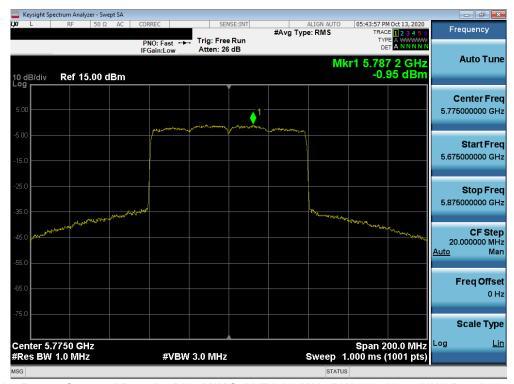




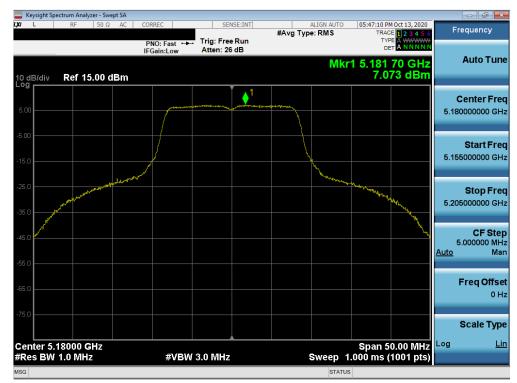
Plot 7-209. Power Spectral Density Plot MIMO ANT1 (80MHz BW 802.11ac (UNII Band 3) - Ch. 155)



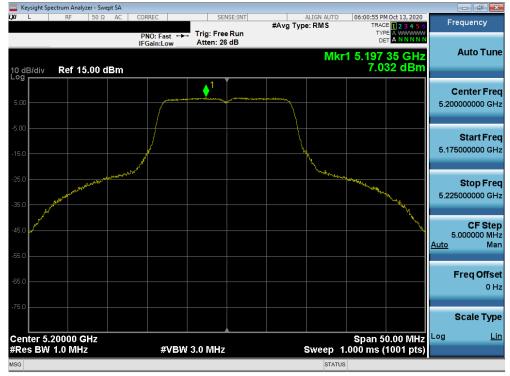
Plot 7-210. Power Spectral Density Plot MIMO ANT1 (80MHz BW 802.11ax (UNII Band 3) - Ch. 155)

FCC ID: A3LSMG998U	Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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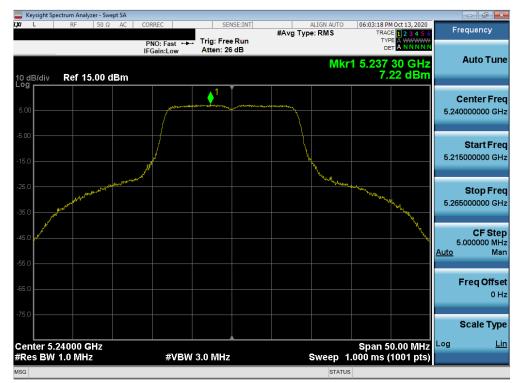
Plot 7-211. Power Spectral Density Plot MIMO ANT2 (802.11a (UNII Band 1) - Ch. 36)



Plot 7-212. Power Spectral Density Plot MIMO ANT2 (802.11a (UNII Band 1) - Ch. 40)

FCC ID: A3LSMG998U	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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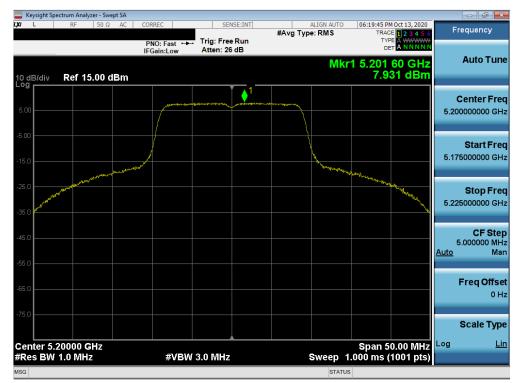
Plot 7-213. Power Spectral Density Plot MIMO ANT2 (802.11a (UNII Band 1) - Ch. 48)



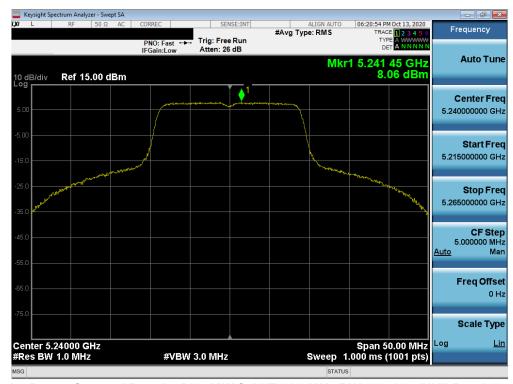
Plot 7-214. Power Spectral Density Plot MIMO ANT2 (20MHz BW 802.11n (UNII Band 1) - Ch. 36)

FCC ID: A3LSMG998U	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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Plot 7-215. Power Spectral Density Plot MIMO ANT2 (20MHz BW 802.11n (UNII Band 1) - Ch. 40)



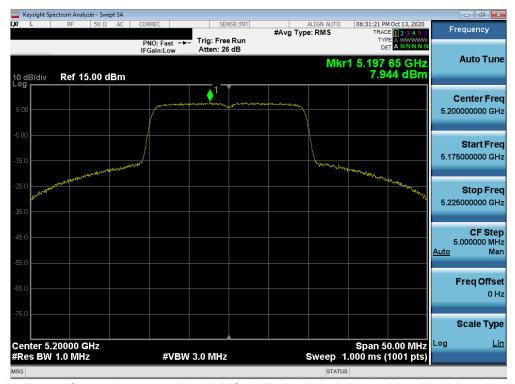
Plot 7-216. Power Spectral Density Plot MIMO ANT2 (20MHz BW 802.11n (UNII Band 1) - Ch. 48)

FCC ID: A3LSMG998U	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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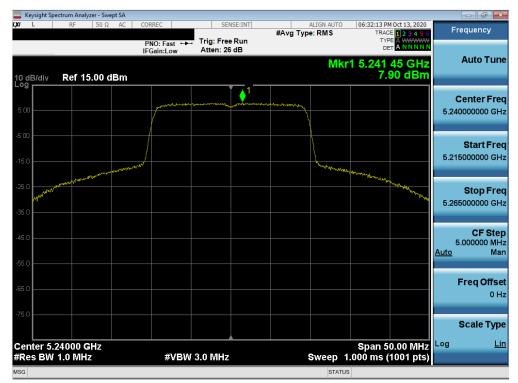
Plot 7-217. Power Spectral Density Plot MIMO ANT2 (20MHz BW 802.11ax (UNII Band 1) - Ch. 36)



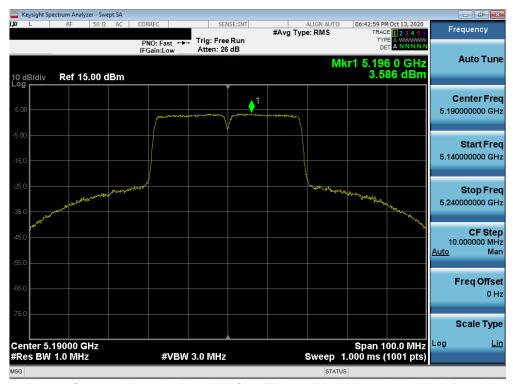
Plot 7-218. Power Spectral Density Plot MIMO ANT2 (20MHz BW 802.11ax (UNII Band 1) - Ch. 40)

FCC ID: A3LSMG998U	PCTEST* Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Done 126 of 207
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Plot 7-219. Power Spectral Density Plot MIMO ANT2 (20MHz BW 802.11ax (UNII Band 1) - Ch. 48)



Plot 7-220. Power Spectral Density Plot MIMO ANT2 (40MHz BW 802.11n (UNII Band 1) - Ch. 38)

FCC ID: A3LSMG998U	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Daga 127 of 207
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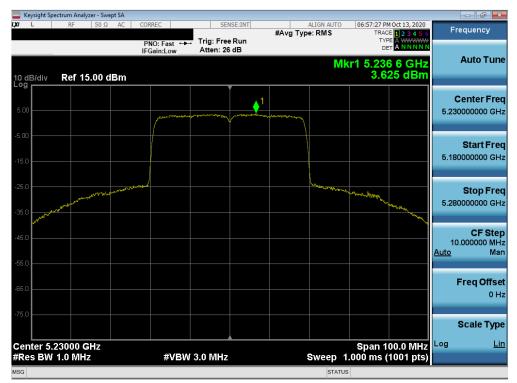
Plot 7-221. Power Spectral Density Plot MIMO ANT2 (40MHz BW 802.11n (UNII Band 1) - Ch. 46)



Plot 7-222. Power Spectral Density Plot MIMO ANT2 (40MHz BW 802.11ax (UNII Band 1) - Ch. 38)

FCC ID: A3LSMG998U	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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Plot 7-223. Power Spectral Density Plot MIMO ANT2 (40MHz BW 802.11ax (UNII Band 1) - Ch. 46)



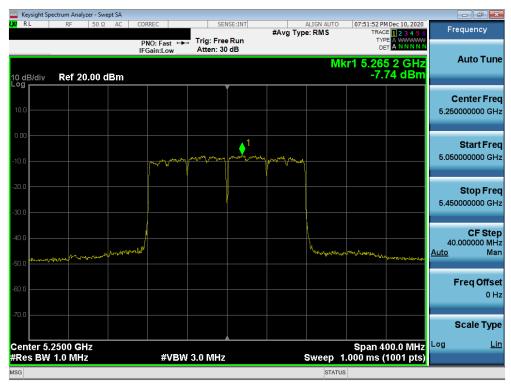
Plot 7-224. Power Spectral Density Plot MIMO ANT2 (80MHz BW 802.11ac (UNII Band 1) - Ch. 42)

FCC ID: A3LSMG998U	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogg 120 of 207
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Plot 7-225. Power Spectral Density Plot MIMO ANT2 (80MHz BW 802.11ax (UNII Band 1) - Ch. 42)



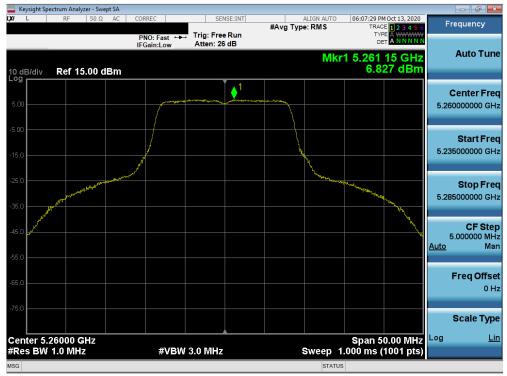
Plot 7-226. Power Spectral Density Plot MIMO ANT2 (160MHz BW 802.11ac (UNII Band 1) - Ch. 50)

FCC ID: A3LSMG998U	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1M2009230152-09.A3L	Test Dates: 10/05 - 12/11/2020	EUT Type: Portable Handset	Page 140 of 207





