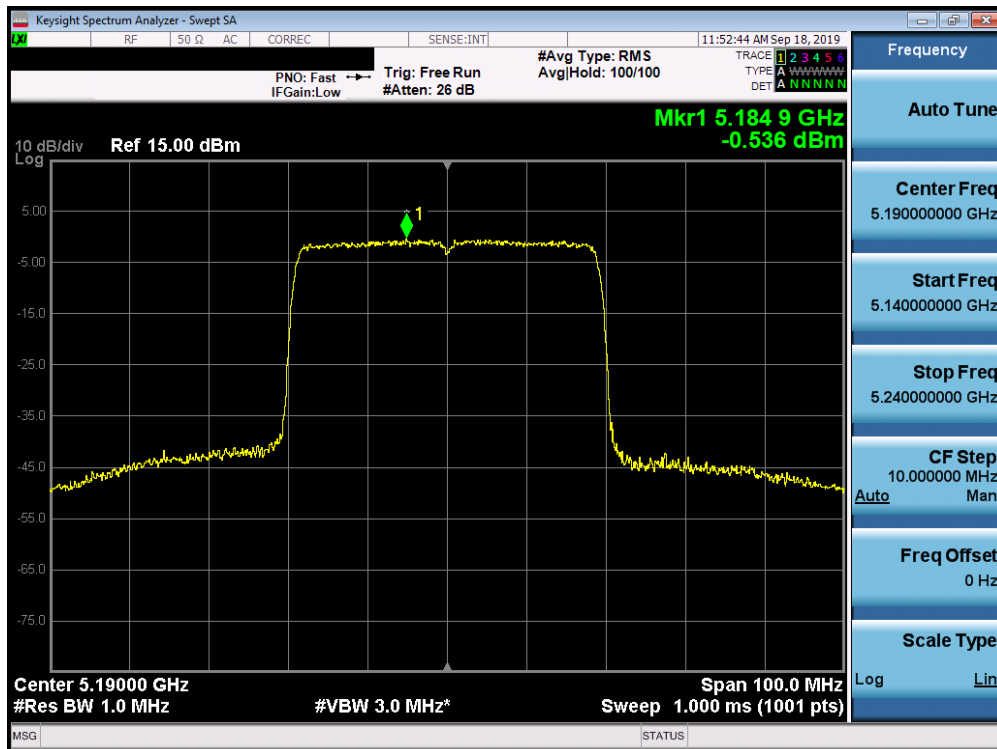
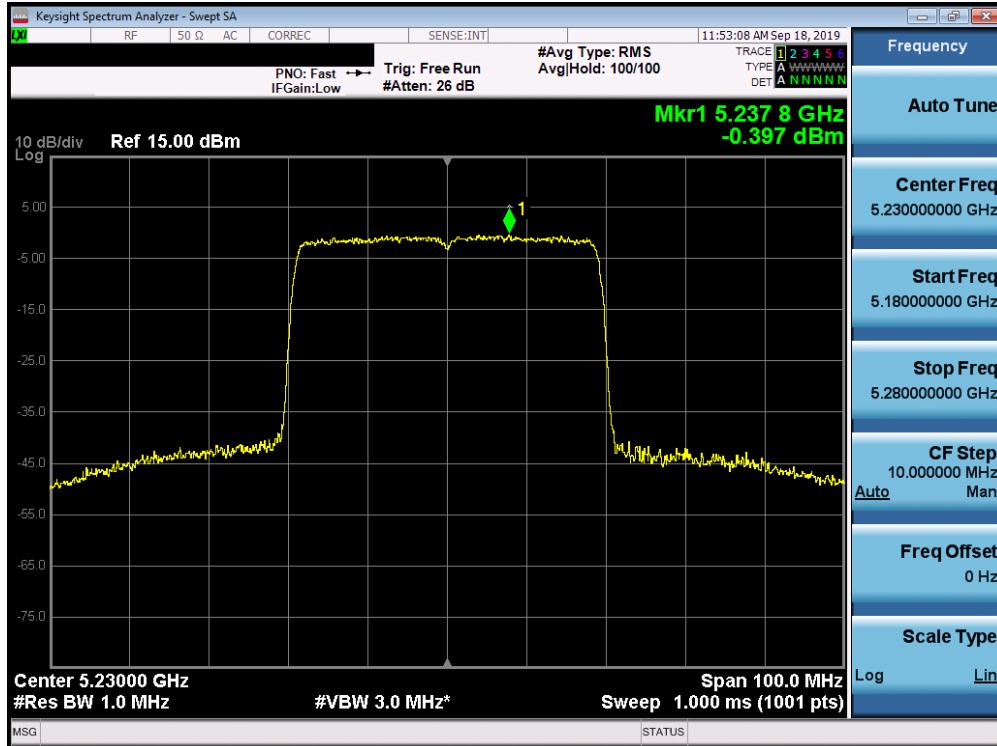


Plot 7-84. Power Spectral Density Plot SISO ANT1 (20MHz BW 802.11ax – Full Tones (UNII Band 1) – Ch. 48)

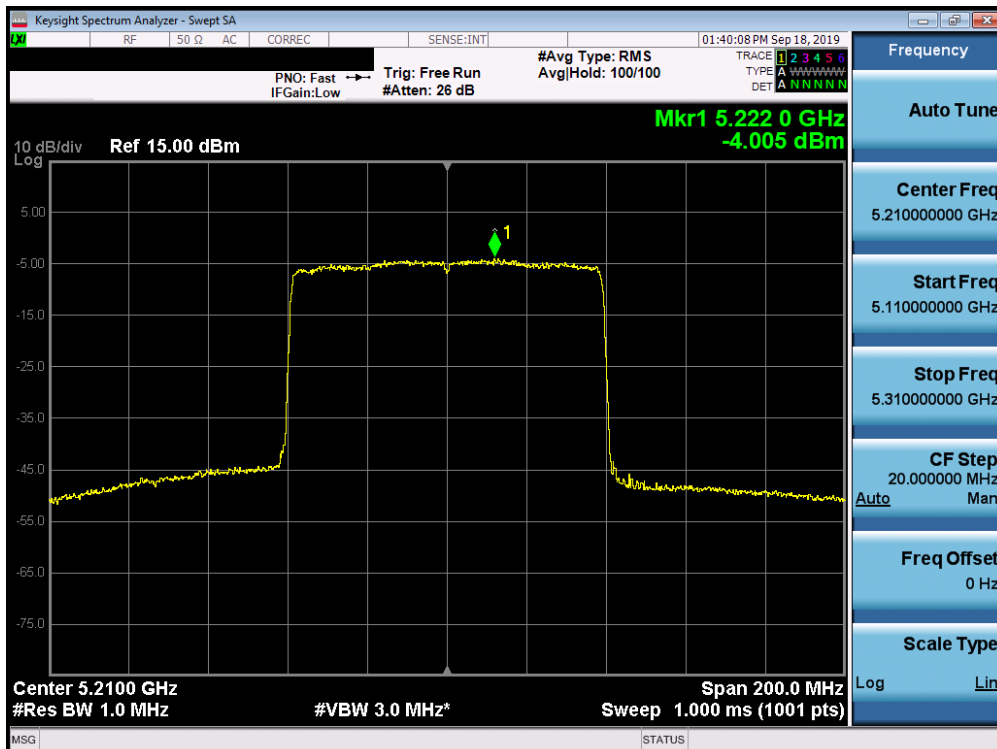


Plot 7-85. Power Spectral Density Plot SISO ANT1 (40MHz BW 802.11ax – Full Tones (UNII Band 1) – Ch. 38)

FCC ID: A3LSMN976U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset		Page 88 of 270

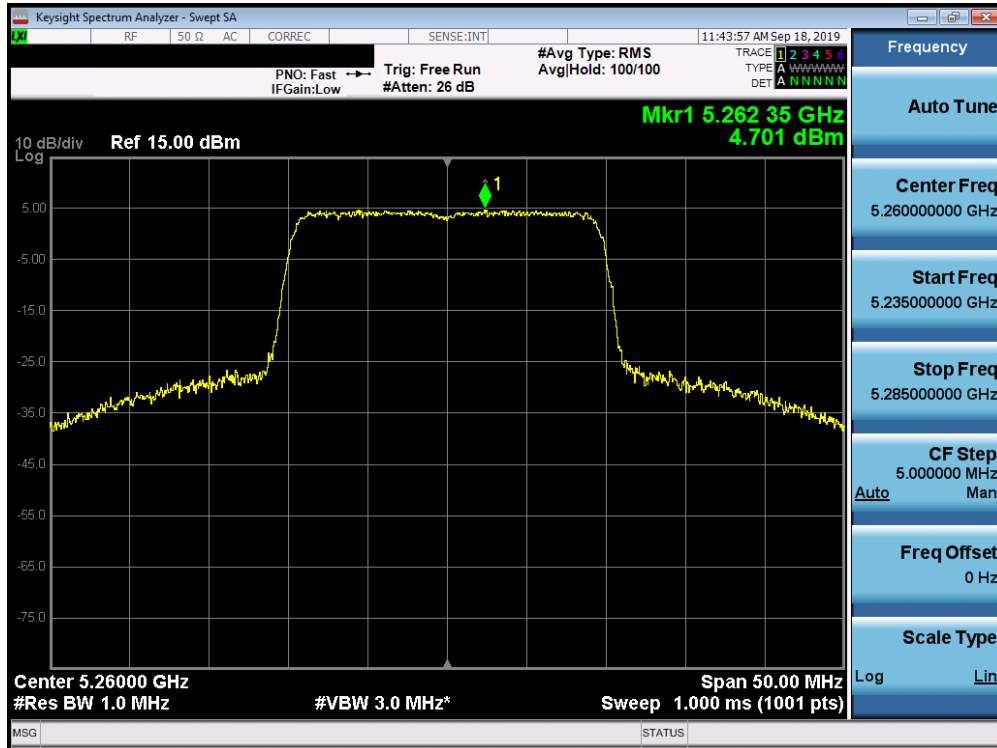


Plot 7-86. Power Spectral Density Plot SISO ANT1 (40MHz BW 802.11ax – Full Tones (UNII Band 1) – Ch. 46)

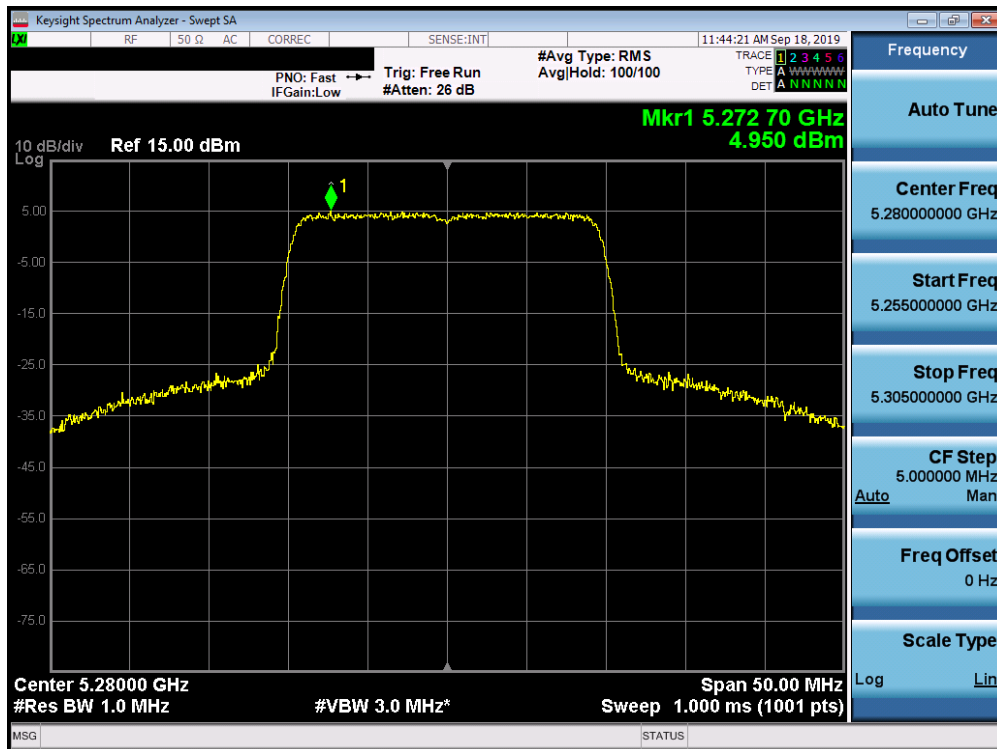


Plot 7-87. Power Spectral Density Plot SISO ANT1 (80MHz BW 802.11ax – Full Tones (UNII Band 1) – Ch. 42)

FCC ID: A3LSMN976U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset		Page 89 of 270

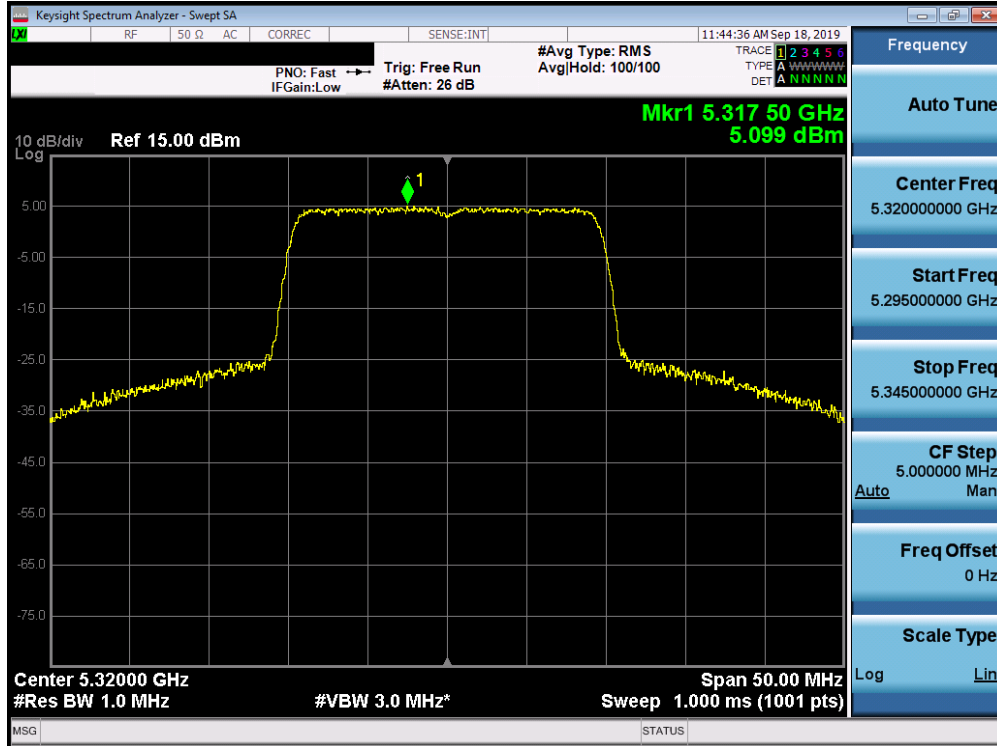


Plot 7-88. Power Spectral Density Plot SISO ANT1 (20MHz BW 802.11ax – Full Tones (UNII Band 2A) – Ch. 52)

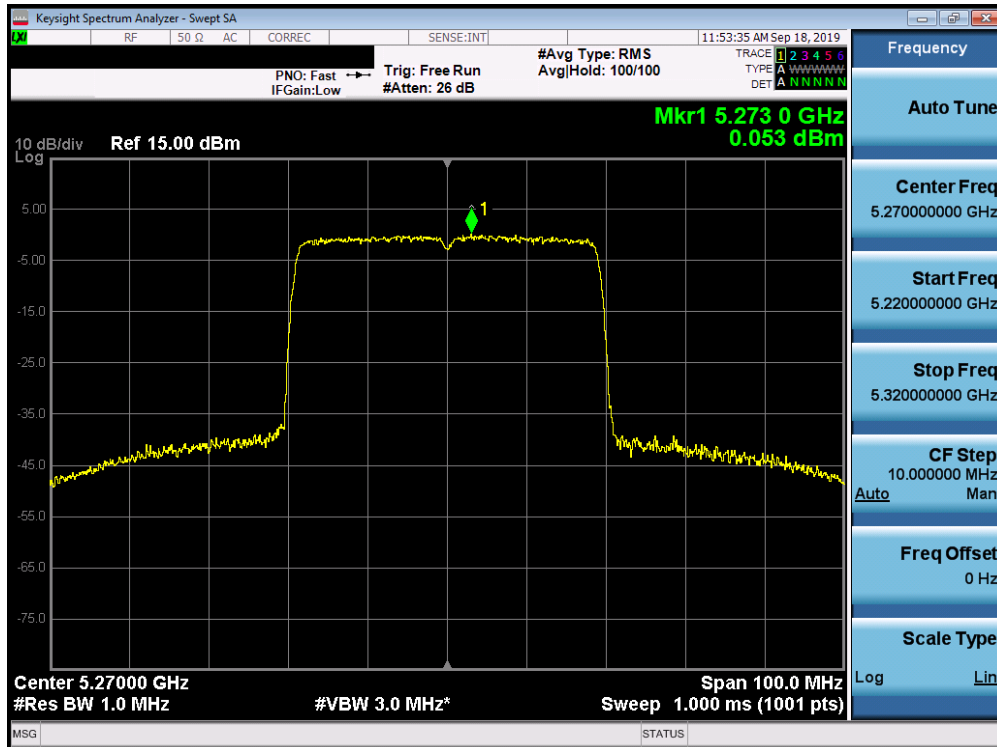


Plot 7-89. Power Spectral Density Plot SISO ANT1 (20MHz BW 802.11ax – Full Tones (UNII Band 2A) – Ch. 56)

FCC ID: A3LSMN976U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset		Page 90 of 270

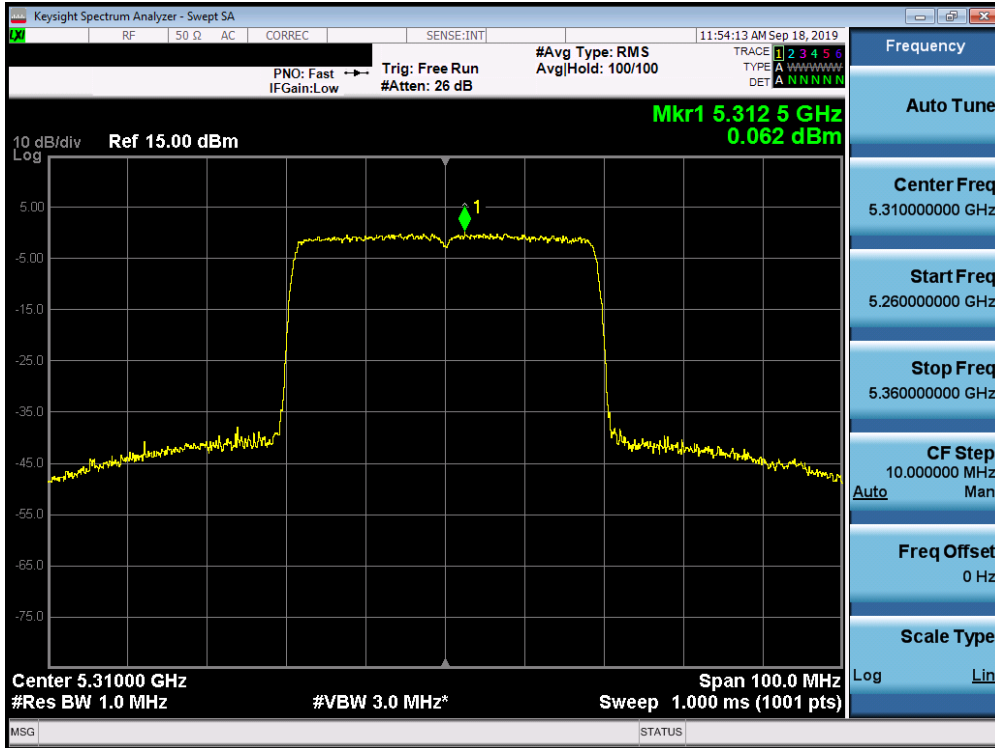


Plot 7-90. Power Spectral Density Plot SISO ANT1 (20MHz BW 802.11ax – Full Tones (UNII Band 2A) – Ch. 64)

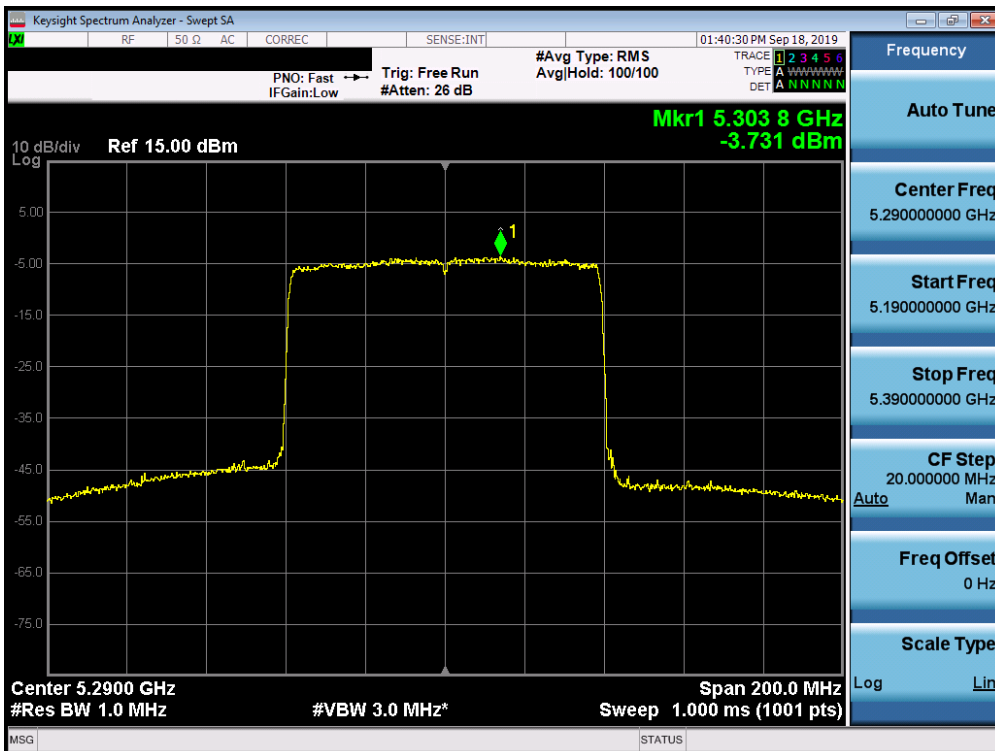


Plot 7-91. Power Spectral Density Plot SISO ANT1 (40MHz BW 802.11ax – Full Tones (UNII Band 2A) – Ch. 54)

FCC ID: A3LSMN976U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset		Page 91 of 270

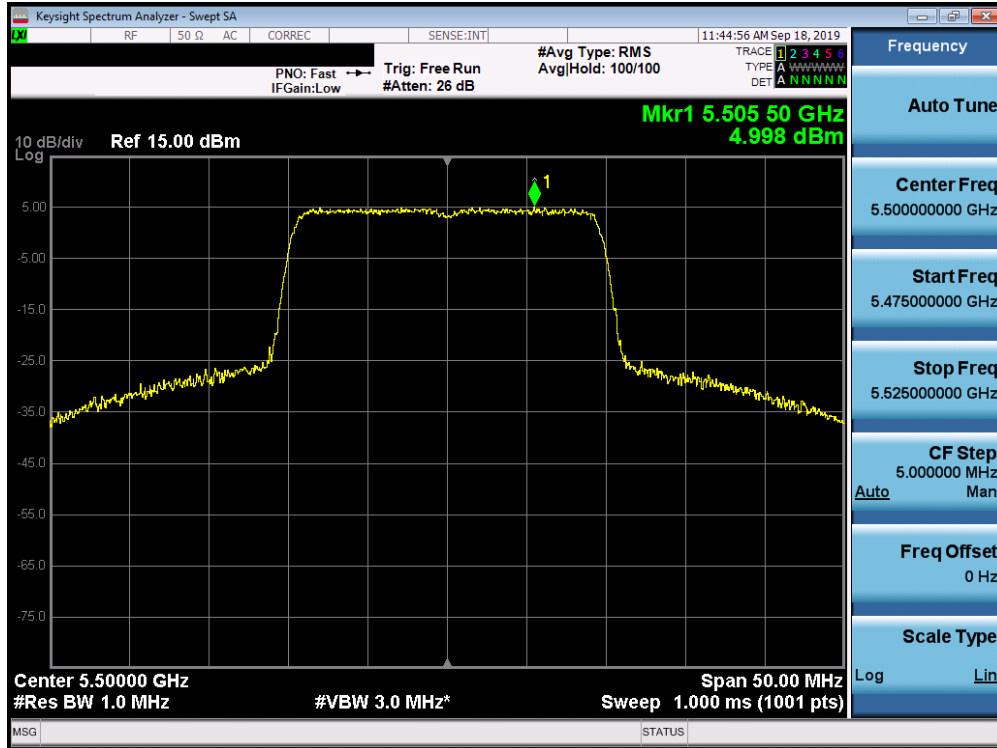


Plot 7-92. Power Spectral Density Plot SISO ANT1 (40MHz BW 802.11ax – Full Tones (UNII Band 2A) – Ch. 62)

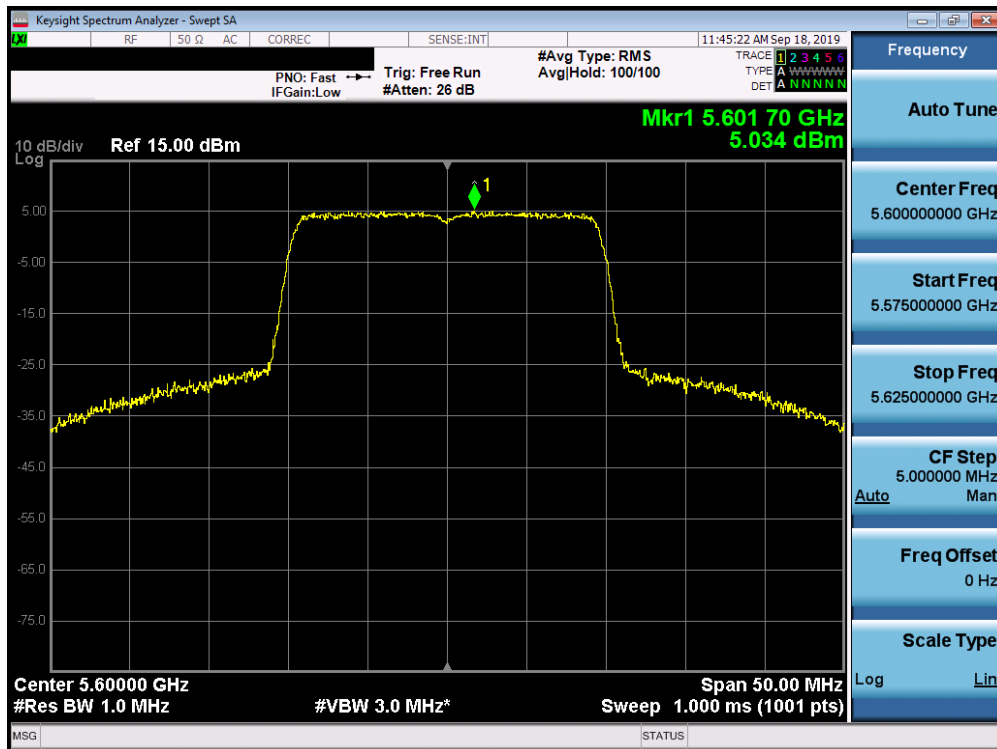


Plot 7-93. Power Spectral Density Plot SISO ANT1 (80MHz BW 802.11ax – Full Tones (UNII Band 2A) – Ch. 58)

