

7.6 Radiated Spurious Emission Measurements – Above 1GHz

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

Test Overview and Limit

All out of band radiated spurious emissions are measured with a spectrum analyzer connected to a receive antenna while the EUT is operating at its maximum duty cycle, at its maximum power control level, as defined in ANSI C63.10-2013 and KDB 789033 D02 v02r01, and at the appropriate frequencies. All channels, modes (e.g. 802.11a, 802.11n (20MHz BW), 802.11n (40MHz BW), and 802.11ac (80MHz)), and modulations/data rates were investigated among all UNII bands. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

For transmitters operating in the 5.15-5.25 GHz and 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.

For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz.

For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR and Table 6 of RSS-Gen (8.10) must not exceed the limits shown in Table 7-27 per Section 15.209 and RSS-Gen (8.9).

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

Table 7-27. Radiated Limits

Test Procedures Used

ANSI C63.10-2013 – Sections 12.7.7.2, 12.7.6, 12.7.5

KDB 789033 D02 v02r01 – Section G

Test Settings

Average Measurements above 1GHz (Method AD)

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = power average (RMS)
5. Number of measurement points = 1001 (Number of points must be $\geq 2 \times \text{span/RBW}$)
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.

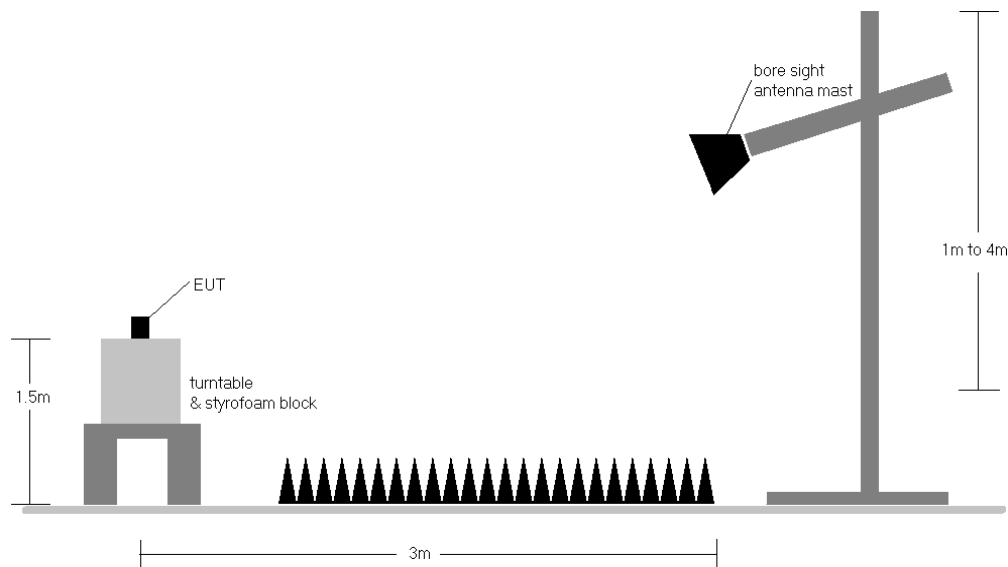


Figure 7-5. Test Instrument & Measurement Setup

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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 7-27.
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 7-27. All spurious emissions that do not lie in a restricted band are subject to a peak limit of -27dBm/MHz. At a distance of 3 meters, the field strength limit in 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]

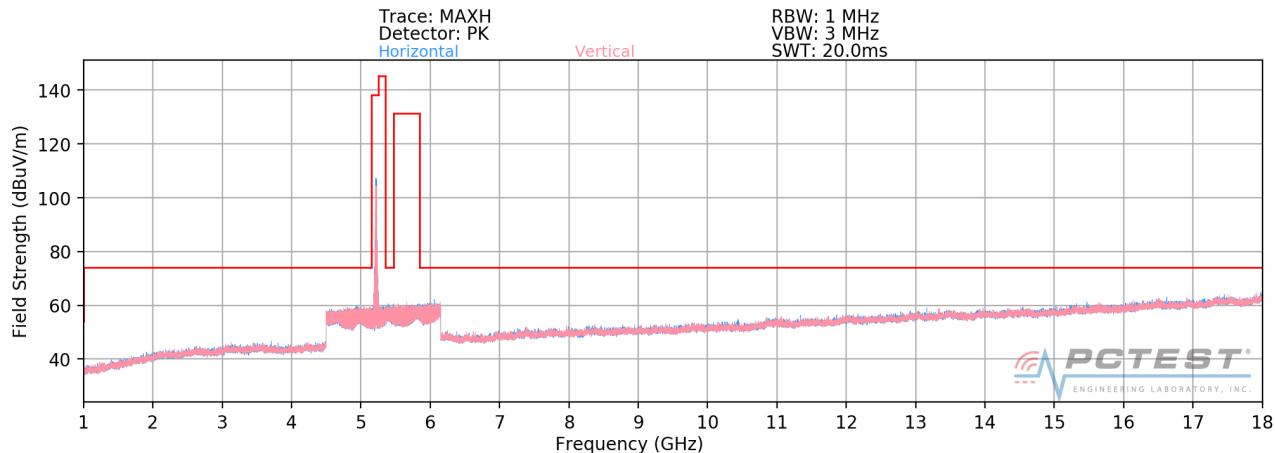
Radiated Band Edge Measurement Offset

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

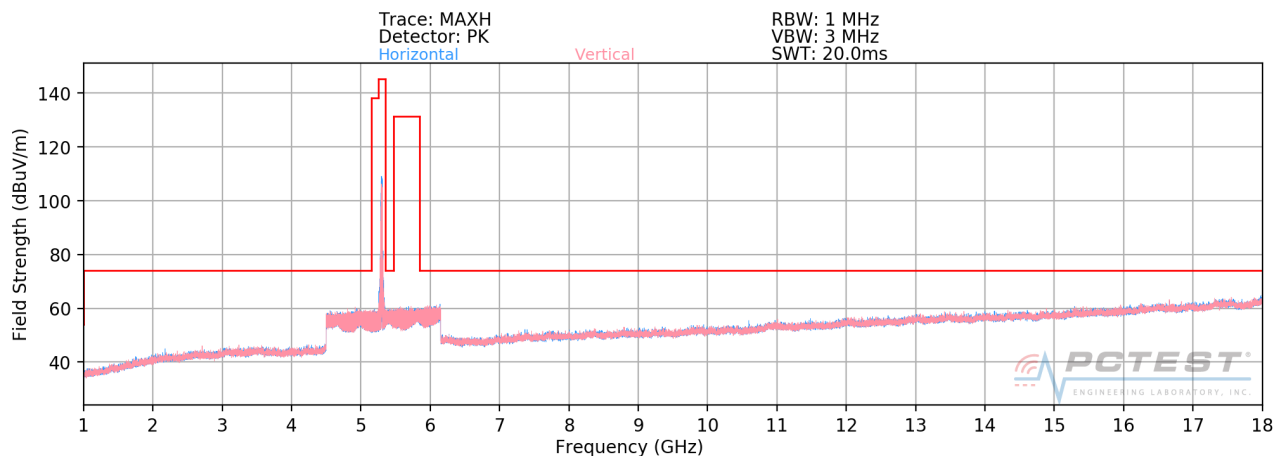
$$\text{Offset (dB)} = (\text{Antenna Factor} + \text{Cable Loss} + \text{Attenuator}) - \text{Preamplifier Gain}$$

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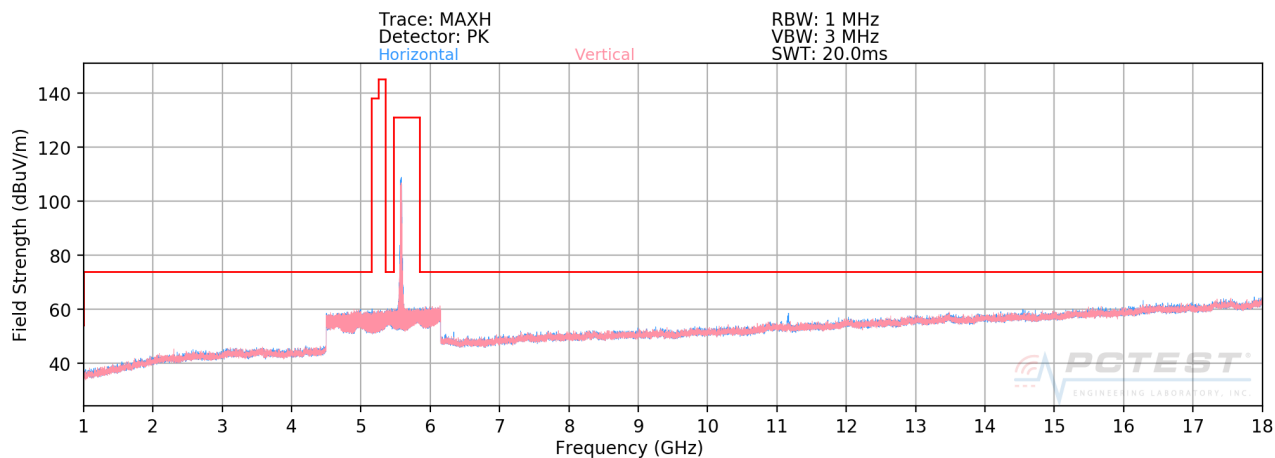
7.6.1 SISO Antenna-1 Radiated Spurious Emission Measurements



Plot 7-268. Radiated Spurious Plot above 1GHz SISO ANT1 (802.11a – U1 Ch. 40)

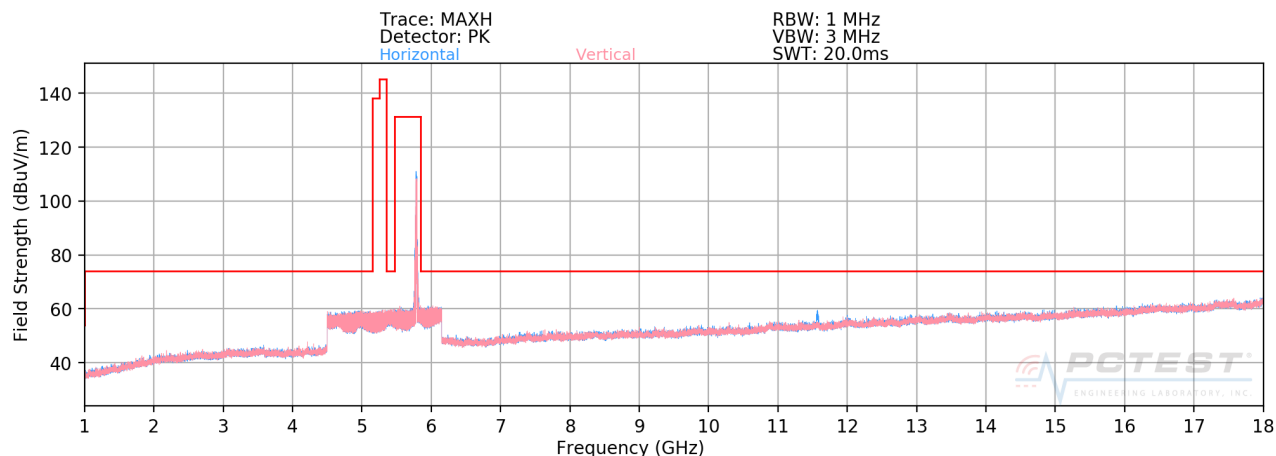


Plot 7-269. Radiated Spurious Plot above 1GHz SISO ANT1 (802.11a – U2A Ch. 56)



Plot 7-270. Radiated Spurious Plot above 1GHz SISO ANT1 (802.11a – U2C Ch. 120)