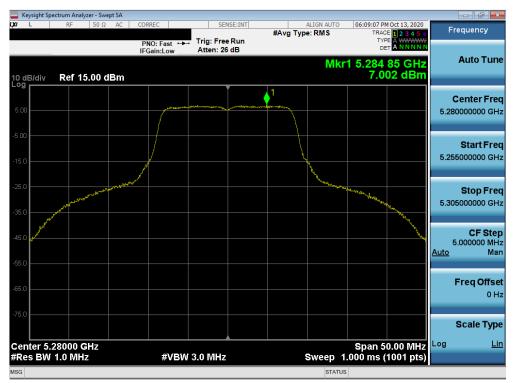
Plot 7-227. Power Spectral Density Plot MIMO ANT2 (160MHz BW 802.11ax (UNII Band 1) - Ch. 50)



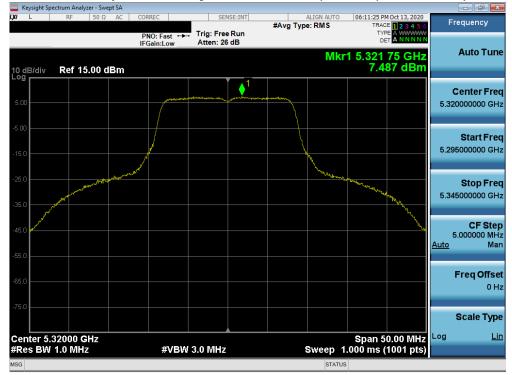
Plot 7-228. Power Spectral Density Plot MIMO ANT2 (802.11a (UNII Band 2A) - Ch. 52)

FCC ID: A3LSMG998U	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Plot 7-229. Power Spectral Density Plot MIMO ANT2 (802.11a (UNII Band 2A) - Ch. 56)



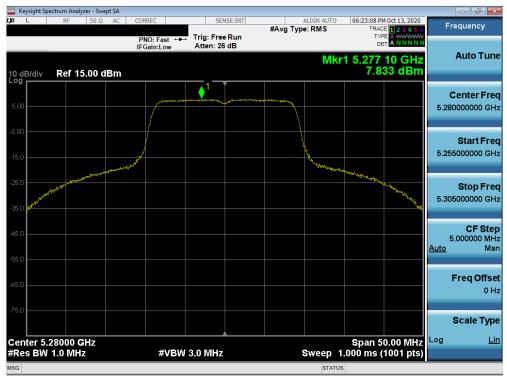
Plot 7-230. Power Spectral Density Plot MIMO ANT2 (802.11a (UNII Band 2A) - Ch. 64)

FCC ID: A3LSMG998U	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dama 140 of 207
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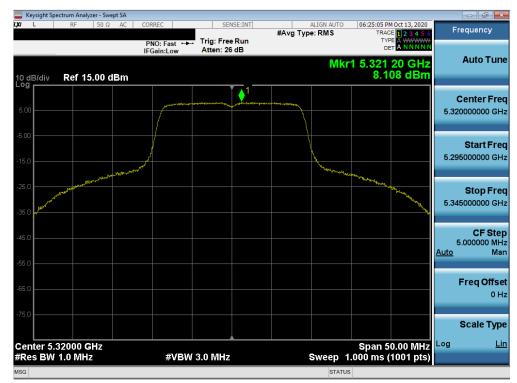
Plot 7-231. Power Spectral Density Plot MIMO ANT2 (20MHz BW 802.11n (UNII Band 2A) - Ch. 52)



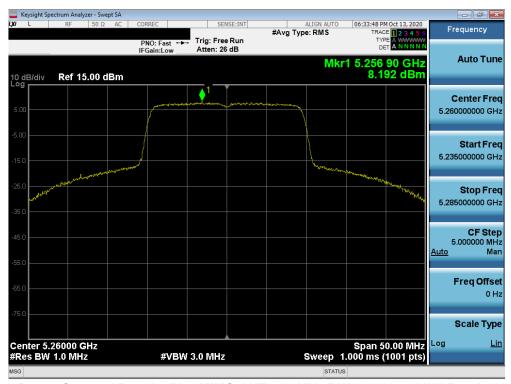
Plot 7-232. Power Spectral Density Plot MIMO ANT2 (20MHz BW 802.11n (UNII Band 2A) - Ch. 56)

FCC ID: A3LSMG998U	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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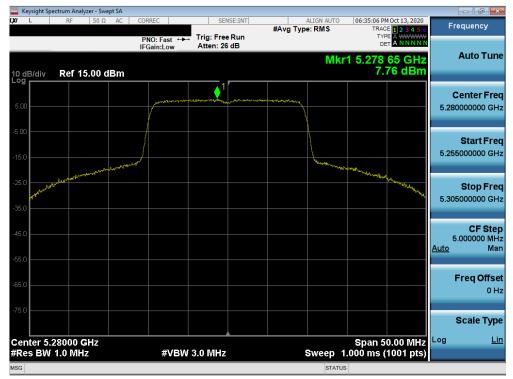
Plot 7-233. Power Spectral Density Plot MIMO ANT2 (20MHz BW 802.11n (UNII Band 2A) - Ch. 64)



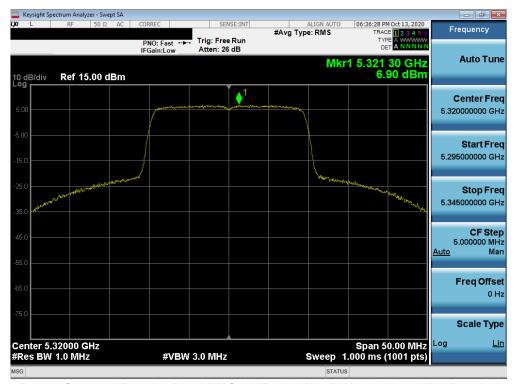
Plot 7-234. Power Spectral Density Plot MIMO ANT2 (20MHz BW 802.11ax (UNII Band 2A) - Ch. 52)

FCC ID: A3LSMG998U	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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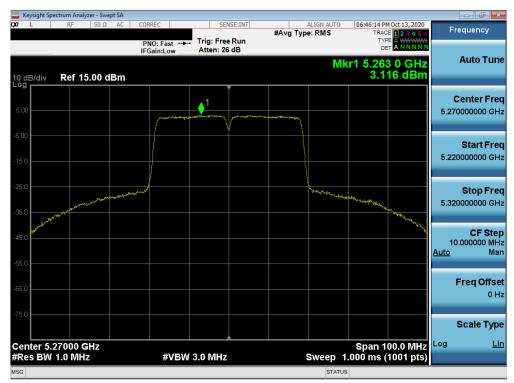
Plot 7-235. Power Spectral Density Plot MIMO ANT2 (20MHz BW 802.11ax (UNII Band 2A) - Ch. 56)



Plot 7-236. Power Spectral Density Plot MIMO ANT2 (20MHz BW 802.11ax (UNII Band 2A) - Ch. 64)

FCC ID: A3LSMG998U	Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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Plot 7-237. Power Spectral Density Plot MIMO ANT2 (40MHz BW 802.11n (UNII Band 2A) - Ch. 54)



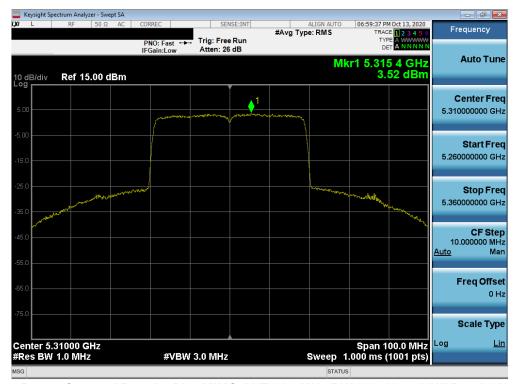
Plot 7-238. Power Spectral Density Plot MIMO ANT2 (40MHz BW 802.11n (UNII Band 2A) - Ch. 62)

FCC ID: A3LSMG998U	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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Plot 7-239. Power Spectral Density Plot MIMO ANT2 (40MHz BW 802.11ax (UNII Band 2A) - Ch. 54)



Plot 7-240. Power Spectral Density Plot MIMO ANT2 (40MHz BW 802.11ax (UNII Band 2A) - Ch. 62)

FCC ID: A3LSMG998U	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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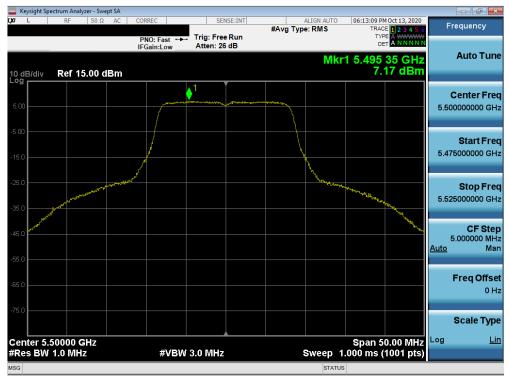
Plot 7-241. Power Spectral Density Plot MIMO ANT2 (80MHz BW 802.11ac (UNII Band 2A) - Ch. 58)



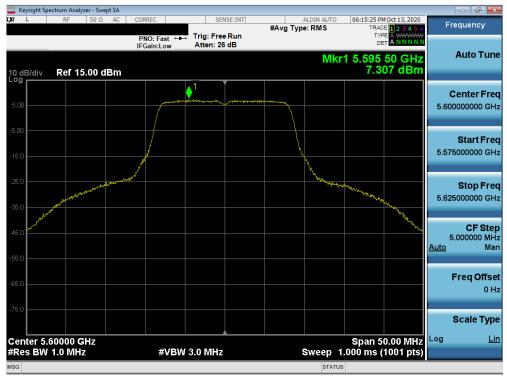
Plot 7-242. Power Spectral Density Plot MIMO ANT2 (80MHz BW 802.11ax (UNII Band 2A) - Ch. 58)

FCC ID: A3LSMG998U	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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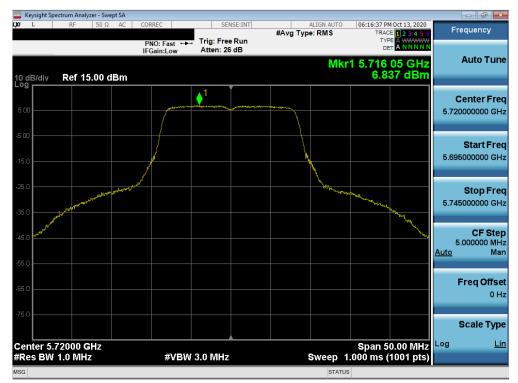
Plot 7-243. Power Spectral Density Plot MIMO ANT2 (802.11a (UNII Band 2C) - Ch. 100)



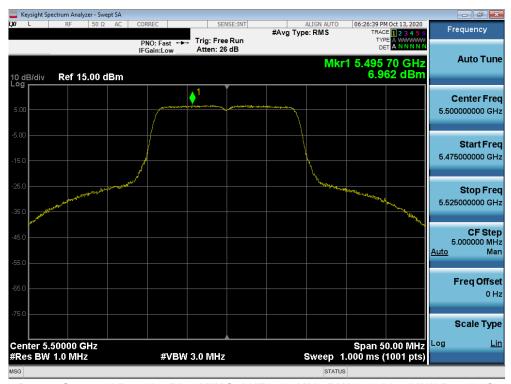
Plot 7-244. Power Spectral Density Plot MIMO ANT2 (802.11a (UNII Band 2C) - Ch. 120)