FCC ID: A3LSMN976U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset		Page 92 of 270

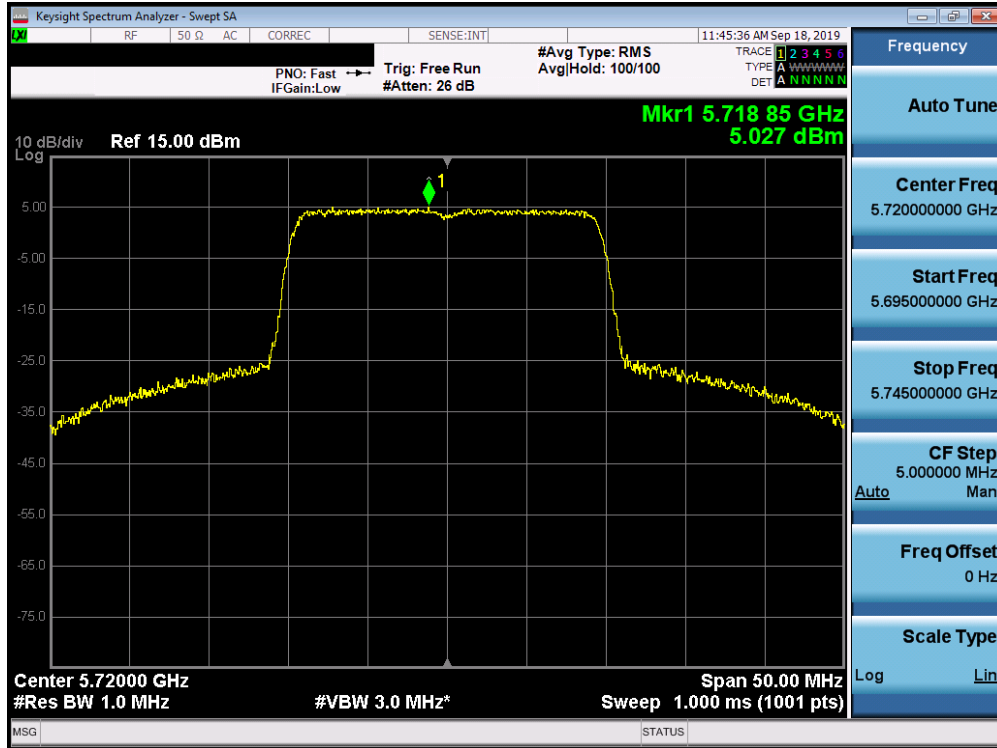


Plot 7-94. Power Spectral Density Plot SISO ANT1 (20MHz BW 802.11ax – Full Tones (UNII Band 2C) – Ch. 100)

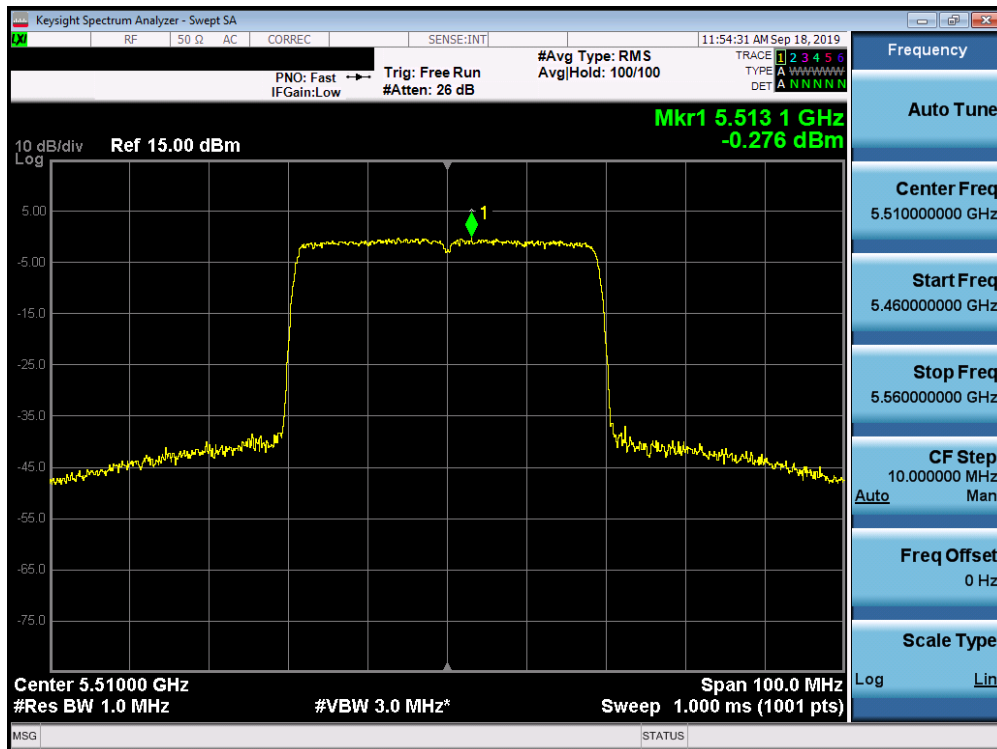


Plot 7-95. Power Spectral Density Plot SISO ANT1 (20MHz BW 802.11ax – Full Tones (UNII Band 2C) – Ch. 120)

FCC ID: A3LSMN976U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset		Page 93 of 270

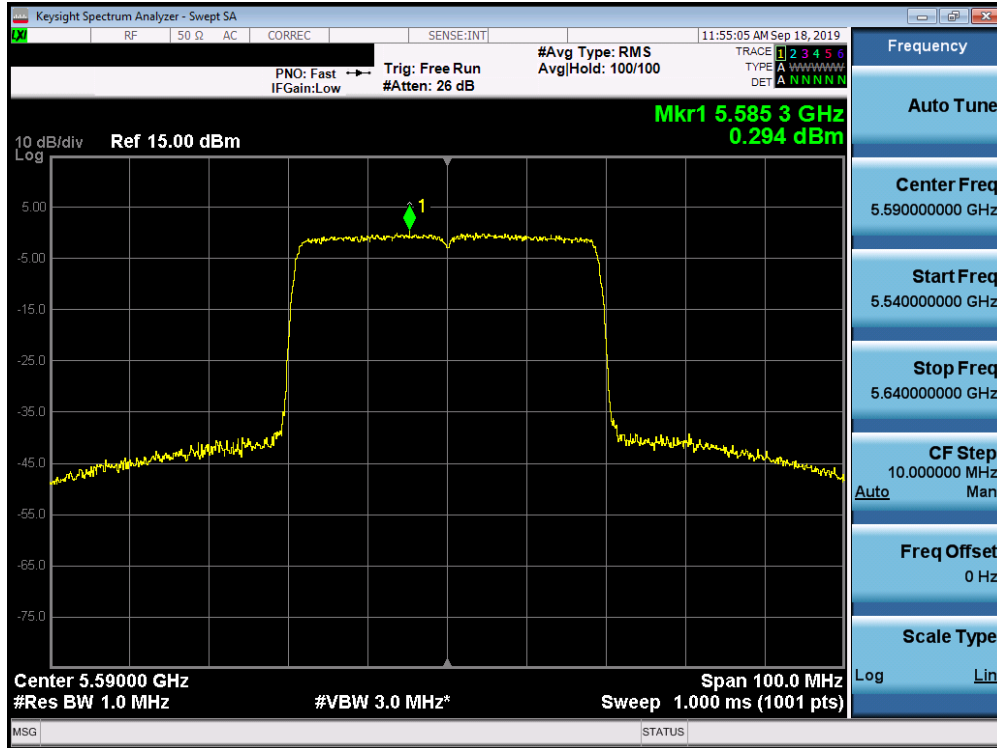


Plot 7-96. Power Spectral Density Plot SISO ANT1 (20MHz BW 802.11ax – Full Tones (UNII Band 2C) – Ch. 144)

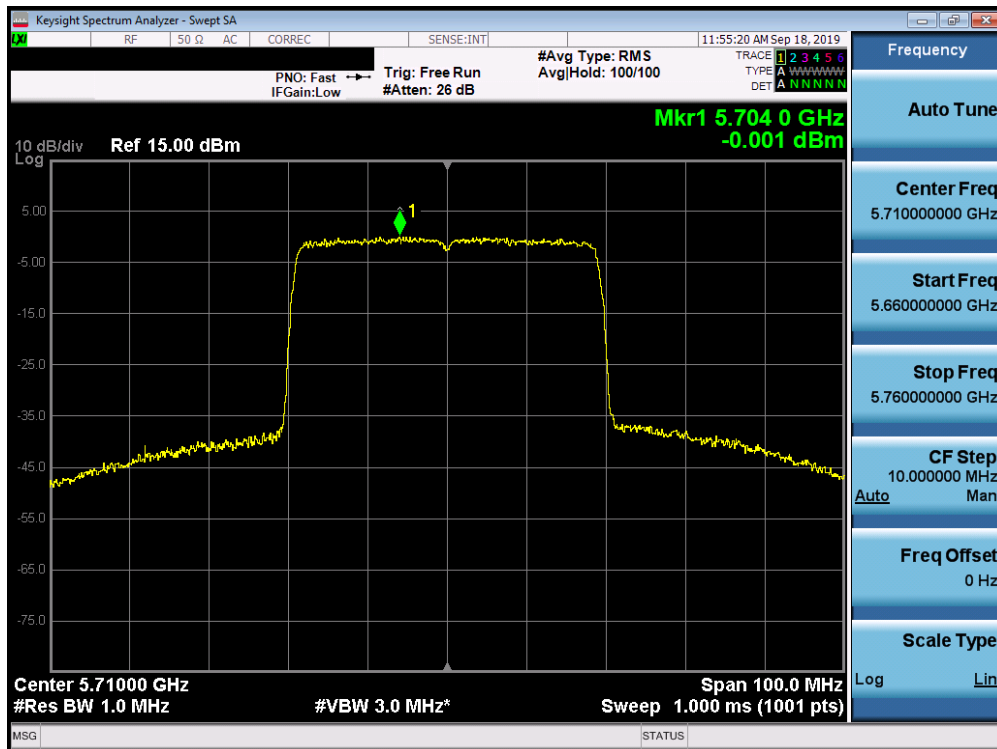


Plot 7-97. Power Spectral Density Plot SISO ANT1 (40MHz BW 802.11ax – Full Tones (UNII Band 2C) – Ch. 102)

FCC ID: A3LSMN976U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset		Page 94 of 270

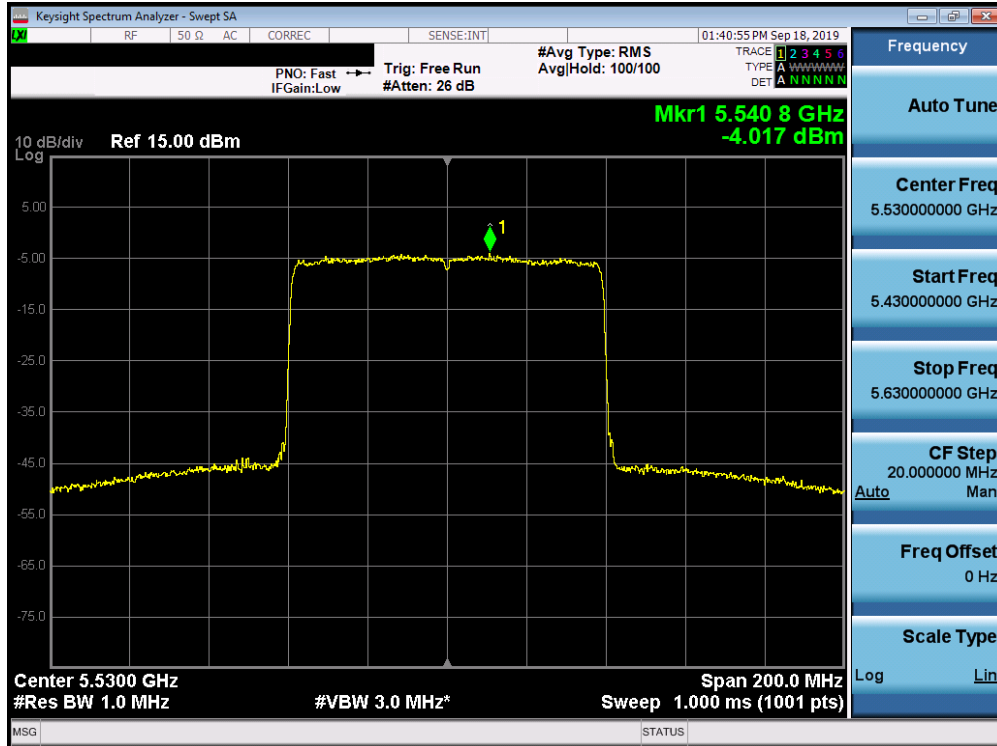


Plot 7-98. Power Spectral Density Plot SISO ANT1 (40MHz BW 802.11ax – Full Tones (UNII Band 2C) – Ch. 118)

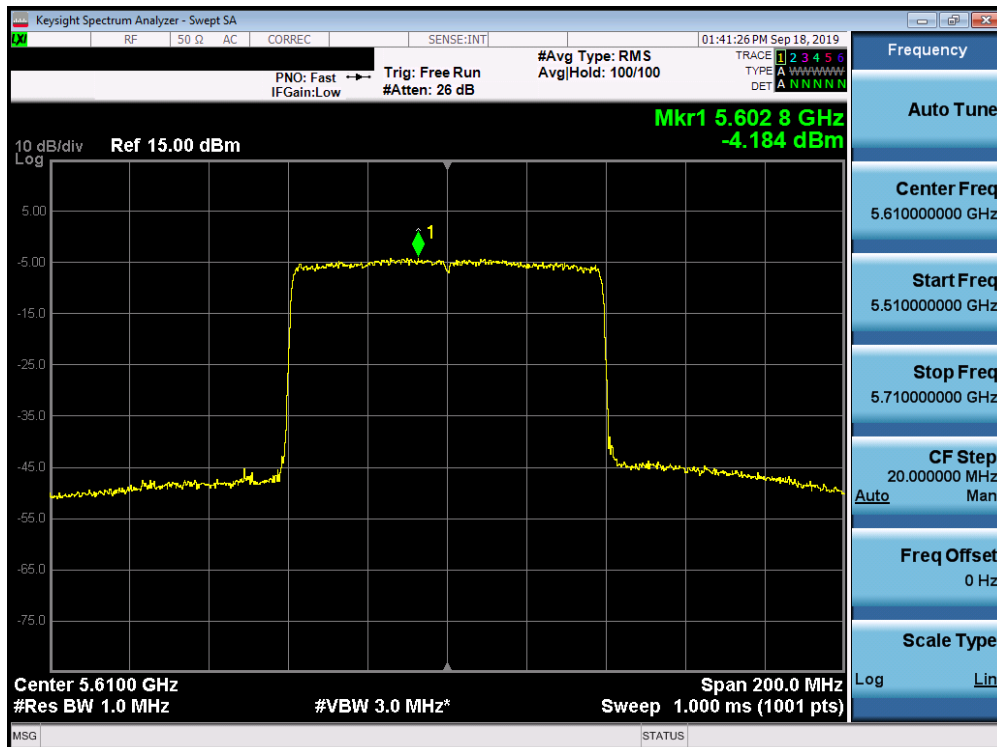


Plot 7-99. Power Spectral Density Plot SISO ANT1 (40MHz BW 802.11ax – Full Tones (UNII Band 2C) – Ch. 142)

FCC ID: A3LSMN976U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset		Page 95 of 270

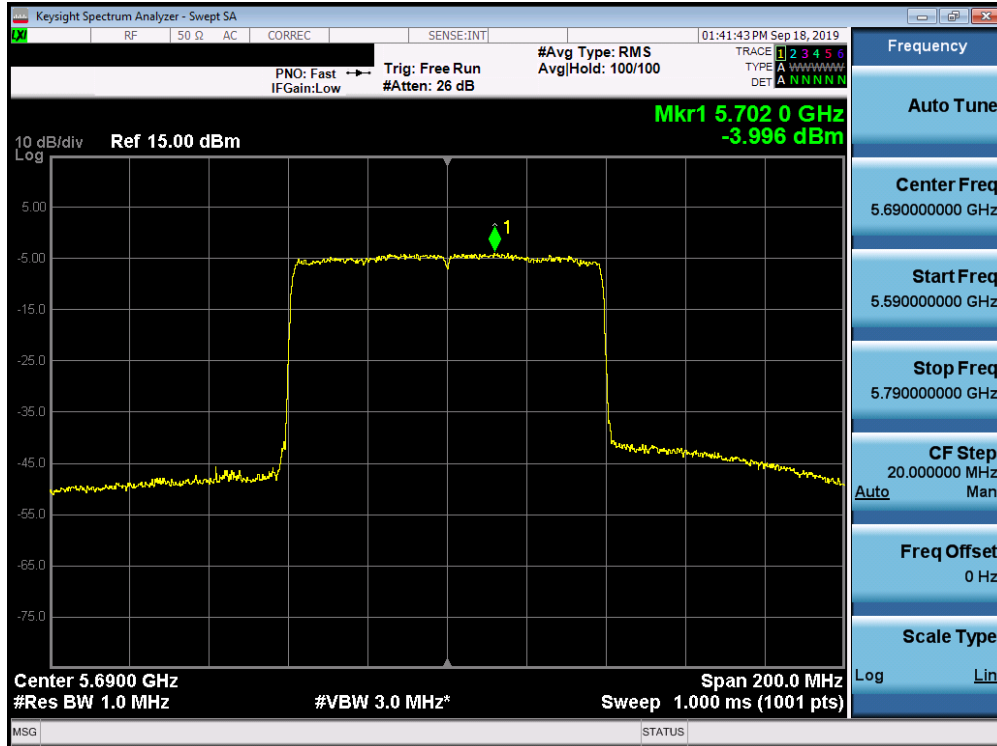


Plot 7-100. Power Spectral Density Plot SISO ANT1 (80MHz BW 802.11ax – Full Tones (UNII Band 2C) – Ch. 106)



Plot 7-101. Power Spectral Density Plot SISO ANT1 (80MHz BW 802.11ax – Full Tones (UNII Band 2C) – Ch. 122)

FCC ID: A3LSMN976U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset		Page 96 of 270



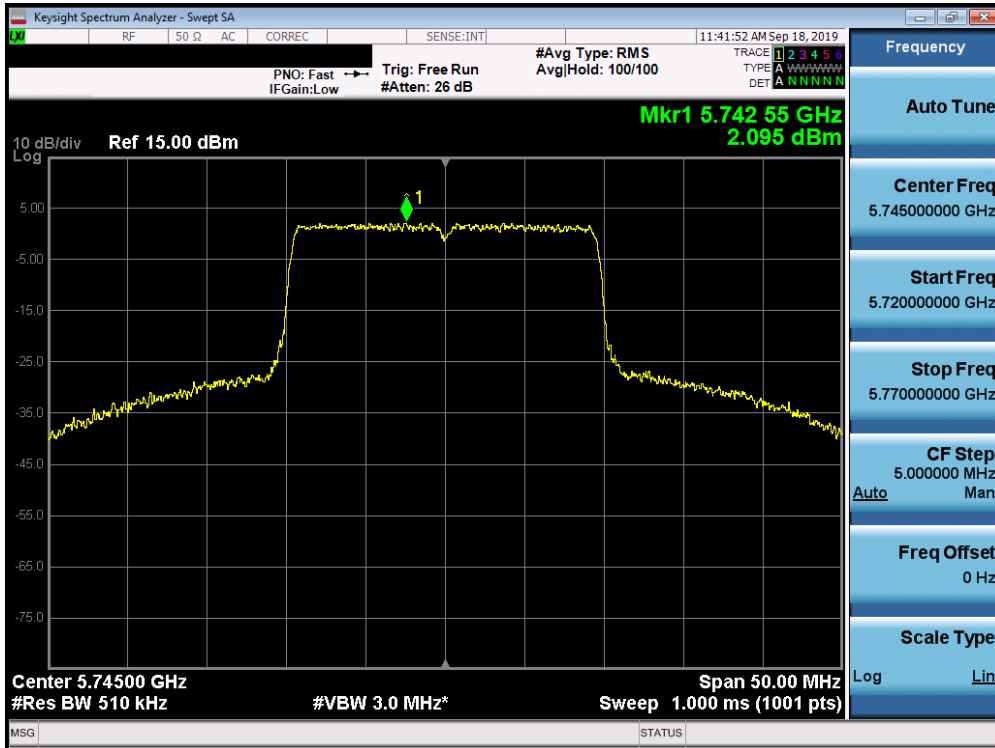
Plot 7-102. Power Spectral Density Plot SISO ANT1 (80MHz BW 802.11ax – Full Tones (UNII Band 2C) – Ch. 138)

FCC ID: A3LSMN976U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset		Page 97 of 270

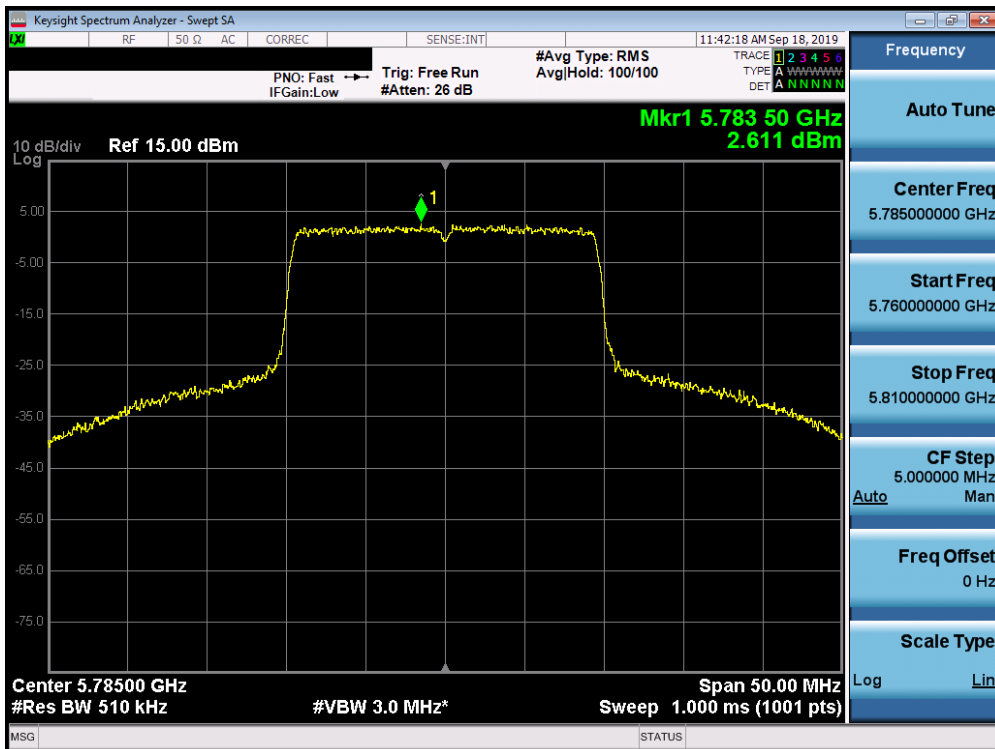
	Frequency [MHz]	Channel No.	802.11 Mode	Tones	Data Rate [Mbps]	Measured Power Density [dBm]	Max Permissible Power Density	Margin [dB]
Band 3	5745	149	ax (20MHz)	242T	MCS0	2.10	30.00	-27.91
	5785	157	ax (20MHz)	242T	MCS0	2.61	30.00	-27.39
	5825	165	ax (20MHz)	242T	MCS0	2.41	30.00	-27.59
	5755	151	ax (40MHz)	484T	MCS0	-2.85	30.00	-32.85
	5795	159	ax (40MHz)	484T	MCS0	-2.41	30.00	-32.41
	5775	155	ax (80MHz)	996T	MCS0	-6.16	30.00	-36.16

Table 7-54. Band 3 Conducted Power Spectral Density Measurements SISO ANT1 (Full Tones)

FCC ID: A3LSMN976U	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset	Page 98 of 270

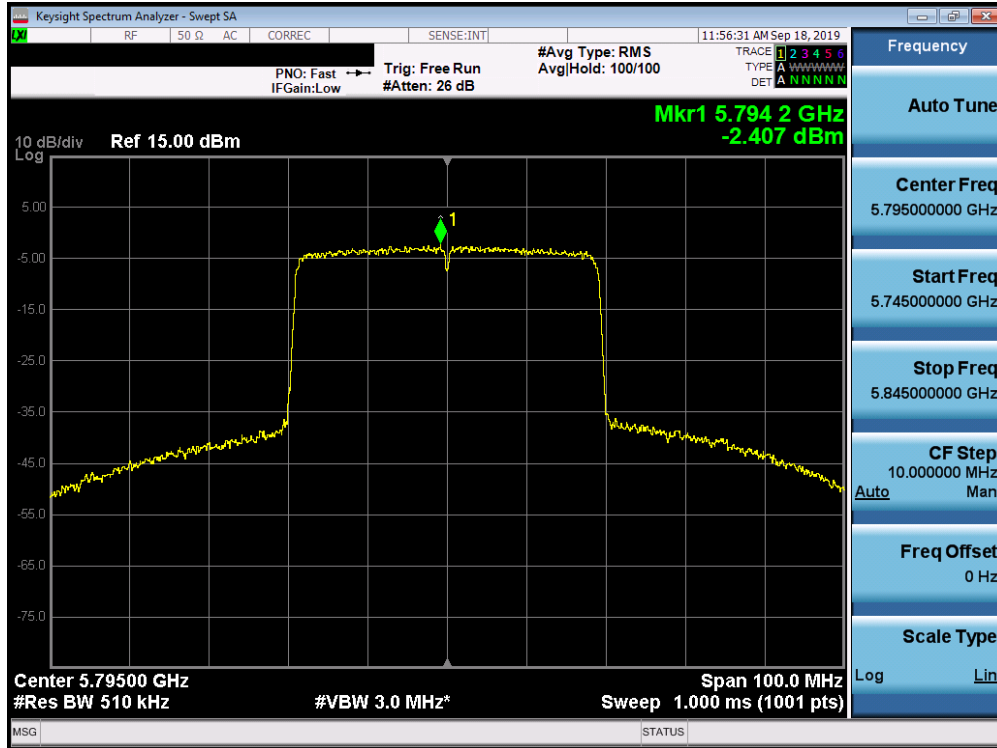


Plot 7-103. Power Spectral Density Plot SISO ANT1 (20MHz BW 802.11ax – Full Tones (UNII Band 3) – Ch. 149)