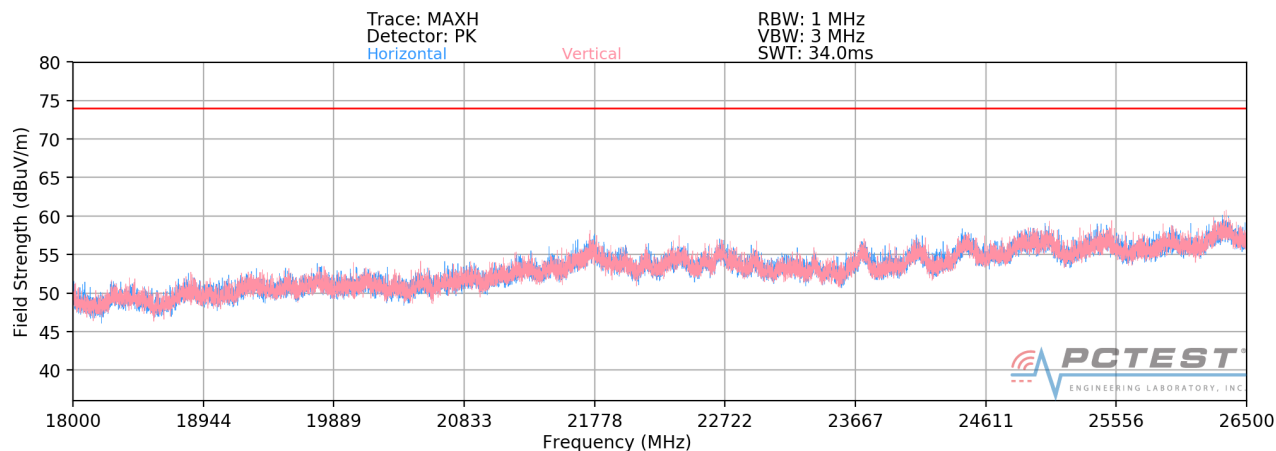
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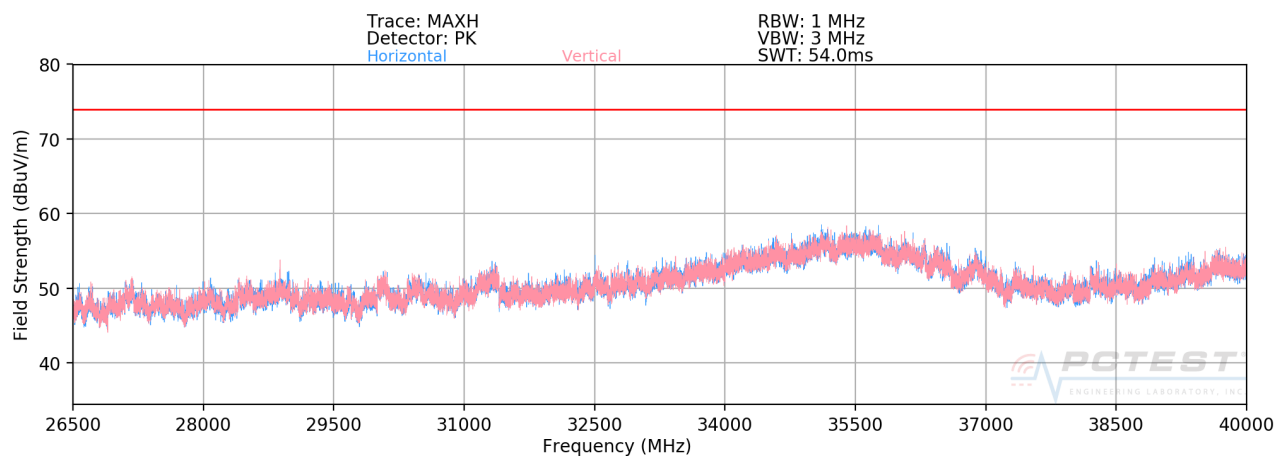
Plot 7-271. Radiated Spurious Plot above 1GHz SISO ANT1 (802.11a – U3 Ch. 157)

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



Plot 7-272. Radiated Spurious Plot 18GHz - 26.5GHz SISO ANT1 (802.11a)



Plot 7-273. Radiated Spurious Plot 26.5GHz - 40GHz SISO ANT1 (802.11a)

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SISO Antenna-1 Radiated Spurious Emission Measurements

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

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
10360.00	Peak	H	113	339	-64.04	12.19	0.00	55.15	68.20	-13.05
* 15540.00	Average	H	-	-	-81.67	14.06	0.00	39.39	53.98	-14.59
* 15540.00	Peak	H	-	-	-69.41	14.06	0.00	51.65	73.98	-22.33
* 20720.00	Average	H	-	-	-70.90	16.59	-9.54	43.15	53.98	-10.83
* 20720.00	Peak	H	-	-	-64.35	16.59	-9.54	49.70	73.98	-24.28
25900.00	Peak	H	-	-	-63.40	19.49	-9.54	53.54	68.20	-14.66

Table 7-28. Radiated Measurements SISO ANT1

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
10400.00	Peak	H	110	342	-66.57	12.11	0.00	52.54	68.20	-15.66
* 15600.00	Average	H	-	-	-82.08	14.11	0.00	39.03	53.98	-14.95
* 15600.00	Peak	H	-	-	-69.54	14.11	0.00	51.57	73.98	-22.41
* 20800.00	Average	H	-	-	-70.80	17.21	-9.54	43.86	53.98	-10.12
* 20800.00	Peak	H	-	-	-63.58	17.21	-9.54	51.08	73.98	-22.90
26000.00	Peak	H	-	-	-60.77	19.93	-9.54	56.62	68.20	-11.58

Table 7-29. Radiated Measurements SISO ANT1

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
10480.00	Peak	H	113	357	-65.92	12.46	0.00	53.54	68.20	-14.66
* 15720.00	Average	H	-	-	-81.95	14.51	0.00	39.56	53.98	-14.42
* 15720.00	Peak	H	-	-	-69.62	14.51	0.00	51.89	73.98	-22.09
* 20960.00	Average	H	-	-	-70.97	17.50	-9.54	43.99	53.98	-9.99
* 20960.00	Peak	H	-	-	-64.23	17.50	-9.54	50.73	73.98	-23.25
26200.00	Peak	H	-	-	-59.60	20.16	-9.54	58.02	68.20	-10.18

Table 7-30. Radiated Measurements SISO ANT1

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
10480.00	Peak	H	109	279	-66.36	12.46	0.00	53.10	68.20	-15.10
* 15720.00	Average	H	-	-	-82.01	14.51	0.00	39.50	53.98	-14.48
* 15720.00	Peak	H	-	-	-67.22	14.51	0.00	54.29	73.98	-19.69
* 20960.00	Average	H	-	-	-70.56	17.50	-9.54	44.40	53.98	-9.58
* 20960.00	Peak	H	-	-	-65.12	17.50	-9.54	49.84	73.98	-24.14
26200.00	Peak	H	-	-	-60.06	20.16	-9.54	57.56	68.20	-10.64

Table 7-31. Radiated Measurements SISO ANT1 with WCP

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
10520.00	Peak	H	111	6	-66.49	12.74	0.00	53.25	68.20	-14.95
* 15780.00	Average	H	-	-	-81.89	14.08	0.00	39.19	53.98	-14.79
* 15780.00	Peak	H	-	-	-69.69	14.08	0.00	51.39	73.98	-22.59
* 21040.00	Average	H	-	-	-69.88	17.50	-9.54	45.08	53.98	-8.90
* 21040.00	Peak	H	-	-	-66.21	17.50	-9.54	48.75	73.98	-25.23
26300.00	Peak	H	-	-	-60.11	20.28	-9.54	57.63	68.20	-10.57

Table 7-32. Radiated Measurements SISO ANT1

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
10560.00	Peak	H	119	0	-66.42	12.64	0.00	53.22	68.20	-14.98
* 15840.00	Average	H	-	-	-81.61	13.80	0.00	39.19	53.98	-14.79
* 15840.00	Peak	H	-	-	-69.34	13.80	0.00	51.46	73.98	-22.52
* 21120.00	Average	H	-	-	-70.02	17.55	-9.54	44.98	53.98	-8.99
* 21120.00	Peak	H	-	-	-67.09	17.55	-9.54	47.91	73.98	-26.06
26400.00	Peak	H	-	-	-61.22	20.52	-9.54	56.76	68.20	-11.44

Table 7-33. Radiated Measurements SISO ANT1

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 10640.00	Average	H	112	356	-78.19	12.25	0.00	41.06	53.98	-12.92
* 10640.00	Peak	H	112	356	-65.40	12.25	0.00	53.85	73.98	-20.13
* 15960.00	Average	H	-	-	-82.15	14.54	0.00	39.39	53.98	-14.59
* 15960.00	Peak	H	-	-	-69.83	14.54	0.00	51.71	73.98	-22.27
* 21280.00	Average	H	-	-	-69.89	17.78	-9.54	45.35	53.98	-8.63
* 21280.00	Peak	H	-	-	-67.24	17.78	-9.54	48.00	73.98	-25.98
26600.00	Peak	H	-	-	-60.89	5.35	-9.54	41.92	68.20	-26.28

Table 7-34. Radiated Measurements SISO ANT1

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 10640.00	Average	H	120	355	-77.89	12.25	0.00	41.36	53.98	-12.62
* 10640.00	Peak	H	120	355	-64.09	12.25	0.00	55.16	73.98	-18.82
* 15960.00	Average	H	-	-	-81.12	14.54	0.00	40.42	53.98	-13.56
* 15960.00	Peak	H	-	-	-70.22	14.54	0.00	51.32	73.98	-22.66
* 21280.00	Average	H	-	-	-70.36	17.78	-9.54	44.88	53.98	-9.10
* 21280.00	Peak	H	-	-	-68.64	17.78	-9.54	46.60	73.98	-27.38
26600.00	Peak	H	-	-	-61.03	5.35	-9.54	41.78	68.20	-26.42

Table 7-35. Radiated Measurements SISO ANT1 with WCP

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 11000.00	Average	H	328	349	-74.82	12.63	0.00	44.81	53.98	-9.16
* 11000.00	Peak	H	328	349	-62.16	12.63	0.00	57.47	73.98	-16.50
16500.00	Peak	H	-	-	-69.44	15.23	0.00	52.79	68.20	-15.41
22000.00	Peak	H	-	-	-57.28	18.88	-9.54	59.06	68.20	-9.14
27500.00	Peak	H	-	-	-59.67	3.82	-9.54	41.61	68.20	-26.59

Table 7-36. Radiated Measurements SISO ANT1

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 11200.00	Average	H	327	349	-73.49	12.70	0.00	46.21	53.98	-7.77
* 11200.00	Peak	H	327	349	-60.35	12.70	0.00	59.35	73.98	-14.63
16800.00	Peak	H	-	-	-69.14	16.13	0.00	53.99	68.20	-14.21
* 22400.00	Average	H	-	-	-68.52	19.68	-9.54	48.62	53.98	-5.36
* 22400.00	Peak	H	-	-	-56.73	19.68	-9.54	60.41	73.98	-13.57
28000.00	Peak	H	-	-	-59.94	4.99	-9.54	42.51	68.20	-25.69

Table 7-37. Radiated Measurements SISO ANT1

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 11440.00	Average	H	330	359	-72.55	13.58	0.00	48.03	53.98	-5.95
* 11440.00	Peak	H	330	359	-59.75	13.58	0.00	60.83	73.98	-13.15
17160.00	Peak	H	-	-	-68.99	18.01	0.00	56.02	68.20	-12.18
* 22880.00	Average	H	-	-	-68.78	18.97	-9.54	47.64	53.98	-6.33
* 22880.00	Peak	H	-	-	-58.43	18.97	-9.54	57.99	73.98	-15.98
28600.00	Peak	H	-	-	-60.54	3.71	-9.54	40.63	68.20	-27.57

Table 7-38. Radiated Measurements SISO ANT1

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 11440.00	Average	H	324	6	-72.64	13.58	0.00	47.94	53.98	-6.04
* 11440.00	Peak	H	324	6	-60.01	13.58	0.00	60.57	73.98	-13.41
17160.00	Peak	H	-	-	-69.31	18.01	0.00	55.70	68.20	-12.50
* 22880.00	Average	H	-	-	-68.42	18.97	-9.54	48.00	53.98	-5.97
* 22880.00	Peak	H	-	-	-58.39	18.97	-9.54	58.03	73.98	-15.94
28600.00	Peak	H	-	-	-61.02	3.71	-9.54	40.15	68.20	-28.05

Table 7-39. Radiated Measurements SISO ANT1 with WCP

FCC ID: A3LSMN976U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/30/2019	EUT Type: Portable Handset		Page 182 of 245

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 11490.00	Average	H	394	10	-71.09	13.53	0.00	49.44	53.98	-4.54
* 11490.00	Peak	H	394	10	-58.54	13.53	0.00	61.99	73.98	-11.99
17235.00	Peak	H	-	-	-69.01	18.49	0.00	56.48	68.20	-11.72
* 22980.00	Average	H	-	-	-68.71	18.96	-9.54	47.71	53.98	-6.27
* 22980.00	Peak	H	-	-	-57.34	18.96	-9.54	59.08	73.98	-14.90
28725.00	Peak	H	-	-	-60.85	4.27	-9.54	40.88	68.20	-27.32

Table 7-40. Radiated Measurements SISO ANT1

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 11570.00	Average	H	400	23	-71.15	13.42	0.00	49.27	53.98	-4.71
* 11570.00	Peak	H	400	23	-58.79	13.42	0.00	61.63	73.98	-12.35
17355.00	Peak	H	-	-	-69.75	19.56	0.00	56.81	68.20	-11.39
23140.00	Peak	H	-	-	-56.75	19.12	-9.54	59.83	68.20	-8.37
28925.00	Peak	H	-	-	-61.38	4.82	-9.54	40.90	68.20	-27.30

Table 7-41. Radiated Measurements SISO ANT1

FCC ID: A3LSMN976U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/30/2019	EUT Type: Portable Handset		Page 183 of 245

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 11650.00	Average	H	393	10	-70.64	14.37	0.00	50.73	53.98	-3.25
* 11650.00	Peak	H	393	10	-58.14	14.37	0.00	63.23	73.98	-10.75
17475.00	Peak	H	-	-	-68.57	19.49	0.00	57.92	68.20	-10.28
23300.00	Peak	H	-	-	-56.39	18.21	-9.54	59.28	68.20	-8.92
29125.00	Peak	H	-	-	-58.63	2.68	-9.54	41.51	68.20	-26.69