FCC ID: A3LSMG998U	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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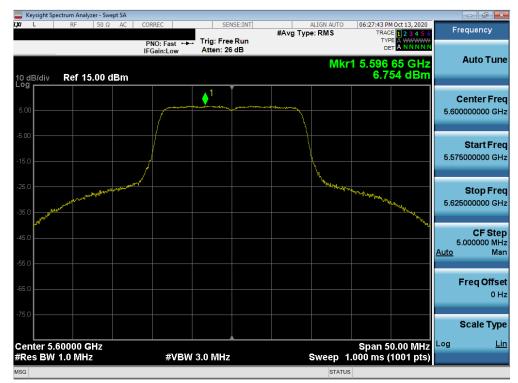
Plot 7-245. Power Spectral Density Plot MIMO ANT2 (802.11a (UNII Band 2C) - Ch. 144)



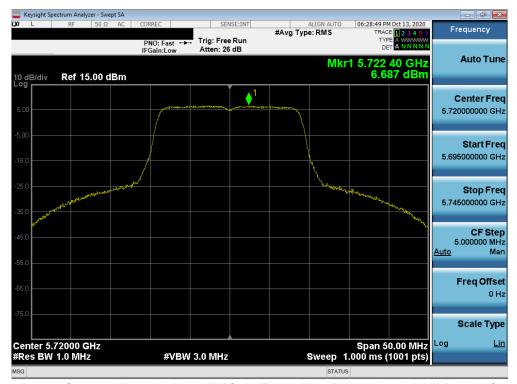
Plot 7-246. Power Spectral Density Plot MIMO ANT2 (20MHz BW 802.11n (UNII Band 2C) - Ch. 100)

FCC ID: A3LSMG998U	Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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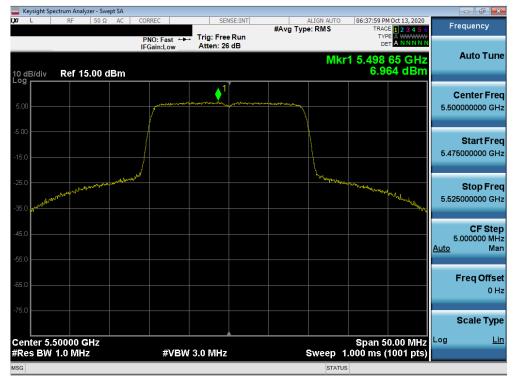
Plot 7-247. Power Spectral Density Plot MIMO ANT2 (20MHz BW 802.11n (UNII Band 2C) - Ch. 120)



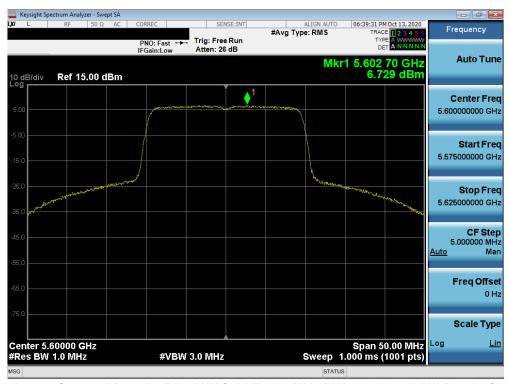
Plot 7-248. Power Spectral Density Plot MIMO ANT2 (20MHz BW 802.11n (UNII Band 2C) - Ch. 144)

FCC ID: A3LSMG998U	Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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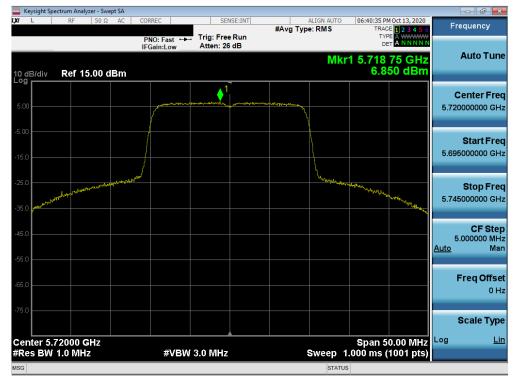
Plot 7-249. Power Spectral Density Plot MIMO ANT2 (20MHz BW 802.11ax (UNII Band 2C) - Ch. 100)



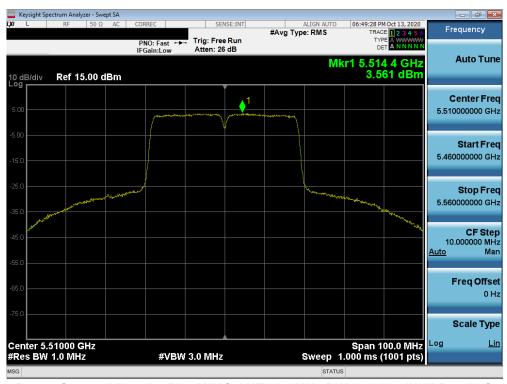
Plot 7-250. Power Spectral Density Plot MIMO ANT2 (20MHz BW 802.11ax (UNII Band 2C) - Ch. 120)

FCC ID: A3LSMG998U	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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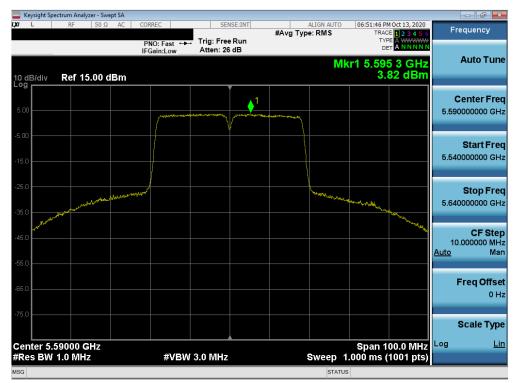
Plot 7-251. Power Spectral Density Plot MIMO ANT2 (20MHz BW 802.11ax (UNII Band 2C) - Ch. 144)



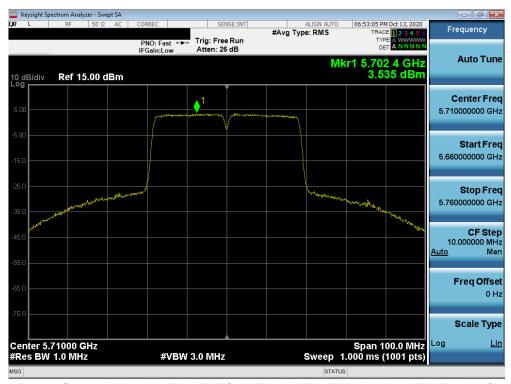
Plot 7-252. Power Spectral Density Plot MIMO ANT2 (40MHz BW 802.11n (UNII Band 2C) - Ch. 102)

FCC ID: A3LSMG998U	Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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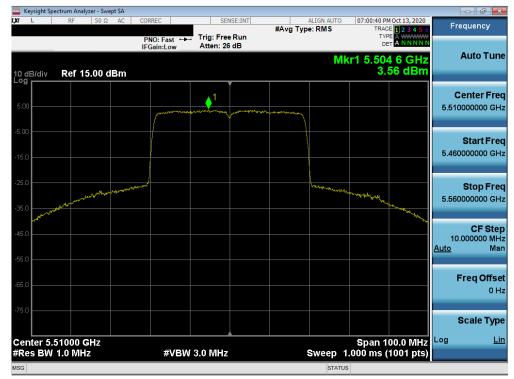
Plot 7-253. Power Spectral Density Plot MIMO ANT2 (40MHz BW 802.11n (UNII Band 2C) - Ch. 118)



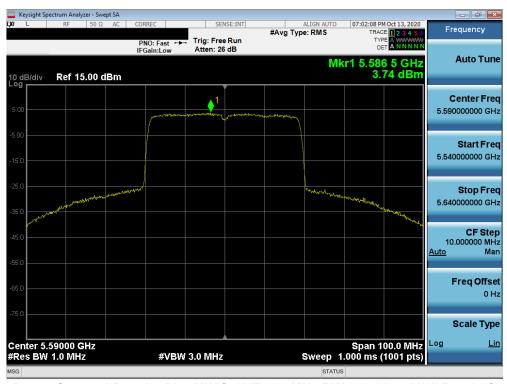
Plot 7-254. Power Spectral Density Plot MIMO ANT2 (40MHz BW 802.11n (UNII Band 2C) - Ch. 142)

FCC ID: A3LSMG998U	Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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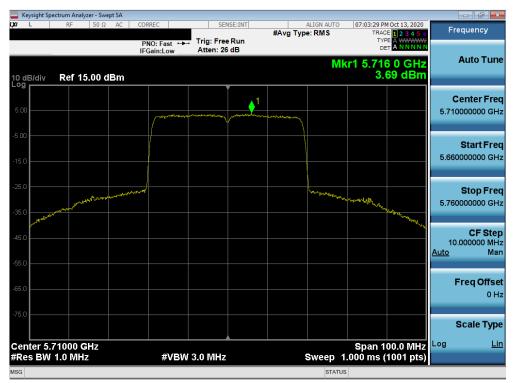
Plot 7-255. Power Spectral Density Plot MIMO ANT2 (40MHz BW 802.11ax (UNII Band 2C) - Ch. 102)



Plot 7-256. Power Spectral Density Plot MIMO ANT2 (40MHz BW 802.11ax (UNII Band 2C) - Ch. 118)

FCC ID: A3LSMG998U	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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Plot 7-257. Power Spectral Density Plot MIMO ANT2 (40MHz BW 802.11ax (UNII Band 2C) - Ch. 142)



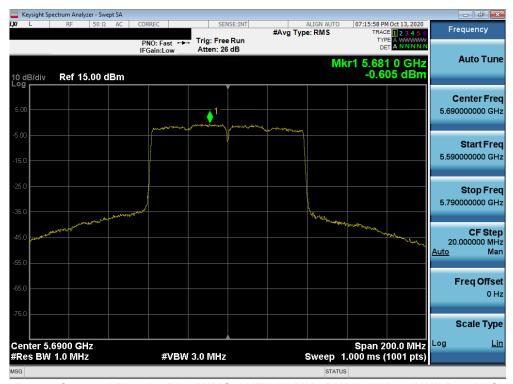
Plot 7-258. Power Spectral Density Plot MIMO ANT2 (80MHz BW 802.11ac (UNII Band 2C) - Ch. 106)

FCC ID: A3LSMG998U	Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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Plot 7-259. Power Spectral Density Plot MIMO ANT2 (80MHz BW 802.11ac (UNII Band 2C) - Ch. 122)



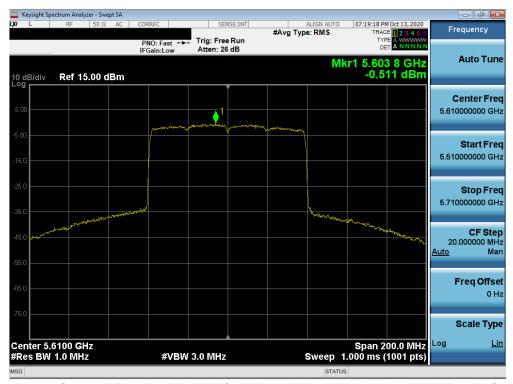
Plot 7-260. Power Spectral Density Plot MIMO ANT2 (80MHz BW 802.11ac (UNII Band 2C) - Ch. 138)