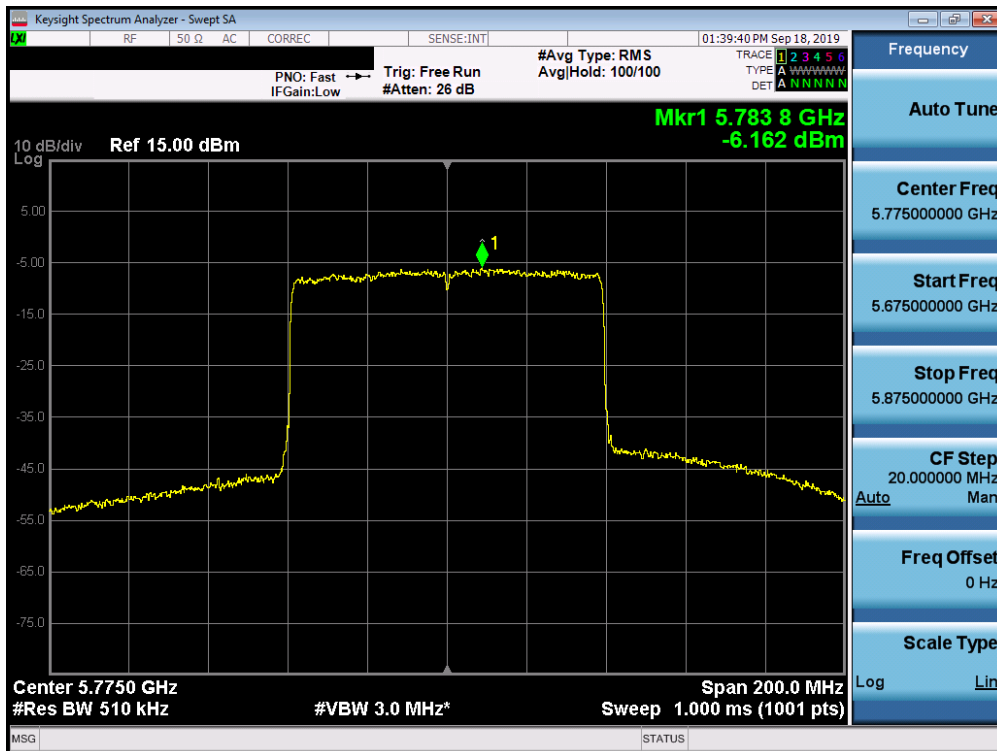


Plot 7-104. Power Spectral Density Plot SISO ANT1 (20MHz BW 802.11ax – Full Tones (UNII Band 3) – Ch. 157)

FCC ID: A3LSMN976U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset		Page 99 of 270



Plot 7-107. Power Spectral Density Plot SISO ANT1 (40MHz BW 802.11ax – Full Tones (UNII Band 3) – Ch. 159)



Plot 7-108. Power Spectral Density Plot SISO ANT1 (80MHz BW 802.11ax – Full Tones (UNII Band 3) – Ch. 155)

FCC ID: A3LSMN976U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset		Page 101 of 270

SISO Antenna-2 Power Spectral Density Measurements (26 Tones)

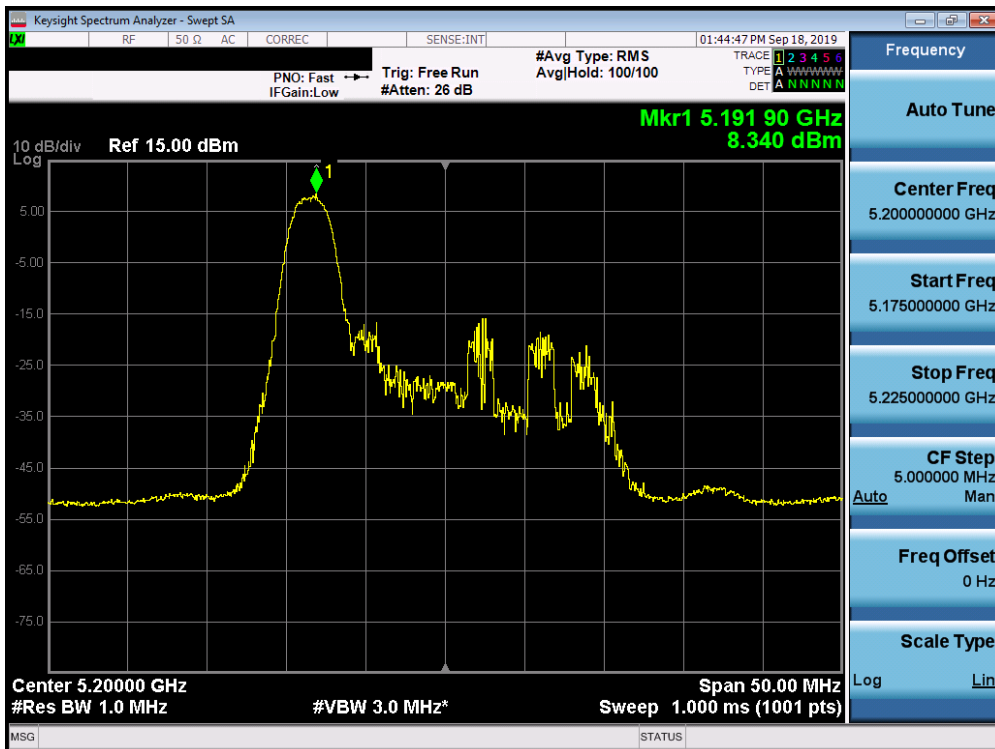
	Frequency [MHz]	Channel No.	802.11 Mode	Tones	Data Rate [Mbps]	Measured Power Density [dBm]	Max Power Density [dBm/MHz]	Margin [dB]
Band 1	5180	36	ax (20MHz)	26T	MCS0	8.14	11.0	-2.86
	5200	40	ax (20MHz)	26T	MCS0	8.34	11.0	-2.66
	5240	48	ax (20MHz)	26T	MCS0	8.37	11.0	-2.63
	5190	38	ax (40MHz)	26T	MCS0	8.56	11.0	-2.44
	5230	46	ax (40MHz)	26T	MCS0	8.24	11.0	-2.76
	5210	42	ax (80MHz)	26T	MCS0	7.94	11.0	-3.06
Band 2A	5260	52	ax (20MHz)	26T	MCS0	8.30	11.0	-2.70
	5280	56	ax (20MHz)	26T	MCS0	7.58	11.0	-3.42
	5320	64	ax (20MHz)	26T	MCS0	7.52	11.0	-3.48
	5270	54	ax (40MHz)	26T	MCS0	8.62	11.0	-2.38
	5310	62	ax (40MHz)	26T	MCS0	8.66	11.0	-2.34
	5290	58	ax (80MHz)	26T	MCS0	8.46	11.0	-2.54
Band 2C	5500	100	ax (20MHz)	26T	MCS0	8.03	11.0	-2.97
	5600	120	ax (20MHz)	26T	MCS0	8.72	11.0	-2.29
	5720	144	ax (20MHz)	26T	MCS0	8.36	11.0	-2.64
	5510	102	ax (40MHz)	26T	MCS0	8.91	11.0	-2.09
	5590	118	ax (40MHz)	26T	MCS0	8.55	11.0	-2.45
	5710	142	ax (40MHz)	26T	MCS0	8.81	11.0	-2.19
	5530	106	ax (80MHz)	26T	MCS0	7.94	11.0	-3.06
	5610	122	ax (80MHz)	26T	MCS0	8.51	11.0	-2.49
	5690	138	ax (80MHz)	26T	MCS0	7.06	11.0	-3.94

Table 7-55. Conducted Power Spectral Density Measurements SISO ANT2 (26 Tones)

FCC ID: A3LSMN976U			MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset		Page 102 of 270	

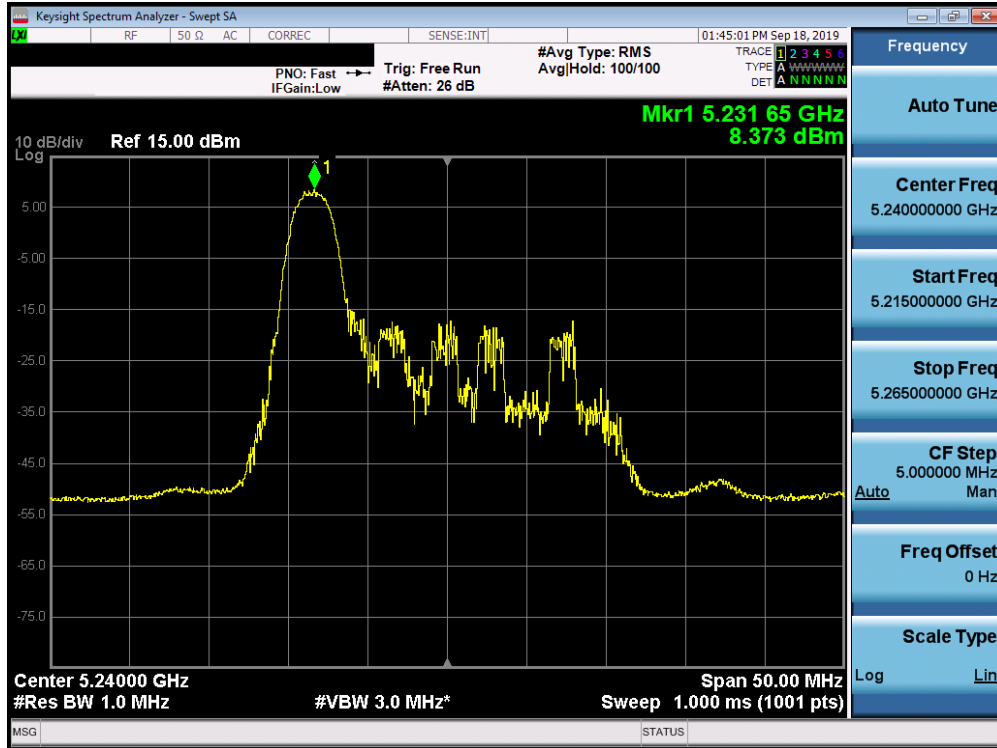


Plot 7-109. Power Spectral Density Plot SISO ANT2 (20MHz BW 802.11ax – 26 Tones (UNII Band 1) – Ch. 36)

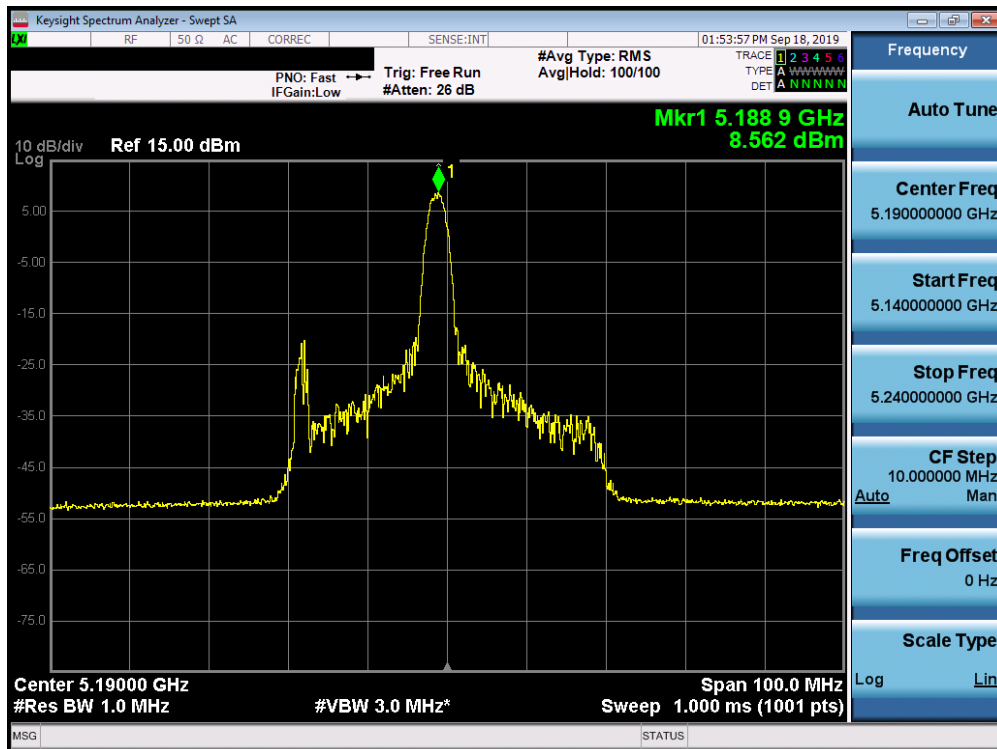


Plot 7-110. Power Spectral Density Plot SISO ANT2 (20MHz BW 802.11ax – 26 Tones (UNII Band 1) – Ch. 40)

FCC ID: A3LSMN976U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset		Page 103 of 270

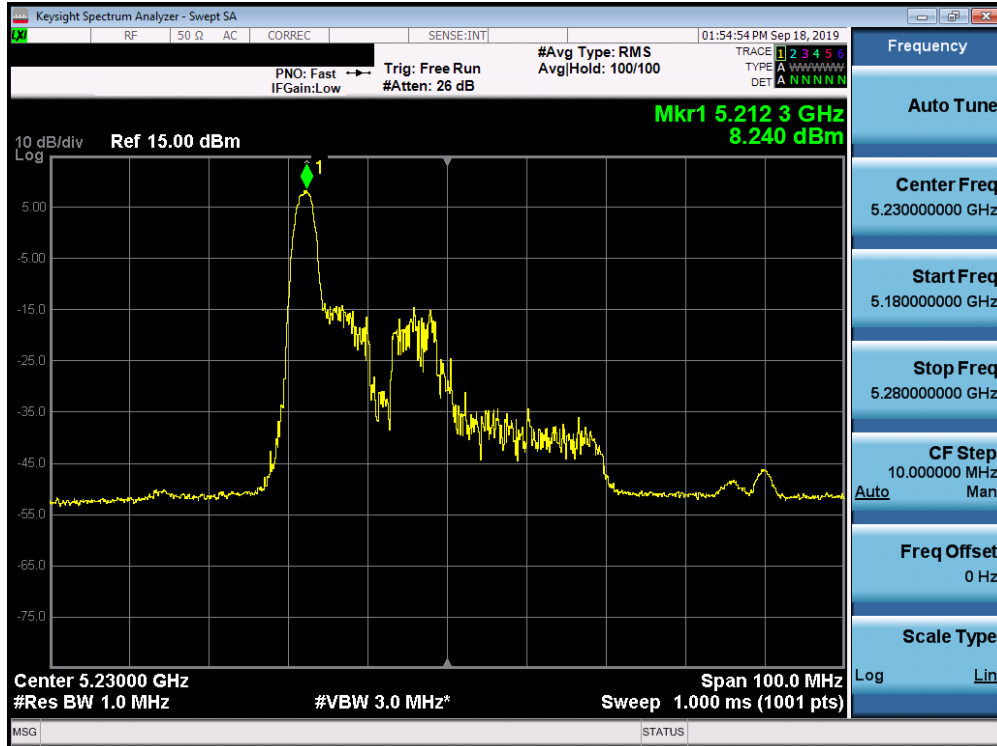


Plot 7-111. Power Spectral Density Plot SISO ANT2 (20MHz BW 802.11ax – 26 Tones (UNII Band 1) – Ch. 48)

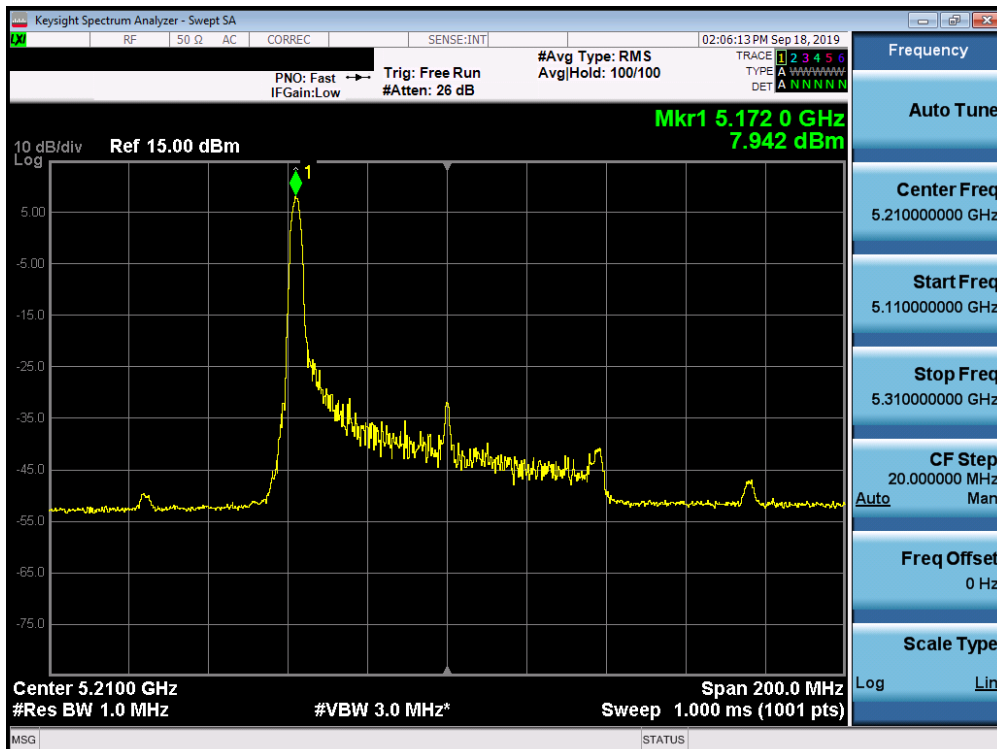


Plot 7-112. Power Spectral Density Plot SISO ANT2 (40MHz BW 802.11ax – 26 Tones (UNII Band 1) – Ch. 38)

FCC ID: A3LSMN976U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset		Page 104 of 270

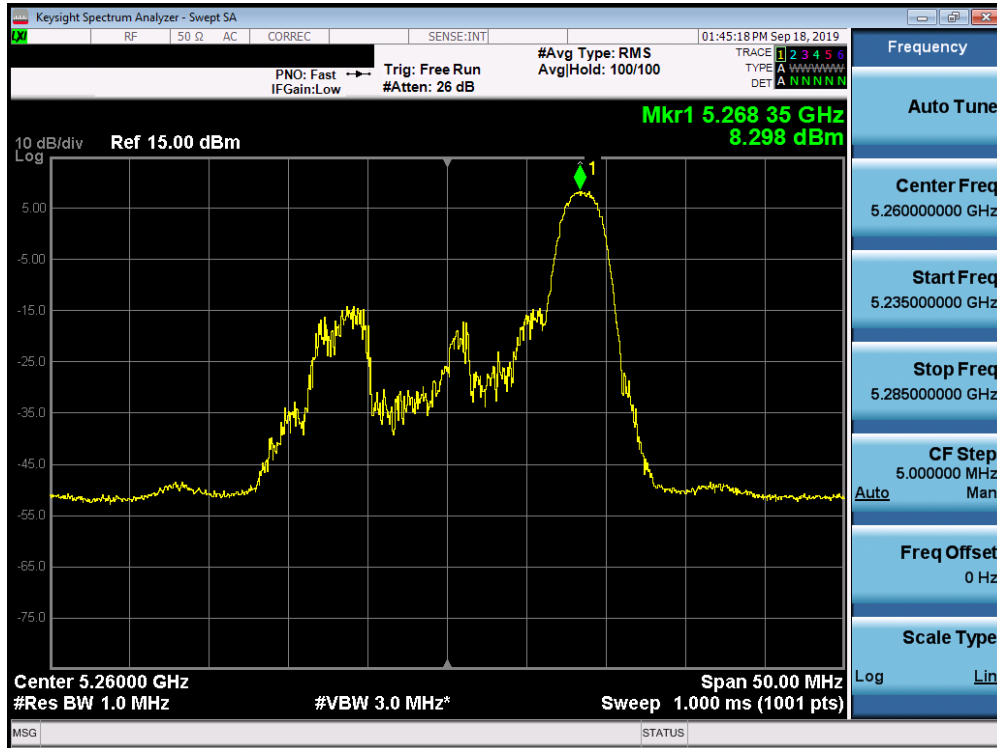


Plot 7-113. Power Spectral Density Plot SISO ANT2 (40MHz BW 802.11ax – 26 Tones (UNII Band 1) – Ch. 46)

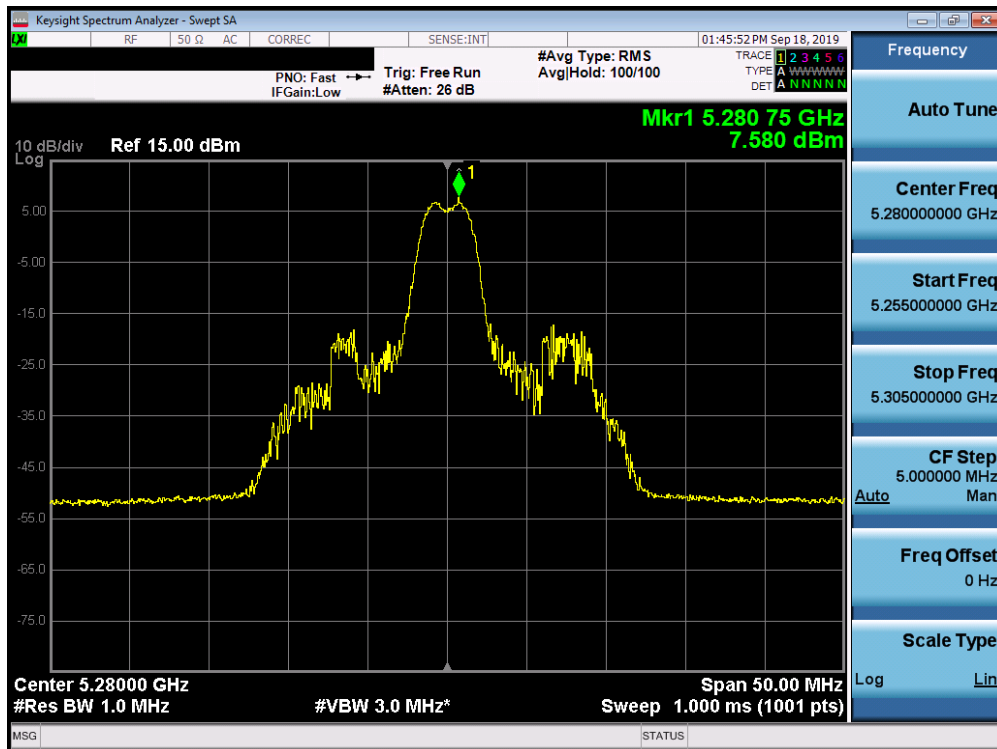


Plot 7-114. Power Spectral Density Plot SISO ANT2 (80MHz BW 802.11ax – 26 Tones (UNII Band 1) – Ch. 42)

FCC ID: A3LSMN976U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset		Page 105 of 270

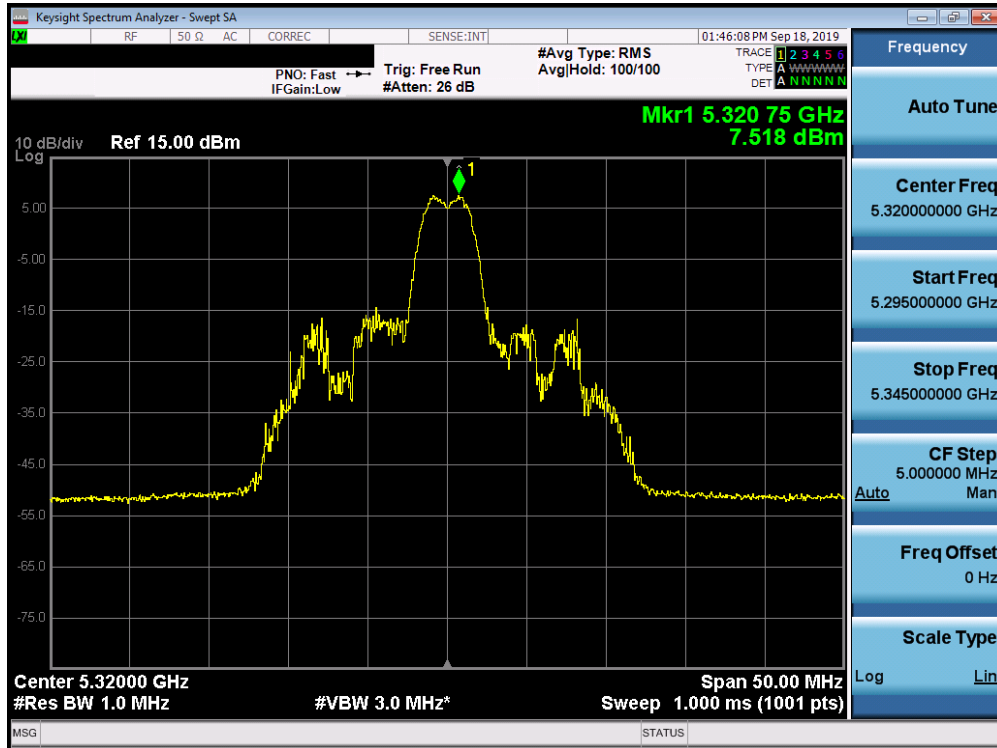


Plot 7-115. Power Spectral Density Plot SISO ANT2 (20MHz BW 802.11ax – 26 Tones (UNII Band 2A) – Ch. 52)

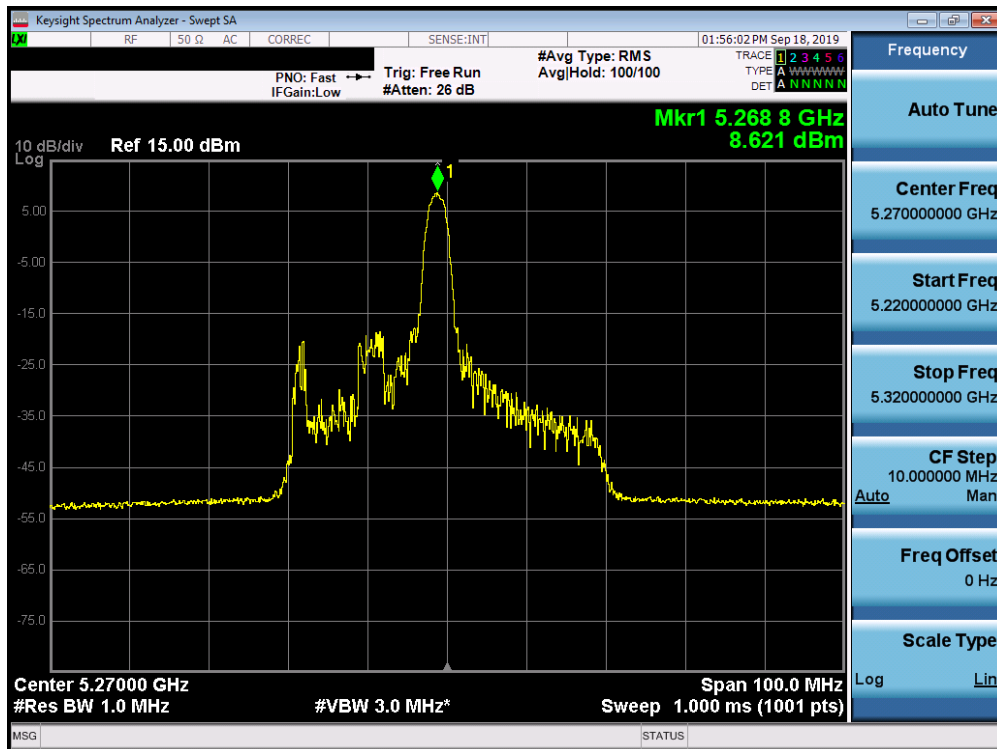


Plot 7-116. Power Spectral Density Plot SISO ANT2 (20MHz BW 802.11ax – 26 Tones (UNII Band 2A) – Ch. 56)