Table 7-42. Radiated Measurements SISO ANT1

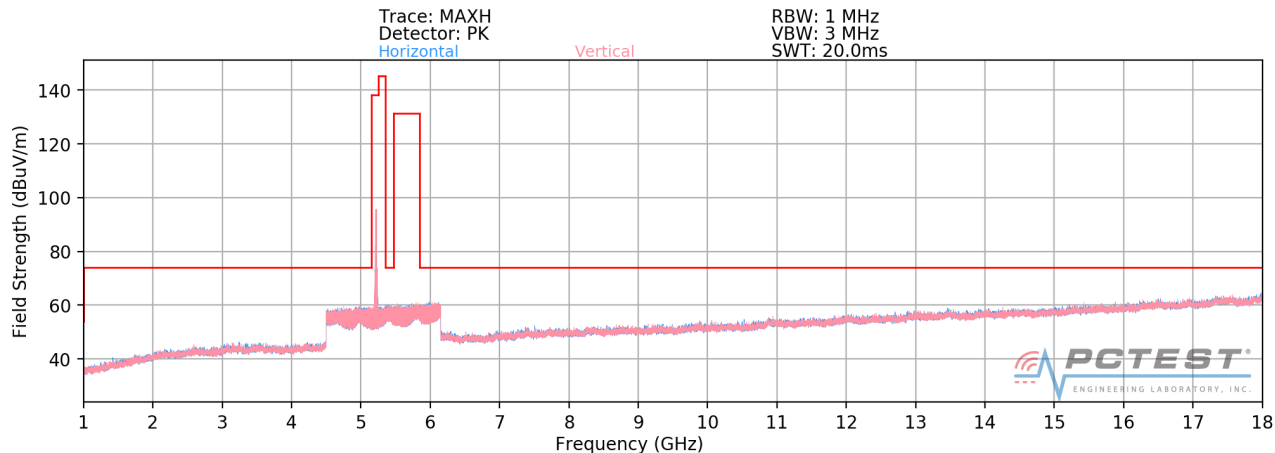
Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5825MHz
Channel: 165

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 11650.00	Average	H	372	21	-70.55	14.37	0.00	50.82	53.98	-3.16
* 11650.00	Peak	H	372	21	-59.36	14.37	0.00	62.01	73.98	-11.97
17475.00	Peak	H	-	-	-68.66	19.49	0.00	57.83	68.20	-10.37
23300.00	Peak	H	-	-	-57.22	18.21	-9.54	58.45	68.20	-9.75
29125.00	Peak	H	-	-	-59.32	2.68	-9.54	40.82	68.20	-27.38

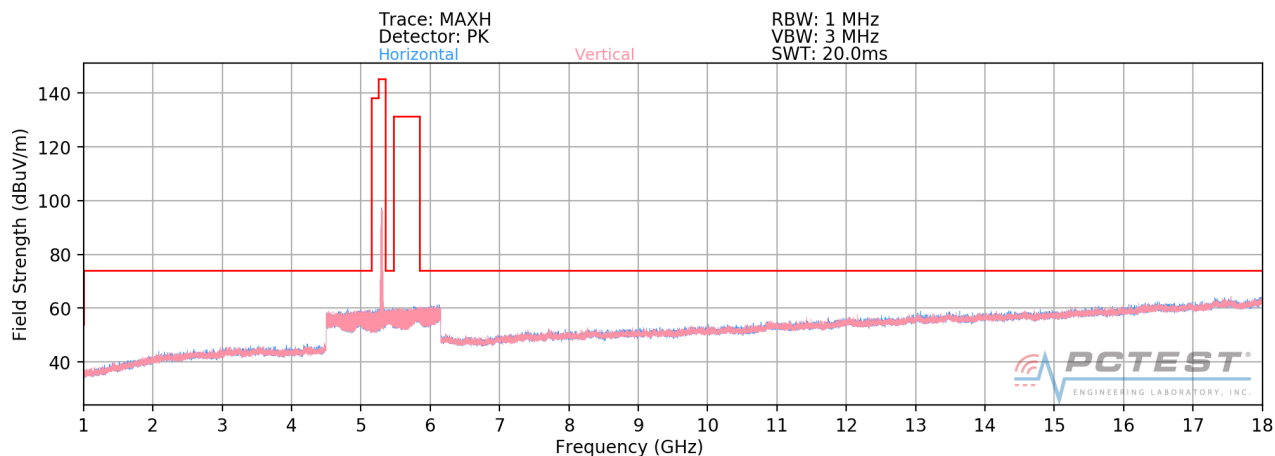
Table 7-43. Radiated Measurements SISO ANT1 with WCP

FCC ID: A3LSMN976U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/30/2019	EUT Type: Portable Handset		Page 184 of 245

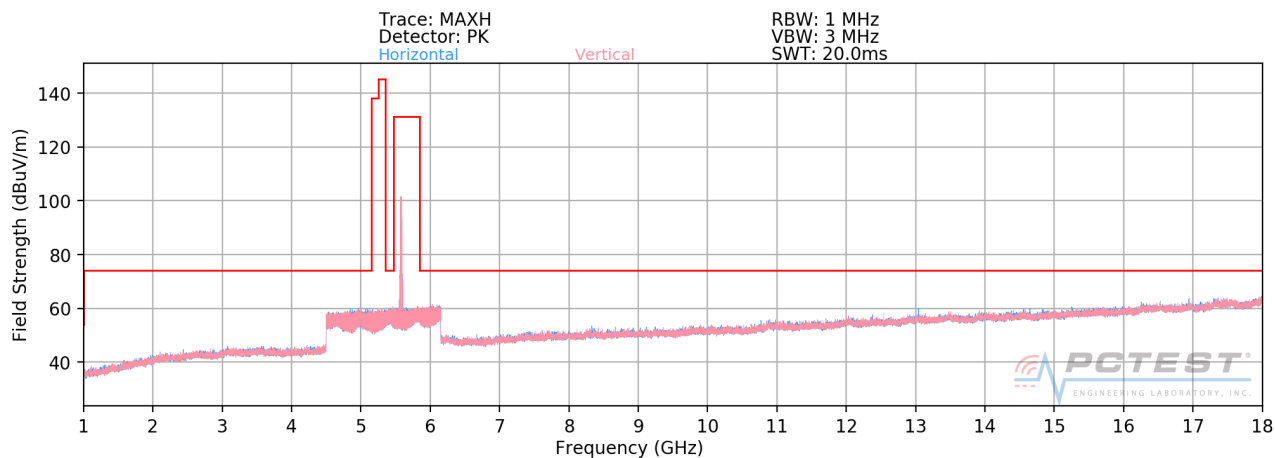
7.6.2 SISO Antenna-2 Radiated Spurious Emission Measurements



Plot 7-274. Radiated Spurious Plot above 1GHz SISO ANT2 (802.11a – U1 Ch. 40)

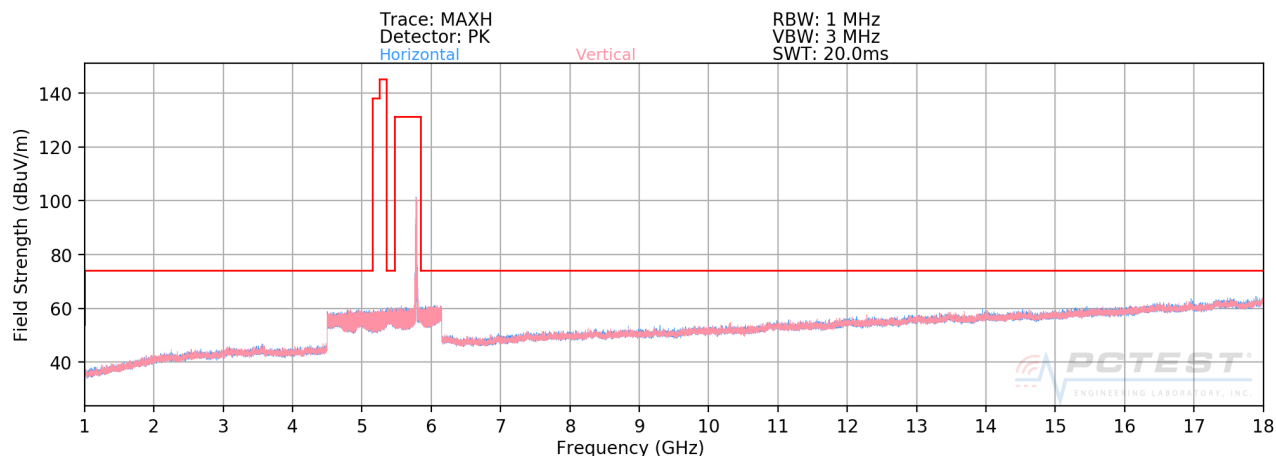


Plot 7-275. Radiated Spurious Plot above 1GHz SISO ANT2 (802.11a – U2A Ch. 56)



Plot 7-276. Radiated Spurious Plot above 1GHz SISO ANT2 (802.11a – U2C Ch. 120)

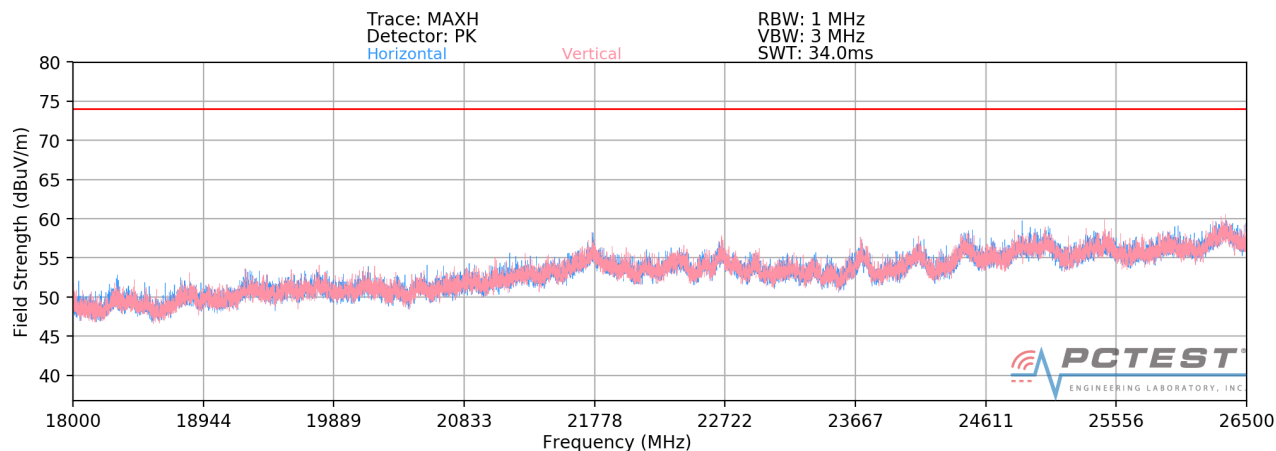
FCC ID: A3LSMN976U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/30/2019	EUT Type: Portable Handset		Page 185 of 245



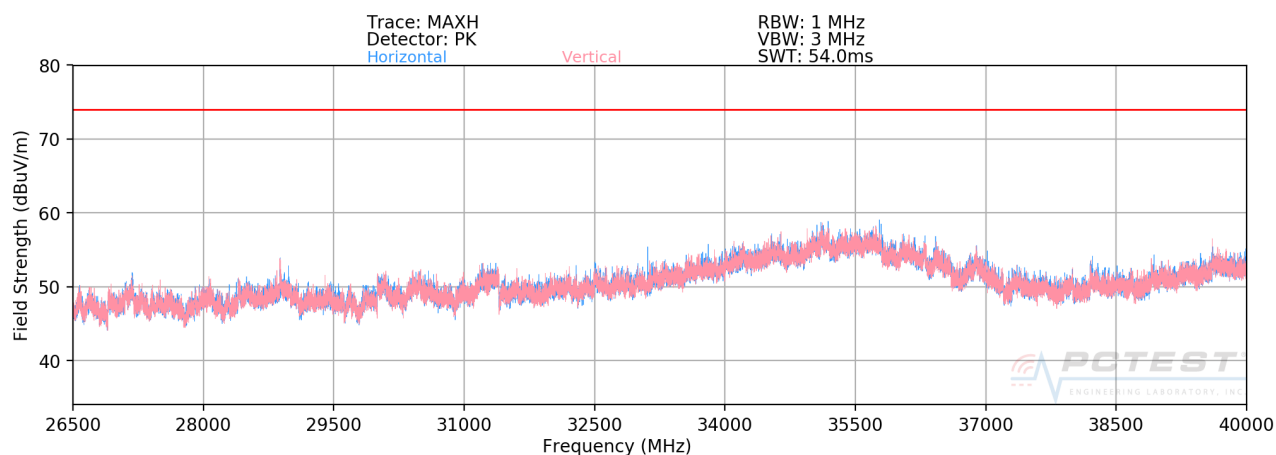
Plot 7-277. Radiated Spurious Plot above 1GHz SISO ANT2 (802.11a – U3 Ch. 157)

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 - 10/30/2019	EUT Type: Portable Handset		Page 186 of 245

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



Plot 7-278. Radiated Spurious Plot above 18GHz - 26.5GHz SISO ANT2 (802.11a)



Plot 7-279. Radiated Spurious Plot 26.5GHz - 40GHz SISO ANT2 (802.11a)

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 - 10/30/2019	EUT Type: Portable Handset		Page 187 of 245

SISO Antenna-2 Radiated Spurious Emission Measurements

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

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
10360.00	Peak	H	112	360	-66.81	12.19	0.00	52.38	68.20	-15.82
* 15540.00	Average	H	-	-	-81.96	14.06	0.00	39.10	53.98	-14.88
* 15540.00	Peak	H	-	-	-69.70	14.06	0.00	51.36	73.98	-22.62
* 20720.00	Average	H	-	-	-69.69	16.59	-9.54	44.36	53.98	-9.62
* 20720.00	Peak	H	-	-	-58.54	16.59	-9.54	55.51	73.98	-18.47
25900.00	Peak	H	-	-	-54.85	19.49	-9.54	62.09	68.20	-6.11