FCC ID: A3LSMG998U	Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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Plot 7-261. Power Spectral Density Plot MIMO ANT2 (80MHz BW 802.11ax (UNII Band 2C) - Ch. 106)



Plot 7-262. Power Spectral Density Plot MIMO ANT2 (80MHz BW 802.11ax (UNII Band 2C) - Ch. 122)

FCC ID: A3LSMG998U	Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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Plot 7-263. Power Spectral Density Plot MIMO ANT2 (80MHz BW 802.11ax (UNII Band 2C) - Ch. 138)



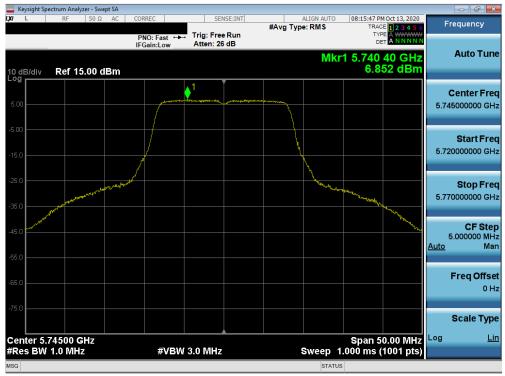
Plot 7-264. Power Spectral Density Plot MIMO ANT2 (160MHz BW 802.11ac (UNII Band 2C) - Ch. 114)

FCC ID: A3LSMG998U	Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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Plot 7-265. Power Spectral Density Plot MIMO ANT2 (160MHz BW 802.11ax (UNII Band 2C) - Ch. 114)



Plot 7-266. Power Spectral Density Plot MIMO ANT2 (802.11a (UNII Band 3) - Ch. 149)

FCC ID: A3LSMG998U	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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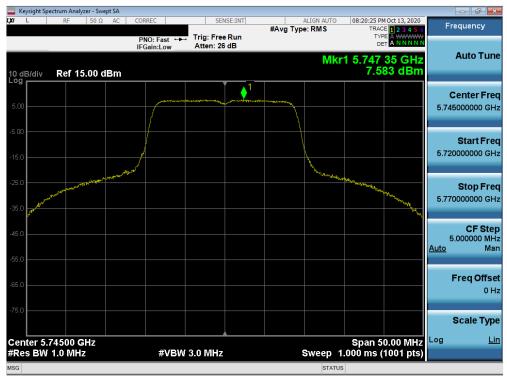
Plot 7-267. Power Spectral Density Plot MIMO ANT2 (802.11a (UNII Band 3) - Ch. 157)



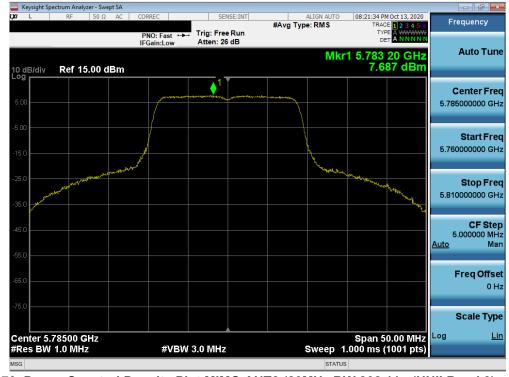
Plot 7-268. Power Spectral Density Plot MIMO ANT2 (802.11a (UNII Band 3) - Ch. 165)

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Plot 7-269. Power Spectral Density Plot MIMO ANT2 (20MHz BW 802.11n (UNII Band 3) - Ch. 149)



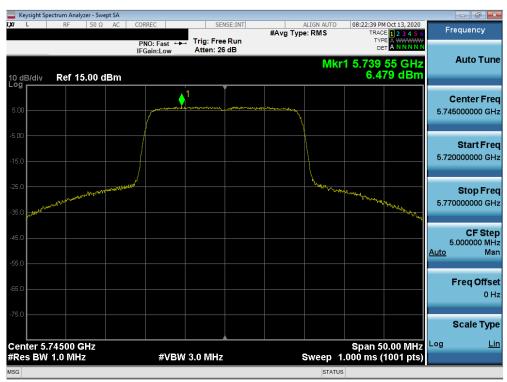
Plot 7-270. Power Spectral Density Plot MIMO ANT2 (20MHz BW 802.11n (UNII Band 3) - Ch. 157)

FCC ID: A3LSMG998U	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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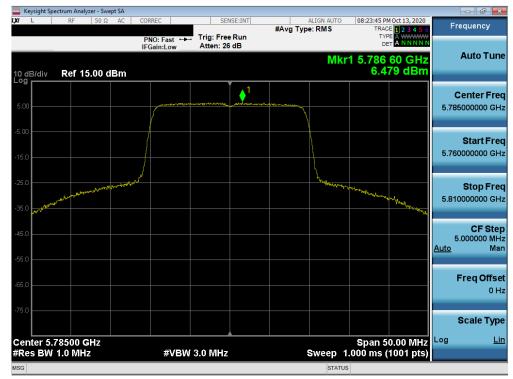
Plot 7-271. Power Spectral Density Plot MIMO ANT2 (20MHz BW 802.11n (UNII Band 3) - Ch. 165)



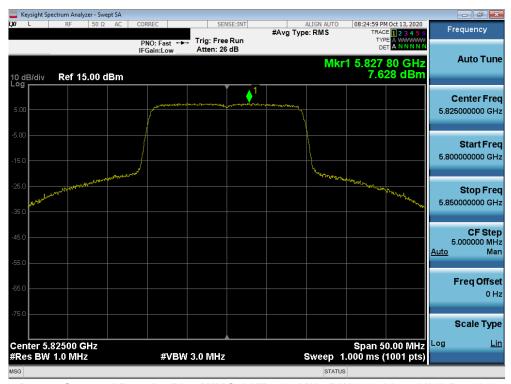
Plot 7-272. Power Spectral Density Plot MIMO ANT2 (20MHz BW 802.11ax (UNII Band 3) - Ch. 149)

FCC ID: A3LSMG998U	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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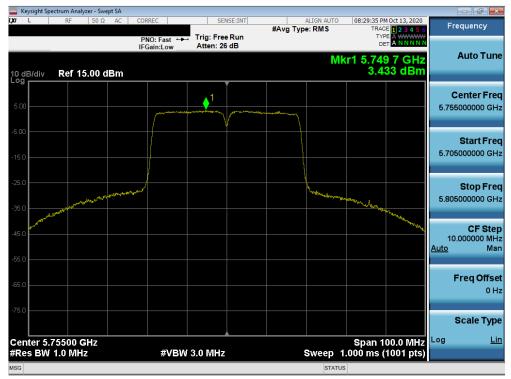
Plot 7-273. Power Spectral Density Plot MIMO ANT2 (20MHz BW 802.11ax (UNII Band 3) - Ch. 157)



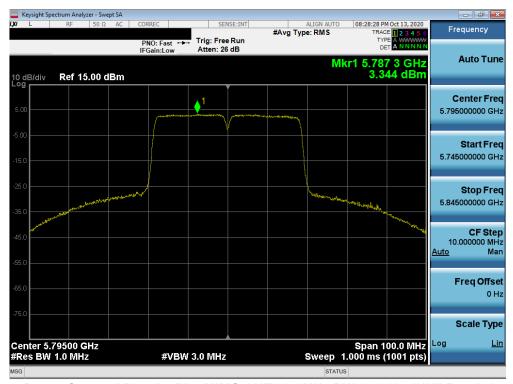
Plot 7-274. Power Spectral Density Plot MIMO ANT2 (20MHz BW 802.11ax (UNII Band 3) - Ch. 165)

FCC ID: A3LSMG998U	Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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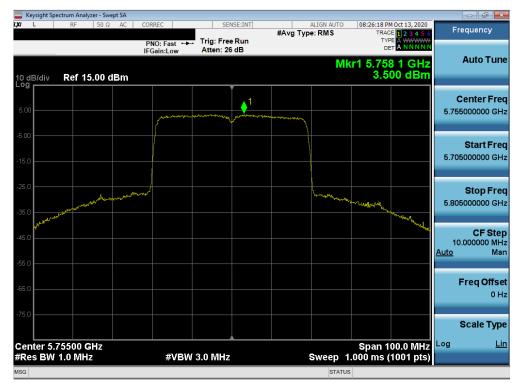
Plot 7-275. Power Spectral Density Plot MIMO ANT2 (40MHz BW 802.11n (UNII Band 3) - Ch. 151)



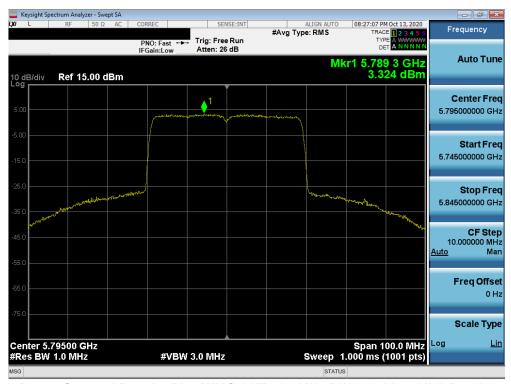
Plot 7-276. Power Spectral Density Plot MIMO ANT2 (40MHz BW 802.11n (UNII Band 3) - Ch. 159)

FCC ID: A3LSMG998U	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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Plot 7-277. Power Spectral Density Plot MIMO ANT2 (40MHz BW 802.11ax (UNII Band 3) - Ch. 151)



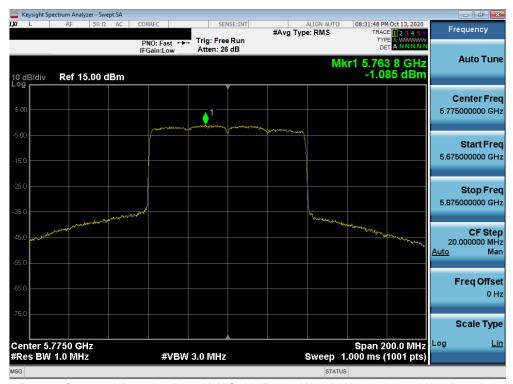
Plot 7-278. Power Spectral Density Plot MIMO ANT2 (40MHz BW 802.11ax (UNII Band 3) - Ch. 159)

FCC ID: A3LSMG998U	Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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Plot 7-279. Power Spectral Density Plot MIMO ANT2 (80MHz BW 802.11ac (UNII Band 3) - Ch. 155)



Plot 7-280. Power Spectral Density Plot MIMO ANT2 (80MHz BW 802.11ax (UNII Band 3) - Ch. 155)

FCC ID: A3LSMG998U	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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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 as shown in the section above. The measured values were then summed in linear power units then converted back to dBm.

Sample MIMO Calculation:

At 5180MHz in 802.11n (20MHz BW) mode, the average conducted power spectral density was measured to be 7.82 dBm for Antenna-1 and 7.87 dBm for Antenna-2.