FCC ID: A3LSMN976U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset		Page 106 of 270



Plot 7-117. Power Spectral Density Plot SISO ANT2 (20MHz BW 802.11ax – 26 Tones (UNII Band 2A) – Ch. 64)

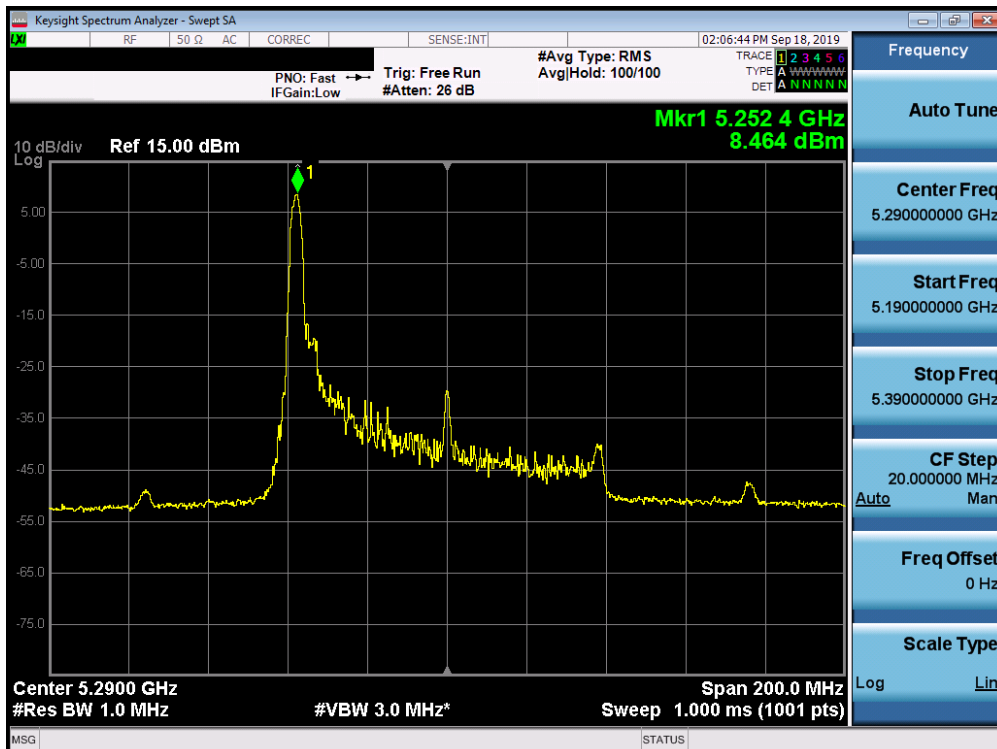


Plot 7-118. Power Spectral Density Plot SISO ANT2 (40MHz BW 802.11ax – 26 Tones (UNII Band 2A) – Ch. 54)

FCC ID: A3LSMN976U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset		Page 107 of 270

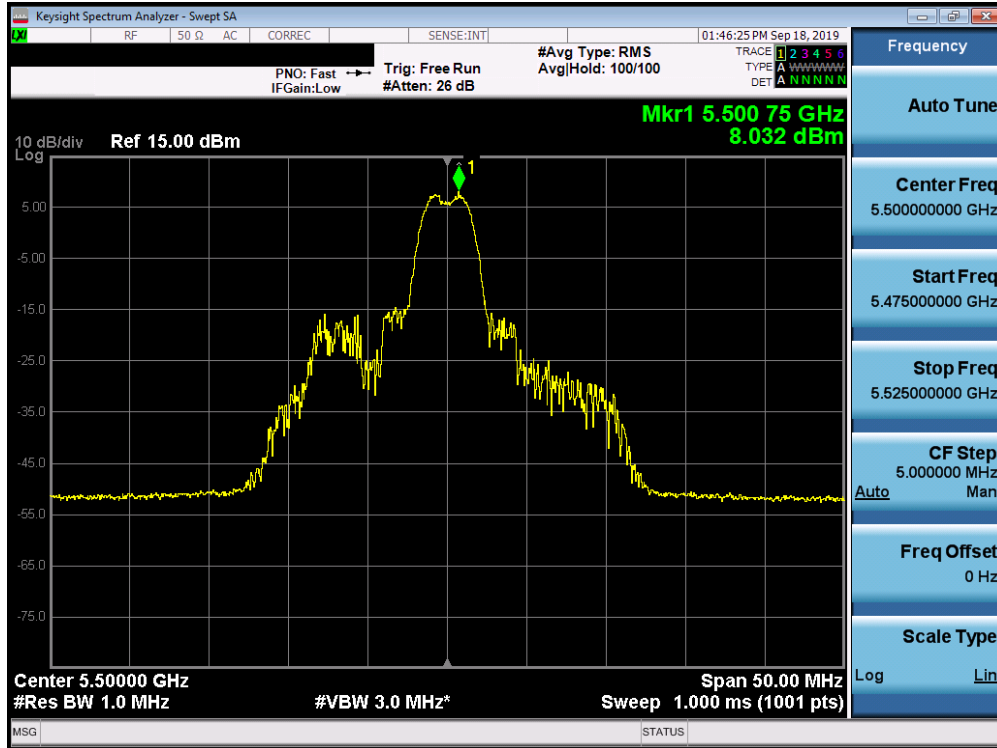


Plot 7-119. Power Spectral Density Plot SISO ANT2 (40MHz BW 802.11ax – 26 Tones (UNII Band 2A) – Ch. 62)

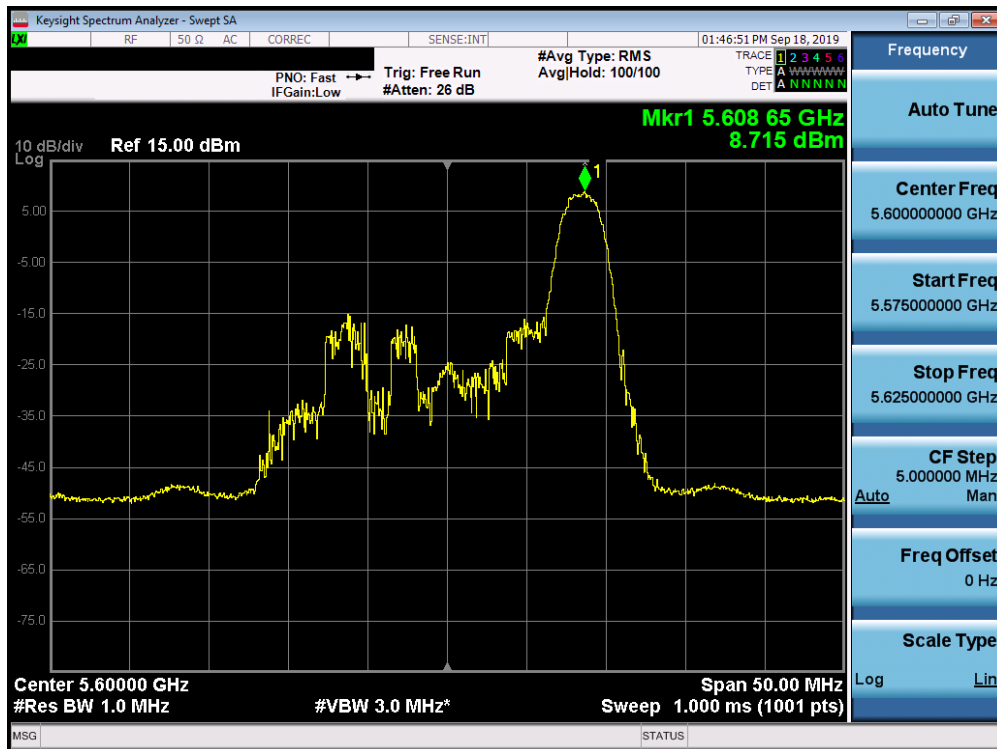


Plot 7-120. Power Spectral Density Plot SISO ANT2 (80MHz BW 802.11ax – 26 Tones (UNII Band 2A) – Ch. 58)

FCC ID: A3LSMN976U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset		Page 108 of 270

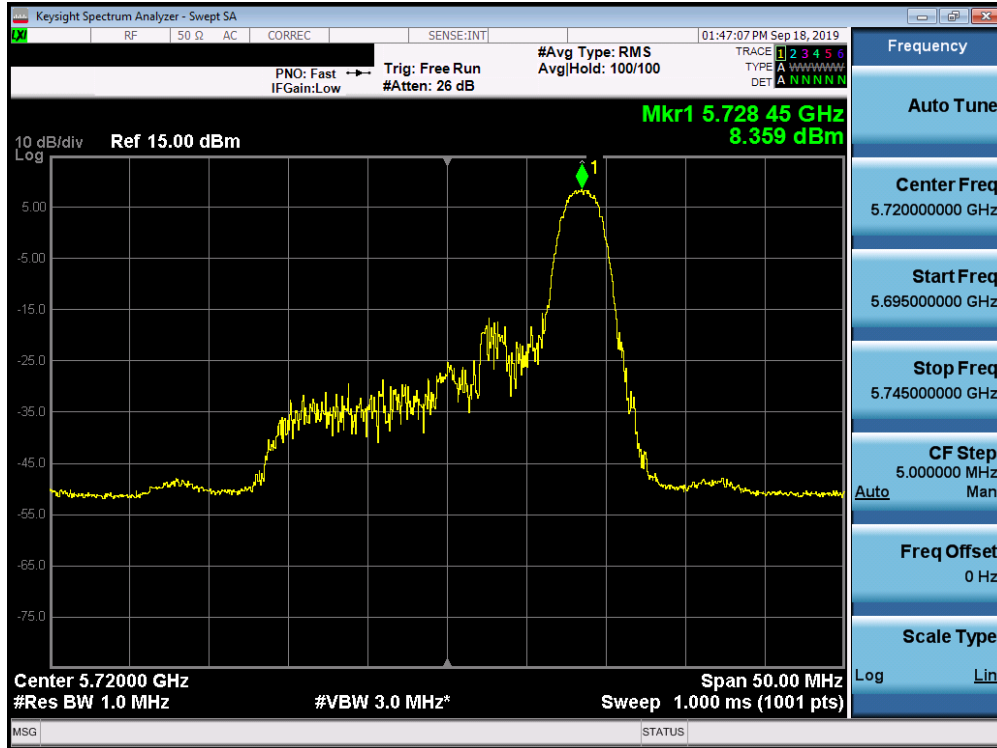


Plot 7-121. Power Spectral Density Plot SISO ANT2 (20MHz BW 802.11ax – 26 Tones (UNII Band 2C) – Ch. 100)

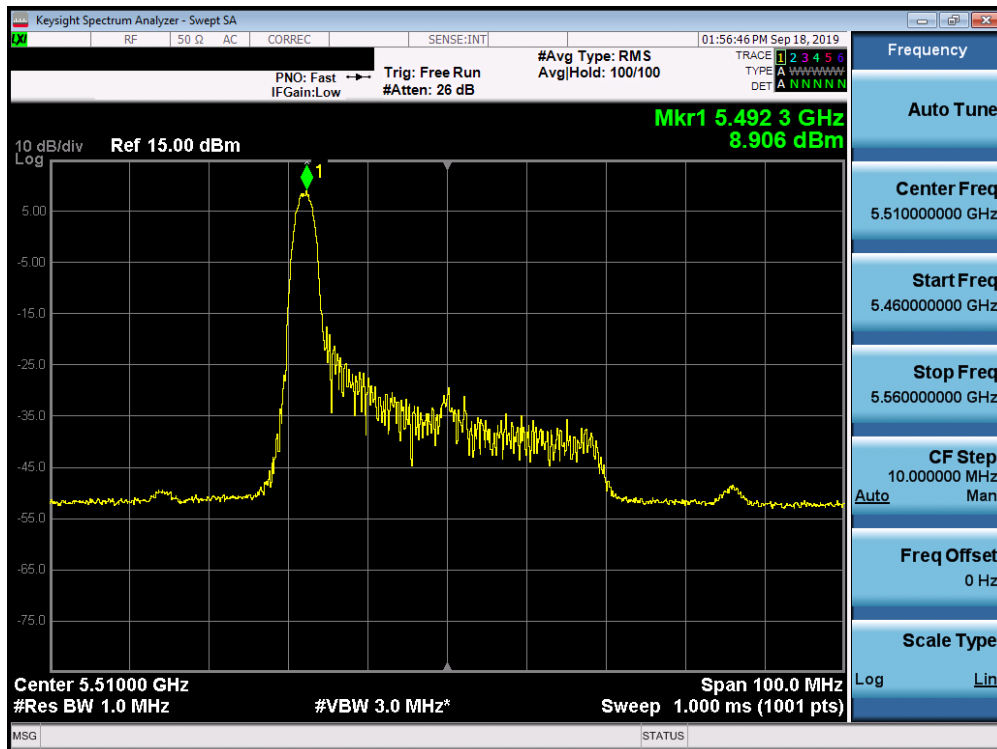


Plot 7-122. Power Spectral Density Plot SISO ANT2 (20MHz BW 802.11ax – 26 Tones (UNII Band 2C) – Ch. 120)

FCC ID: A3LSMN976U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset		Page 109 of 270

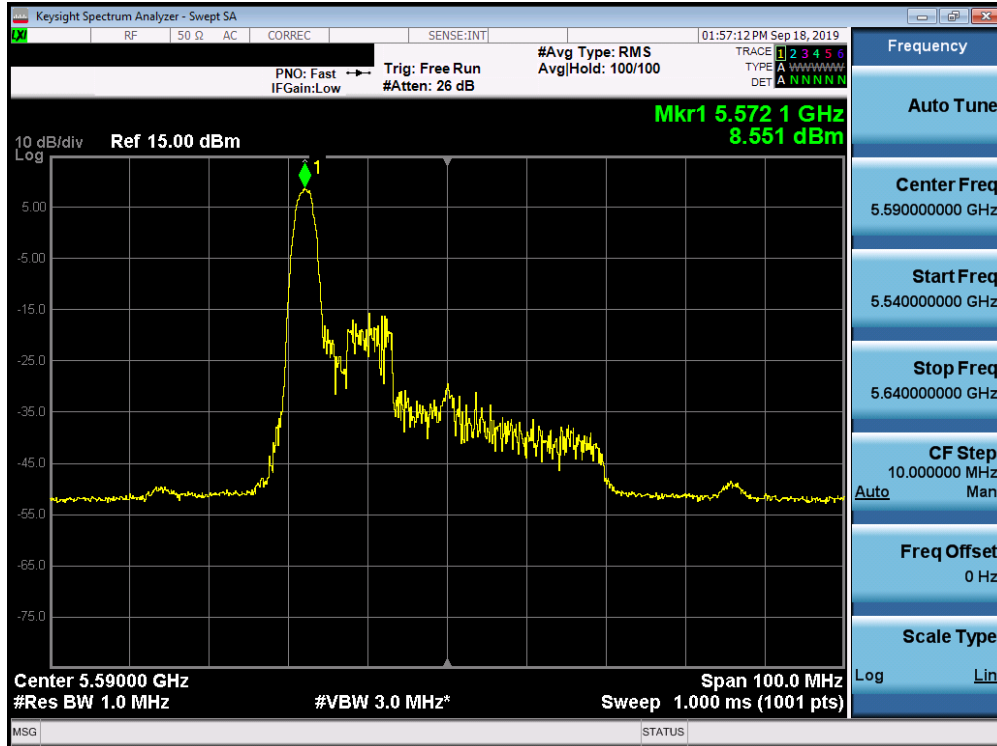


Plot 7-123. Power Spectral Density Plot SISO ANT2 (20MHz BW 802.11ax – 26 Tones (UNII Band 2C) – Ch. 144)

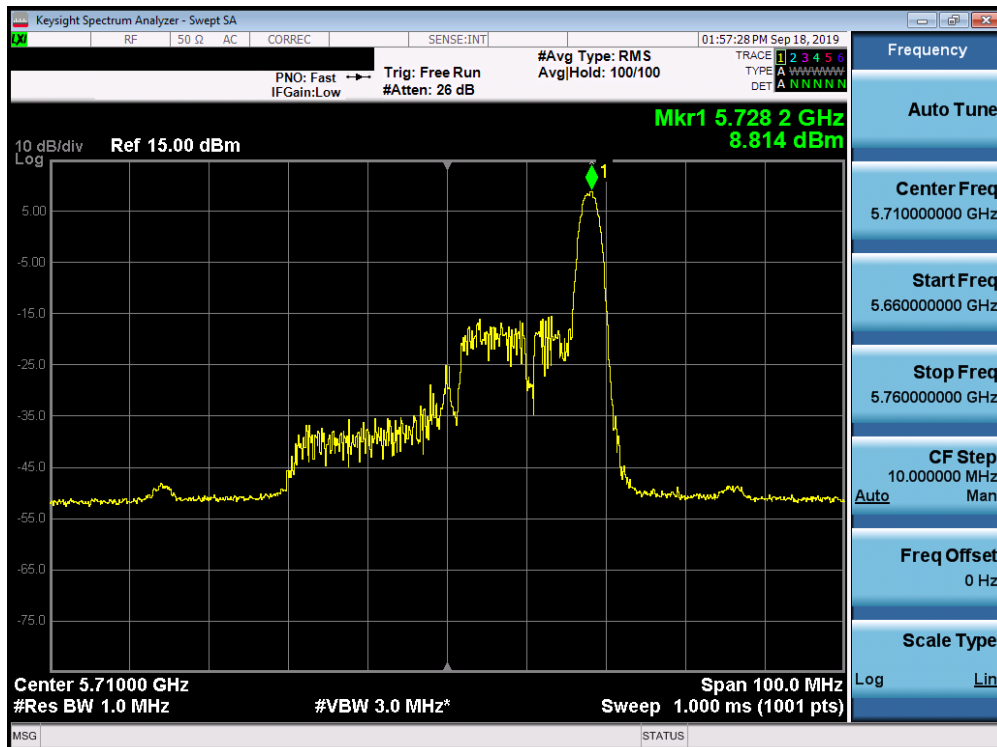


Plot 7-124. Power Spectral Density Plot SISO ANT2 (40MHz BW 802.11ax – 26 Tones (UNII Band 2C) – Ch. 102)

FCC ID: A3LSMN976U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset		Page 110 of 270

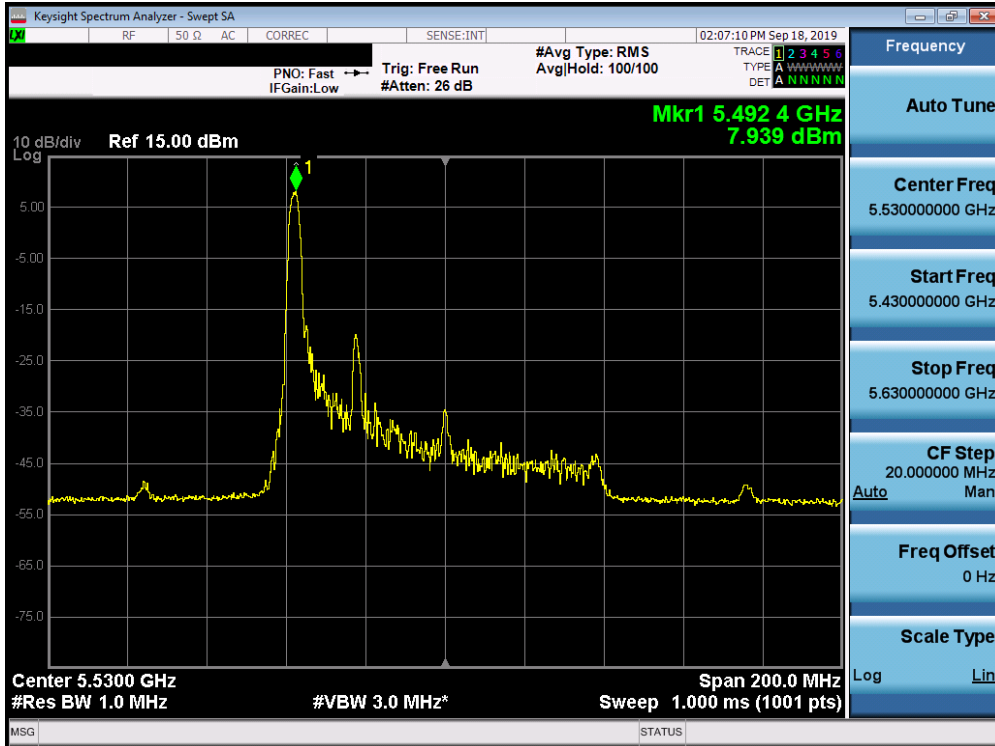


Plot 7-125. Power Spectral Density Plot SISO ANT2 (40MHz BW 802.11ax – 26 Tones (UNII Band 2C) – Ch. 118)

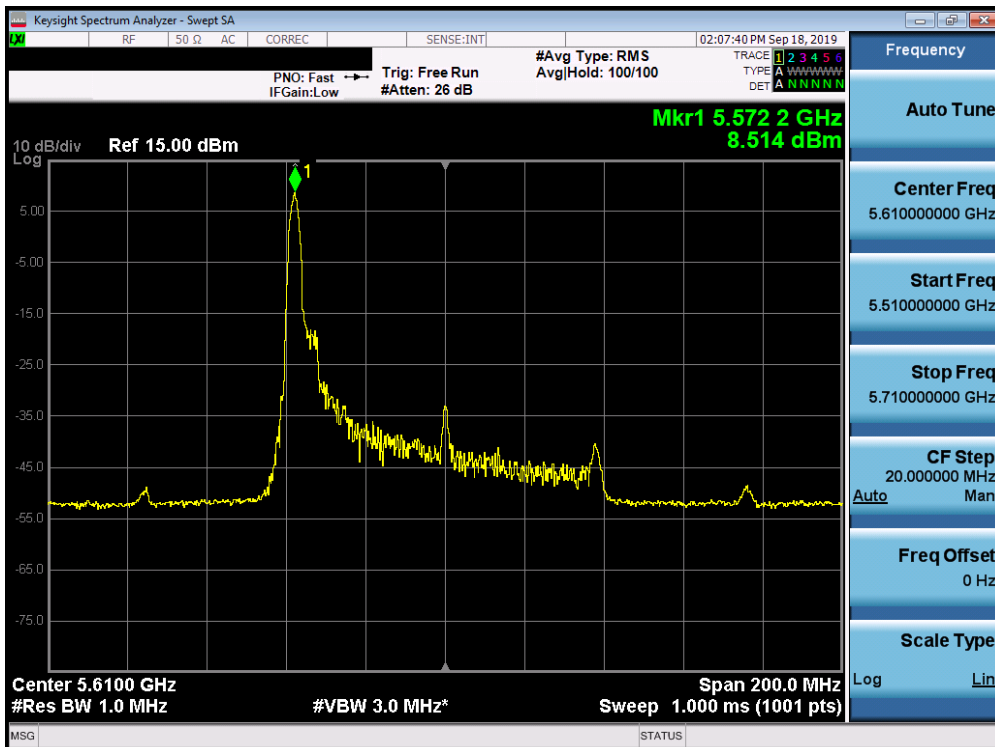


Plot 7-126. Power Spectral Density Plot SISO ANT2 (40MHz BW 802.11ax – 26 Tones (UNII Band 2C) – Ch. 142)

FCC ID: A3LSMN976U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset		Page 111 of 270



Plot 7-127. Power Spectral Density Plot SISO ANT2 (80MHz BW 802.11ax – 26 Tones (UNII Band 2C) – Ch. 106)



Plot 7-128. Power Spectral Density Plot SISO ANT2 (80MHz BW 802.11ax – 26 Tones (UNII Band 2C) – Ch. 122)

FCC ID: A3LSMN976U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset		Page 112 of 270



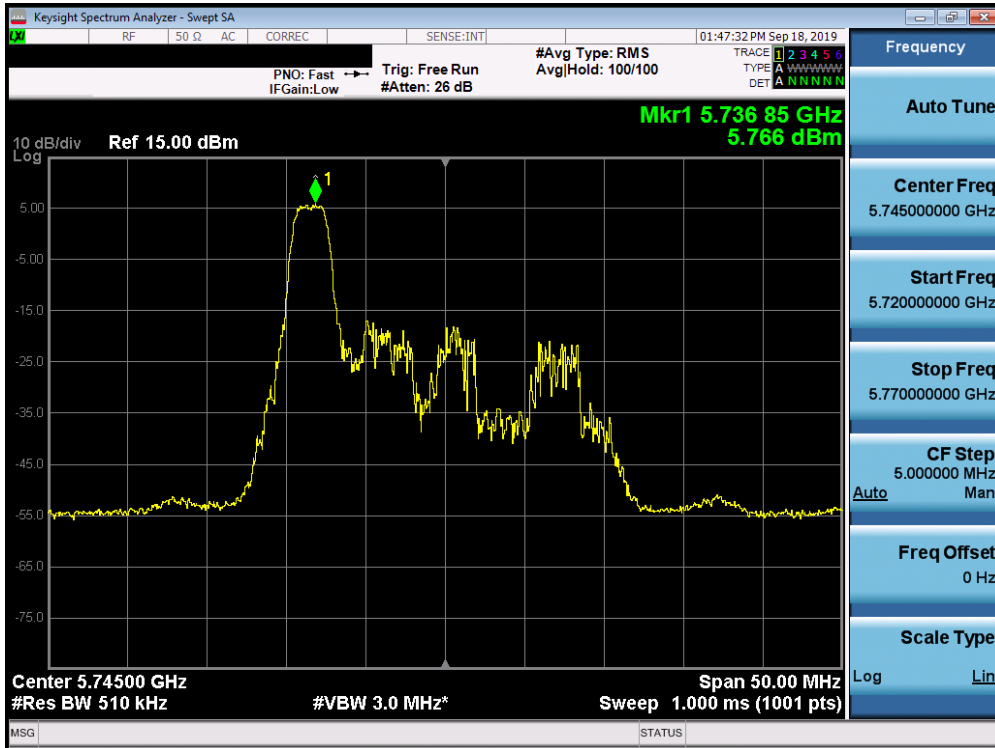
Plot 7-129. Power Spectral Density Plot SISO ANT2 (80MHz BW 802.11ax – 26 Tones (UNII Band 2C) – Ch. 138)

FCC ID: A3LSMN976U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset		Page 113 of 270

	Frequency [MHz]	Channel No.	802.11 Mode	Tones	Data Rate [Mbps]	Measured Power Density [dBm]	Max Permissible Power Density	Margin [dB]
Band 3	5745	149	ax (20MHz)	26T	MCS0	5.77	30.00	-24.23
	5785	157	ax (20MHz)	26T	MCS0	5.74	30.00	-24.27
	5825	165	ax (20MHz)	26T	MCS0	5.52	30.00	-24.48
	5755	151	ax (40MHz)	26T	MCS0	6.42	30.00	-23.58
	5795	159	ax (40MHz)	26T	MCS0	5.98	30.00	-24.02
	5775	155	ax (80MHz)	26T	MCS0	6.06	30.00	-23.94

Table 7-56. Band 3 Conducted Power Spectral Density Measurements SISO ANT2 (26 Tones)

FCC ID: A3LSMN976U	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset	Page 114 of 270