Table 7-44. Radiated Measurements SISO ANT2

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
10400.00	Peak	H	112	356	-66.79	12.11	0.00	52.32	68.20	-15.88
* 15600.00	Average	H	-	-	-82.18	14.11	0.00	38.93	53.98	-15.05
* 15600.00	Peak	H	-	-	-70.14	14.11	0.00	50.97	73.98	-23.01
* 20800.00	Average	H	-	-	-69.95	17.21	-9.54	44.71	53.98	-9.27
* 20800.00	Peak	H	-	-	-58.44	17.21	-9.54	56.22	73.98	-17.76
26000.00	Peak	H	-	-	-55.05	19.93	-9.54	62.34	68.20	-5.86

Table 7-45. Radiated Measurements SISO ANT2

FCC ID: A3LSMN976U	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/30/2019	EUT Type: Portable Handset	Page 188 of 245

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
10480.00	Peak	H	111	345	-67.92	12.46	0.00	51.54	68.20	-16.66
* 15720.00	Average	H	-	-	-82.09	14.51	0.00	39.42	53.98	-14.56
* 15720.00	Peak	H	-	-	-70.02	14.51	0.00	51.49	73.98	-22.49
* 20960.00	Average	H	-	-	-70.12	17.50	-9.54	44.84	53.98	-9.14
* 20960.00	Peak	H	-	-	-58.94	17.50	-9.54	56.02	73.98	-17.96
26200.00	Peak	H	-	-	-54.19	20.16	-9.54	63.43	68.20	-4.77

Table 7-46. Radiated Measurements SISO ANT2

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
10480.00	Peak	H	116	338	-68.16	12.46	0.00	51.30	68.20	-16.90
* 15720.00	Average	H	-	-	-72.39	14.51	0.00	49.12	53.98	-4.86
* 15720.00	Peak	H	-	-	-69.89	14.51	0.00	51.62	73.98	-22.36
* 20960.00	Average	H	-	-	-70.22	17.50	-9.54	44.74	53.98	-9.24
* 20960.00	Peak	H	-	-	-59.34	17.50	-9.54	55.62	73.98	-18.36
26200.00	Peak	H	-	-	-55.39	20.16	-9.54	62.23	68.20	-5.97

Table 7-47. Radiated Measurements SISO ANT2 with WCP

FCC ID: A3LSMN976U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/30/2019	EUT Type: Portable Handset		Page 189 of 245

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
10520.00	Peak	H	-	-	-68.65	12.74	0.00	51.09	68.20	-17.11
* 15780.00	Average	H	-	-	-82.45	14.08	0.00	38.63	53.98	-15.35
* 15780.00	Peak	H	-	-	-70.46	14.08	0.00	50.62	73.98	-23.36
* 21040.00	Average	H	-	-	-69.64	17.50	-9.54	45.32	53.98	-8.66
* 21040.00	Peak	H	-	-	-58.27	17.50	-9.54	56.69	73.98	-17.29
26300.00	Peak	H	-	-	-54.10	20.28	-9.54	63.64	68.20	-4.56

Table 7-48. Radiated Measurements SISO ANT2

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
10560.00	Peak	H	-	-	-68.02	12.64	0.00	51.62	68.20	-16.58
* 15840.00	Average	H	-	-	-81.76	13.80	0.00	39.04	53.98	-14.94
* 15840.00	Peak	H	-	-	-68.66	13.80	0.00	52.14	73.98	-21.84
* 21120.00	Average	H	-	-	-69.47	17.55	-9.54	45.53	53.98	-8.44
* 21120.00	Peak	H	-	-	-58.72	17.55	-9.54	56.28	73.98	-17.69
26400.00	Peak	H	-	-	-55.09	20.52	-9.54	62.89	68.20	-5.31

Table 7-49. Radiated Measurements SISO ANT2

FCC ID: A3LSMN976U	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/30/2019	EUT Type: Portable Handset	Page 190 of 245

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 10640.00	Average	H	-	-	-80.69	12.25	0.00	38.56	53.98	-15.42
* 10640.00	Peak	H	-	-	-66.54	12.25	0.00	52.71	73.98	-21.27
* 15960.00	Average	H	-	-	-82.21	14.54	0.00	39.33	53.98	-14.65
* 15960.00	Peak	H	-	-	-70.36	14.54	0.00	51.18	73.98	-22.80
* 21280.00	Average	H	-	-	-69.28	17.78	-9.54	45.96	53.98	-8.02
* 21280.00	Peak	H	-	-	-58.63	17.78	-9.54	56.61	73.98	-17.37
26600.00	Peak	H	-	-	-59.15	5.35	-9.54	43.66	68.20	-24.54

Table 7-50. Radiated Measurements SISO ANT2

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 10640.00	Average	H	-	-	-80.72	12.25	0.00	38.53	53.98	-15.45
* 10640.00	Peak	H	-	-	-67.01	12.25	0.00	52.24	73.98	-21.74
* 15960.00	Average	H	-	-	-82.33	14.54	0.00	39.21	53.98	-14.77
* 15960.00	Peak	H	-	-	-70.55	14.54	0.00	50.99	73.98	-22.99
* 21280.00	Average	H	-	-	-70.26	17.78	-9.54	44.98	53.98	-9.00
* 21280.00	Peak	H	-	-	-59.61	17.78	-9.54	55.63	73.98	-18.35
26600.00	Peak	H	-	-	-59.31	5.35	-9.54	43.50	68.20	-24.70

Table 7-51. Radiated Measurements SISO ANT2 with WCP

FCC ID: A3LSMN976U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/30/2019	EUT Type: Portable Handset		Page 191 of 245

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 11000.00	Average	H	327	353	-77.28	12.63	0.00	42.35	53.98	-11.62
* 11000.00	Peak	H	327	353	-63.96	12.63	0.00	55.67	73.98	-18.30
16500.00	Peak	H	-	-	-70.01	15.23	0.00	52.22	68.20	-15.98
22000.00	Peak	H	-	-	-57.41	18.88	-9.54	58.93	68.20	-9.27
27500.00	Peak	H	-	-	-60.09	3.82	-9.54	41.19	68.20	-27.01

Table 7-52. Radiated Measurements SISO ANT2

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 11200.00	Average	H	314	353	-78.24	13.01	0.00	41.77	53.98	-12.21
* 11200.00	Peak	H	314	353	-65.50	13.01	0.00	54.51	73.98	-19.47
16800.00	Peak	H	-	-	-70.09	16.50	0.00	53.41	68.20	-14.79
* 22400.00	Average	H	-	-	-68.65	19.68	-9.54	48.49	53.98	-5.49
* 22400.00	Peak	H	-	-	-57.80	19.68	-9.54	59.34	73.98	-14.64
28000.00	Peak	H	-	-	-60.59	4.99	-9.54	41.86	68.20	-26.34

Table 7-53. Radiated Measurements SISO ANT2

FCC ID: A3LSMN976U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/30/2019	EUT Type: Portable Handset		Page 192 of 245

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 11440.00	Average	H	-	-	-80.97	13.58	0.00	39.61	53.98	-14.37
* 11440.00	Peak	H	-	-	-68.60	13.58	0.00	51.98	73.98	-22.00
17160.00	Peak	H	-	-	-69.58	18.01	0.00	55.43	68.20	-12.77
* 22880.00	Average	H	-	-	-68.74	18.97	-9.54	47.68	53.98	-6.29
* 22880.00	Peak	H	-	-	-57.94	18.97	-9.54	58.48	73.98	-15.49
28600.00	Peak	H	-	-	-60.23	3.71	-9.54	40.94	68.20	-27.26

Table 7-54. Radiated Measurements SISO ANT2

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 11440.00	Average	H	-	-	-81.21	13.58	0.00	39.37	53.98	-14.61
* 11440.00	Peak	H	-	-	-68.91	13.58	0.00	51.67	73.98	-22.31
17160.00	Peak	H	-	-	-70.31	18.01	0.00	54.70	68.20	-13.50
* 22880.00	Average	H	-	-	-69.22	18.97	-9.54	47.20	53.98	-6.77
* 22880.00	Peak	H	-	-	-57.91	18.97	-9.54	58.51	73.98	-15.46
28600.00	Peak	H	-	-	-60.01	3.71	-9.54	41.16	68.20	-27.04

Table 7-55. Radiated Measurements SISO ANT2 with WCP

FCC ID: A3LSMN976U	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/30/2019	EUT Type: Portable Handset	
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Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6Mbps
 Distance of Measurements: 1 & 3 Meters
 Operating Frequency: 5745MHz
 Channel: 149

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 11490.00	Average	H	312	-1	-80.91	13.53	0.00	39.62	53.98	-14.36
* 11490.00	Peak	H	312	-1	-66.83	13.53	0.00	53.70	73.98	-20.28
17235.00	Peak	H	-	-	-70.02	18.49	0.00	55.47	68.20	-12.73
* 22980.00	Average	H	-	-	-68.73	18.96	-9.54	47.69	53.98	-6.29
* 22980.00	Peak	H	-	-	-57.83	18.96	-9.54	58.59	73.98	-15.39
28725.00	Peak	H	-	-	-60.13	4.27	-9.54	41.60	68.20	-26.60

Table 7-56. Radiated Measurements SISO ANT2

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 11570.00	Average	H	299	-4	-79.50	13.42	0.00	40.92	53.98	-13.06
* 11570.00	Peak	H	299	-4	-65.84	13.42	0.00	54.58	73.98	-19.40
17355.00	Peak	H	-	-	-69.04	19.56	0.00	57.52	68.20	-10.68
23140.00	Peak	H	-	-	-57.48	19.12	-9.54	59.10	68.20	-9.10
28925.00	Peak	H	-	-	-60.23	4.82	-9.54	42.05	68.20	-26.15

Table 7-57. Radiated Measurements SISO ANT2

FCC ID: A3LSMN976U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/30/2019	EUT Type: Portable Handset		Page 194 of 245

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 11650.00	Average	H	312	11	-78.14	14.37	0.00	43.23	53.98	-10.75
* 11650.00	Peak	H	312	11	-63.40	14.37	0.00	57.97	73.98	-16.01
17475.00	Peak	H	-	-	-69.65	19.49	0.00	56.84	68.20	-11.36
23300.00	Peak	H	-	-	-57.01	18.21	-9.54	58.66	68.20	-9.54
29125.00	Peak	H	-	-	-58.60	2.68	-9.54	41.54	68.20	-26.66

Table 7-58. Radiated Measurements SISO ANT2

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 11650.00	Average	H	312	11	-78.14	14.37	0.00	43.14	53.98	-10.84
* 11650.00	Peak	H	312	11	-63.40	14.37	0.00	60.25	73.98	-13.73
17475.00	Peak	H	-	-	-69.65	19.49	0.00	56.26	68.20	-11.94
23300.00	Peak	H	-	-	-57.01	18.21	-9.54	58.45	68.20	-9.75
29125.00	Peak	H	-	-	-58.60	2.68	-9.54	40.84	68.20	-27.36

Table 7-59. Radiated Measurements SISO ANT2 with WCP

FCC ID: A3LSMN976U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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7.6.3 MIMO/CDD Radiated Spurious Emission Measurements

MIMO/CDD Radiated Spurious Emission Measurements

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

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
10360.00	Peak	H	333	270	-63.99	12.19	0.00	55.20	68.20	-13.00
* 15540.00	Average	H	210	61	-81.17	14.06	0.00	39.89	53.98	-14.09
* 15540.00	Peak	H	210	61	-69.22	14.06	0.00	51.84	73.98	-22.14
* 20720.00	Average	H	-	-	-77.80	16.59	-9.54	36.25	53.98	-17.73
* 20720.00	Peak	H	-	-	-66.76	16.59	-9.54	47.29	73.98	-26.69
25900.00	Peak	H	-	-	-65.73	19.49	-9.54	51.21	68.20	-16.99

Table 7-60. Radiated Measurements MIMO/CDD

FCC ID: A3LSMN976U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5200MHz
Channel: 40

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
10400.00	Peak	H	117	4	-64.41	12.11	0.00	54.70	68.20	-13.50
* 15600.00	Average	H	119	370	-81.06	14.11	0.00	40.05	53.98	-13.93
* 15600.00	Peak	H	119	370	-69.06	14.11	0.00	52.05	73.98	-21.93
* 20800.00	Average	H	-	-	-77.75	17.21	-9.54	36.91	53.98	-17.07
* 20800.00	Peak	H	-	-	-65.55	17.21	-9.54	49.11	73.98	-24.87
26000.00	Peak	H	-	-	-65.72	19.93	-9.54	51.67	68.20	-16.53

Table 7-61. Radiated Measurements MIMO/CDD

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
10480.00	Peak	H	112	15	-64.90	12.46	0.00	54.56	68.20	-13.64
* 15720.00	Average	H	117	30	-80.41	14.51	0.00	41.10	53.98	-12.88
* 15720.00	Peak	H	117	30	-69.01	14.51	0.00	52.50	73.98	-21.48
* 20960.00	Average	H	-	-	-78.05	17.50	-9.54	36.91	53.98	-17.07
* 20960.00	Peak	H	-	-	-66.28	17.50	-9.54	48.68	73.98	-25.30
26200.00	Peak	H	-	-	-65.19	20.16	-9.54	52.43	68.20	-15.77

