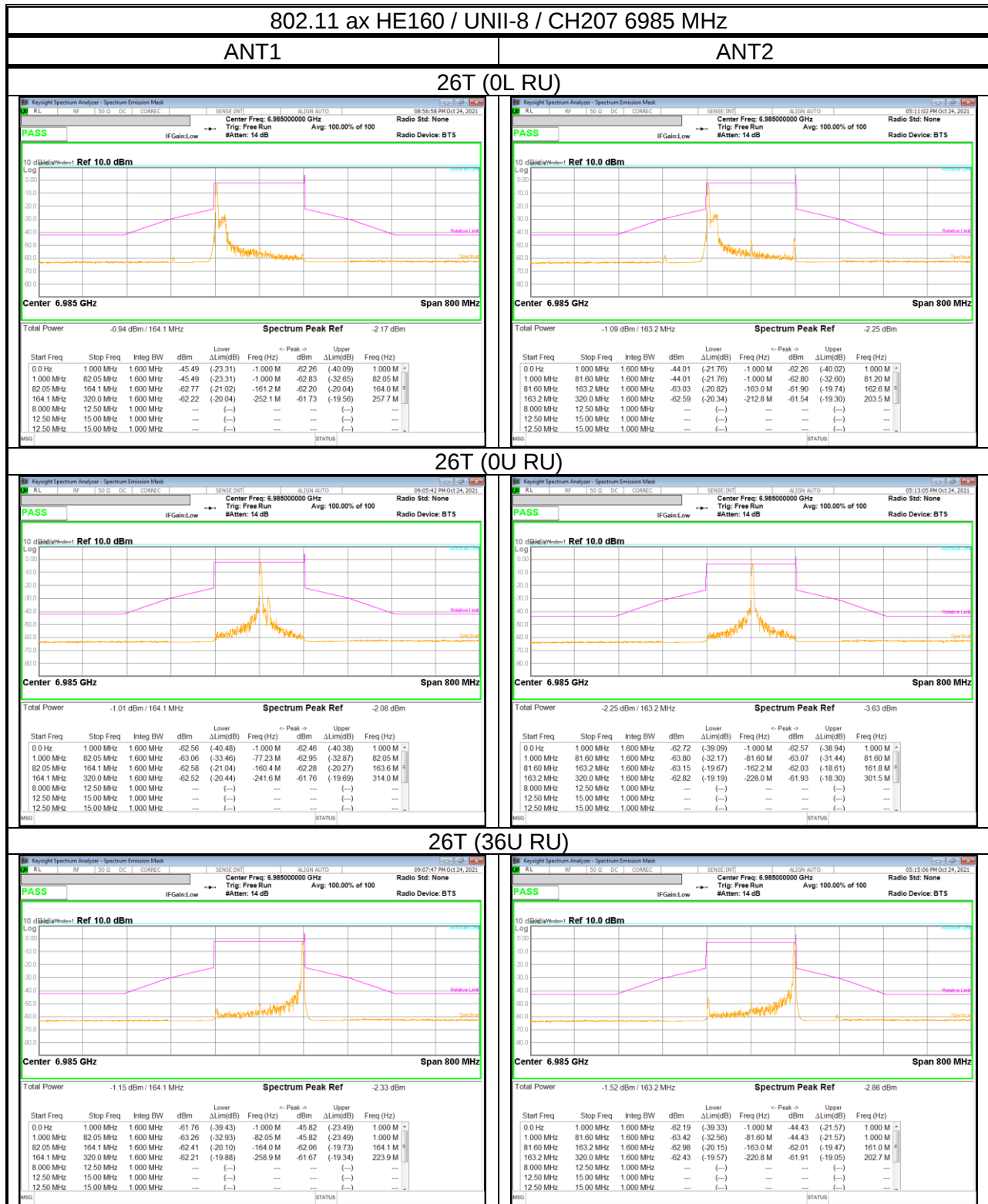




11. TRANSMITTER ABOVE 1 GHz

LIMITS

FCC §15.205 and §15.209

Limits for radiated disturbance of an intentional radiator		
Frequency range (MHz)	Limits (µV/m)	Measurement Distance (m)
0.009 – 0.490	2400 / F (kHz)	300
0.490 – 1.705	24000 / F (kHz)	30
1.705 – 30.0	30	30
30 – 88	100**	3
88 – 216	150**	3
216 – 960	200**	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g. §§ 15.231 and 15.241.