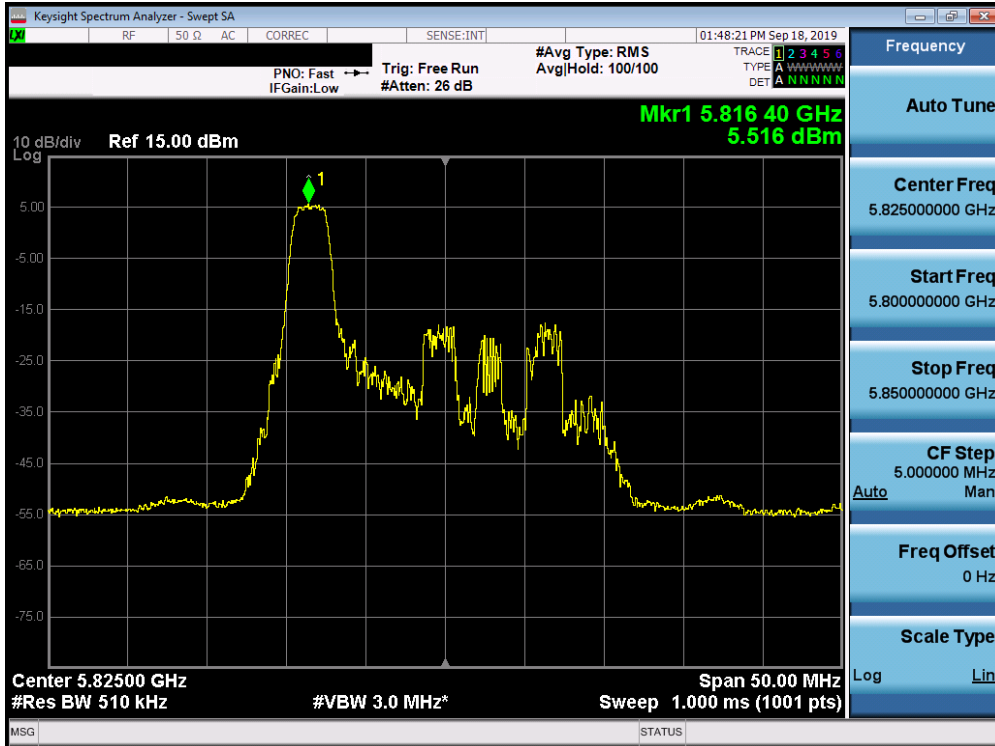


Plot 7-130. Power Spectral Density Plot SISO ANT2 (20MHz BW 802.11ax – 26 Tones (UNII Band 3) – Ch. 149)

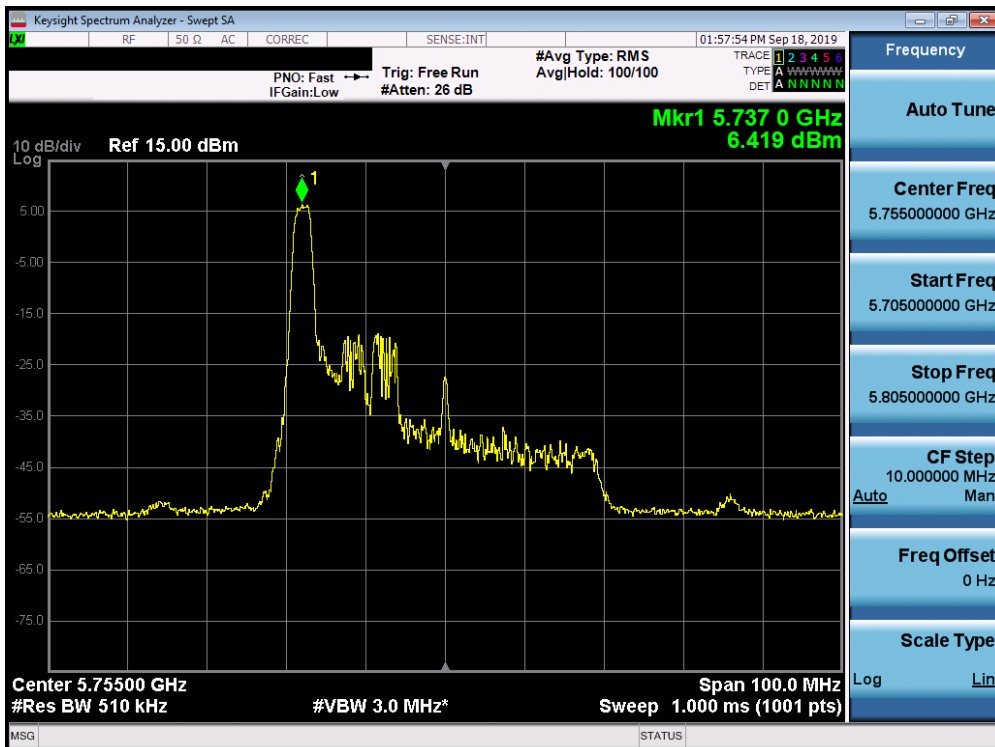


Plot 7-131. Power Spectral Density Plot SISO ANT2 (20MHz BW 802.11ax – 26 Tones (UNII Band 3) – Ch. 157)

FCC ID: A3LSMN976U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset		Page 115 of 270

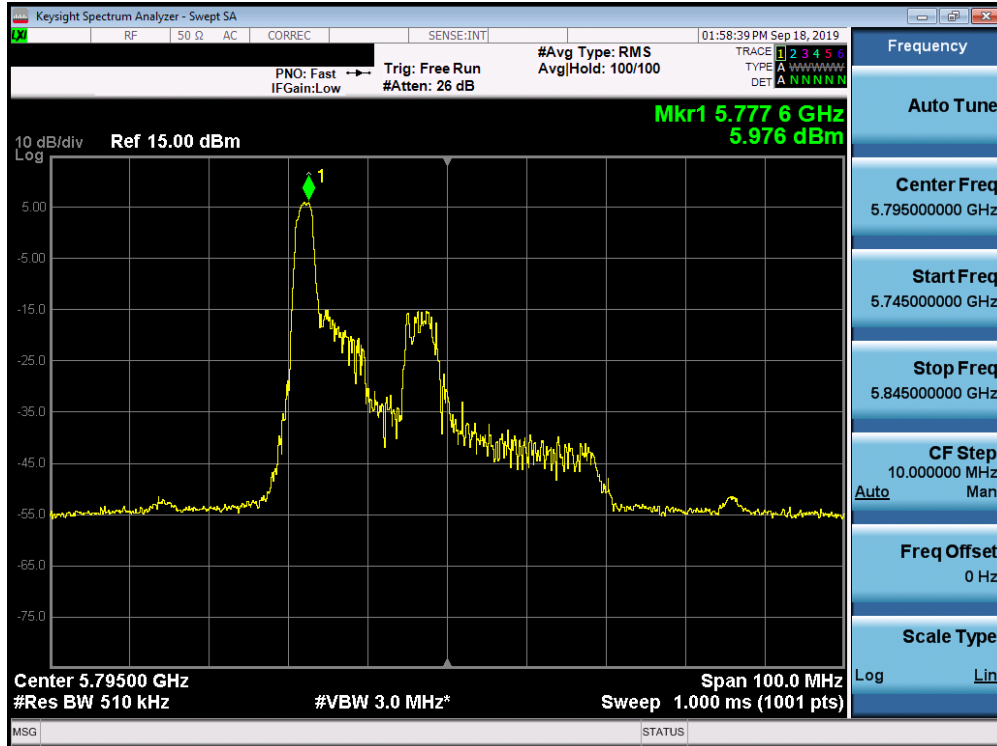


Plot 7-132. Power Spectral Density Plot SISO ANT2 (20 MHz BW 802.11ax – 26 Tones (UNII Band 3) – Ch. 165)

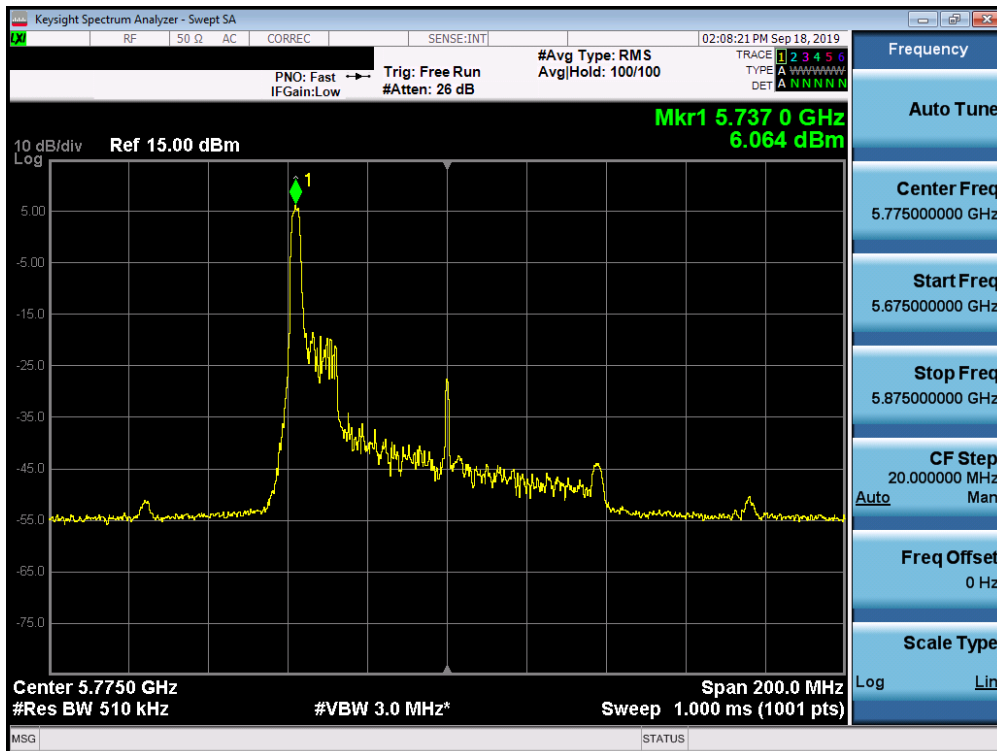


Plot 7-133. Power Spectral Density Plot SISO ANT2 (40MHz BW 802.11ax – 26 Tones (UNII Band 3) – Ch. 151)

FCC ID: A3LSMN976U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset		Page 116 of 270



Plot 7-134. Power Spectral Density Plot SISO ANT2 (40MHz BW 802.11ax – 26 Tones (UNII Band 3) – Ch. 159)



Plot 7-135. Power Spectral Density Plot SISO ANT2 (80MHz BW 802.11ax – 26 Tones (UNII Band 3) – Ch. 155)

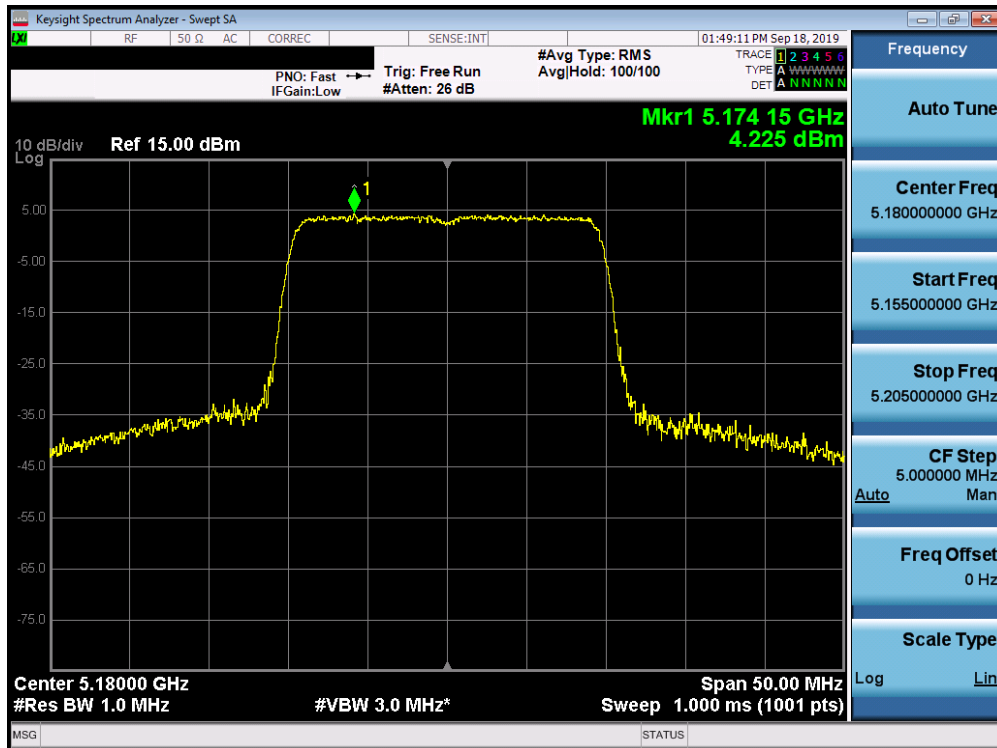
FCC ID: A3LSMN976U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset		Page 117 of 270

SISO Antenna-2 Power Spectral Density Measurements (Full Tones)

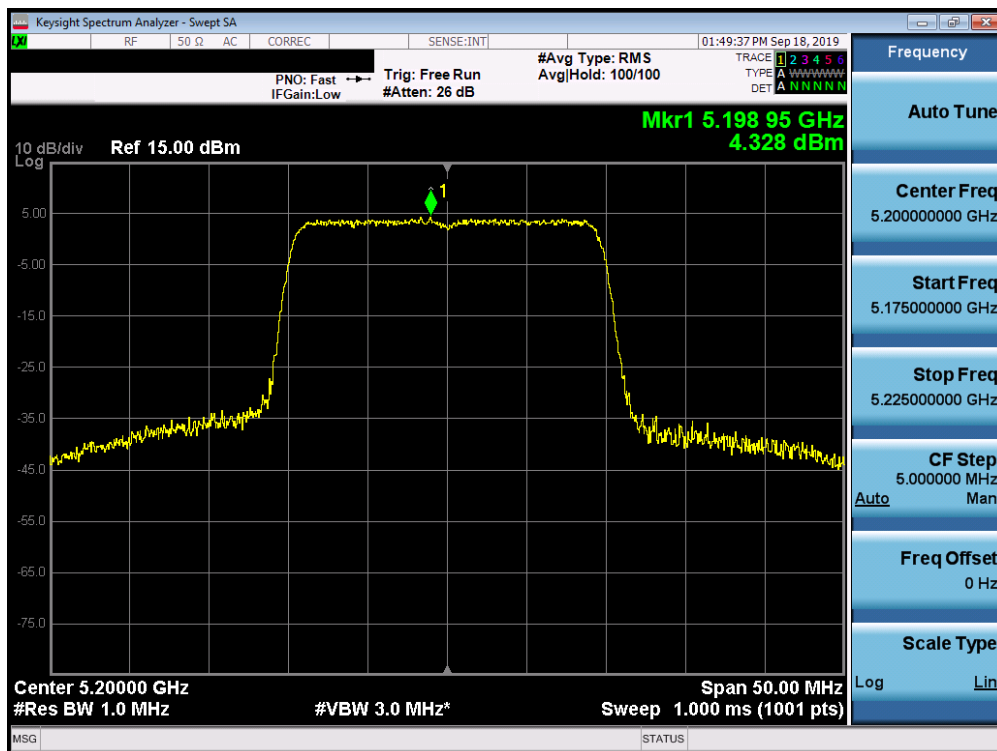
	Frequency [MHz]	Channel No.	802.11 Mode	Tones	Data Rate [Mbps]	Measured Power Density [dBm]	Max Power Density [dBm/MHz]	Margin [dB]
Band 1	5180	36	ax (20MHz)	242T	MCS0	4.23	11.0	-6.78
	5200	40	ax (20MHz)	242T	MCS0	4.33	11.0	-6.67
	5240	48	ax (20MHz)	242T	MCS0	4.22	11.0	-6.78
	5190	38	ax (40MHz)	484T	MCS0	-0.60	11.0	-11.60
	5230	46	ax (40MHz)	484T	MCS0	-0.25	11.0	-11.25
	5210	42	ax (80MHz)	996T	MCS0	-4.23	11.0	-15.23
Band 2A	5260	52	ax (20MHz)	242T	MCS0	4.19	11.0	-6.81
	5280	56	ax (20MHz)	242T	MCS0	3.89	11.0	-7.11
	5320	64	ax (20MHz)	242T	MCS0	4.08	11.0	-6.92
	5270	54	ax (40MHz)	484T	MCS0	-0.80	11.0	-11.80
	5310	62	ax (40MHz)	484T	MCS0	-0.53	11.0	-11.53
	5290	58	ax (80MHz)	996T	MCS0	-3.96	11.0	-14.96
Band 2C	5500	100	ax (20MHz)	242T	MCS0	4.50	11.0	-6.50
	5600	120	ax (20MHz)	242T	MCS0	4.51	11.0	-6.49
	5720	144	ax (20MHz)	242T	MCS0	4.56	11.0	-6.44
	5510	102	ax (40MHz)	484T	MCS0	-0.51	11.0	-11.51
	5590	118	ax (40MHz)	484T	MCS0	-0.28	11.0	-11.28
	5710	142	ax (40MHz)	484T	MCS0	-0.16	11.0	-11.16
	5530	106	ax (80MHz)	996T	MCS0	-4.71	11.0	-15.71
	5610	122	ax (80MHz)	996T	MCS0	-4.67	11.0	-15.67
	5690	138	ax (80MHz)	996T	MCS0	-4.36	11.0	-15.36

Table 7-57. Conducted Power Spectral Density Measurements SISO ANT2 (Full Tones)

FCC ID: A3LSMN976U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset	Page 118 of 270	

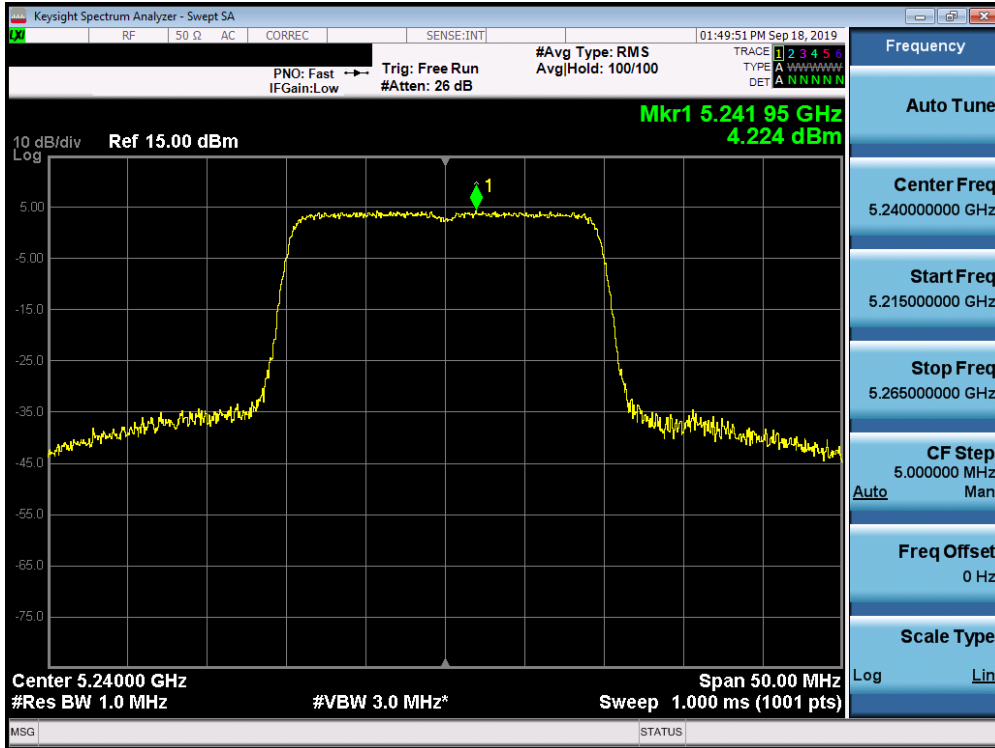


Plot 7-136. Power Spectral Density Plot SISO ANT2 (20MHz BW 802.11ax – Full Tones (UNII Band 1) – Ch. 36)

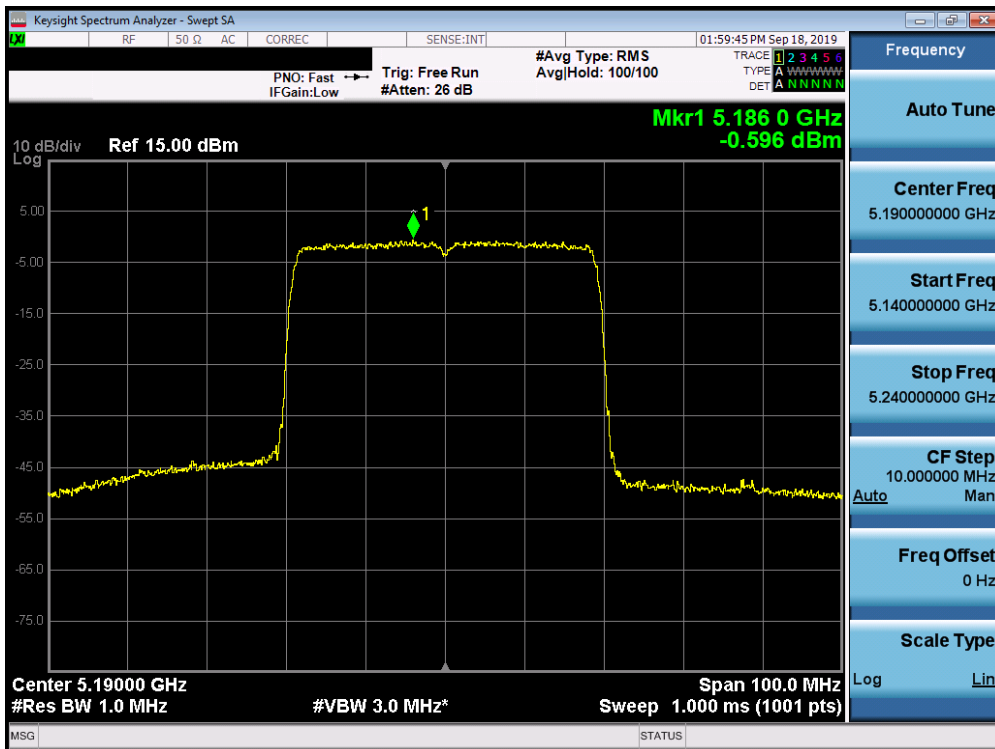


Plot 7-137. Power Spectral Density Plot SISO ANT2 (20MHz BW 802.11ax – Full Tones (UNII Band 1) – Ch. 40)

FCC ID: A3LSMN976U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset		Page 119 of 270

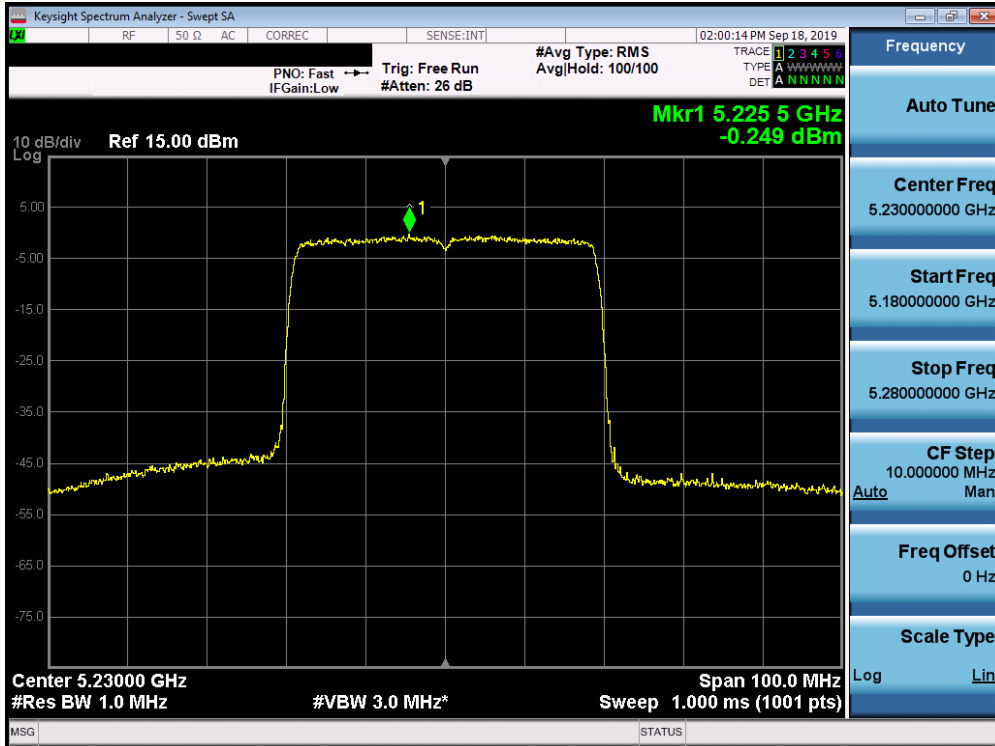


Plot 7-138. Power Spectral Density Plot SISO ANT2 (20MHz BW 802.11ax – Full Tones (UNII Band 1) – Ch. 48)

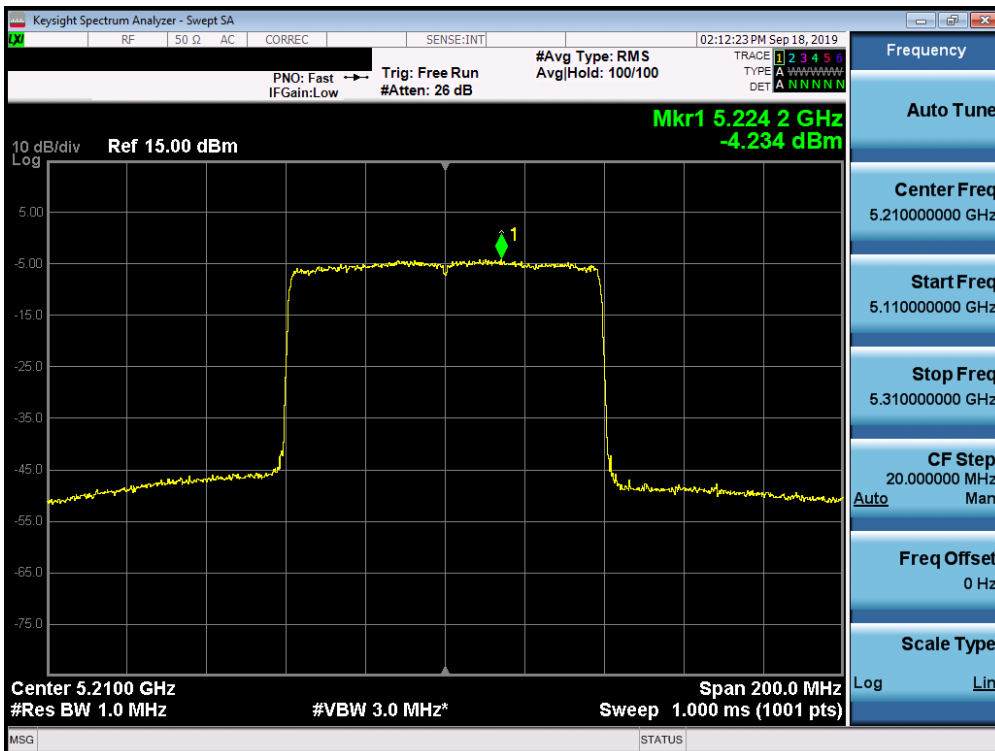


Plot 7-139. Power Spectral Density Plot SISO ANT2 (40MHz BW 802.11ax – Full Tones (UNII Band 1) – Ch. 38)