Table 7-62. Radiated Measurements MIMO/CDD

FCC ID: A3LSMN976U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency:
Channel:

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
10360.00	Peak	H	149	315	-68.71	12.19	0.00	50.48	68.20	-17.72
* 15540.00	Average	H	115	167	-80.39	14.06	0.00	40.67	53.98	-13.31
* 15540.00	Peak	H	115	167	-69.38	14.06	0.00	51.68	73.98	-22.30
* 20720.00	Average	H	-	-	-77.79	16.59	-9.54	36.26	53.98	-17.72
* 20720.00	Peak	H	-	-	-66.73	16.59	-9.54	47.32	73.98	-26.66
25900.00	Peak	H	-	-	-65.01	19.49	-9.54	51.93	68.20	-16.27

Table 7-63. Radiated Measurements MIMO/CDD with WCP

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
10520.00	Peak	H	116	360	-66.34	12.74	0.00	53.40	68.20	-14.80
* 15780.00	Average	H	-	-	-81.52	14.08	0.00	39.56	53.98	-14.42
* 15780.00	Peak	H	-	-	-69.80	14.08	0.00	51.28	73.98	-22.70
* 21040.00	Average	H	-	-	-77.45	17.50	-9.54	37.51	53.98	-16.47
* 21040.00	Peak	H	-	-	-66.42	17.50	-9.54	48.54	73.98	-25.44
26300.00	Peak	H	-	-	-64.59	20.28	-9.54	53.15	68.20	-15.05

Table 7-64. Radiated Measurements MIMO/CDD

FCC ID: A3LSMN976U	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
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Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5280MHz
Channel: 56

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
10560.00	Peak	H	111	358	-64.39	12.64	0.00	55.25	68.20	-12.95
* 15840.00	Average	H	119	369	-80.37	13.80	0.00	40.43	53.98	-13.55
* 15840.00	Peak	H	119	369	-68.72	13.80	0.00	52.08	73.98	-21.90
* 21120.00	Average	H	-	-	-77.45	17.55	-9.54	37.55	53.98	-16.42
* 21120.00	Peak	H	-	-	-66.04	17.55	-9.54	48.96	73.98	-25.01
26400.00	Peak	H	-	-	-64.63	20.52	-9.54	53.35	68.20	-14.85

Table 7-65. Radiated Measurements MIMO/CDD

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 10640.00	Average	H	114	7	-76.86	12.25	0.00	42.39	53.98	-11.59
* 10640.00	Peak	H	114	7	-63.04	12.25	0.00	56.21	73.98	-17.77
* 15960.00	Average	H	112	10	-80.54	14.54	0.00	41.00	53.98	-12.98
* 15960.00	Peak	H	112	10	-68.42	14.54	0.00	53.12	73.98	-20.86
* 21280.00	Average	H	-	-	-76.91	17.78	-9.54	38.33	53.98	-15.65
* 21280.00	Peak	H	-	-	-65.38	17.78	-9.54	49.86	73.98	-24.12
26600.00	Peak	H	-	-	-52.22	5.35	-9.54	50.59	68.20	-17.61

Table 7-66. Radiated Measurements MIMO/CDD

FCC ID: A3LSMN976U	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
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Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency:
Channel:

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
10640.00	Average	H	152	198	-75.71	12.25	0.00	43.54	53.98	-10.44
* 10640.00	Peak	H	152	198	-62.25	12.25	0.00	57.00	73.98	-16.98
* 15960.00	Average	H	-	-	-80.99	14.54	0.00	40.55	53.98	-13.43
* 15960.00	Peak	H	-	-	-69.30	14.54	0.00	52.24	73.98	-21.74
* 21280.00	Average	H	-	-	-77.07	17.78	-9.54	38.17	53.98	-15.81
21280.00	Peak	H	-	-	-65.78	17.78	-9.54	49.46	73.98	-24.52
26600.00	Peak	H	-	-	-49.57	5.35	-9.54	53.24	68.20	-14.96

Table 7-67. Radiated Measurements MIMO/CDD with WCP

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 11000.00	Average	H	319	356	-71.85	12.63	0.00	47.78	53.98	-6.19
* 11000.00	Peak	H	319	356	-59.26	12.63	0.00	60.37	73.98	-13.60
16500.00	Peak	H	-	-	-70.33	15.23	0.00	51.90	68.20	-16.30
22000.00	Peak	H	-	-	-66.29	18.88	-9.54	50.05	68.20	-18.15
27500.00	Peak	H	-	-	-50.75	3.82	-9.54	50.53	68.20	-17.67

Table 7-68. Radiated Measurements MIMO/CDD

FCC ID: A3LSMN976U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5580MHz
Channel: 116

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 11200.00	Average	H	314	359	-72.03	12.70	0.00	47.67	53.98	-6.31
* 11200.00	Peak	H	314	359	-59.82	12.70	0.00	59.88	73.98	-14.10
16800.00	Peak	H	-	-	-69.89	16.13	0.00	53.24	68.20	-14.96
* 22400.00	Average	H	-	-	-77.51	19.68	-9.54	39.63	53.98	-14.35
* 22400.00	Peak	H	-	-	-66.60	19.68	-9.54	50.54	73.98	-23.44
28000.00	Peak	H	-	-	-51.13	4.99	-9.54	51.32	68.20	-16.88

Table 7-69. Radiated Measurements MIMO/CDD

Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5700MHz
Channel: 140

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 11440.00	Average	H	111	354	-72.37	13.58	0.00	48.21	53.98	-5.77
* 11440.00	Peak	H	111	354	-60.67	13.58	0.00	59.91	73.98	-14.07
17160.00	Peak	H	-	-	-70.05	18.01	0.00	54.96	68.20	-13.24
* 22880.00	Average	H	-	-	-77.43	18.97	-9.54	38.99	53.98	-14.98
* 22880.00	Peak	H	-	-	-66.37	18.97	-9.54	50.05	73.98	-23.92
28600.00	Peak	H	-	-	-50.22	3.71	-9.54	50.95	68.20	-17.25

Table 7-70. Radiated Measurements MIMO/CDD

FCC ID: A3LSMN976U	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
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Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency:
Channel:

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 11440.00	Average	H	319	351	-72.69	13.58	0.00	47.89	53.98	-6.09
* 11440.00	Peak	H	319	351	-61.24	13.58	0.00	59.34	73.98	-14.64
17160.00	Peak	H	-	-	-72.33	18.01	0.00	52.68	68.20	-15.52
22880.00	Average	H	-	-	-77.68	18.97	-9.54	38.74	53.98	-15.23
22880.00	Peak	H	-	-	-67.14	18.97	-9.54	49.28	73.98	-24.69
28600.00	Peak	H	-	-	-49.17	3.71	-9.54	52.00	68.20	-16.20

Table 7-71. Radiated Measurements MIMO/CDD with WCP

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 11490.00	Average	H	336	4	-70.01	13.53	0.00	50.52	53.98	-3.46
* 11490.00	Peak	H	336	4	-57.49	13.53	0.00	63.04	73.98	-10.94
17235.00	Peak	H	-	-	-69.16	18.49	0.00	56.33	68.20	-11.87
* 22980.00	Average	H	-	-	-77.78	18.96	-9.54	38.64	53.98	-15.34
* 22980.00	Peak	H	-	-	-67.04	18.96	-9.54	49.38	73.98	-24.60
28725.00	Peak	H	-	-	-51.61	4.27	-9.54	50.12	69.20	-19.08

Table 7-72. Radiated Measurements MIMO/CDD

FCC ID: A3LSMN976U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5785MHz
Channel: 157

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 11570.00	Average	H	303	351	-69.71	13.42	0.00	50.71	53.98	-3.27
* 11570.00	Peak	H	303	351	-57.64	13.42	0.00	62.78	73.98	-11.20
17355.00	Peak	H	-	-	-70.25	19.56	0.00	56.31	68.20	-11.89
23140.00	Peak	H	-	-	-66.62	19.12	-9.54	49.96	68.20	-18.24
28925.00	Peak	H	-	-	-50.94	4.82	-9.54	51.34	68.20	-16.86

Table 7-73. Radiated Measurements MIMO/CDD

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 11650.00	Average	H	319	351	-71.89	14.37	0.00	49.48	53.98	-4.50
* 11650.00	Peak	H	319	351	-57.90	14.37	0.00	63.47	73.98	-10.51
17475.00	Peak	H	-	-	-71.05	19.49	0.00	55.44	68.20	-12.76
23300.00	Peak	H	-	-	-66.29	18.21	-9.54	49.38	68.20	-18.82
29125.00	Peak	H	-	-	-49.53	2.68	-9.54	50.61	68.20	-17.59

Table 7-74. Radiated Measurements MIMO/CDD

FCC ID: A3LSMN976U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/30/2019	EUT Type: Portable Handset		Page 203 of 245

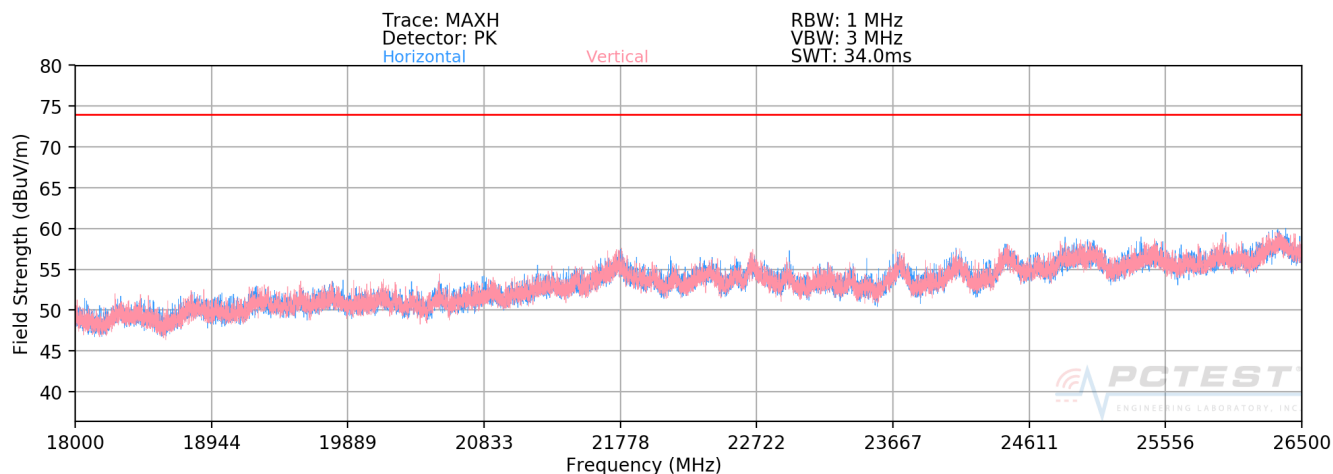
Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6Mbps
 Distance of Measurements: 1 & 3 Meters
 Operating Frequency: 5825MHz
 Channel: 165

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 11570.00	Average	H	280	360	-70.36	13.42	0.00	50.06	53.98	-3.92
* 11570.00	Peak	H	280	360	-58.01	13.42	0.00	62.41	73.98	-11.57
17355.00	Peak	H	-	-	-71.21	19.56	0.00	55.35	68.20	-12.85
23140.00	Peak	H	-	-	-66.59	19.12	-9.54	49.99	68.20	-18.21
28925.00	Peak	H	-	-	-51.26	4.82	-9.54	51.02	68.20	-17.18

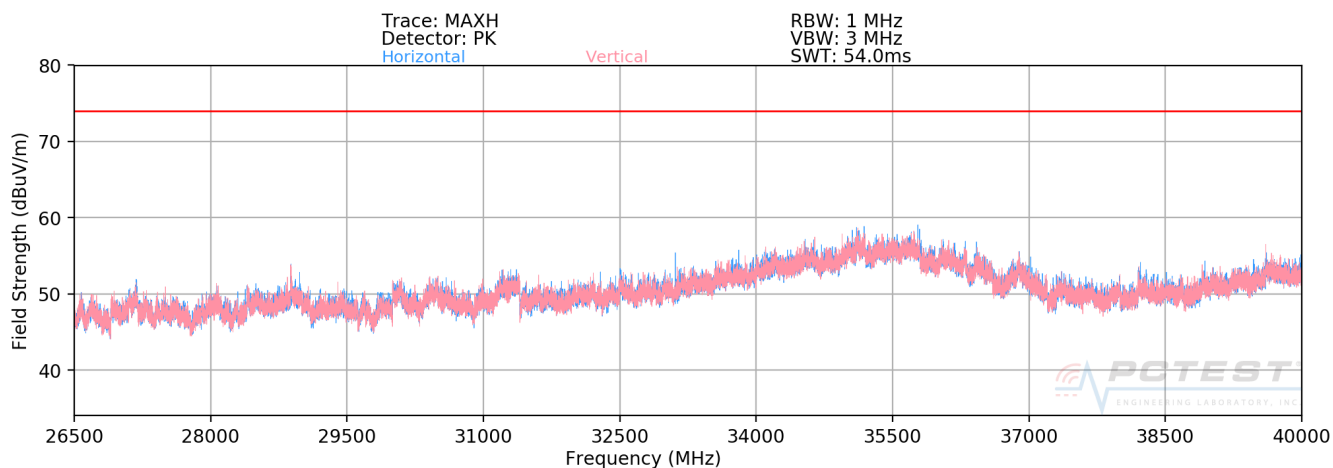
Table 7-75. Radiated Measurements MIMO/CDD with WCP