FCC Part 15.205 (a) : Only spurious emissions are permitted in any of the frequency bands listed below :

MHz	MHz	MHz	MHz	GHz	GHz
0.009 ~ 0.110	8.41425 ~ 8.41475	108 ~ 121.94	1300 ~ 1427	4.5 ~ 5.15	14.47 ~ 14.5
0.495 ~ 0.505	12.29 ~ 12.293	123 ~ 138	1435 ~ 1626.5	5.35 ~ 5.46	15.35 ~ 16.2
2.1735 ~ 2.1905	12.51975 ~ 12.52025	149.9 ~ 150.05	1645.5 ~ 1646.5	7.25 ~ 7.75	17.7 ~ 21.4
4.125 ~ 4.128	12.57675 ~ 12.57725	156.52475 ~ 156.52525	1660 ~ 1710	8.025 ~ 8.5	22.01 ~ 23.12
4.17725 ~ 4.17775	13.36 ~ 13.41	156.7 ~ 156.9	1718.8 ~ 1722.2	9.0 ~ 9.2	23.6 ~ 24.0
4.20725 ~ 4.20775	16.42 ~ 16.423	162.0125 ~ 167.17	2200 ~ 2300	9.3 ~ 9.5	31.2 ~ 31.8
6.215 ~ 6.218	16.69475 ~ 16.69525	167.72 ~ 173.2	2310 ~ 2390	10.6 ~ 12.7	36.43 ~ 36.5
6.26775 ~ 6.26825	16.80425 ~ 16.80475	240 ~ 285	2483.5 ~ 2500	13.25 ~ 13.4	Above 38.6
6.31175 ~ 6.31225	25.5 ~ 25.67	322 ~ 335.4	2655 ~ 2900		
8.291 ~ 8.294	37.5 ~ 38.25	399.90 ~ 410	3260 ~ 3267		
8.362 ~ 8.366	73 ~ 74.6	608 ~ 614	3332 ~ 3339		
8.37625 ~ 8.38675	74.8 ~ 75.2	960 ~ 1240	3345.8 ~ 3358		
			3600 ~ 4400		

▪ FCC Part 15.205(b) : The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in §15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in §15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in §15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in §15.35 apply to these measurements.

FCC §15.407 (b)

(6) For transmitters operating within the 5.925-7.125 GHz band: Any emissions outside of the 5.925-7.125 GHz band must not exceed an e.i.r.p. of -27 dBm/MHz.

(8) The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.

(9) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.

(10) The provisions of §15.205 apply to intentional radiators operating under this section.

(11) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency band edges as the design of the equipment permits.

KDB 987594 D02

G. Unwanted Emission Measurement

Use guidance in KDB 789033 for measurements below 1000 MHz and above 1000 MHz.

Unwanted emissions outside of restricted bands are measured with a RMS detector. In addition, 15.35(b) applies where the peak emissions must be limited to no more than 20 dB above the average limit

Note

- Limit translation to field strength level (FCC §15.407)

$$E[\text{dBuV/m}] = \text{EIRP}[\text{dBm}] + 95.2 = -27\text{dBm} + 95.2 = 68.2\text{dBuV/m}$$

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane for below 1GHz and 100 cm for above 1GHz. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

Reference to KDB 789033 D02 v02r01 UNII part G) 6) c) Method AD:

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and add duty cycle factor to the reading offset for average measurements.

Pre-scans to detect harmonic and spurious emissions, the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 30 kHz for peak measurements.

The spectrum from 1GHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band.