FCC ID: A3LSMN976U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset		Page 120 of 270

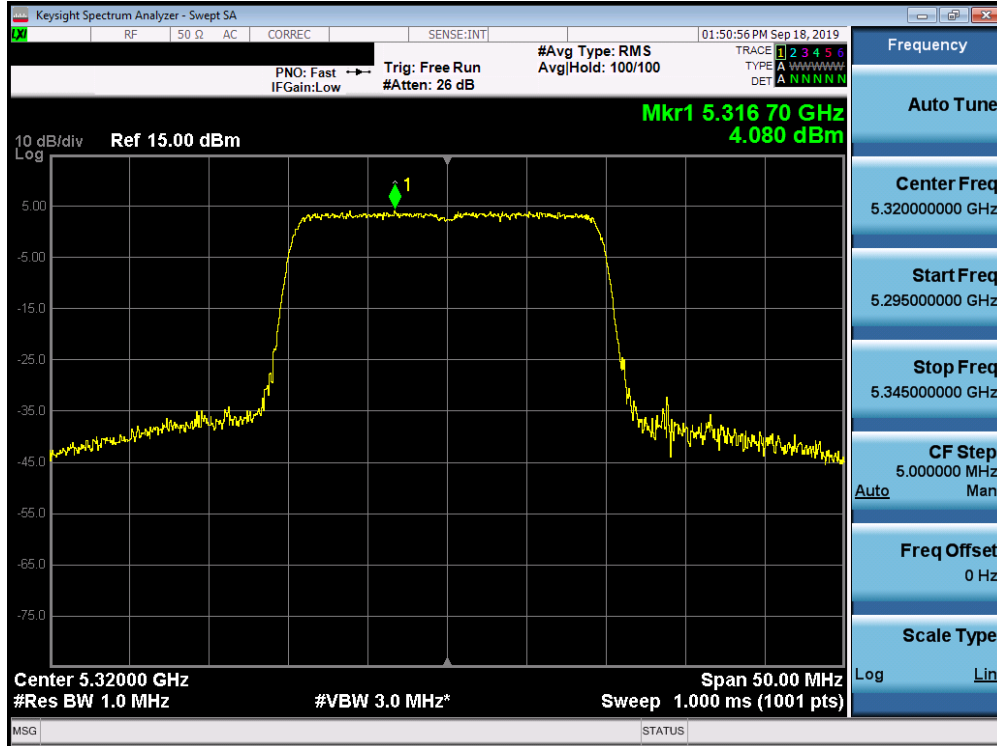


Plot 7-140. Power Spectral Density Plot SISO ANT2 (40MHz BW 802.11ax – Full Tones (UNII Band 1) – Ch. 46)

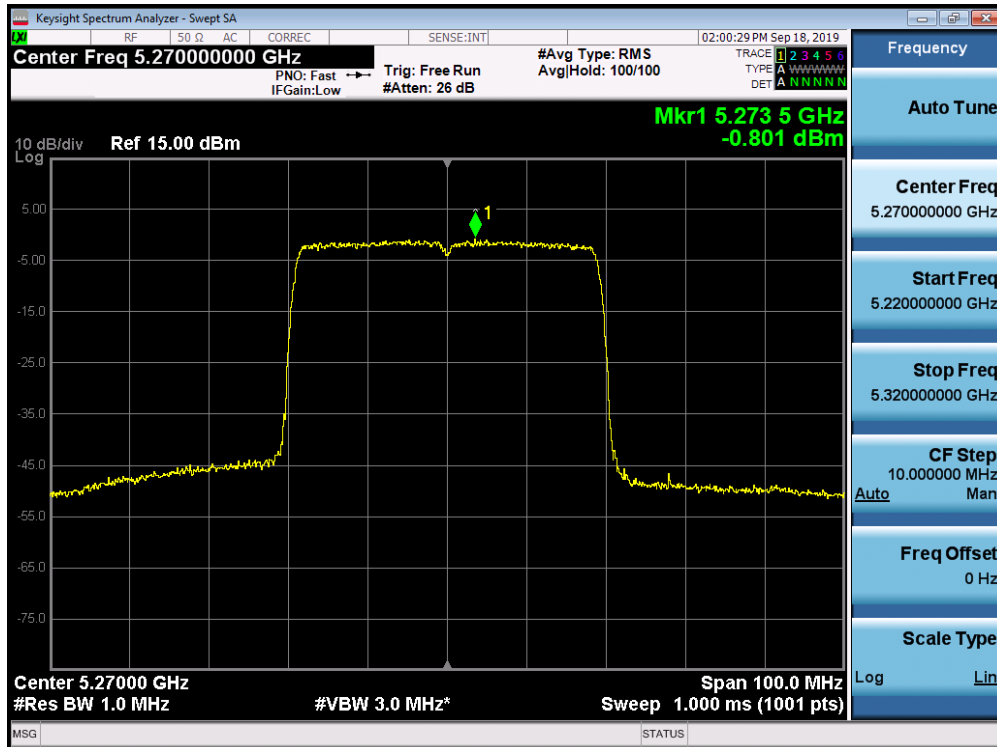


Plot 7-141. Power Spectral Density Plot SISO ANT2 (80MHz BW 802.11ax – Full Tones (UNII Band 1) – Ch. 42)

FCC ID: A3LSMN976U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset		Page 121 of 270

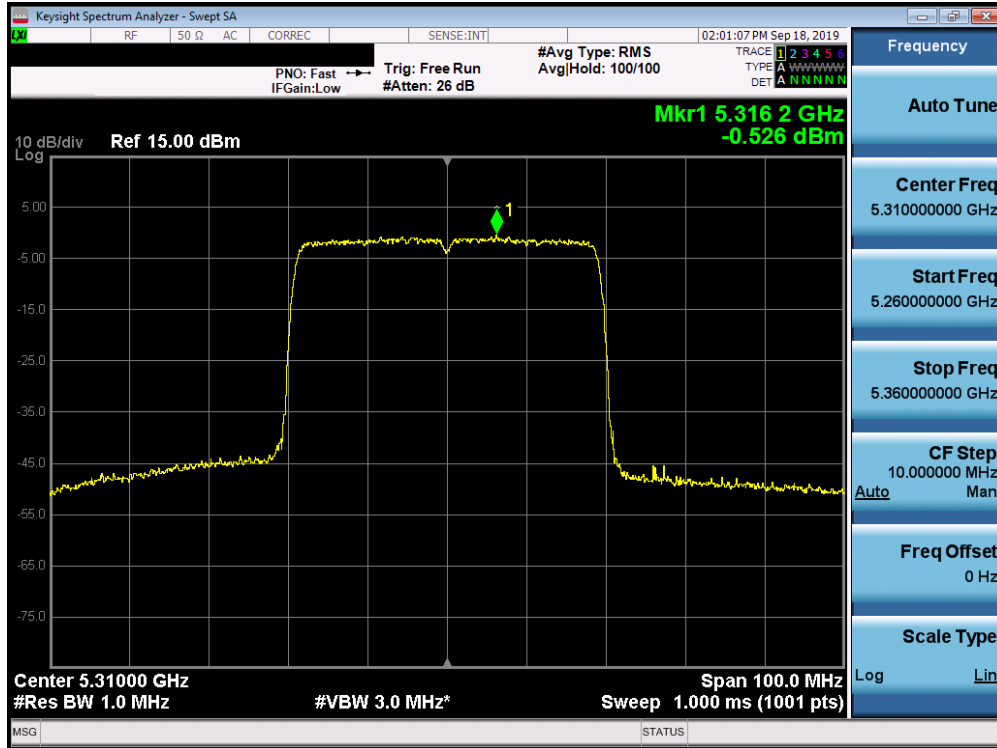


Plot 7-144. Power Spectral Density Plot SISO ANT2 (20MHz BW 802.11ax – Full Tones (UNII Band 2A) – Ch. 64)

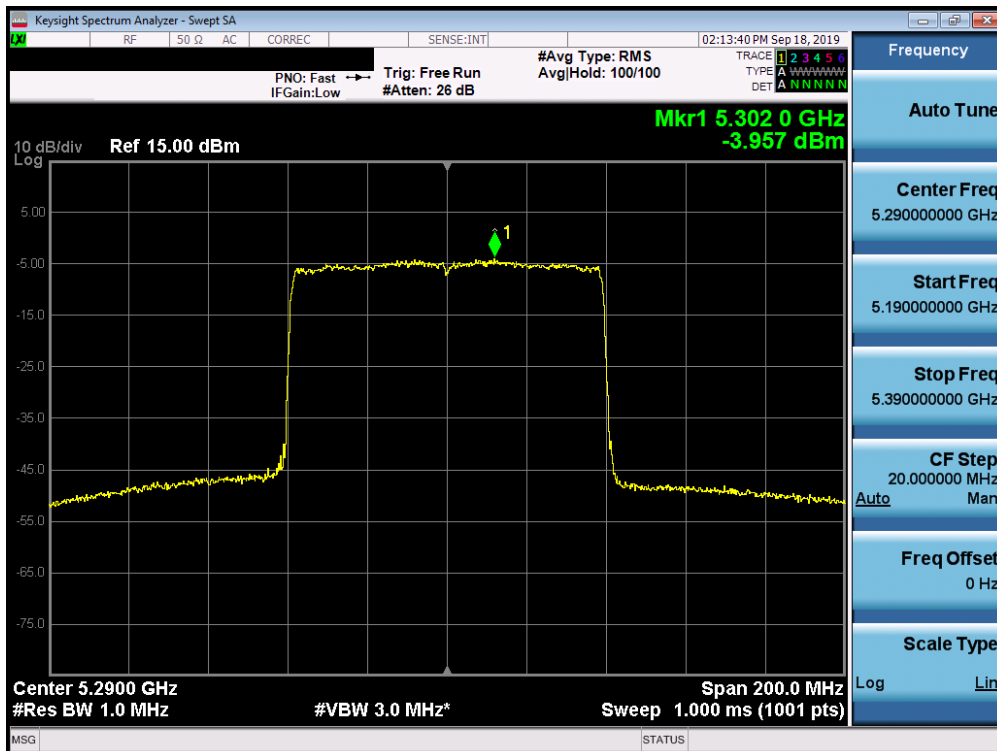


Plot 7-145. Power Spectral Density Plot SISO ANT2 (40MHz BW 802.11ax – Full Tones (UNII Band 2A) – Ch. 54)

FCC ID: A3LSMN976U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset		Page 123 of 270

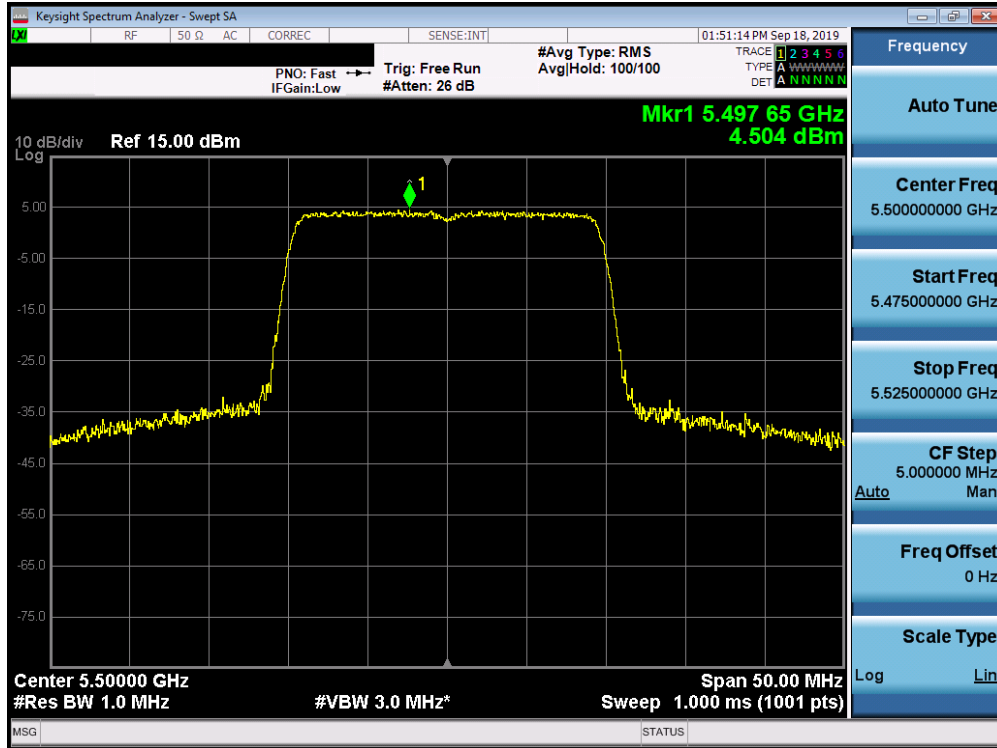


Plot 7-146. Power Spectral Density Plot SISO ANT2 (40MHz BW 802.11ax – Full Tones (UNII Band 2A) – Ch. 62)

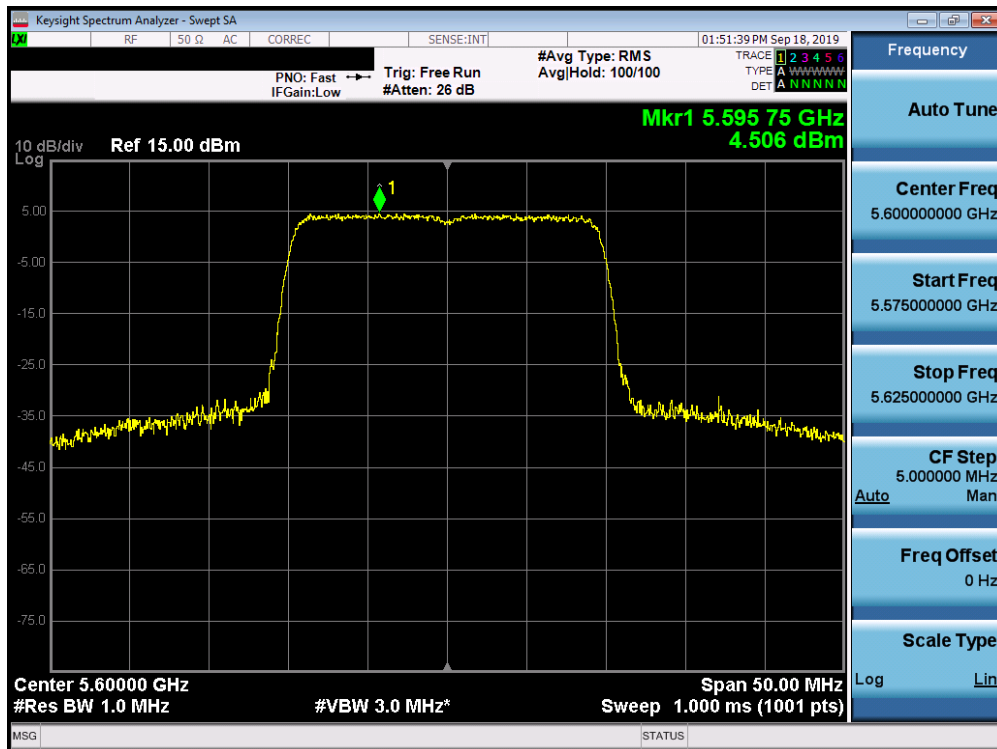


Plot 7-147. Power Spectral Density Plot SISO ANT2 (80MHz BW 802.11ax – Full Tones (UNII Band 2A) – Ch. 58)

FCC ID: A3LSMN976U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset		Page 124 of 270

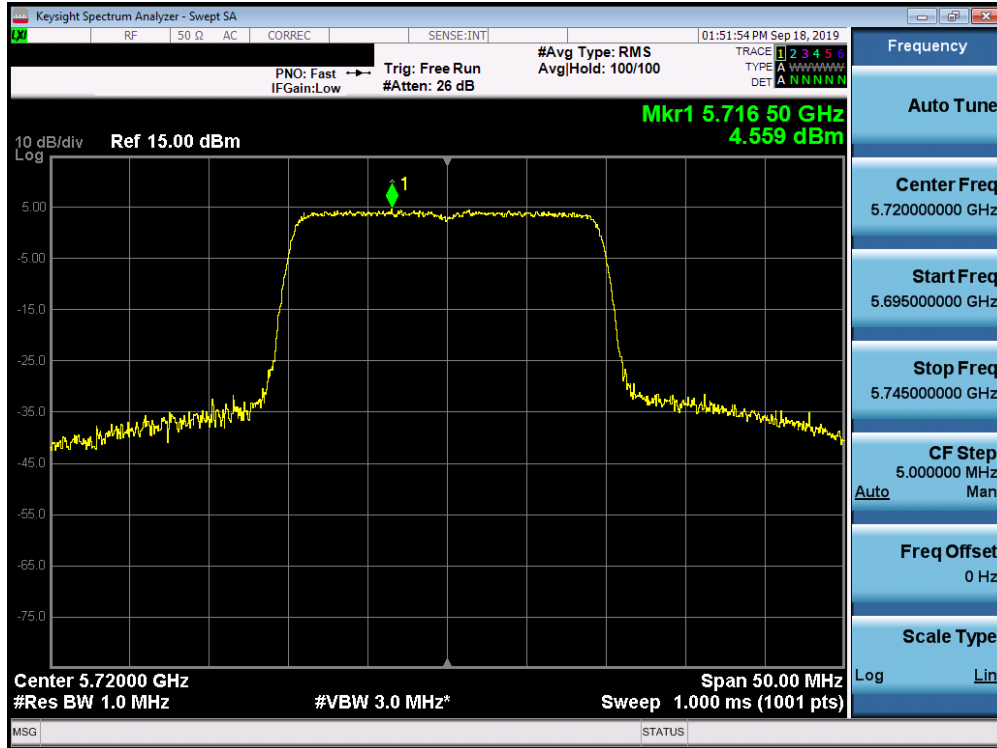


Plot 7-148. Power Spectral Density Plot SISO ANT2 (20MHz BW 802.11ax – Full Tones (UNII Band 2C) – Ch. 100)

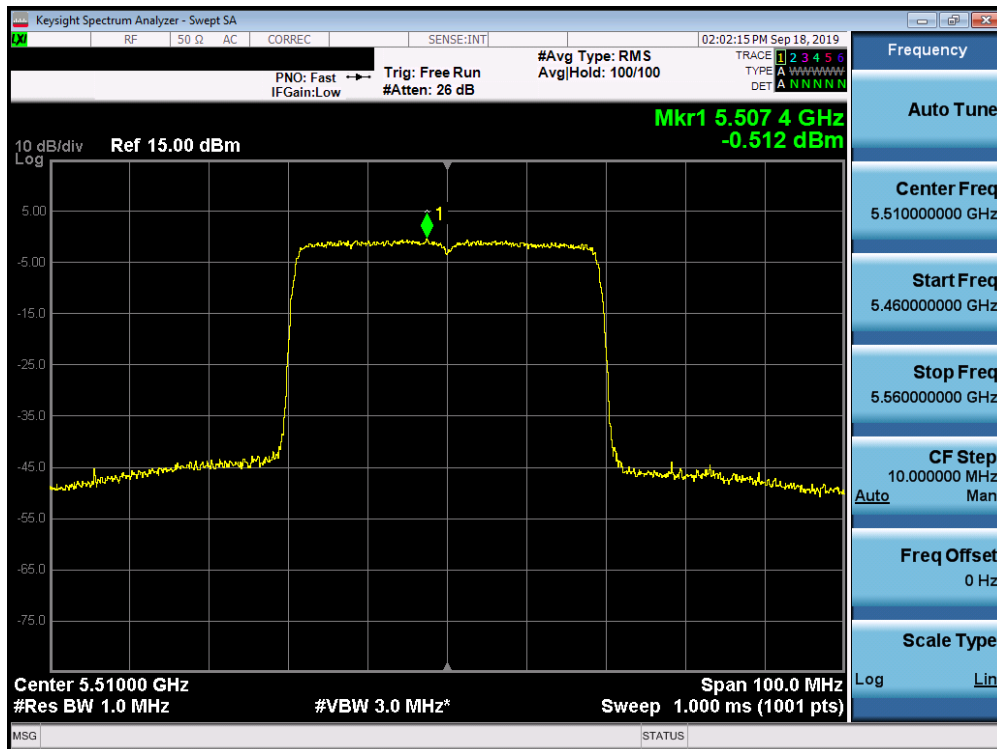


Plot 7-149. Power Spectral Density Plot SISO ANT2 (20MHz BW 802.11ax – Full Tones (UNII Band 2C) – Ch. 120)

FCC ID: A3LSMN976U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset		Page 125 of 270

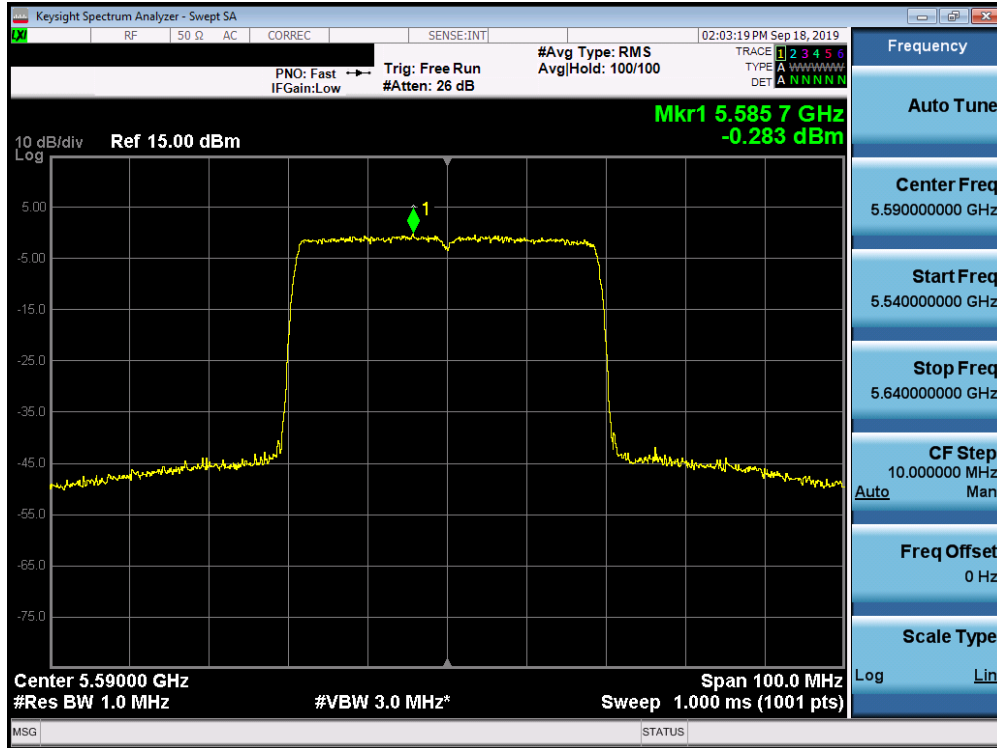


Plot 7-150. Power Spectral Density Plot SISO ANT2 (20MHz BW 802.11ax – Full Tones (UNII Band 2C) – Ch. 144)

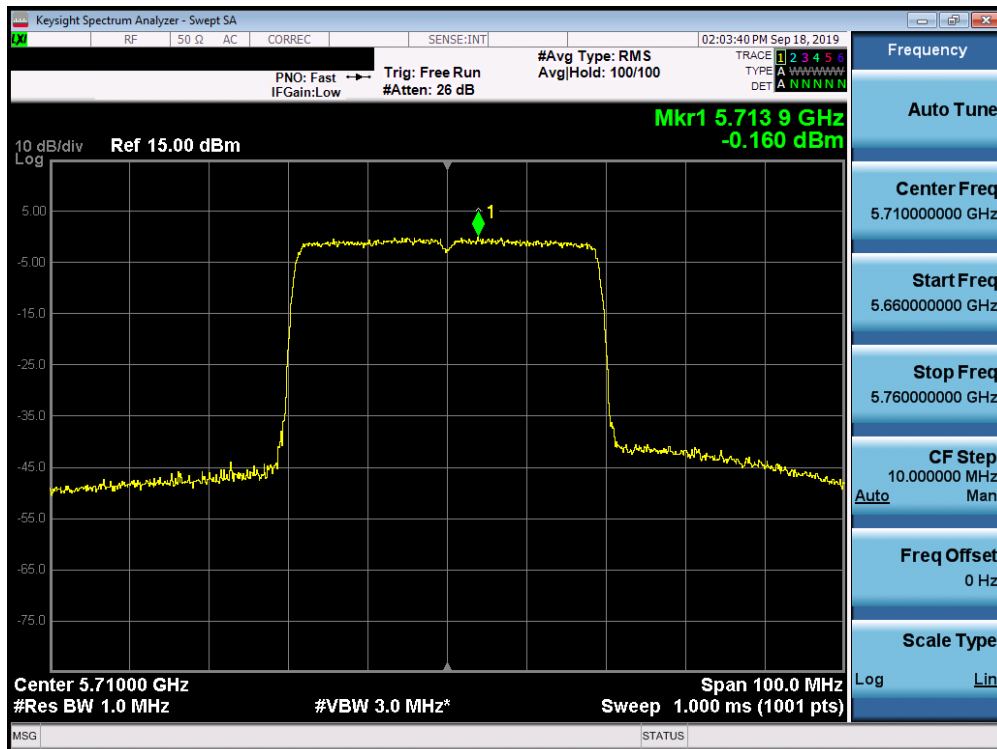


Plot 7-151. Power Spectral Density Plot SISO ANT2 (40MHz BW 802.11ax – Full Tones (UNII Band 2C) – Ch. 102)

FCC ID: A3LSMN976U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset		Page 126 of 270

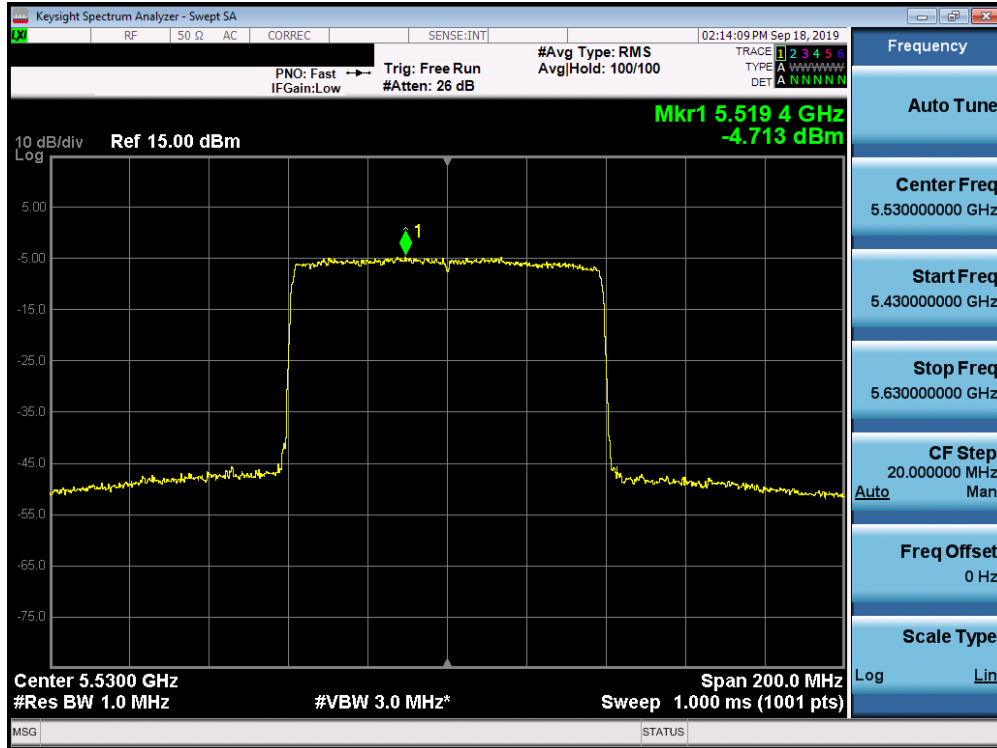


Plot 7-152. Power Spectral Density Plot SISO ANT2 (40MHz BW 802.11ax – Full Tones (UNII Band 2C) – Ch. 118)