Antenna 1 + Antenna 2 = MIMO

(7.82 dBm + 7.87 dBm) = (6.06 mW + 6.12 mW) = 12.18 mW = 10.86 dBm

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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), 802.11ac (80MHz), and 802.11ax (160MHz)), 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 7-17 per Section 15.209 and RSS-Gen (8.9).

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

Table 7-17. 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 > 2 x span/RBW)
- 6. Averaging type = power (RMS)
- 7. Sweep time = auto couple
- 8. Trace was averaged over 100 sweeps

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Peak Measurements above 1GHz

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

Peak Measurements below 1GHz

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

Test Setup

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

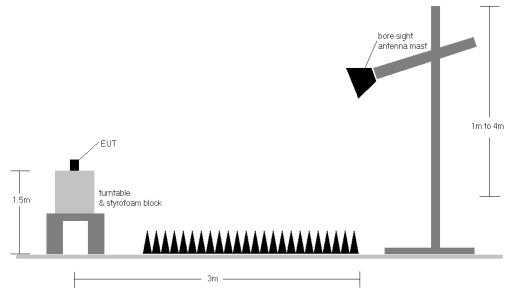


Figure 7-5. Test Instrument & Measurement Setup

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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 7-17.
- 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 7-17. 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. Radiated spurious emissions were investigated while operating in MIMO mode, however, it was determined that single antenna operation produced the worst case emissions. Since the emissions produced from MIMO operation were found to be more than 20dB below the limit, the MIMO emissions are not reported.
- 8. 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.
- 9. The "-" shown in the following RSE tables are used to denote a noise floor measurement.

Sample Calculations

Determining Spurious Emissions Levels

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

Radiated Band Edge Measurement Offset

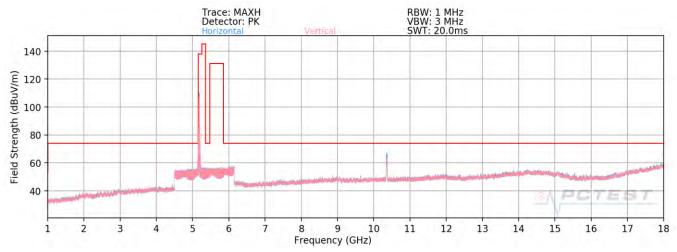
 The amplitude offset shown in the radiated restricted band edge plots was calculated using the formula:

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

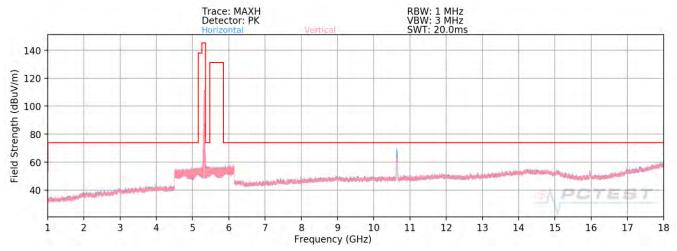
FCC ID: A3LSMG998U	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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7.6.1 MIMO Radiated Spurious Emission Measurements



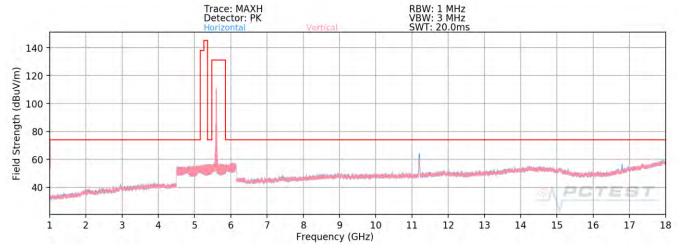
Plot 7-281. Radiated Spurious Plot above 1GHz MIMO (802.11n - U1 Ch. 40)



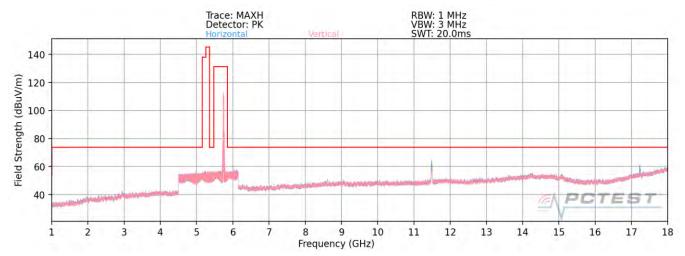
Plot 7-282. Radiated Spurious Plot above 1GHz MIMO (802.11n - U2A Ch. 56)

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Plot 7-283. Radiated Spurious Plot above 1GHz MIMO (802.11n - U2C Ch. 120)



Plot 7-284. Radiated Spurious Plot above 1GHz MIMO (802.11n - U3 Ch. 157)

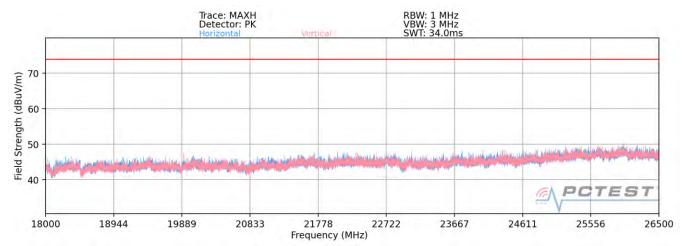
FCC ID: A3LSMG998U	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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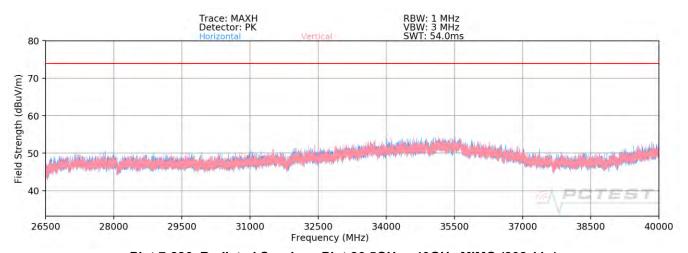
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MIMO Radiated Spurious Emissions Measurements (Above 18GHz)



Plot 7-285. Radiated Spurious Plot above 18GHz - 26.5GHz MIMO (802.11n)



Plot 7-286. Radiated Spurious Plot 26.5GHz - 40GHz MIMO (802.11n)

FCC ID: A3LSMG998U	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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MIMO Radiated Spurious Emission Measurements §15.407(b) §15.205 & §15.209; RSS-Gen [8.9]

Worst Case Mode: 802.11n Worst Case Transfer Rate: MCS10 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	V	115	240	-53.65	11.84	0.00	65.19	68.20	-3.01
*	15540.00	Average	V	-	-	-81.65	13.58	0.00	38.93	53.98	-15.05
*	15540.00	Peak	V	-	-	-69.44	13.58	0.00	51.14	73.98	-22.84
*	20720.00	Average	٧	-	-	-63.62	1.63	-9.54	35.47	53.98	-18.51
*	20720.00	Peak	V	-	-	-50.60	1.63	-9.54	48.49	73.98	-25.49
	25900.00	Peak	V	-	-	-50.51	4.37	-9.54	51.32	68.20	-16.88

Table 7-18. Radiated Measurements MIMO

Worst Case Mode: 802.11n Worst Case Transfer Rate: MCS10 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	V	200	228	-53.58	11.70	0.00	65.12	68.20	-3.08
*	15600.00	Average	٧	-	-	-81.45	14.13	0.00	39.68	53.98	-14.30
*	15600.00	Peak	٧	-	-	-69.06	14.13	0.00	52.07	73.98	-21.91
*	20800.00	Average	٧	-	-	-63.54	1.54	-9.54	35.46	53.98	-18.52
*	20800.00	Peak	V	-	-	-50.92	1.54	-9.54	48.08	73.98	-25.90
•	26000.00	Peak	٧	-	-	-50.01	4.18	-9.54	51.62	68.20	-16.58

Table 7-19. Radiated Measurements MIMO

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Worst Case Mode: 802.11n

Worst Case Transfer Rate: MCS10

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	V	204	231	-55.53	12.16	0.00	63.63	68.20	-4.57
*	15720.00	Average	٧	-	-	-81.29	13.64	0.00	39.35	53.98	-14.63
*	15720.00	Peak	V	-	-	-67.99	13.64	0.00	52.65	73.98	-21.33
*	20960.00	Average	٧	-	-	-62.54	1.82	-9.54	36.73	53.98	-17.24
*	20960.00	Peak	٧	-	-	-50.85	1.82	-9.54	48.42	73.98	-25.55
	26200.00	Peak	٧	-	-	-50.28	4.39	-9.54	51.57	68.20	-16.63

Table 7-20. Radiated Measurements MIMO

Worst Case Mode: 802.11n

Worst Case Transfer Rate: MCS10

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	V	210	225	-55.50	12.35	0.00	63.85	68.20	-4.35
*	15780.00	Average	٧	256	256	-79.67	14.06	0.00	41.39	53.98	-12.59
*	15780.00	Peak	V	256	256	-66.39	14.06	0.00	54.67	73.98	-19.31
*	21040.00	Average	V	-	-	-62.82	1.91	-9.54	36.55	53.98	-17.43
*	21040.00	Peak	V	-	-	-50.09	1.91	-9.54	49.28	73.98	-24.70
	26300.00	Peak	٧	-	-	-50.40	4.34	-9.54	51.39	68.20	-16.81

Table 7-21. Radiated Measurements MIMO

FCC ID: A3LSMG998U	Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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Worst Case Mode: 802.11n

Worst Case Transfer Rate: MCS10

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	V	214	242	-56.12	12.23	0.00	63.11	68.20	-5.09
*	15840.00	Average	٧	113	283	-79.38	13.44	0.00	41.06	53.98	-12.92
*	15840.00	Peak	V	113	283	-65.66	13.44	0.00	54.78	73.98	-19.20
*	21120.00	Average	V	-	-	-62.20	2.11	-9.54	37.36	53.98	-16.62
*	21120.00	Peak	V	-	-	-50.96	2.11	-9.54	48.60	73.98	-25.38
	26400.00	Peak	V	-	-	-50.07	4.39	-9.54	51.78	68.20	-16.42

Table 7-22. Radiated Measurements MIMO

Worst Case Mode: 802.11n

Worst Case Transfer Rate: MCS10

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	V	118	230	-68.75	12.62	0.00	50.87	53.98	-3.11
*	10640.00	Peak	٧	118	230	-54.83	12.62	0.00	64.79	73.98	-9.19
*	15960.00	Average	V	-	-	-82.17	14.58	0.00	39.41	53.98	-14.57
*	15960.00	Peak	٧	-	-	-70.04	14.58	0.00	51.54	73.98	-22.44
*	21280.00	Average	٧	-	-	-63.45	2.09	-9.54	36.09	53.98	-17.89
*	21280.00	Peak	V	-	-	-51.31	2.09	-9.54	48.23	73.98	-25.75
	26600.00	Peak	V	-	-	-50.18	4.43	-9.54	51.71	68.20	-16.49

Table 7-23. Radiated Measurements MIMO

FCC ID: A3LSMG998U	Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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Worst Case Mode: 802.11n