FCC ID: A3LSMN976U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/30/2019	EUT Type: Portable Handset		Page 204 of 245

MIMO/CDD Radiated Spurious Emissions Measurements (Above 18GHz)



Plot 7-280. Radiated Spurious Plot above 18GHz - 26.5GHz MIMO/CDD (802.11a)



Plot 7-281. Radiated Spurious Plot 26.5GHz - 40GHz MIMO/CDD (802.11a)

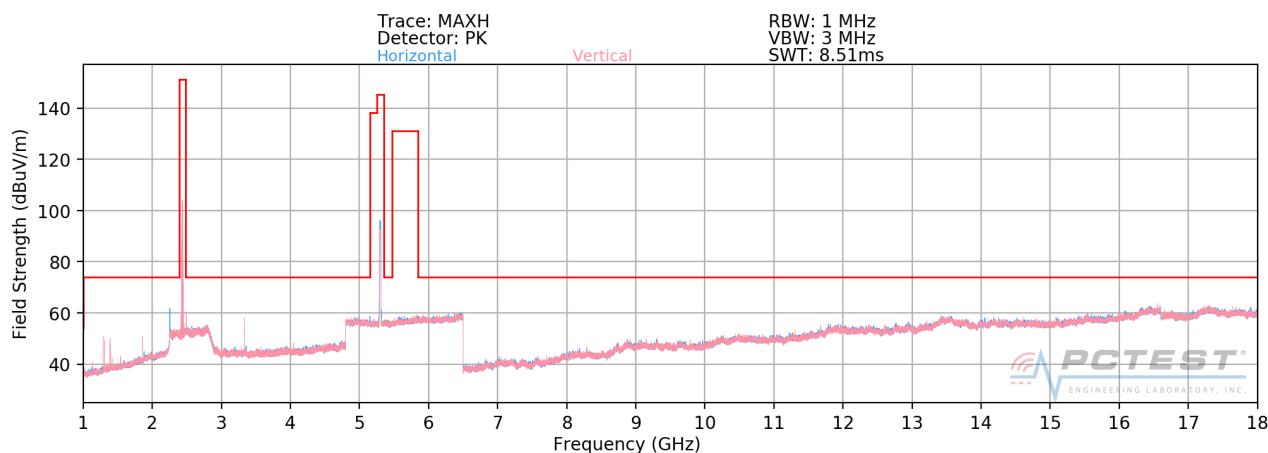
FCC ID: A3LSMN976U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/30/2019	EUT Type: Portable Handset		Page 205 of 245

7.6.4 Simultaneous Tx Radiated Spurious Emissions Measurements

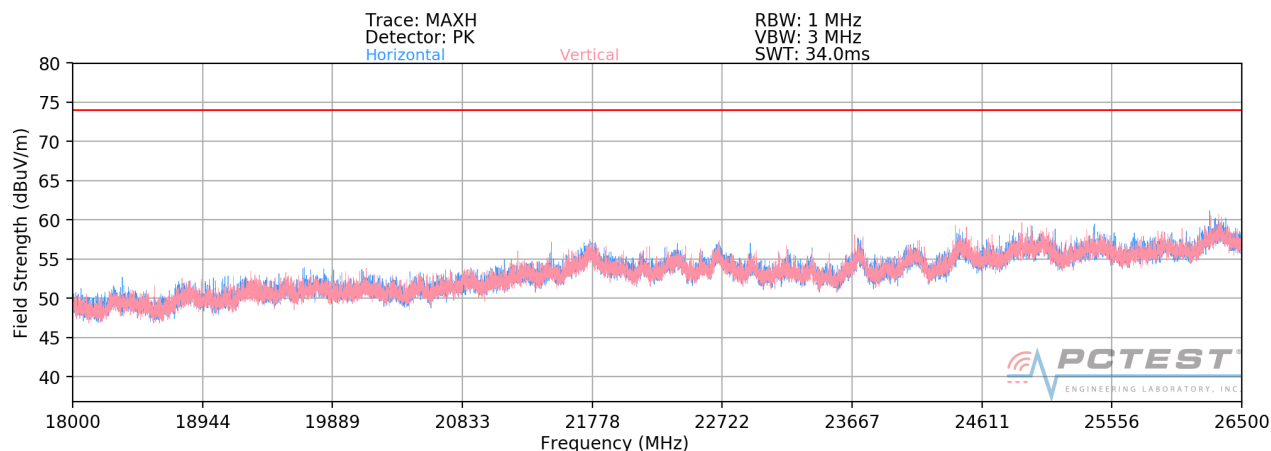
§15.407(b) §15.205 & §15.209; RSS-Gen [8.9]

Description	2.4 GHz Emission	5 GHz Emission
Antenna	1	2
Channel	6	40
Operating Frequency (MHz)	2437	5200
Data Rate (Mbps)	1	MCS0
Mode	802.11b	802.11n

Table 7-76. Simultaneous Transmission Config-1

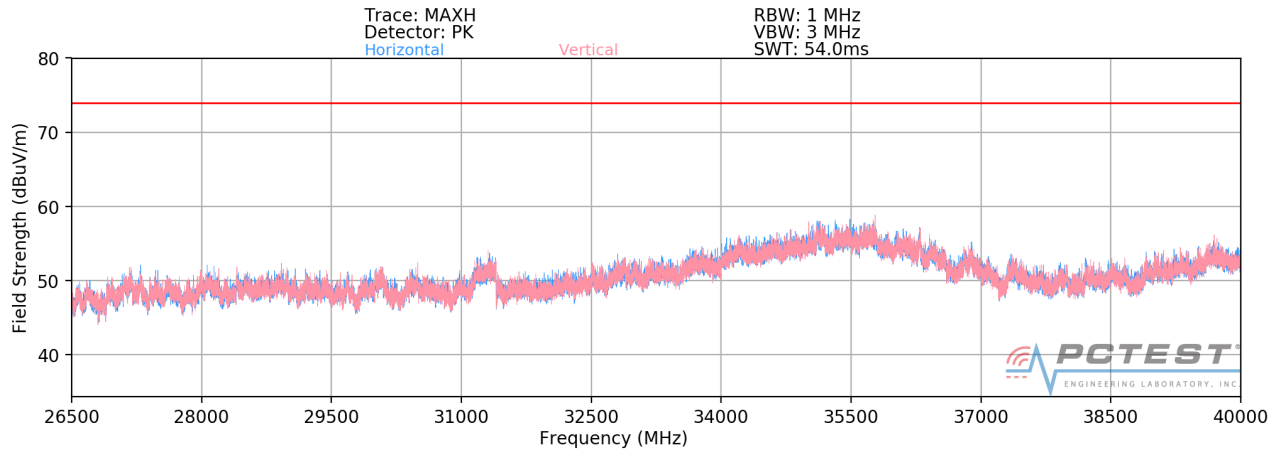


Plot 7-282. Radiated Spurious Plot above 1GHz (2.4GHz – 5GHz)



Plot 7-283. Radiated Spurious Plot 18GHz – 26.5GHz (2.4GHz – 5GHz)

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 - 10/30/2019	EUT Type: Portable Handset		Page 206 of 245



Plot 7-284. Radiated Spurious Plot above 26.5GHz (2.4GHz – 5GHz)

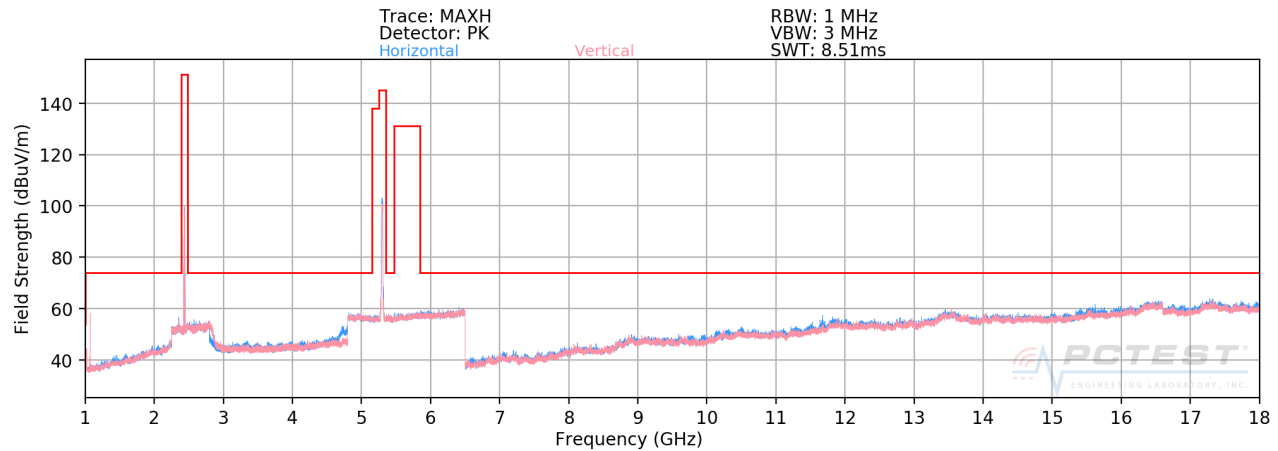
Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBuV/m]	Limit [dBuV/m]	Margin [dB]
726.00	Peak	H	-	-	-75.36	29.12	60.76	68.20	-7.44
3889.00	Average	H	-	-	-78.23	2.86	31.63	53.98	-22.35
3889.00	Peak	H	-	-	-70.08	5.86	42.78	73.98	-31.20
7052.00	Peak	H	-	-	-67.87	7.11	46.24	68.20	-21.96
8763.00	Peak	H	-	-	-68.33	11.05	49.73	68.20	-18.47
10215.00	Peak	H	-	-	-74.04	12.83	45.79	68.20	-22.41
11926.00	Average	H	-	-	-81.22	15.59	41.37	53.98	-12.61
11926.00	Peak	H	-	-	-73.98	15.59	48.61	73.98	-25.37
15089.00	Peak	H	-	-	-79.36	17.59	45.23	68.20	-22.97

Table 7-77. Radiated Measurements (ANT1 2.4GHz – ANT2 5GHz)

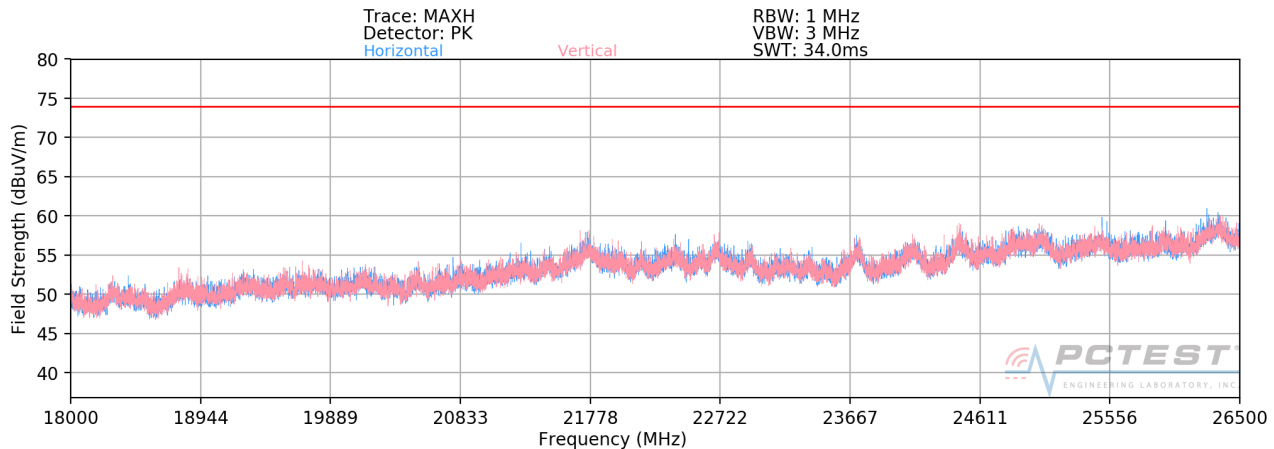
FCC ID: A3LSMN976U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/30/2019	EUT Type: Portable Handset		Page 207 of 245

Description	2.4 GHz Emission	5 GHz Emission
Antenna	2	1
Channel	6	120
Operating Frequency (MHz)	2437	5600
Data Rate (Mbps)	1	MCS0
Mode	802.11b	802.11n