(From 30MHz to 1GHz, test was performed with the EUT set to transmit at the channel with highest output power)

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

Note : Emission was pre-scanned from 9kHz to 30MHz; No emissions were detected which was at least 20dB below the specification limit (consider distance correction factor).
Per FCC part 15.31(o), test results were not reported.

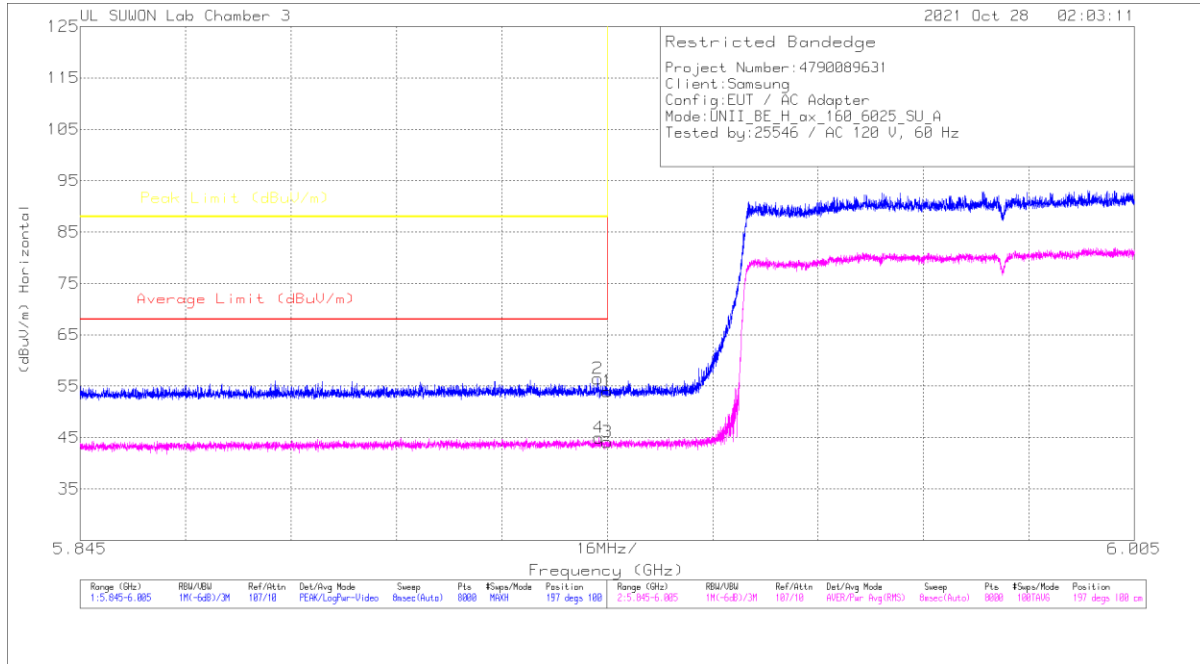
Although these tests were performed other than open field test site, adequate comparison measurements were confirmed against 30 m open area test site.

Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the one of tests made in an open field based on KDB 414788.

11.1. TX ABOVE 1GHz 2Tx MODE IN U-NII-5 BAND

BANDEDGE (WORST CASE: 802.11ax HE160 / 6025 MHz / SU Mode)

HORIZONTAL PEAK AND AVERAGE DATA



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00218957	10dB_ATT(dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Acimuth (Degs)	Height (cm)	Polarity
1	5.92499	37.78	PK	36	-19.8	0	53.98	-	-	88	-34.02	197	100	H
2	5.92355	40.27	PK	36	-19.8	0	56.47	-	-	88	-31.53	197	100	H
3	5.92499	27.58	RMS	36	-19.8	-35	44.13	68	-23.87	-	-	197	100	H
4	5.92373	28.44	RMS	36	-19.8	-35	44.99	68	-23.01	-	-	197	100	H

