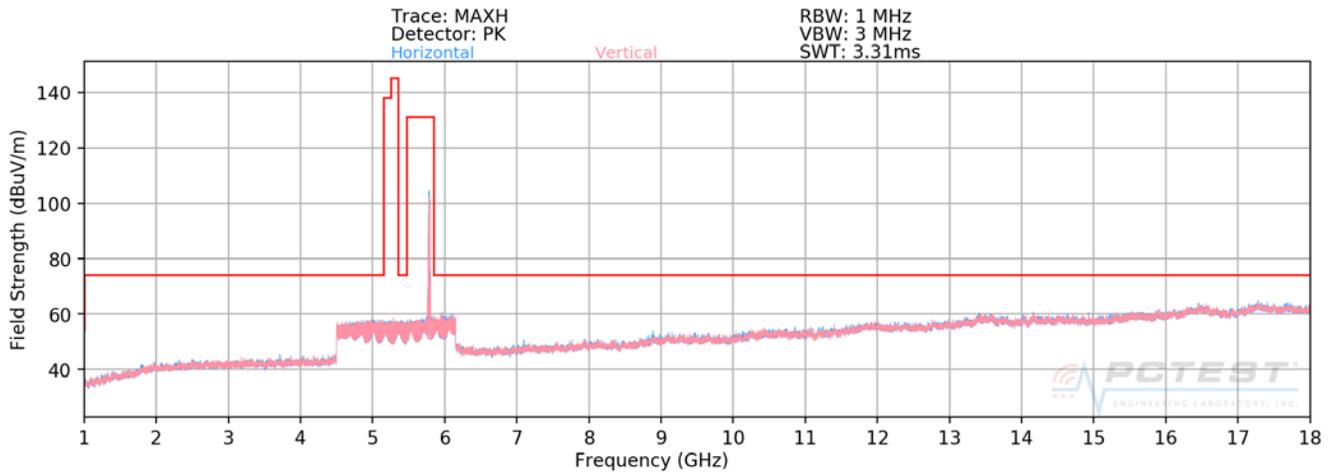


Plot 7-164. Radiated Spurious Plot above 1GHz (802.11a – U2A Ch. 56)



Plot 7-165. Radiated Spurious Plot above 1GHz (802.11a – U2C Ch. 120)

FCC ID: ZNFG820UM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset		Page 123 of 188



Plot 7-166. Radiated Spurious Plot above 1GHz (802.11a – U3 Ch. 157)

FCC ID: ZNFG820UM	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1811300215-06.ZNF	Test Dates: 12/3/2018 -1/4/2019	EUT Type: Portable Handset	Page 124 of 188