Table 7-78. Simultaneous Transmission Config-2

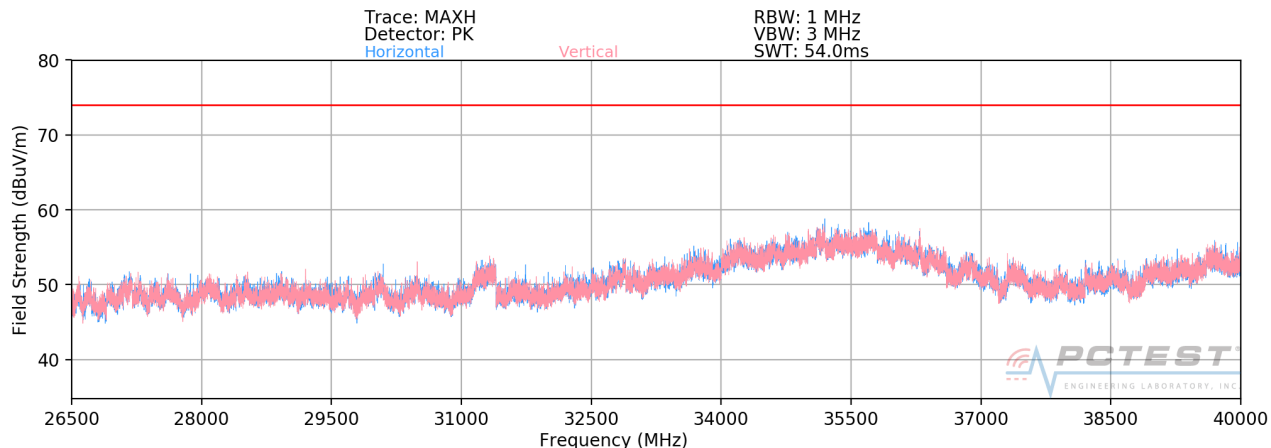


Plot 7-285. Radiated Spurious Plot above 1GHz (5GHz – 2.4 GHz)



Plot 7-286. Radiated Spurious Plot 18GHz – 26.5GHz (5GHz – 2.4 GHz)

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 - 10/30/2019	EUT Type: Portable Handset		Page 208 of 245



Plot 7-287. Radiated Spurious Plot above 26.5GHz (5GHz – 2.4 GHz)

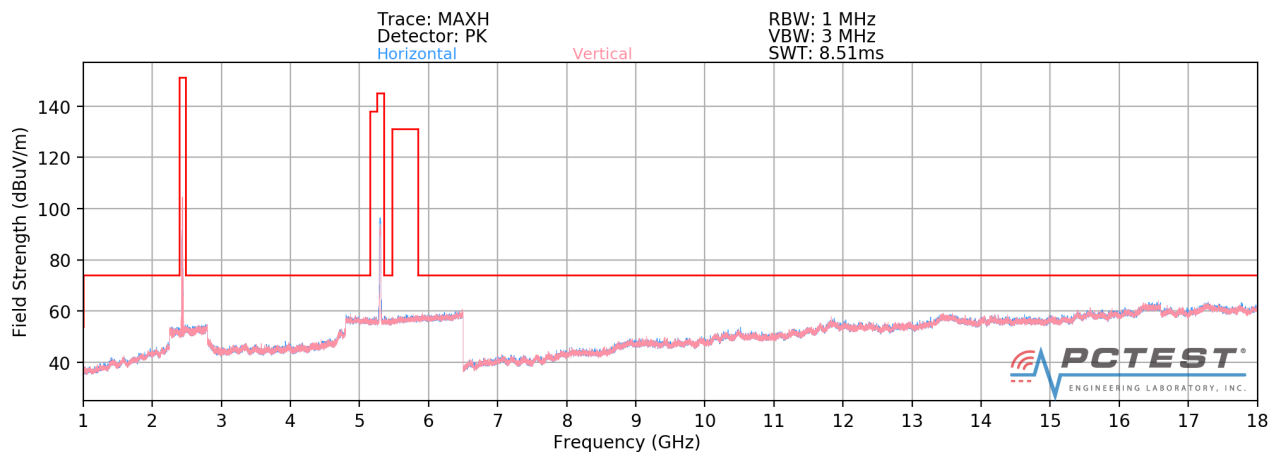
Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBuV/m]	Limit [dBuV/m]	Margin [dB]
406.00	Average	H	-	-	-84.36	23.72	46.36	53.98	-7.62
406.00	Peak	H	-	-	-74.22	23.72	56.50	73.98	-17.48
3249.00	Peak	H	-	-	-66.37	1.20	41.84	68.20	-26.36
6092.00	Peak	H	-	-	-67.98	6.60	45.62	68.20	-22.58
8123.00	Average	H	-	-	-77.99	10.38	39.39	53.98	-14.59
8123.00	Peak	H	-	-	-66.53	10.38	50.85	73.98	-23.13
8935.00	Peak	H	-	-	-69.11	11.86	49.76	68.20	-18.44
10966.00	Average	H	-	-	-70.66	14.39	50.73	53.98	-3.25
10966.00	Peak	H	-	-	-67.51	14.39	53.88	73.98	-20.10
13809.00	Peak	H	-	-	-72.66	18.41	52.75	68.20	-15.45
16652.00	Peak	H	-	-	-66.73	16.98	57.25	68.20	-10.95

Table 7-79. Radiated Measurements (ANT1 5GHz – ANT2 2.4GHz)

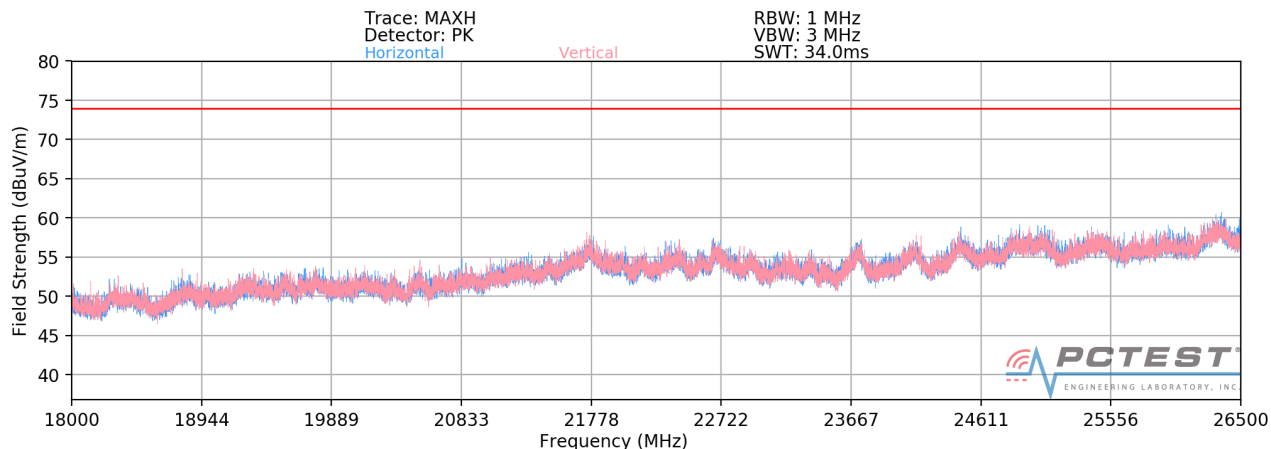
FCC ID: A3LSMN976U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/30/2019	EUT Type: Portable Handset		Page 209 of 245

Description	2.4 GHz Emission	5 GHz Emission
Antenna	1, 2	1, 2
Channel	6	36
Operating Frequency (MHz)	2437	5180
Data Rate (Mbps)	MCS8	MCS8
Mode	802.11n	802.11n

Table 7-80. Dual Band Simultaneous Transmission

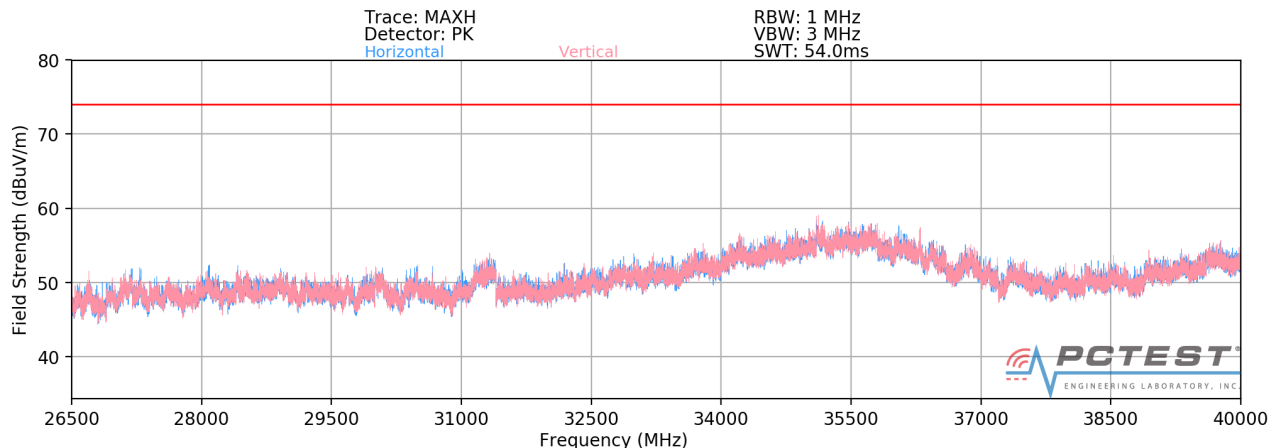


Plot 7-288. Radiated Spurious Plot above 1GHz (Dual Band Simult. Tx)



Plot 7-289. Radiated Spurious Plot 18GHz – 26.5GHz (Dual Band Simult. Tx)

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 - 10/30/2019	EUT Type: Portable Handset		Page 210 of 245



Plot 7-290. Radiated Spurious Plot above 26.5GHz (Dual Band Simult. Tx)

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
406.00	Average	H	-	-	-84.66	23.72	46.06	53.98	-7.92
406.00	Peak	H	-	-	-75.23	23.72	55.49	73.98	-18.49
3249.00	Peak	H	-	-	-67.33	1.20	40.87	68.20	-27.33
6092.00	Peak	H	-	-	-68.09	6.60	45.51	68.20	-22.69
8123.00	Average	H	-	-	-78.26	10.38	39.12	53.98	-14.86
8123.00	Peak	H	-	-	-66.41	10.38	50.97	73.98	-23.01
8935.00	Peak	H	-	-	-70.23	11.86	48.63	68.20	-19.57
10966.00	Average	H	-	-	-71.09	14.39	50.30	53.98	-3.68
10966.00	Peak	H	-	-	-67.86	14.39	53.53	73.98	-20.45
13809.00	Peak	H	-	-	-72.19	18.41	53.22	68.20	-14.98
16652.00	Peak	H	-	-	-66.49	16.98	57.49	68.20	-10.71

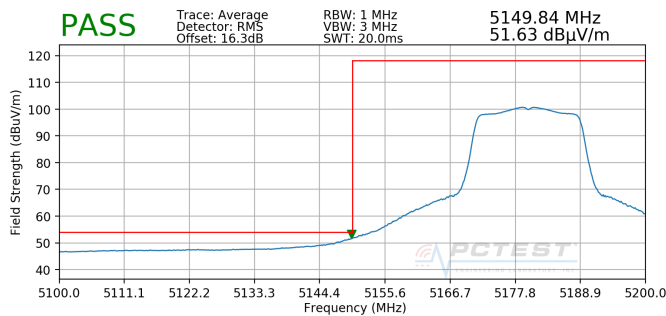
Table 7-81. Radiated Measurements (Dual Band Simult. Tx)

FCC ID: A3LSMN976U	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1909040147-08.A3L	Test Dates: 9/09 - 10/30/2019	EUT Type: Portable Handset	Page 211 of 245

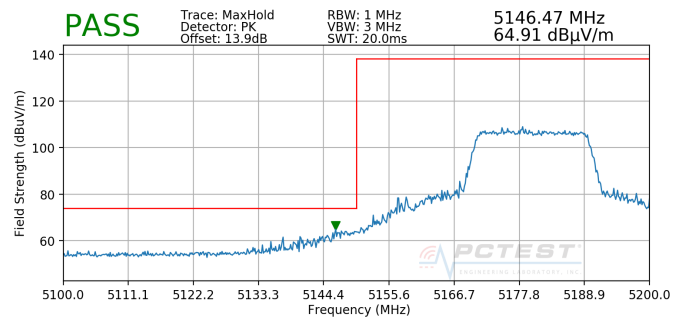
7.6.5 SISO Antenna-1 Radiated Band Edge Measurements (20MHz BW)

\$15.407(b.1)(b.2) §15.205 §15.209; RSS-Gen [8.9]; RSS-Gen [8.9]

Worst Case Mode:	802.11n
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5180MHz
Channel:	36

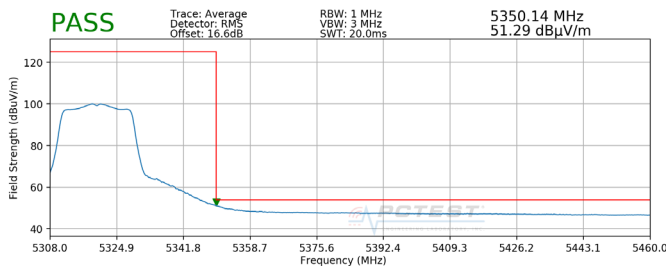


Plot 7-291. Radiated Lower Band Edge Plot SISO ANT1 (Average – UNII Band 1)

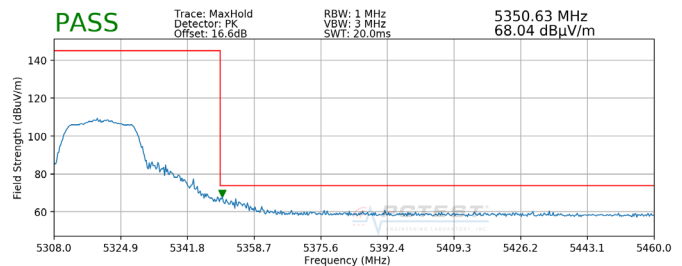


Plot 7-292. Radiated Lower Band Edge Plot SISO ANT1 (Peak – UNII Band 1)

Worst Case Mode:	802.11n
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5320MHz
Channel:	64