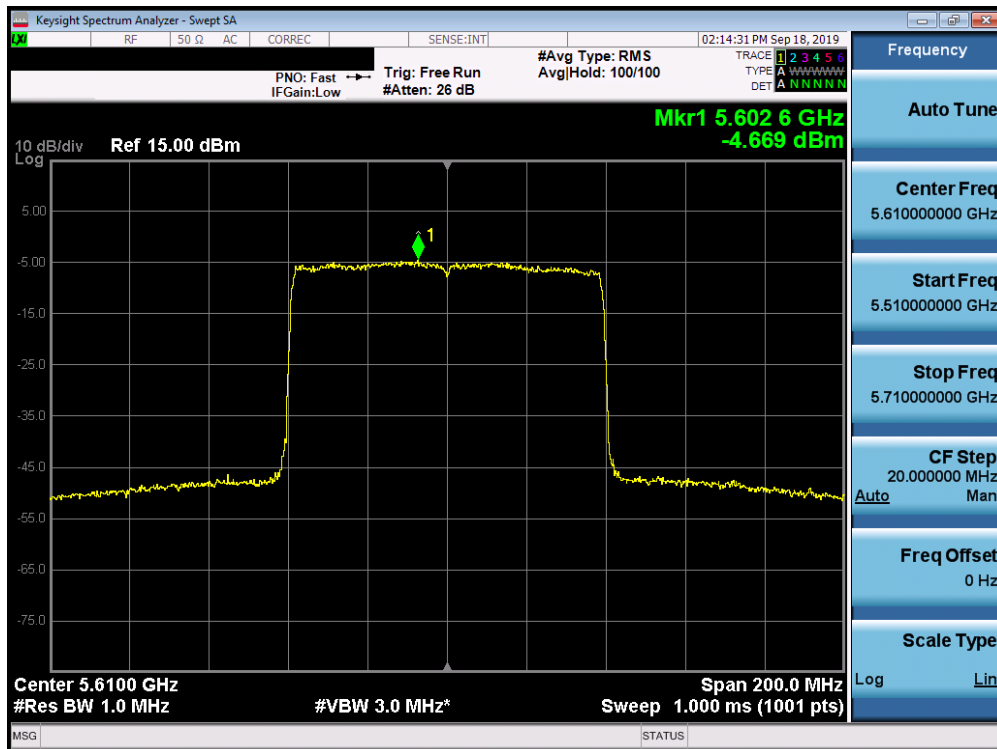


Plot 7-153. Power Spectral Density Plot SISO ANT2 (40MHz BW 802.11ax – Full Tones (UNII Band 2C) – Ch. 142)

FCC ID: A3LSMN976U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset		Page 127 of 270

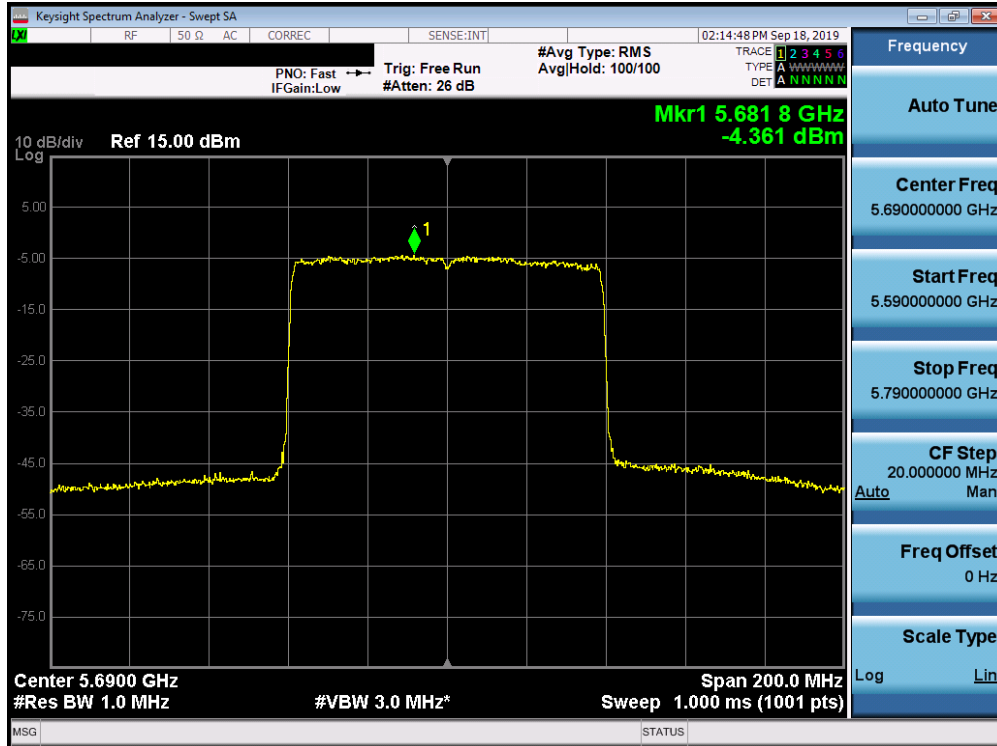


Plot 7-154. Power Spectral Density Plot SISO ANT2 (80MHz BW 802.11ax – Full Tones (UNII Band 2C) – Ch. 106)



Plot 7-155. Power Spectral Density Plot SISO ANT2 (80MHz BW 802.11ax – Full Tones (UNII Band 2C) – Ch. 122)

FCC ID: A3LSMN976U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset		Page 128 of 270



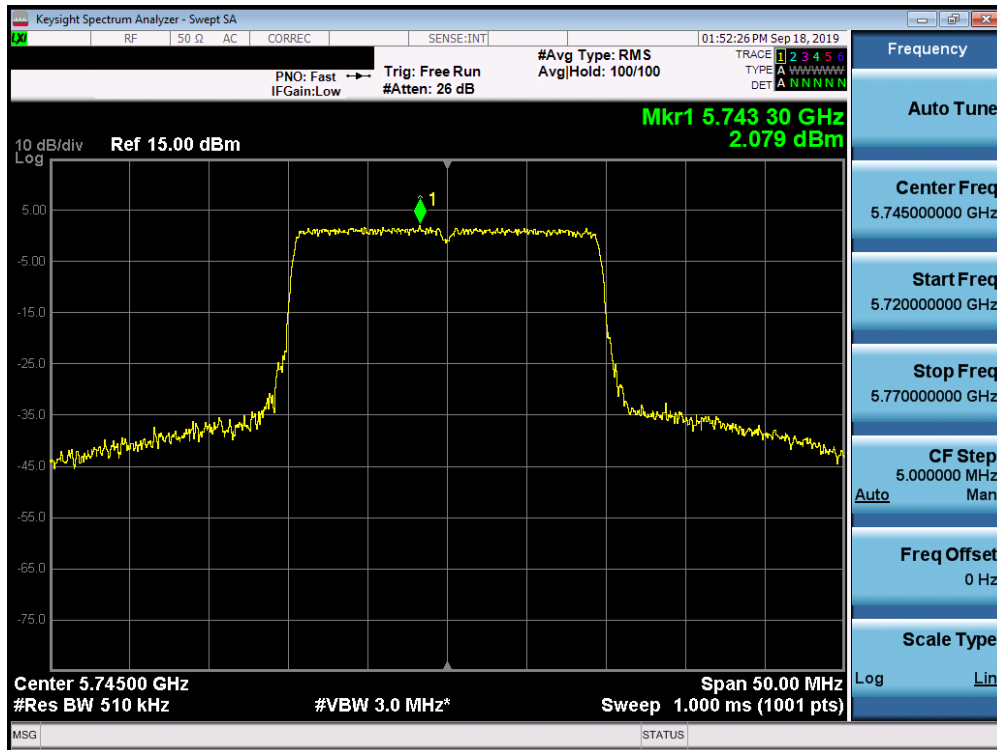
Plot 7-156. Power Spectral Density Plot SISO ANT2 (80MHz BW 802.11ax – Full Tones (UNII Band 2C) – Ch. 138)

FCC ID: A3LSMN976U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset		Page 129 of 270

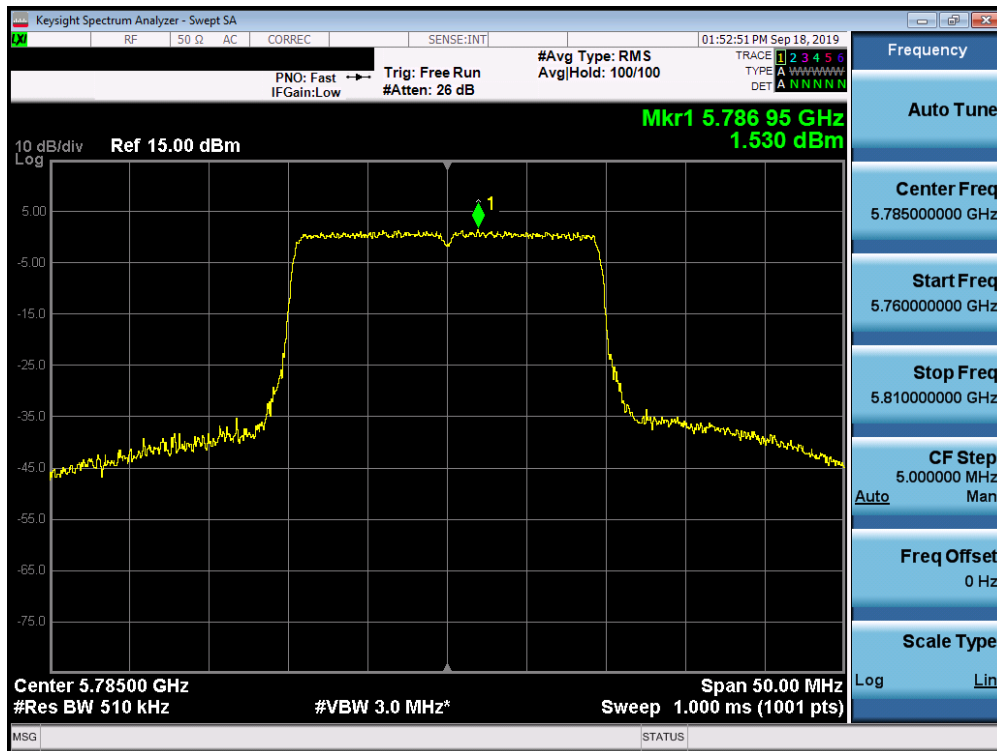
	Frequency [MHz]	Channel No.	802.11 Mode	Tones	Data Rate [Mbps]	Measured Power Density [dBm]	Max Permissible Power Density	Margin [dB]
Band 3	5745	149	ax (20MHz)	242T	MCS0	2.08	30.00	-27.92
	5785	157	ax (20MHz)	242T	MCS0	1.53	30.00	-28.47
	5825	165	ax (20MHz)	242T	MCS0	1.84	30.00	-28.16
	5755	151	ax (40MHz)	484T	MCS0	-3.07	30.00	-33.07
	5795	159	ax (40MHz)	484T	MCS0	-2.94	30.00	-32.94
	5775	155	ax (80MHz)	996T	MCS0	-7.04	30.00	-37.04

Table 7-58. Band 3 Conducted Power Spectral Density Measurements SISO ANT2 (Full Tones)

FCC ID: A3LSMN976U	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset	Page 130 of 270

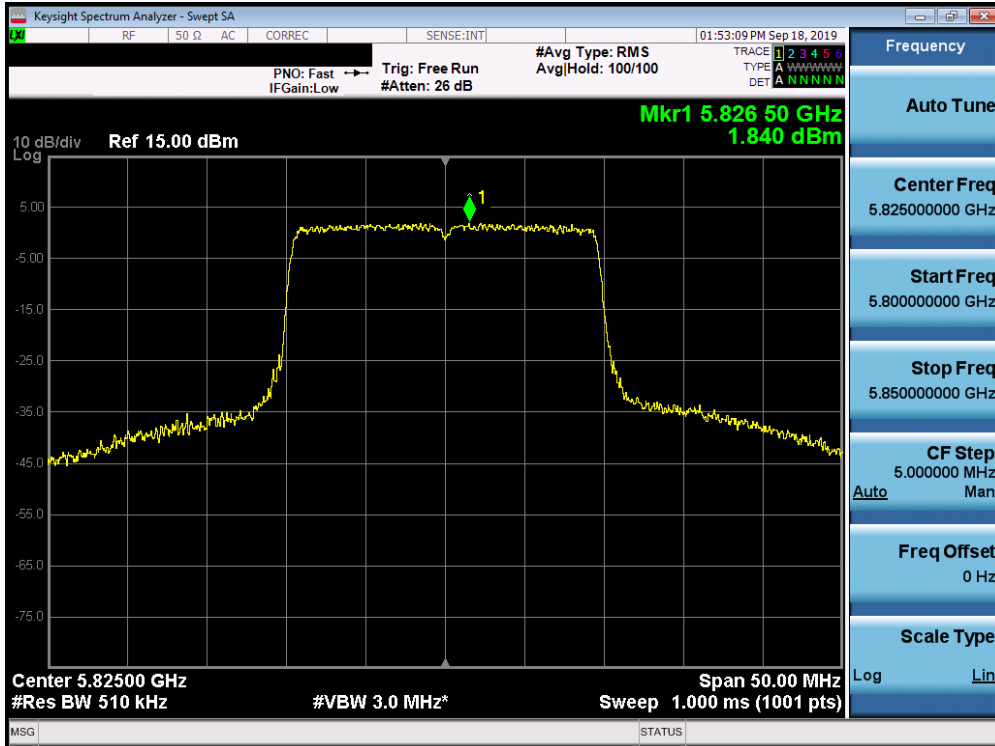


Plot 7-157. Power Spectral Density Plot SISO ANT2 (20MHz BW 802.11ax – Full Tones (UNII Band 3) – Ch. 149)

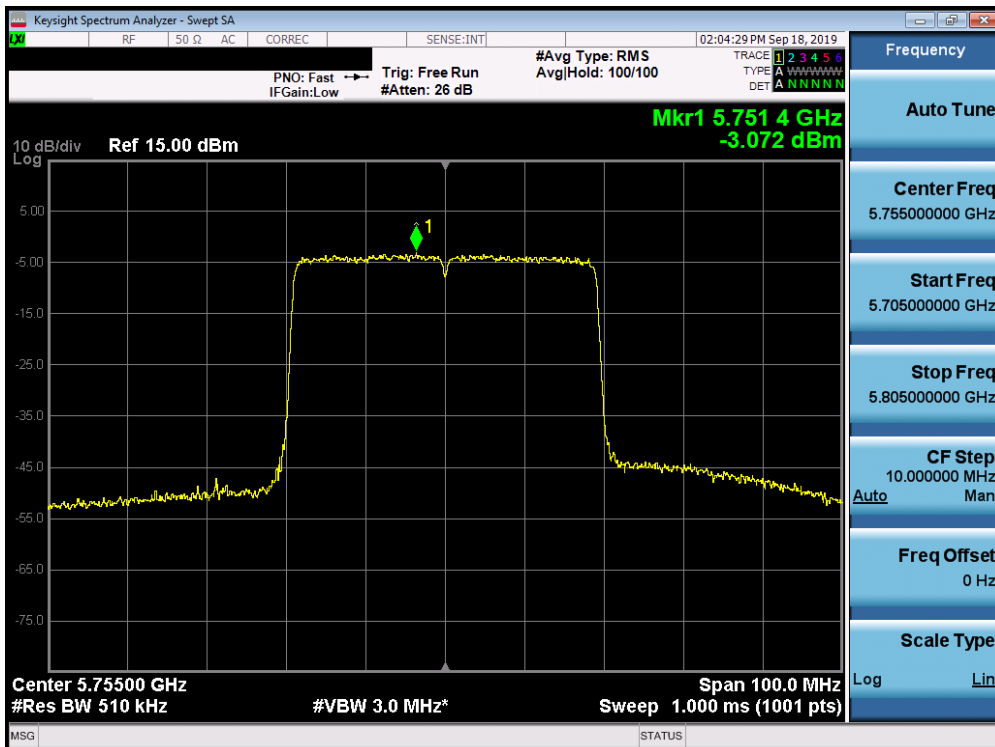


Plot 7-158. Power Spectral Density Plot SISO ANT2 (20MHz BW 802.11ax – Full Tones (UNII Band 3) – Ch. 157)

FCC ID: A3LSMN976U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset		Page 131 of 270

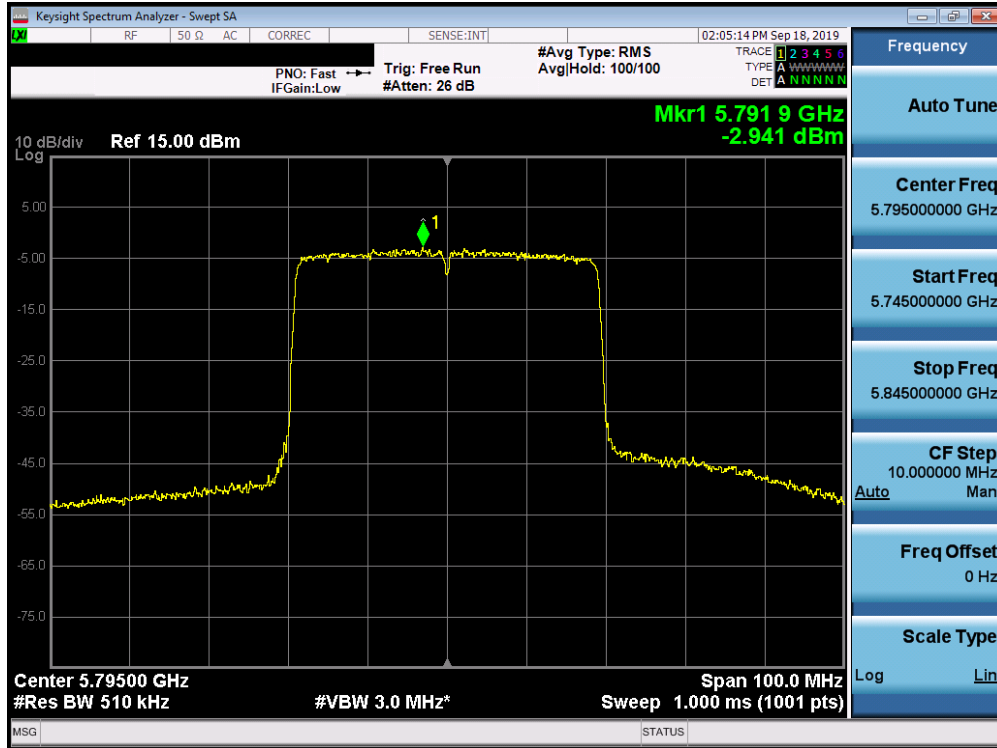


Plot 7-159. Power Spectral Density Plot SISO ANT2 (20 MHz BW 802.11ax – Full Tones (UNII Band 3) – Ch. 165)

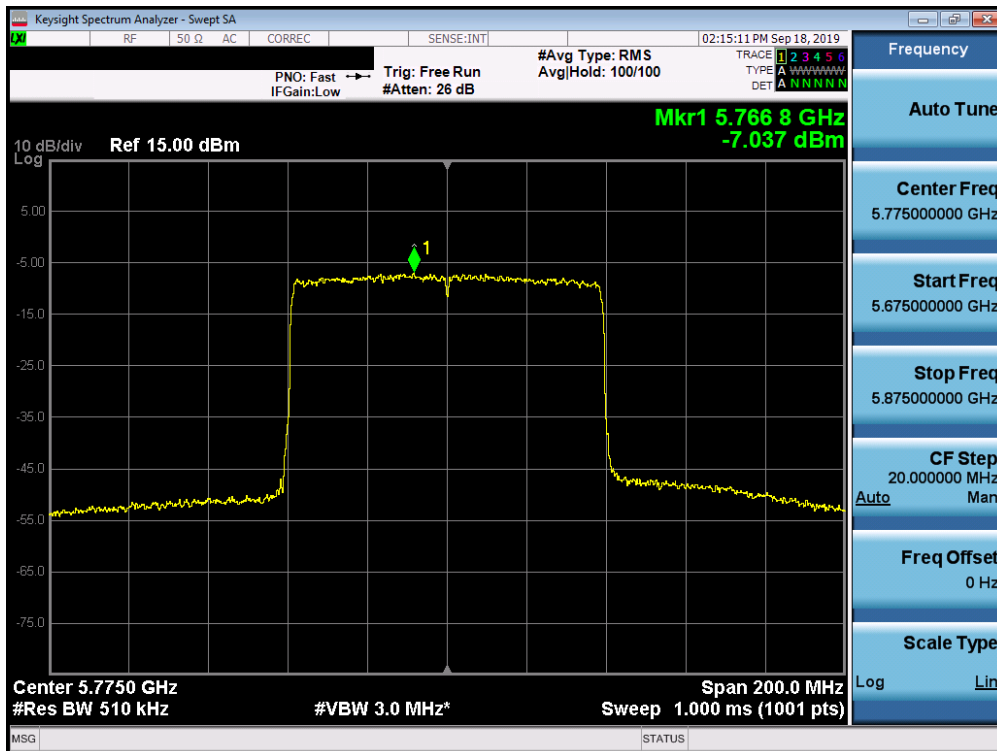


Plot 7-160. Power Spectral Density Plot SISO ANT2 (40MHz BW 802.11ax – Full Tones (UNII Band 3) – Ch. 151)

FCC ID: A3LSMN976U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset		Page 132 of 270



Plot 7-161. Power Spectral Density Plot SISO ANT2 (40MHz BW 802.11ax – Full Tones (UNII Band 3) – Ch. 159)



Plot 7-162. Power Spectral Density Plot SISO ANT2 (80MHz BW 802.11ax – Full Tones (UNII Band 3) – Ch. 155)

FCC ID: A3LSMN976U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset		Page 133 of 270

Summed MIMO Power Spectral Density Measurements (26 Tones)

	Frequency [MHz]	Channel No.	802.11 Mode	Tones	Data Rate [Mbps]	Antenna-1 Power Density [dBm]	Antenna-2 Power Density [dBm]	Summed MIMO Power Density [dBm]	Max Power Density [dBm/MHz]	Margin [dB]
Band 1	5180	36	ax (20MHz)	26T	MCS0	5.89	5.18	8.56	11.00	-2.44
	5200	40	ax (20MHz)	26T	MCS0	5.71	5.40	8.57	11.00	-2.43
	5240	48	ax (20MHz)	26T	MCS0	5.35	5.27	8.32	11.00	-2.68
	5190	38	ax (40MHz)	26T	MCS0	6.36	4.95	8.72	11.00	-2.28
	5230	46	ax (40MHz)	26T	MCS0	5.69	5.46	8.59	11.00	-2.41
	5210	42	ax (80MHz)	26T	MCS0	6.04	5.96	9.01	11.00	-1.99
Band 2A	5260	52	ax (20MHz)	26T	MCS0	6.73	5.06	8.99	11.00	-2.01
	5280	56	ax (20MHz)	26T	MCS0	5.57	3.49	7.66	11.00	-3.34
	5320	64	ax (20MHz)	26T	MCS0	5.42	3.99	7.77	11.00	-3.23
	5270	54	ax (40MHz)	26T	MCS0	6.73	4.82	8.89	11.00	-2.11
	5310	62	ax (40MHz)	26T	MCS0	6.93	4.90	9.04	11.00	-1.96
	5290	58	ax (80MHz)	26T	MCS0	6.98	5.16	9.17	11.00	-1.83
Band 2C	5500	100	ax (20MHz)	26T	MCS0	6.52	5.28	8.95	11.00	-2.05
	5600	120	ax (20MHz)	26T	MCS0	7.05	5.01	9.16	11.00	-1.84
	5720	144	ax (20MHz)	26T	MCS0	6.95	5.56	9.32	11.00	-1.68
	5510	102	ax (40MHz)	26T	MCS0	6.41	5.35	8.92	11.00	-2.08
	5590	118	ax (40MHz)	26T	MCS0	6.24	5.23	8.77	11.00	-2.23
	5710	142	ax (40MHz)	26T	MCS0	6.54	5.57	9.09	11.00	-1.91
	5530	106	ax (80MHz)	26T	MCS0	5.77	4.54	8.21	11.00	-2.79
	5610	122	ax (80MHz)	26T	MCS0	5.98	4.86	8.46	11.00	-2.54
	5690	138	ax (80MHz)	26T	MCS0	5.81	4.81	8.35	11.00	-2.65

Table 7-59. Bands 1, 2A, 2C MIMO Conducted Power Spectral Density Measurements MIMO (26 Tones)

	Frequency [MHz]	Channel No.	802.11 Mode	Tones	Data Rate [Mbps]	Antenna-1 Power Density [dBm]	Antenna-2 Power Density [dBm]	Summed MIMO Power Density [dBm]	Max Permissible Power Density	Margin [dB]
Band 3	5745	149	ax (20MHz)	26T	MCS0	3.38	2.98	6.20	30.00	-23.80
	5785	157	ax (20MHz)	26T	MCS0	3.09	2.63	5.88	30.00	-24.12
	5825	165	ax (20MHz)	26T	MCS0	3.75	2.89	6.35	30.00	-23.65
	5755	151	ax (40MHz)	26T	MCS0	4.28	3.45	6.89	30.00	-23.11
	5795	159	ax (40MHz)	26T	MCS0	3.96	3.09	6.56	30.00	-23.44
	5775	155	ax (80MHz)	26T	MCS0	4.63	3.75	7.22	30.00	-22.78

Table 7-60. Band 3 MIMO Conducted Power Spectral Density Measurements MIMO (26 Tones)

FCC ID: A3LSMN976U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset		Page 134 of 270

	Frequency [MHz]	Channel No.	802.11 Mode	Tones	Data Rate [Mbps]	Antenna-1 Power Density [dBm]	Antenna-2 Power Density [dBm]	Summed MIMO Power Density [dBm]	Max Power Density [dBm/MHz]	Margin [dB]
Band 1	5180	36	ax (20MHz)	242T	MCS0	0.98	0.75	3.87	11.00	-7.13
	5200	40	ax (20MHz)	242T	MCS0	0.99	0.78	3.89	11.00	-7.11
	5240	48	ax (20MHz)	242T	MCS0	1.03	0.69	3.87	11.00	-7.13
	5190	38	ax (40MHz)	484T	MCS0	-3.25	-3.73	-0.47	11.00	-11.47
	5230	46	ax (40MHz)	484T	MCS0	-3.33	-3.39	-0.35	11.00	-11.35
	5210	42	ax (80MHz)	996T	MCS0	-7.24	-7.73	-4.46	11.00	-15.46
Band 2A	5260	52	ax (20MHz)	242T	MCS0	1.70	0.77	4.27	11.00	-6.73
	5280	56	ax (20MHz)	242T	MCS0	1.83	0.64	4.29	11.00	-6.71
	5320	64	ax (20MHz)	242T	MCS0	1.92	0.51	4.28	11.00	-6.72
	5270	54	ax (40MHz)	484T	MCS0	-2.38	-4.02	-0.11	11.00	-11.11
	5310	62	ax (40MHz)	484T	MCS0	-2.35	-3.88	-0.04	11.00	-11.04
	5290	58	ax (80MHz)	996T	MCS0	-6.18	-7.91	-3.95	11.00	-14.95
Band 2C	5500	100	ax (20MHz)	242T	MCS0	2.08	1.37	4.74	11.00	-6.26
	5600	120	ax (20MHz)	242T	MCS0	2.01	1.09	4.58	11.00	-6.42
	5720	144	ax (20MHz)	242T	MCS0	2.01	1.50	4.77	11.00	-6.23
	5510	102	ax (40MHz)	484T	MCS0	-2.62	-3.91	-0.21	11.00	-11.21
	5590	118	ax (40MHz)	484T	MCS0	-2.64	-3.85	-0.19	11.00	-11.19
	5710	142	ax (40MHz)	484T	MCS0	-2.49	-3.69	-0.04	11.00	-11.04
	5530	106	ax (80MHz)	996T	MCS0	-7.22	-7.50	-4.35	11.00	-15.35
	5610	122	ax (80MHz)	996T	MCS0	-7.05	-7.47	-4.25	11.00	-15.25
5690	138	ax (80MHz)	996T	MCS0	-6.54	-7.32	-3.90	11.00	-14.90	

Table 7-61. Bands 1, 2A, 2C MIMO Conducted Power Spectral Density Measurements MIMO (Full Tones)

	Frequency [MHz]	Channel No.	802.11 Mode	Tones	Data Rate [Mbps]	Antenna-1 Power Density [dBm]	Antenna-2 Power Density [dBm]	Summed MIMO Power Density [dBm]	Max Permissible Power Density	Margin [dB]
Band 3	5745	149	ax (20MHz)	242T	MCS0	-1.17	-1.36	1.74	30.00	-28.26
	5785	157	ax (20MHz)	242T	MCS0	-0.64	-1.44	1.99	30.00	-28.01
	5825	165	ax (20MHz)	242T	MCS0	-1.15	-1.30	1.78	30.00	-28.22
	5755	151	ax (40MHz)	484T	MCS0	-5.31	-6.18	-2.71	30.00	-32.71
	5795	159	ax (40MHz)	484T	MCS0	-5.70	-5.84	-2.76	30.00	-32.76
	5775	155	ax (80MHz)	996T	MCS0	-9.21	-9.32	-6.25	30.00	-36.25

Table 7-62. Band 3 MIMO Conducted Power Spectral Density Measurements MIMO (Full Tones)

FCC ID: A3LSMN976U		MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset		Page 135 of 270	

Note:

Per ANSI C63.10-2013 Section 14.3.2.2 and KDB 662911 v02r01 Section E)2), the power spectral density at Antenna 1 and Antenna 2 were first measured separately with reduced Antenna 1 and Antenna 2 powers per manufacture’s tune-up document. The measured values were then summed in linear power units then converted back to dBm.