Pk - Peak detector
RMS - RMS detection

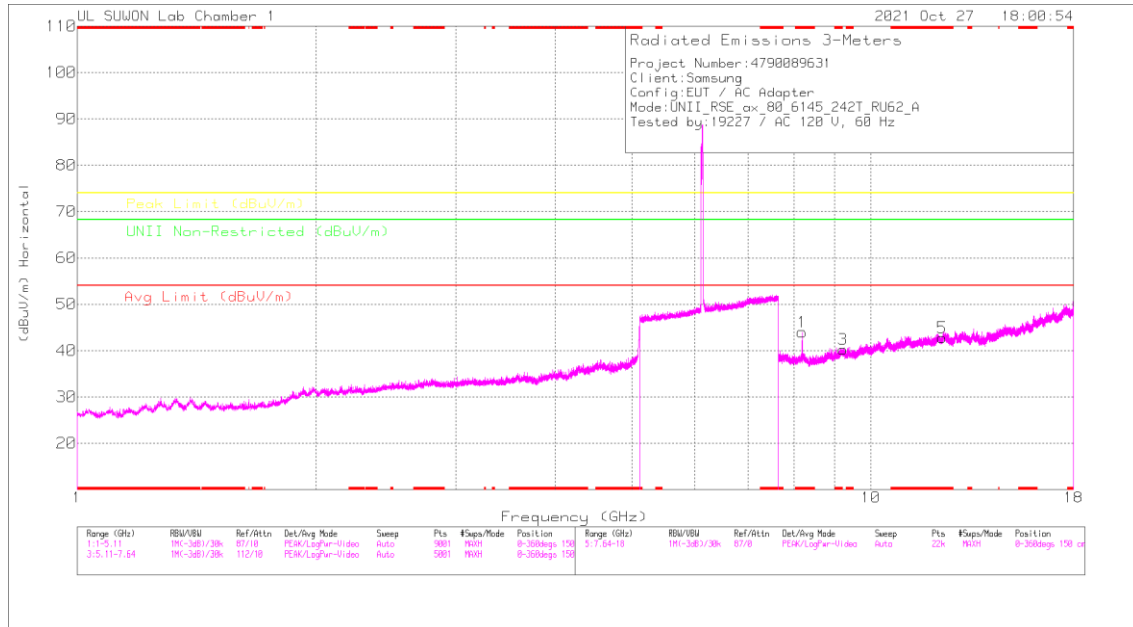
BANDEDGE TEST DATA

Mode	Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBuV]	Detector Mode	ANT Factor	Loss [dB]	DC Corr [dB]	Result [dBuV/m]	AV Limit [dBuV/m]	AV Margin [dB]	PK Limit [dBuV/m]	PK Margin [dB]	Azimuth [Degs]	Height [cm]	Polarity
802.11a	5955	MIMO	5.92499	37.37	Pk	36.00	-19.80	0.00	53.57	-	-	88.00	-34.43	130	101	H
			5.89679	40.07	Pk	36.00	-19.80	0.00	56.27	-	-	88.00	-31.73	130	101	H
			5.92499	26.83	RMS	36.00	-19.80	0.15	43.18	68.00	-24.82	-	-	130	100	H
			5.91045	28.41	RMS	36.00	-19.80	0.15	44.66	68.00	-23.34	-	-	130	100	H
			5.92499	36.68	Pk	36.00	-19.80	0.00	52.88	-	-	88.00	-35.12	114	100	V
			5.89995	40.46	Pk	36.00	-19.80	0.00	56.66	-	-	88.00	-31.34	114	100	V
			5.92499	26.48	RMS	36.00	-19.80	0.15	42.83	68.00	-25.17	-	-	114	100	V
			5.90535	28.14	RMS	36.00	-19.80	0.15	44.49	68.00	-23.51	-	-	114	100	V
			5.92499	36.87	Pk	36.00	-19.80	0.00	53.07	-	-	88.00	-34.93	191	111	H
			5.90633	39.67	Pk	36.00	-19.80	0.00	55.87	-	-	88.00	-32.13	191	111	H
802.11ax (HE20) SU	5955	MIMO	5.92499	26.71	RMS	36.00	-19.80	0.41	43.32	68.00	-24.68	-	-	191	111	H
			5.91225	28.30	RMS	36.00	-19.80	0.41	44.91	68.00	-23.09	-	-	191	111	H
			5.92499	37.39	Pk	36.00	-19.80	0.00	53.59	-	-	88.00	-34.41	132	100	V
			5.85406	39.46	Pk	35.90	-19.80	0.00	55.56	-	-	88.00	-32.44	132	100	V
			5.92499	26.62	RMS	36.00	-19.80	0.41	43.23	68.00	-24.77	-	-	132	100	V
			5.89641	27.84	RMS	36.00	-19.80	0.41	44.45	68.00	-23.55	-	-	132	100	V
			5.92499	36.73	Pk	36.00	-19.80	0.00	52.93	-	-	88.00	-35.07	189	110	H
			5.88045	39.42	Pk	36.00	-19.80	0.00	55.62	-	-	88.00	-32.38	189	110	H