Worst Case Transfer Rate: MCS10

Distance of Measurements: 1 & 3 Meters

Operating Frequency: Channel: 100

5500MHz

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11000.00	Average	V	100	306	-73.16	16.43	0.00	50.27	53.98	-3.71
*	11000.00	Peak	V	100	306	-60.78	16.43	0.00	62.65	73.98	-11.33
	16500.00	Peak	V	-	-	-69.68	23.48	0.00	60.80	68.20	-7.40
	22000.00	Peak	V	-	-	-50.79	2.04	-9.54	48.70	68.20	-19.50
	27500.00	Peak	V	-	-	-50.17	3.49	-9.54	50.78	68.20	-17.42

Table 7-24. Radiated Measurements MIMO

Worst Case Mode: 802.11n

Worst Case Transfer Rate: MCS10

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]
*	11200.00	Average	V	107	110	-72.30	16.18	0.00	50.88	53.98	-3.09
*	11200.00	Peak	٧	107	110	-59.11	16.18	0.00	64.07	73.98	-9.90
	16800.00	Peak	V	-	-	-70.20	24.07	0.00	60.87	68.20	-7.33
*	22400.00	Average	V	-	-	-62.94	2.44	-9.54	36.96	53.98	-17.02
*	22400.00	Peak	٧	-	-	-50.73	2.44	-9.54	49.17	73.98	-24.81
	28000.00	Peak	V	-	-	-50.09	3.61	-9.54	50.98	68.20	-17.22

Table 7-25. Radiated Measurements MIMO

FCC ID: A3LSMG998U	Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dags 170 of 207
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Worst Case Mode: 802.11n

Worst Case Transfer Rate: MCS10

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	٧	100	108	-75.73	17.06	0.00	48.33	53.98	-5.65
*	11440.00	Peak	V	100	108	-62.99	17.06	0.00	61.07	73.98	-12.91
	17160.00	Peak	٧	-	-	-69.51	23.48	0.00	60.97	68.20	-7.23
*	22880.00	Average	٧	-	-	-62.58	2.26	-9.54	37.14	53.98	-16.84
*	22880.00	Peak	V	-	-	-50.85	2.26	-9.54	48.87	73.98	-25.11
	28600.00	Peak	٧	-	-	-50.67	3.87	-9.54	50.66	68.20	-17.54

Table 7-26. Radiated Measurements MIMO

Worst Case Mode: 802.11n

Worst Case Transfer Rate: MCS10

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	V	100	232	-74.36	17.64	0.00	50.28	53.98	-3.70
*	11490.00	Peak	٧	100	232	-62.70	17.64	0.00	61.94	73.98	-12.04
	17235.00	Peak	V	-	-	-70.04	24.38	0.00	61.34	68.20	-6.86
*	22980.00	Average	V	-	-	-62.89	2.17	-9.54	36.74	53.98	-17.24
*	22980.00	Peak	V	-	-	-50.91	2.17	-9.54	48.72	73.98	-25.26
	28725.00	Peak	V	-	-	-50.09	3.73	-9.54	51.10	69.20	-18.10

Table 7-27. Radiated Measurements MIMO

FCC ID: A3LSMG998U	Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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Worst Case Mode: 802.11n

Worst Case Transfer Rate: MCS10

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	٧	102	304	-75.73	16.94	0.00	48.21	53.98	-5.77
*	11570.00	Peak	٧	102	304	-63.77	16.94	0.00	60.17	73.98	-13.81
	17355.00	Peak	٧	-	-	-69.92	24.85	0.00	61.93	68.20	-6.27
	23140.00	Peak	٧	-	-	-50.08	2.10	-9.54	49.47	68.20	-18.73
•	28925.00	Peak	V	-	-	-50.48	3.60	-9.54	50.58	68.20	-17.62

Table 7-28. Radiated Measurements MIMO

Worst Case Mode: 802.11n

Worst Case Transfer Rate: MCS10

Distance of Measurements: 1 & 3 Meters

Operating Frequency: 5825MHz
Channel: 165

Distance Ant. **Antenna** Turntable Analyzer Field **Frequency AFCL** Correction Limit Margin Detector Strength Pol. Height Azimuth Level [MHz] [dB/m] [dBµV/m] [dB] **Factor** [H/V] [cm] [degree] [dBm] [dBµV/m] [dB] 11650.00 V 299 53.98 Average 112 -77.24 17.47 0.00 47.23 -6.75 11650.00 Peak V 112 299 -65.76 17.47 0.00 58.71 73.98 -15.2717475.00 V -70.14 25.03 0.00 68.20 Peak 61.89 -6.31 23300.00 Peak V -50.63 2.14 -9.54 48.97 68.20 -19.23 ٧ -50.80 3.76 -9.54 50.41 68.20 29125.00 Peak -17.79

Table 7-29. Radiated Measurements MIMO

FCC ID: A3LSMG998U	Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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Worst Case Mode: 802.11n

Worst Case Transfer Rate: MCS10

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	V	136	307	-73.74	17.64	0.00	50.90	53.98	-3.08
*	11490.00	Peak	٧	136	307	-61.79	17.64	0.00	62.85	73.98	-11.13
	17235.00	Peak	٧	-	-	-69.94	24.38	0.00	61.44	68.20	-6.76
	22980.00	Average	٧	-	-	-62.89	2.17	-9.54	36.74	53.98	-17.24
	22980.00	Peak	V	-	-	-50.89	2.17	-9.54	48.74	73.98	-25.24
	28725.00	Peak	٧	-	-	-49.95	3.73	-9.54	51.24	69.20	-17.96

Table 7-30. Radiated Measurements MIMO with WCP

FCC ID: A3LSMG998U	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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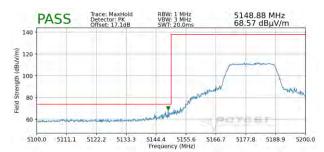
7.6.2 MIMO Radiated Band Edge Measurements (20MHz BW) §15.407(b.1)(b.2) §15.205 §15.209; RSS-Gen [8.9]

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

802.11n
MCS10
3 Meters
5180MHz
36



Plot 7-287. Radiated Lower Band Edge Plot MIMO (Average – UNII Band 1)



Plot 7-288. Radiated Lower Band Edge Plot MIMO (Peak – UNII Band 1)

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

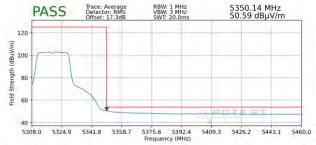
802.11n

MCS10

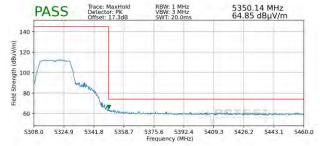
3 Meters

5320MHz

64



Plot 7-289. Radiated Upper Band Edge Plot MIMO (Average – UNII Band 2A)



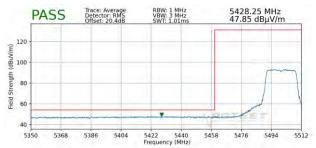
Plot 7-290. Radiated Upper Band Edge Plot MIMO (Peak – UNII Band 2A)

FCC ID: A3LSMG998U	Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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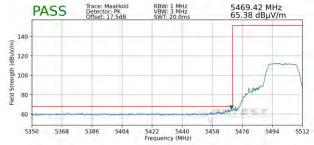


Worst Case Mode: Worst Case Transfer Rate: Distance of Measurements: Operating Frequency: Channel:

802.11n	
MCS10	
3 Meters	
5500MHz	
100	



Plot 7-291. Radiated Lower Band Edge Plot MIMO (Average – UNII Band 2C)



Plot 7-292. Radiated Lower Band Edge Plot MIMO (Peak – UNII Band 2C)

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

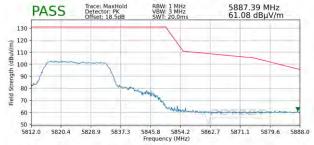
802.11n

MCS10

3 Meters

5825MHz

165



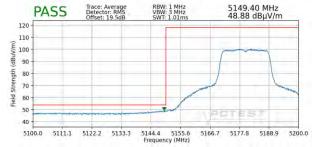
Plot 7-293. Radiated Upper Band Edge Plot MIMO (Peak – UNII Band 3)

FCC ID: A3LSMG998U	Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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Worst Case Mode: 802.11
Worst Case Transfer Rate: MCS10
Distance of Measurements: 3 Meter
Operating Frequency: 5180M
Channel: 36

802.11n	
MCS10	
3 Meters	
5180MHz	
36	



Plot 7-294. Radiated Lower Band Edge Plot MIMO (Average – UNII Band 1) - WCP



Plot 7-295. Radiated Lower Band Edge Plot MIMO (Peak – UNII Band 1) - WCP

FCC ID: A3LSMG998U	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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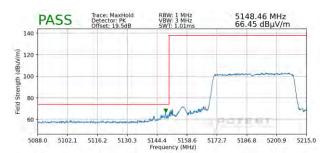
7.6.3 MIMO Radiated Band Edge Measurements (40MHz BW) §15.407(b.1)(b.2) §15.205 §15.209; RSS-Gen [8.9]

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

802.11ax
MCS0
3 Meters
5190MHz
38



Plot 7-296. Radiated Lower Band Edge Plot MIMO (Average – UNII Band 1)



Plot 7-297. Radiated Lower Band Edge Plot MIMO (Peak – UNII Band 1)

Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5310MHz
Channel:	62



Plot 7-298. Radiated Upper Band Edge Plot MIMO (Average – UNII Band 2A)



Plot 7-299. Radiated Upper Band Edge Plot MIMO (Peak – UNII Band 2A)

FCC ID: A3LSMG998U	Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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Worst Case Mode: Worst Case Transfer Rate: Distance of Measurements: Operating Frequency: Channel:

802.11ax	
MCS0	
3 Meters	
5510MHz	
102	



Plot 7-300. Radiated Lower Band Edge Plot MIMO (Average – UNII Band 2C)

Plot 7-301. Radiated Lower Band Edge Plot MIMO (Peak – UNII Band 2C)

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

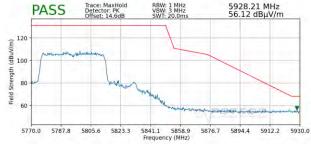
802.11ax

MCS0

3 Meters

5795MHz

159



Plot 7-302. Radiated Upper Band Edge Plot MIMO (Peak – UNII Band 3)

FCC ID: A3LSMG998U	Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dags 100 of 207
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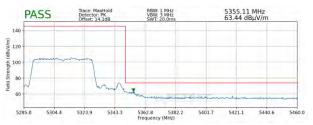


Worst Case Mode:
Worst Case Transfer Rate:
Distance of Measurements:
Operating Frequency:
Channel:

802.11ax
MCS0
3 Meters
5310MHz
62

PASS	Trace: Average Detector: RMS Offset: 14.3dB	RBW: 1 MHz VBW: 3 MHz SWT: 20.0ms	5350.06 MHz 50.68 dBμV/m
0			
0			
80 -			
50			
10		PERMIT	
5285.0 5304.4	5323.9 5343.3	5362.8 5382.2	5401.7 5421.1 5440.6

Plot 7-303. Radiated Upper Band Edge Plot MIMO (Average – UNII Band 2A) – WCP



Plot 7-304. Radiated Upper Band Edge Plot MIMO (Peak – UNII Band 2A) – WCP

FCC ID: A3LSMG998U	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dags 107 of 207
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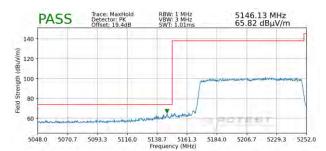
7.6.4 MIMO Radiated Band Edge Measurements (80MHz BW) §15.407(b.1)(b.2) §15.205 §15.209; RSS-Gen [8.9]