Sample Directional Gain Calculation:

Assuming the antenna gain is -8.61 dBi for Antenna-1 and -7.68 dBi for Antenna-2.

$$\begin{aligned}
 \text{Directional gain} &= 10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2 / N_{\text{ANT}}] \text{ dBi} \\
 &= 10 \log[(10^{-8.61/20} + 10^{-7.68/20} / 2)] \text{ dBi} \\
 &= (-5.12) \text{ dBi}
 \end{aligned}$$

Sample MIMO Calculation:

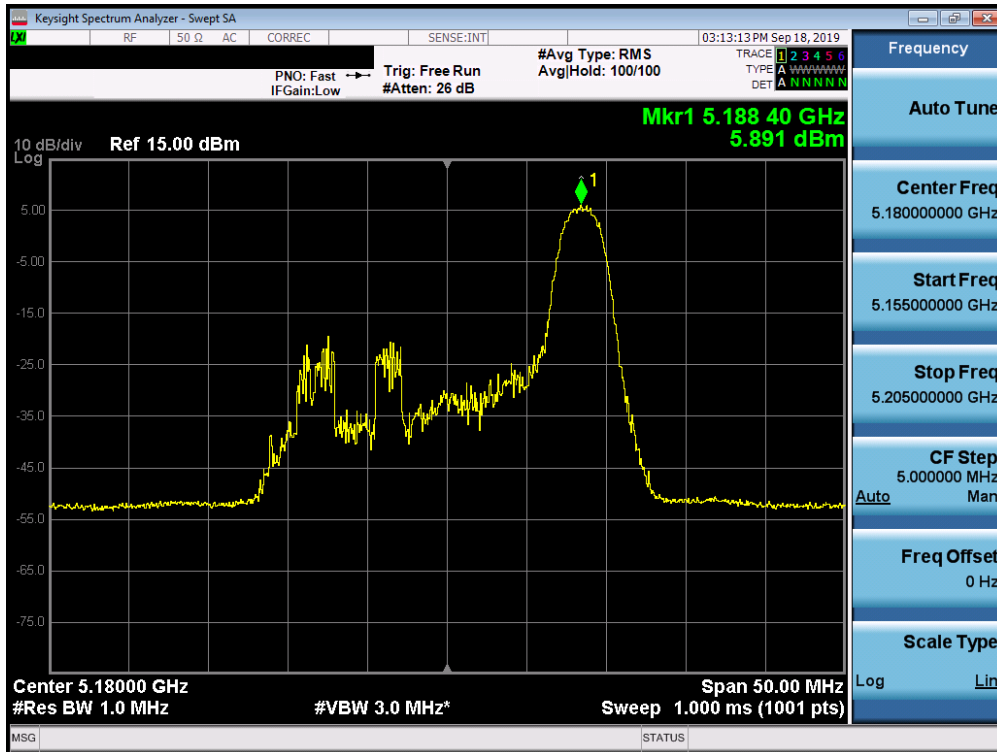
Assuming the average conducted power spectral density was measured to be 5.88 dBm for Antenna-1 and 6.27 dBm for Antenna-2.

Antenna 1 + Antenna 2 = MIMO

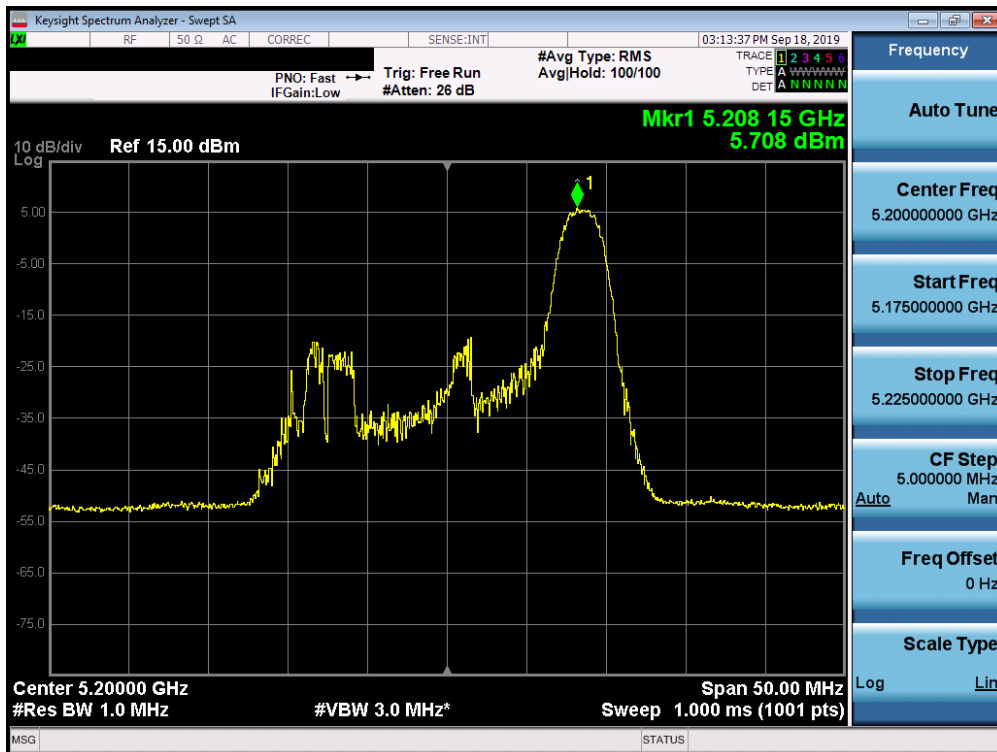
$$(5.88 \text{ dBm} + 6.27 \text{ dBm}) = (3.87 \text{ mW} + 4.24 \text{ mW}) = 8.11 \text{ mW} = 9.09 \text{ dBm}$$

FCC ID: A3LSMN976U	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
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MIMO Antenna-1 Power Spectral Density Measurements (26 Tones)

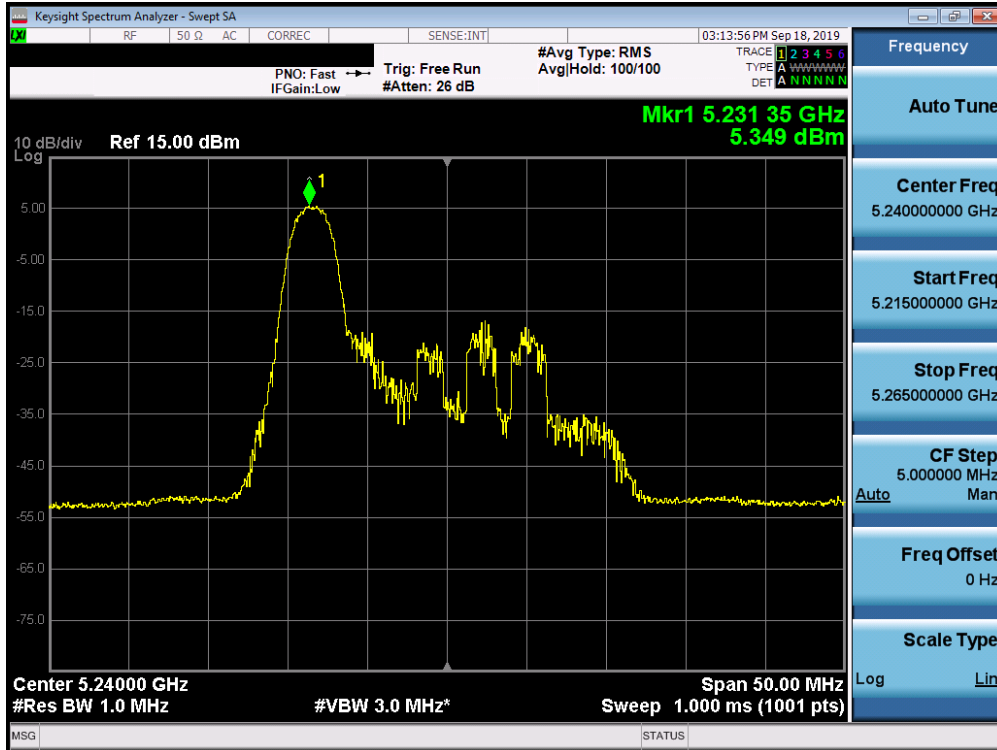


Plot 7-163. Power Spectral Density Plot MIMO ANT1 (20MHz BW 802.11ax – 26 Tones (UNII Band 1) – Ch. 36)

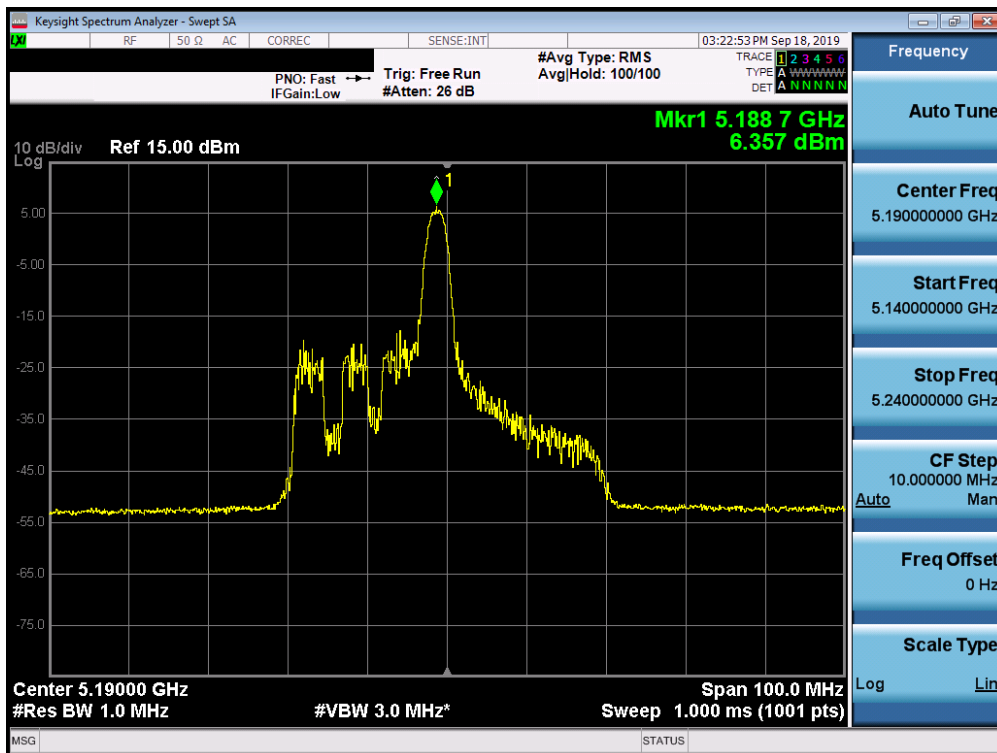


Plot 7-164. Power Spectral Density Plot MIMO ANT1 (20MHz BW 802.11ax – 26 Tones (UNII Band 1) – Ch. 40)

FCC ID: A3LSMN976U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset		Page 137 of 270

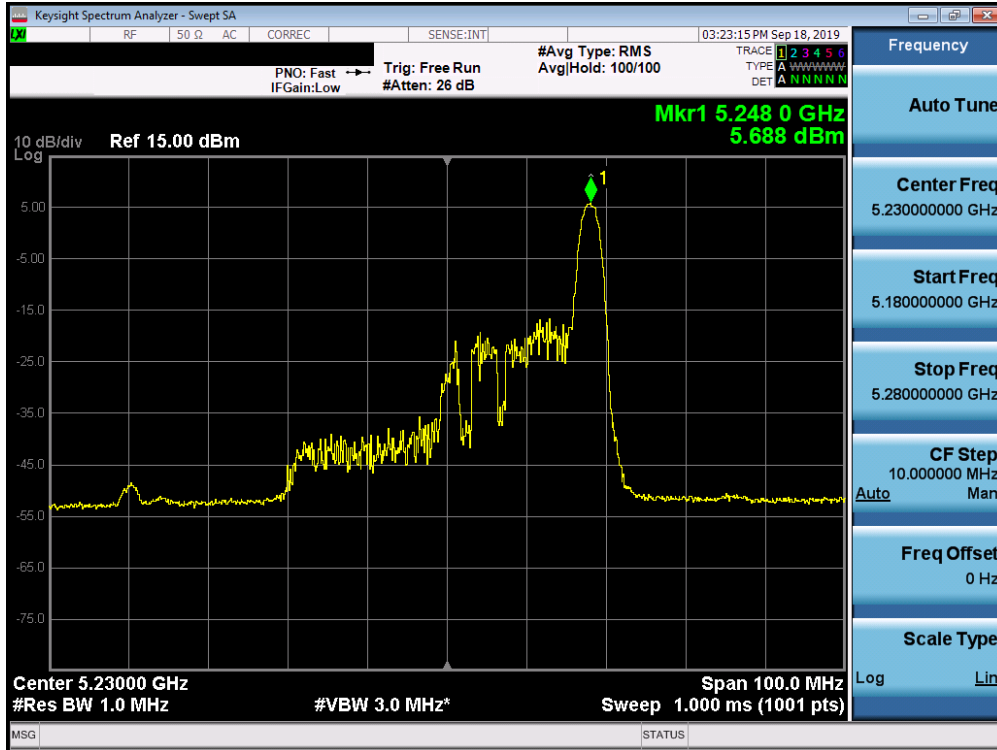


Plot 7-165. Power Spectral Density Plot MIMO ANT1 (20MHz BW 802.11ax – 26 Tones (UNII Band 1) – Ch. 48)

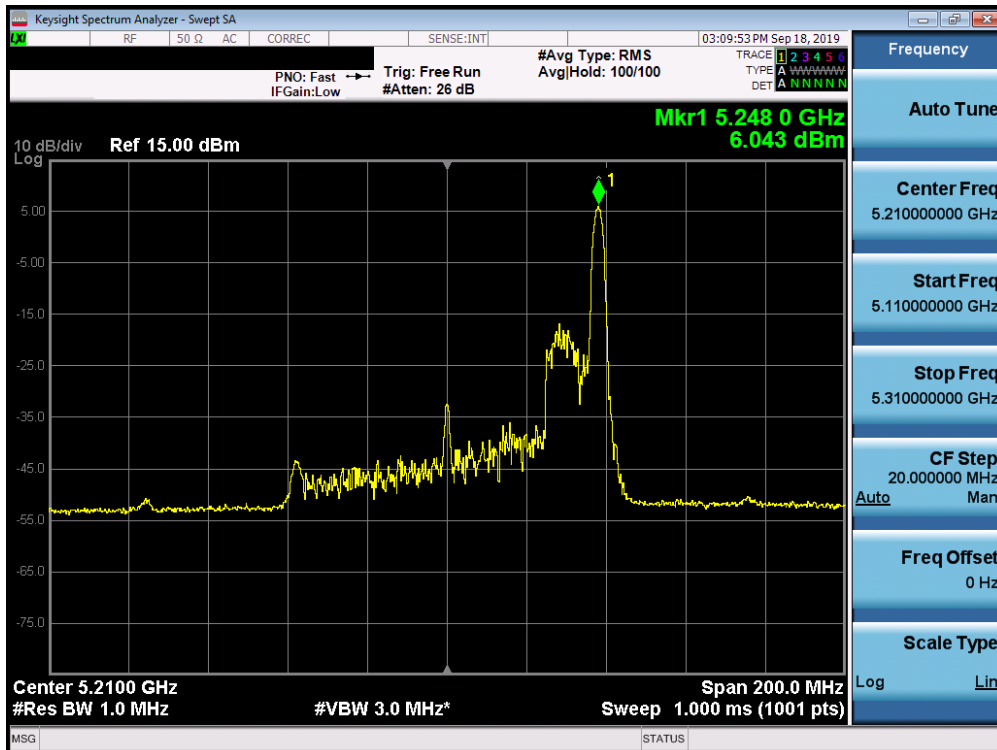


Plot 7-166. Power Spectral Density Plot MIMO ANT1 (40MHz BW 802.11ax – 26 Tones (UNII Band 1) – Ch. 38)

FCC ID: A3LSMN976U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset		Page 138 of 270



Plot 7-167. Power Spectral Density Plot MIMO ANT1 (40MHz BW 802.11ax – 26 Tones (UNII Band 1) – Ch. 46)

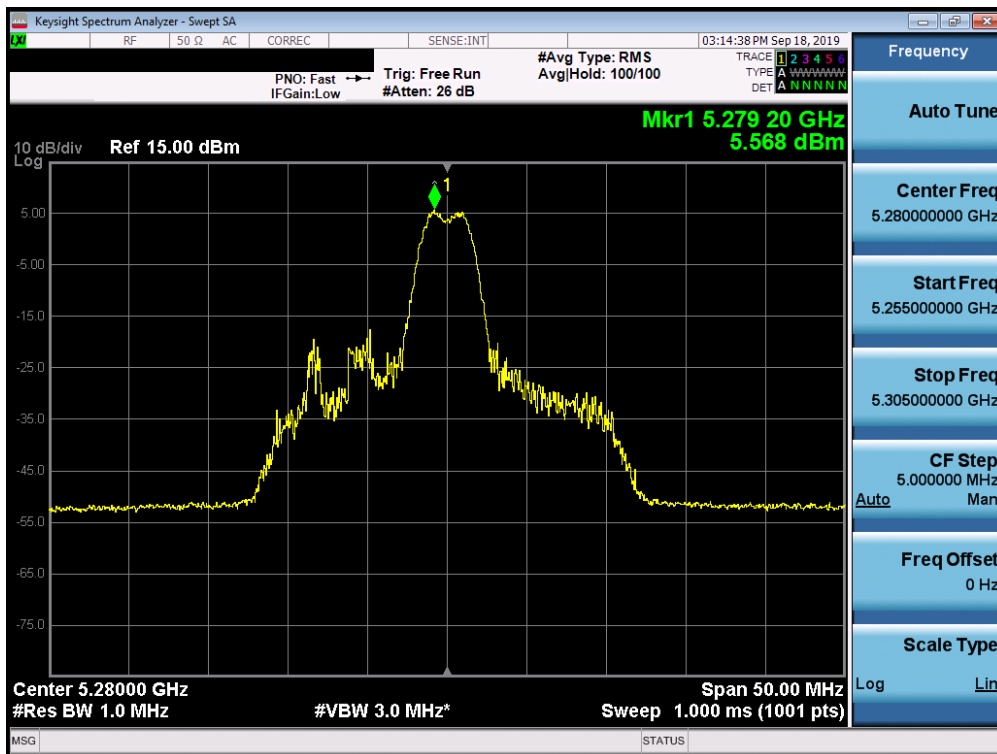


Plot 7-168. Power Spectral Density Plot MIMO ANT1 (80MHz BW 802.11ax – 26 Tones (UNII Band 1) – Ch. 42)

FCC ID: A3LSMN976U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset		Page 139 of 270

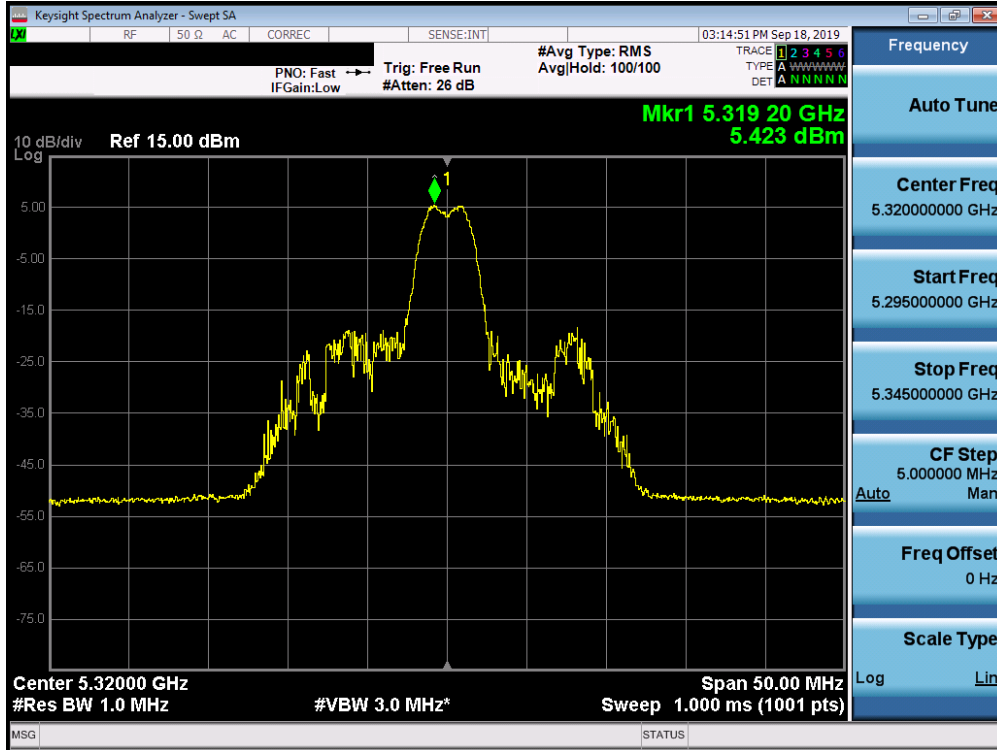


Plot 7-169. Power Spectral Density Plot MIMO ANT1 (20MHz BW 802.11ax – 26 Tones (UNII Band 2A) – Ch. 52)

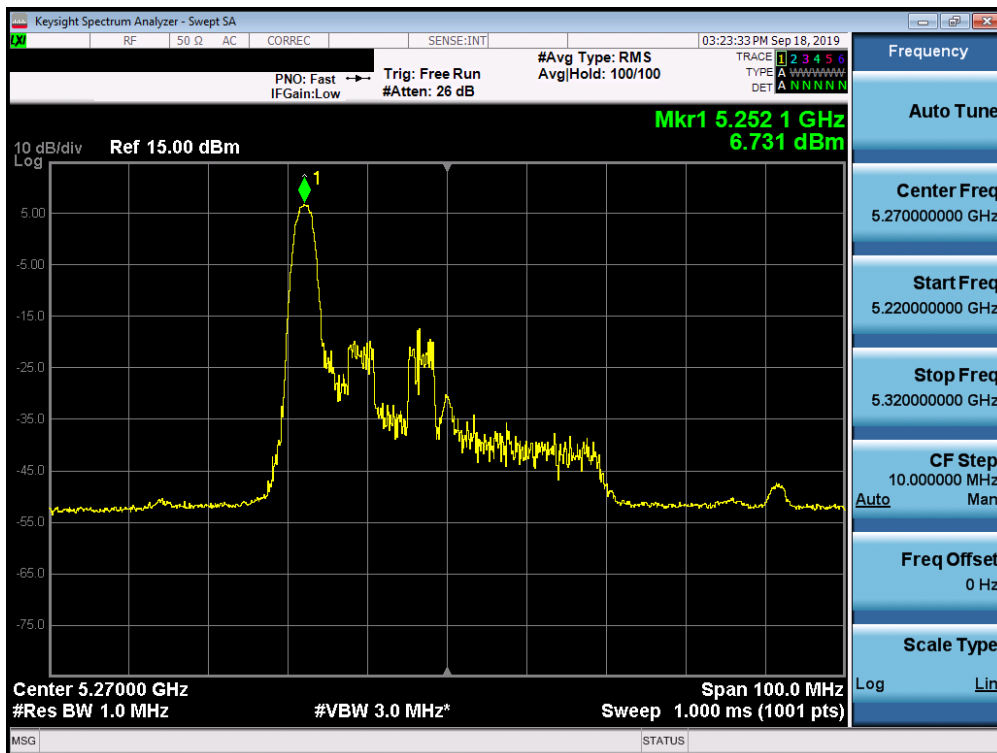


Plot 7-170. Power Spectral Density Plot MIMO ANT1 (20MHz BW 802.11ax – 26 Tones (UNII Band 2A) – Ch. 56)

FCC ID: A3LSMN976U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Plot 7-171. Power Spectral Density Plot MIMO ANT1 (20MHz BW 802.11ax – 26 Tones (UNII Band 2A) – Ch. 64)



Plot 7-172. Power Spectral Density Plot MIMO ANT1 (40MHz BW 802.11ax – 26 Tones (UNII Band 2A) – Ch. 54)

FCC ID: A3LSMN976U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/10/2019	EUT Type: Portable Handset		Page 141 of 270