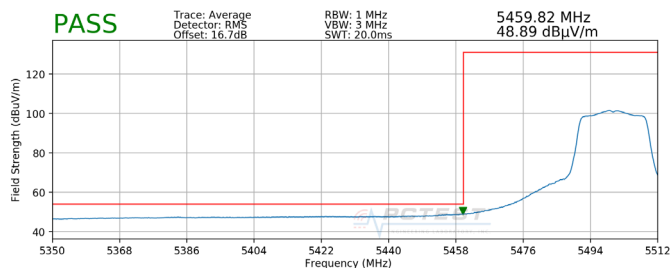
Plot 7-293. Radiated Upper Band Edge Plot SISO ANT1 (Average – UNII Band 2A)



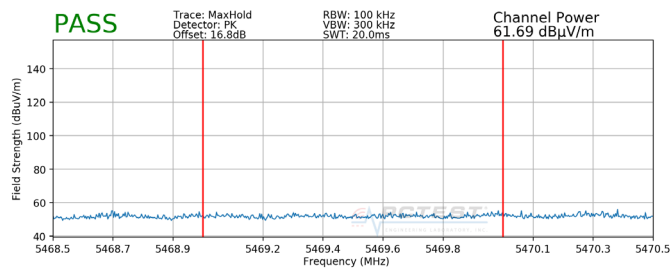
Plot 7-294. Radiated Upper Band Edge Plot SISO ANT1 (Peak – UNII Band 2A)

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 - 10/30/2019	EUT Type: Portable Handset		Page 212 of 245

Worst Case Mode: 802.11n
Worst Case Transfer Rate: MCS0
Distance of Measurements: 3 Meters
Operating Frequency: 5500MHz
Channel: 100

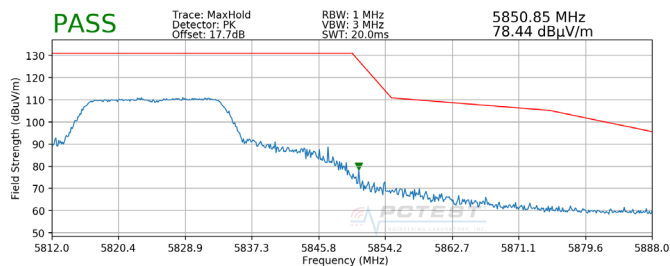


Plot 7-295. Radiated Lower Band Edge Plot SISO ANT1 (Average – UNII Band 2C)



Plot 7-296. Radiated Lower Band Edge Plot SISO ANT1 (Peak – UNII Band 2C)

Worst Case Mode: 802.11n
Worst Case Transfer Rate: MCS0
Distance of Measurements: 3 Meters
Operating Frequency: 5825MHz
Channel: 165



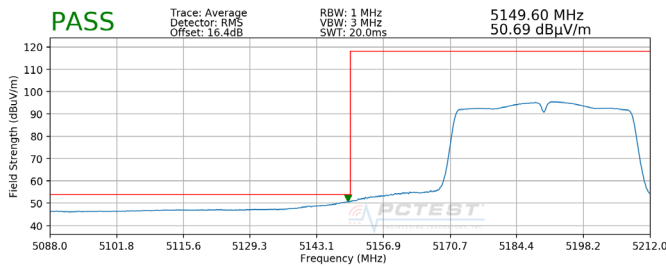
Plot 7-297. Radiated Upper Band Edge Plot SISO ANT1 (Peak – UNII Band 3)

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 - 10/30/2019	EUT Type: Portable Handset		Page 213 of 245

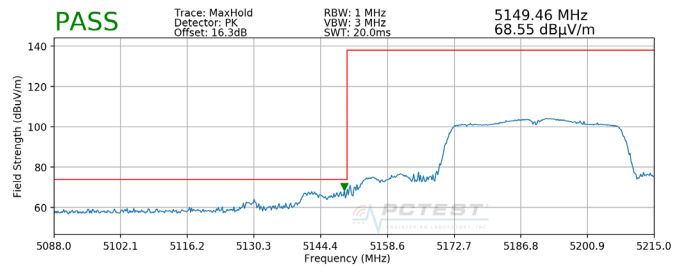
7.6.6 SISO Antenna-1 Radiated Band Edge Measurements (40MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209; RSS-Gen [8.9]

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

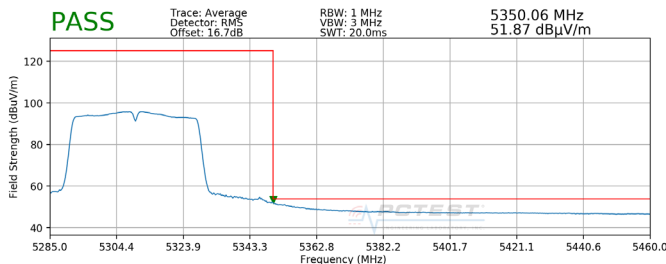


Plot 7-298. Radiated Lower Band Edge Plot SISO ANT1 (Average – UNII Band 1)

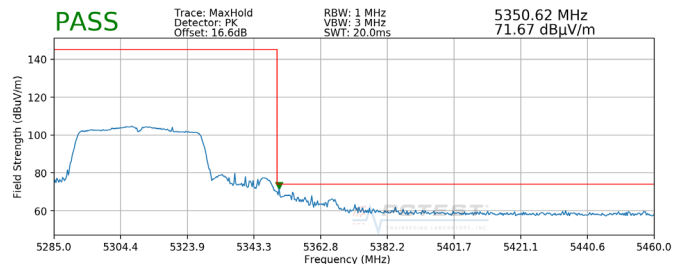


Plot 7-299. Radiated Lower Band Edge Plot SISO ANT1 (Peak – UNII Band 1)

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



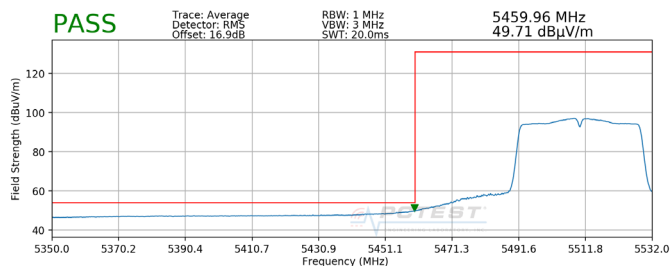
Plot 7-300. Radiated Upper Band Edge Plot SISO ANT1 (Average – UNII Band 2A)



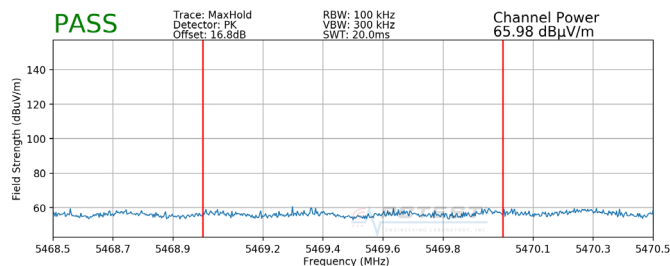
Plot 7-301. Radiated Upper Band Edge Plot SISO ANT1 (Peak – UNII Band 2A)

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 - 10/30/2019	EUT Type: Portable Handset		Page 214 of 245

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

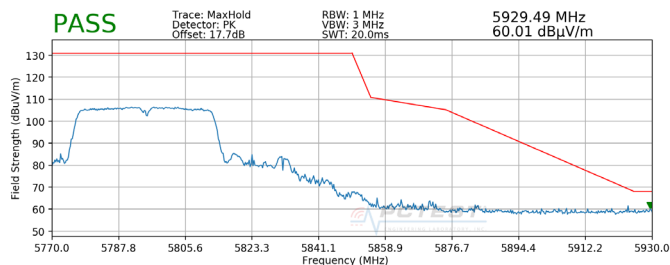


Plot 7-302. Radiated Lower Band Edge Plot SISO ANT1 (Average - UNII Band 2C)



Plot 7-303. Radiated Lower Band Edge Plot SISO ANT1 (Peak - UNII Band 2C)

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



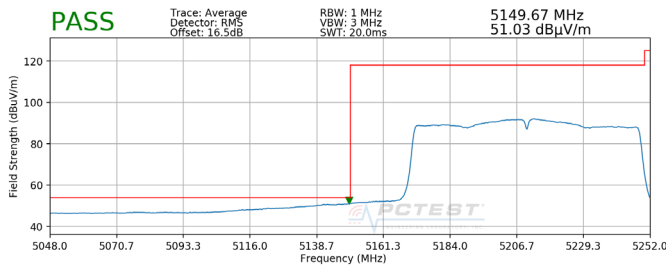
Plot 7-304. Radiated Upper Band Edge Plot SISO ANT1 (Peak - UNII Band 3)

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 - 10/30/2019	EUT Type: Portable Handset		Page 215 of 245

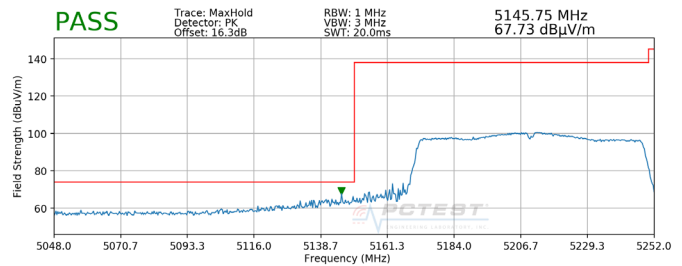
7.6.7 SISO Antenna-1 Radiated Band Edge Measurements (80MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209; RSS-Gen [8.9]

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

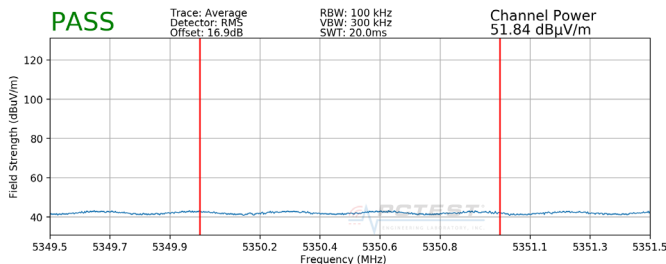


Plot 7-305. Radiated Lower Band Edge Plot SISO ANT1 (Average – UNII Band 1)

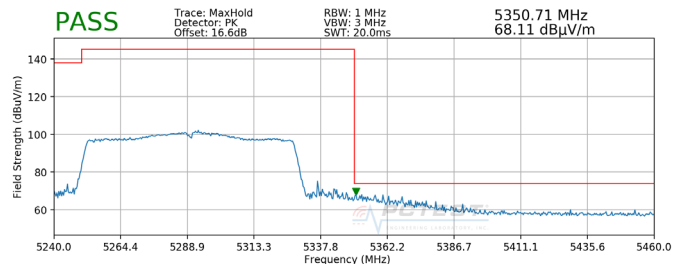


Plot 7-306. Radiated Lower Band Edge Plot SISO ANT1 (Peak – UNII Band 1)

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



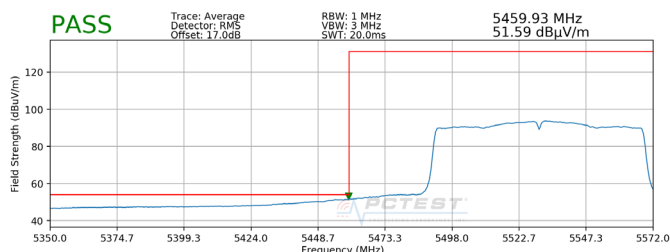
Plot 7-307. Radiated Upper Band Edge Plot SISO ANT1 (Average – UNII Band 2A)



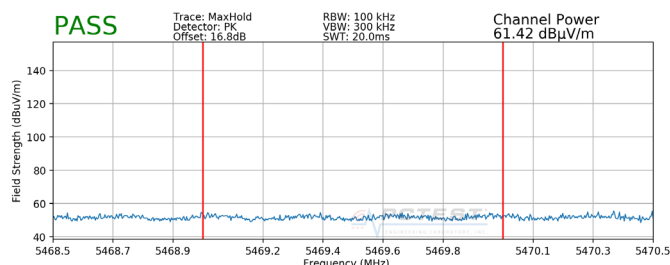
Plot 7-308. Radiated Upper Band Edge Plot SISO ANT1 (Peak – UNII Band 2A)

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 - 10/30/2019	EUT Type: Portable Handset		Page 216 of 245

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

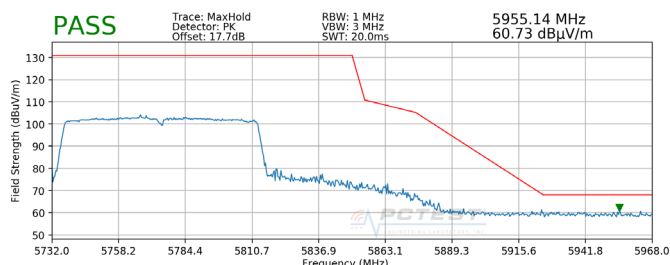


Plot 7-309. Radiated Lower Band Edge Plot SISO ANT1 (Average - UNII Band 2C)



Plot 7-310. Radiated Lower Band Edge Plot SISO ANT1 (Peak - UNII Band 2C)

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



Plot 7-311. Radiated Upper Band Edge Plot SISO ANT1 (Peak - UNII Band 3)

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 - 10/30/2019	EUT Type: Portable Handset		Page 217 of 245