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

802.11ax
MCS0
3 Meters
5210MHz
42



Plot 7-305. Radiated Lower Band Edge Plot MIMO (Average – UNII Band 1)

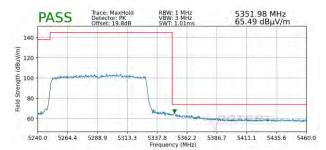


Plot 7-306. Radiated Lower Band Edge Plot MIMO (Peak – UNII Band 1)

Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5290MHz
Channel:	58



Plot 7-307. Radiated Upper Band Edge Plot MIMO (Average – UNII Band 2A)



Plot 7-308. Radiated Upper Band Edge Plot MIMO (Peak – UNII Band 2A)

FCC ID: A3LSMG998U	Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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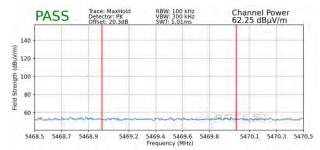


Worst Case Mode: Worst Case Transfer Rate: Distance of Measurements: Operating Frequency: Channel:

802.11ax
MCS0
3 Meters
5530MHz
106

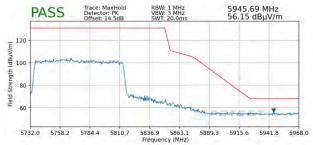


Plot 7-309. Radiated Lower Band Edge Plot MIMO (Average - UNII Band 2C)



Plot 7-310. Radiated Lower Band Edge Plot MIMO (Peak - UNII Band 2C)

Worst Case Mode: 802.11ax Worst Case Transfer Rate: MCS₀ Distance of Measurements: 3 Meters Operating Frequency: 5775MHz Channel: 155



Plot 7-311. Radiated Upper Band Edge Plot MIMO (Peak - UNII Band 3)

FCC ID: A3LSMG998U	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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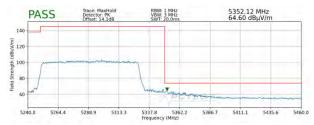


Worst Case Mode: Worst Case Transfer Rate: Distance of Measurements: Operating Frequency: Channel:

802.11ax	
MCS0	
3 Meters	
5530MHz	
106	

Trace: Average Detector: RMS Offset: 14.5dB	VBW: 3 MHz SWT: 20.0ms	50.89 dBµV/m
	7	
	*	
		5386.7 5411.1 5435.6
	5288.9 531.3.3	

Plot 7-312. Radiated Lower Band Edge Plot MIMO (Average - UNII Band 2C) - WCP



Plot 7-313. Radiated Lower Band Edge Plot MIMO (Peak - UNII Band 2C) - WCP

FCC ID: A3LSMG998U	Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dags 100 of 207
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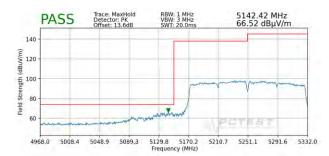
7.6.5 MIMO Radiated Band Edge Measurements (160MHz BW) §15.407(b.1)(b.2) §15.205 §15.209; RSS-Gen [8.9]

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

802.11ax
MCS0
3 Meters
5250MHz
50



Plot 7-314. Radiated Lower Band Edge Plot MIMO (Average – UNII Band 1)



Plot 7-315. Radiated Lower Band Edge Plot MIMO (Peak – UNII Band 1)

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

802.11ax
MCS0
3 Meters
5570MHz
114



Plot 7-316. Radiated Lower Band Edge Plot MIMO (Average – UNII Band 2C)



Plot 7-317. Radiated Lower Band Edge Plot MIMO (Peak – UNII Band 2C)

FCC ID: A3LSMG998U	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 191 of 207
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Worst Case Mode:
Worst Case Transfer Rate:
Distance of Measurements:
Operating Frequency:
Channel:

802.11ax	
MCS0	_
3 Meters	_
5570MHz	_
114	<u> </u>



Plot 7-318. Radiated Lower Band Edge Plot MIMO (Average – UNII Band 2C) – WCP



Plot 7-319. Radiated Lower Band Edge Plot MIMO (Peak – UNII Band 2C) – WCP

FCC ID: A3LSMG998U	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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7.7 Radiated Spurious Emissions Measurements – Below 1GHz §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 maximum power, and at the appropriate frequencies. All data rates and modes were investigated for radiated spurious emissions. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR and Table 6 of RSS-Gen (8.10) must not exceed the limits shown in Table 7-31 per Section 15.209 and RSS-Gen (8.9).

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

Table 7-31. Radiated Limits

Test Procedures Used

ANSI C63.10-2013

Test Settings

Quasi-Peak Field Strength Measurements

- 1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
- 2. RBW = 120kHz (for emissions from 30MHz 1GHz)
- 3. Detector = quasi-peak
- 4. Sweep time = auto couple
- 5. Trace mode = max hold
- 6. Trace was allowed to stabilize

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Test Setup

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

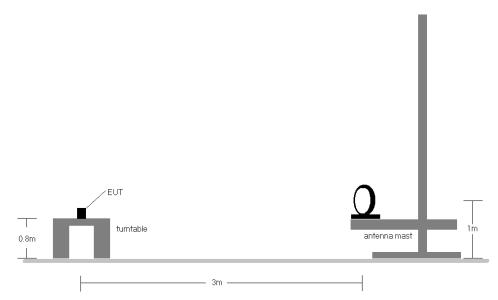


Figure 7-6. Radiated Test Setup < 30MHz

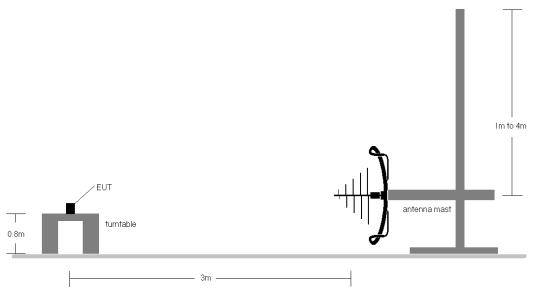


Figure 7-7. Radiated Test Setup < 1GHz

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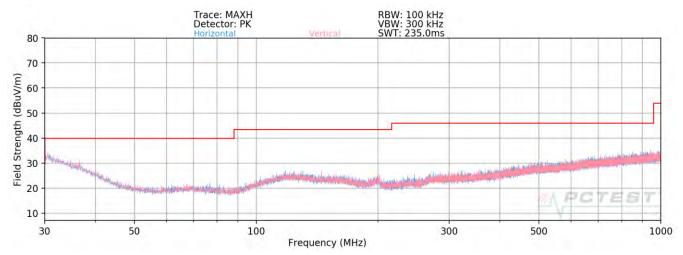


Test Notes

- 1. All emissions lying in restricted bands specified in §15.205 and RSS-Gen (8.10) are below the limit shown in Table 7-31.
- 2. The broadband receive antenna is manipulated through vertical and horizontal polarizations during the tests. The EUT is manipulated through three orthogonal planes.
- 3. This unit was tested with its standard battery.
- 4. The spectrum is investigated using a peak detector and final measurements are recorded using CISPR quasi peak detector. The worst-case emissions are reported however emissions whose levels were not within 20dB of the respective limits were not reported.
- 5. Emissions were measured at a 3 meter test distance.
- 6. Emissions are investigated while operating on the center channel of the mode, band, and modulation that produced the worst case results during the transmitter spurious emissions testing.
- 7. No spurious emissions were detected within 20dB of the limit below 30MHz.
- 8. The results recorded using the broadband antenna is known to correlate with the results obtained by using a tuned dipole with an acceptable degree of accuracy. The VSWR for the measurement antenna was found to be less than 2:1.
- 9. The wide spectrum spurious emissions plots shown on the following pages are used only for the purpose of emission identification. There were no emissions detected in the 30MHz 1GHz frequency range, as shown in the subsequent plots.



Radiated Spurious Emissions Measurements (Below 1GHz) §15.209; RSS-Gen [8.9]



Plot 7-320. Radiated Spurious Plot below 1GHz (802.11a - U3 Ch. 157)

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7.8 Line-Conducted Test Data

§15.407; RSS-Gen [8.8]

Test Overview and Limit

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

All conducted emissions must not exceed the limits shown in the table below, per Section 15.207 and RSS-Gen (8.8).

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

Table 7-32. Conducted Limits

Test Procedures Used

ANSI C63.10-2013, Section 6.2

Test Settings

Quasi-Peak Field Strength Measurements

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

Average Field Strength Measurements

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

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^{*}Decreases with the logarithm of the frequency.



Test Setup

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

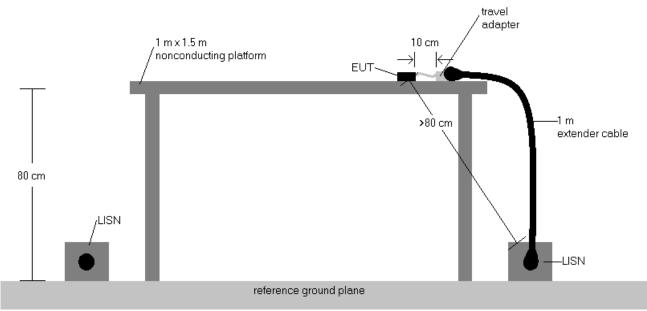


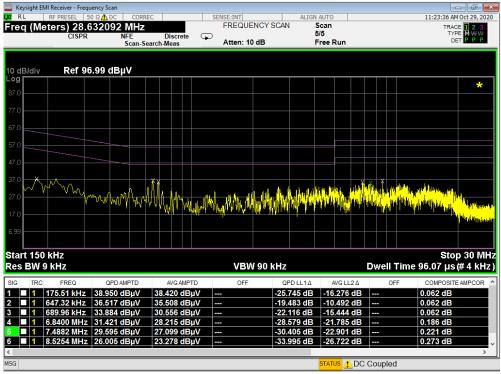
Figure 7-8. Test Instrument & Measurement Setup

Test Notes

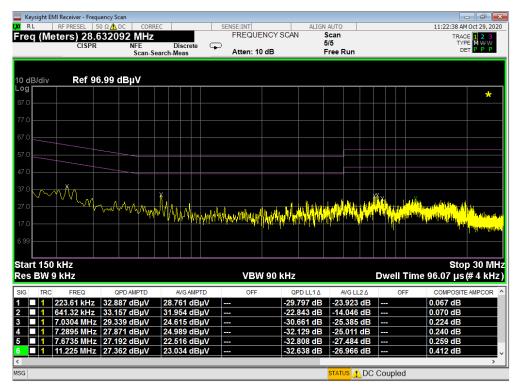
- 1. All modes of operation were investigated and the worst-case emissions are reported using mid channel. The emissions found were not affected by the choice of channel used during testing.
- 2. The limit for an intentional radiator from 150kHz to 30MHz are specified in 15.207 and RSS-Gen (8.8).
- 3. Corr. (dB) = Cable loss (dB) + LISN insertion factor (dB)
- 4. QP/AV Level (dB μ V) = QP/AV Analyzer/Receiver Level (dB μ V) + Corr. (dB)
- Margin (dB) = QP/AV Limit (dB μ V) QP/AV Level (dB μ V) 5.
- 6. Traces shown in plot are made using a peak detector.
- 7. Deviations to the Specifications: None.

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Plot 7-321. Line Conducted Plot with 802.11a UNII Band 1 (L1)

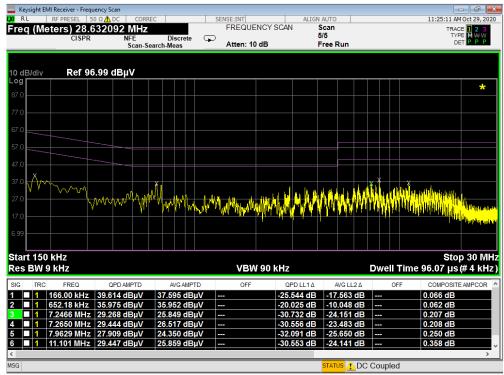


Plot 7-322. Line Conducted Plot with 802.11a UNII Band 1 (N)

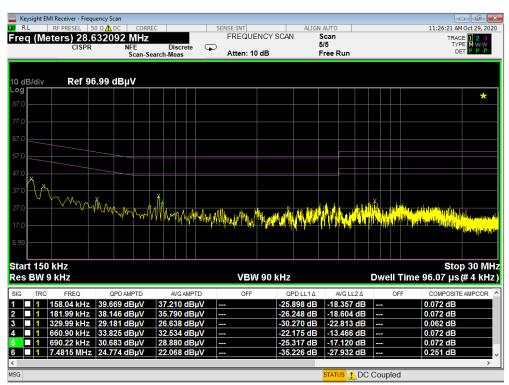
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Plot 7-323. Line Conducted Plot with 802.11a UNII Band 2A (L1)

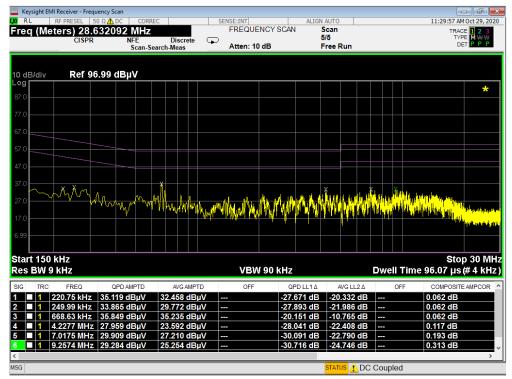


Plot 7-324. Line Conducted Plot with 802.11a UNII Band 2A (N)

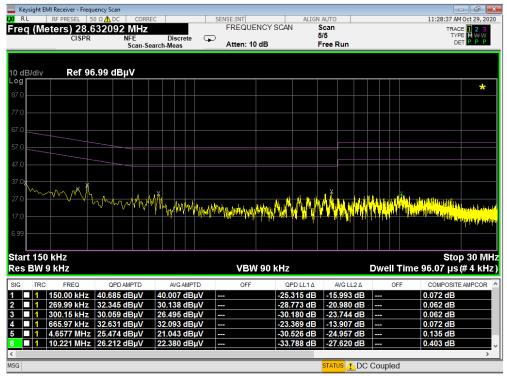
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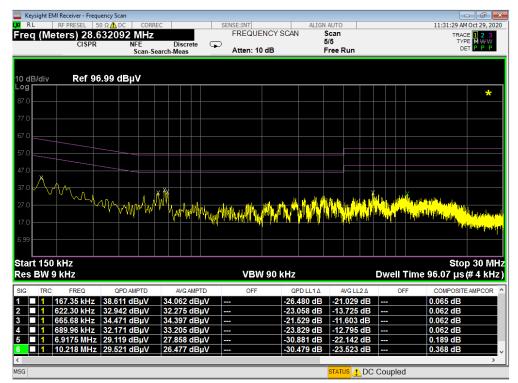
Plot 7-325. Line Conducted Plot with 802.11a UNII Band 2C (L1)



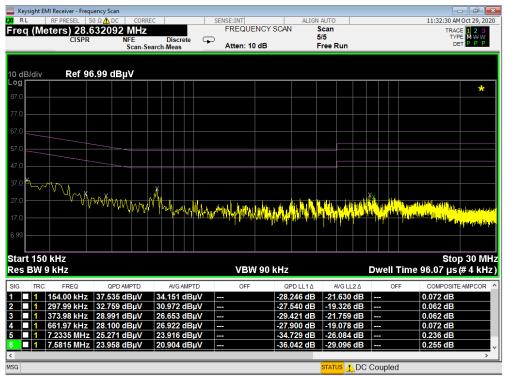
Plot 7-326. Line Conducted Plot with 802.11a UNII Band 2C (N)

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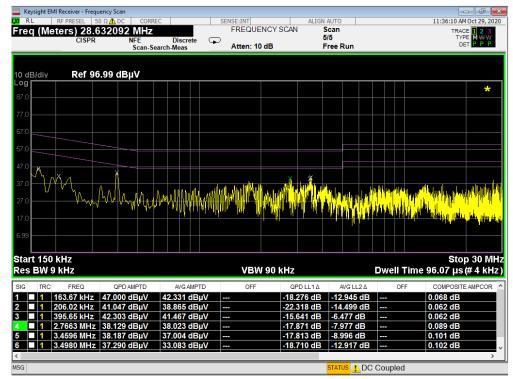
Plot 7-327. Line Conducted Plot with 802.11a UNII Band 3 (L1)



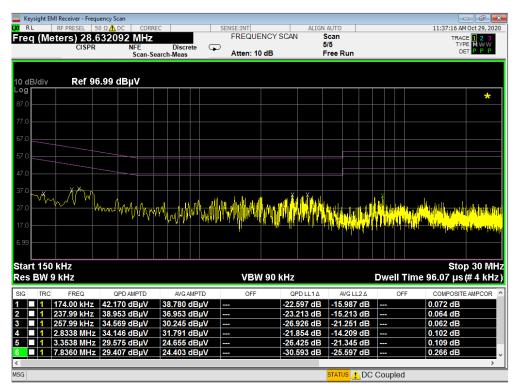
Plot 7-328. Line Conducted Plot with 802.11a UNII Band 3 (N)

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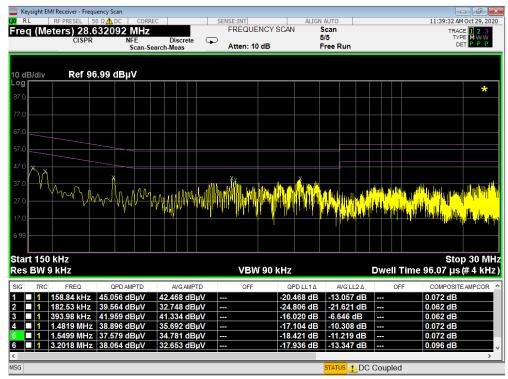
Plot 7-329. Line Conducted Plot with 802.11a UNII Band 1 (L1) with WCP



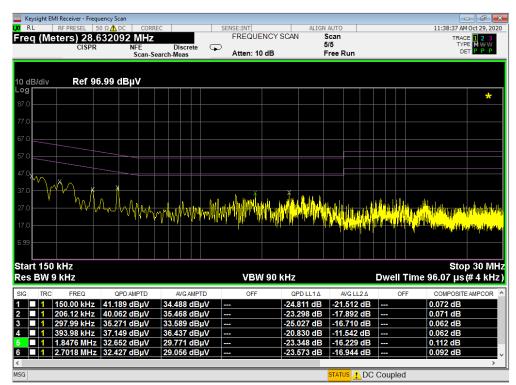
Plot 7-330. Line Conducted Plot with 802.11a UNII Band 1 (N) with WCP

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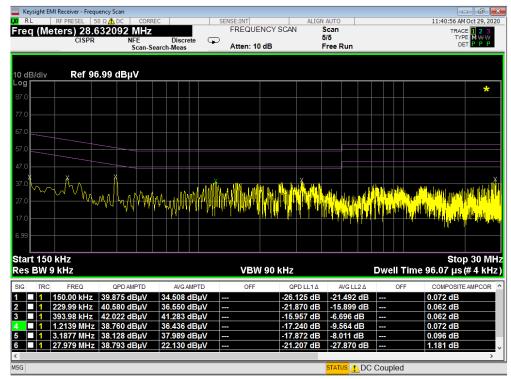
Plot 7-331. Line Conducted Plot with 802.11a UNII Band 2A (L1) with WCP



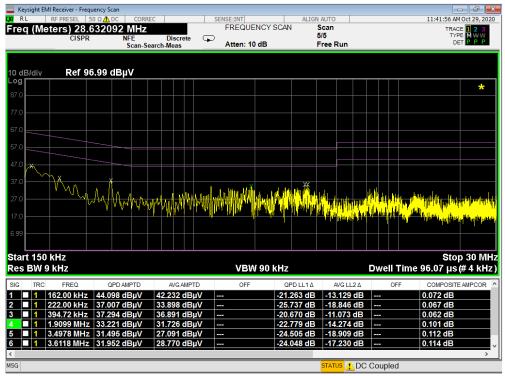
Plot 7-332. Line Conducted Plot with 802.11a UNII Band 2A (N) with WCP

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Plot 7-333. Line Conducted Plot with 802.11a UNII Band 2C (L1) with WCP



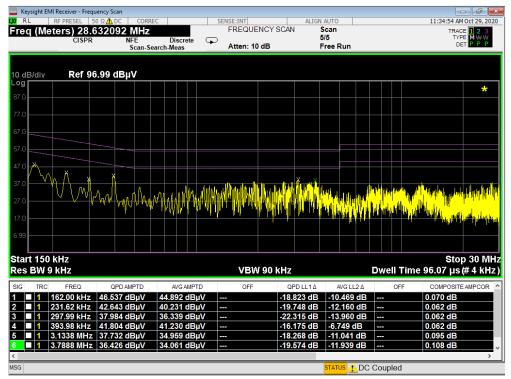
Plot 7-334. Line Conducted Plot with 802.11a UNII Band 2C (N) with WCP

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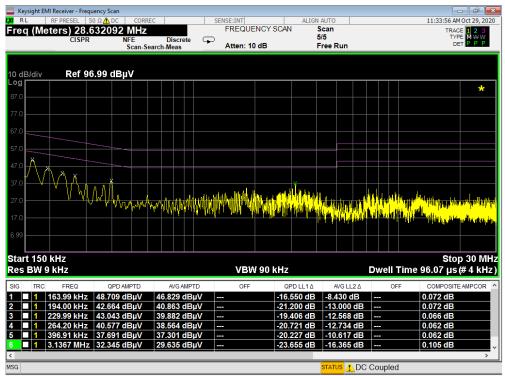
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Plot 7-335. Line Conducted Plot with 802.11a UNII Band 3 (L1) with WCP



Plot 7-336. Line Conducted Plot with 802.11a UNII Band 3 (N) with WCP

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8.0 CONCLUSION

The data collected relate only the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSMG998U** is in compliance with Part 15 Subpart E (15.407) of the FCC Rules.

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