			5.92499	26.75	RMS	36.00	-19.80	0.42	43.37	68.00	-24.63	-	-	189	110	H
			5.91849	27.91	RMS	36.00	-19.80	0.42	44.53	68.00	-23.47	-	-	189	110	H
802.11ax (HE40) SU	5965	MIMO	5.92499	36.30	Pk	36.00	-19.80	0.00	52.50	-	-	88.00	-35.50	147	102	V
			5.90087	39.73	Pk	36.00	-19.80	0.00	55.93	-	-	88.00	-32.07	147	102	V
			5.92499	26.38	RMS	36.00	-19.80	0.42	43.00	68.00	-25.00	-	-	147	102	V
			5.91735	27.92	RMS	36.00	-19.80	0.42	44.54	68.00	-23.46	-	-	147	102	V
			5.92499	37.15	Pk	36.00	-19.80	0.00	53.35	-	-	88.00	-34.65	191	100	H
			5.92193	40.27	Pk	36.00	-19.80	0.00	56.47	-	-	88.00	-31.53	191	100	H
			5.92499	27.16	RMS	36.00	-19.80	0.31	43.67	68.00	-24.33	-	-	191	100	H
			5.91897	28.32	RMS	36.00	-19.80	0.31	44.83	68.00	-23.17	-	-	191	100	H
			5.92499	38.01	Pk	36.00	-19.80	0.00	54.21	-	-	88.00	-33.79	188	105	V
			5.91463	39.61	Pk	36.00	-19.80	0.00	55.81	-	-	88.00	-32.19	188	105	V
802.11ax (HE160) SU	6025	MIMO	5.92499	26.55	RMS	36.00	-19.80	0.31	43.06	68.00	-24.94	-	-	188	105	V
			5.90673	28.02	RMS	36.00	-19.80	0.31	44.53	68.00	-23.47	-	-	188	105	V
			5.92499	37.78	Pk	36.00	-19.80	0.00	53.98	-	-	88.00	-34.02	197	100	H
			5.92355	40.27	Pk	36.00	-19.80	0.00	56.47	-	-	88.00	-31.53	197	100	H
			5.92499	27.58	RMS	36.00	-19.80	0.35	44.13	68.00	-23.87	-	-	197	100	H
			5.92373	28.44	RMS	36.00	-19.80	0.35	44.99	68.00	-23.01	-	-	197	100	H
			5.92499	36.68	Pk	36.00	-19.80	0.00	52.88	-	-	88.00	-35.12	130	100	V
			5.89643	40.17	Pk	36.00	-19.80	0.00	56.37	-	-	88.00	-31.63	130	100	V
			5.92499	26.06	RMS	36.00	-19.80	0.35	42.61	68.00	-25.39	-	-	130	100	V
			5.86800	28.02	RMS	35.90	-19.80	0.35	44.47	68.00	-23.53	-	-	130	100	V

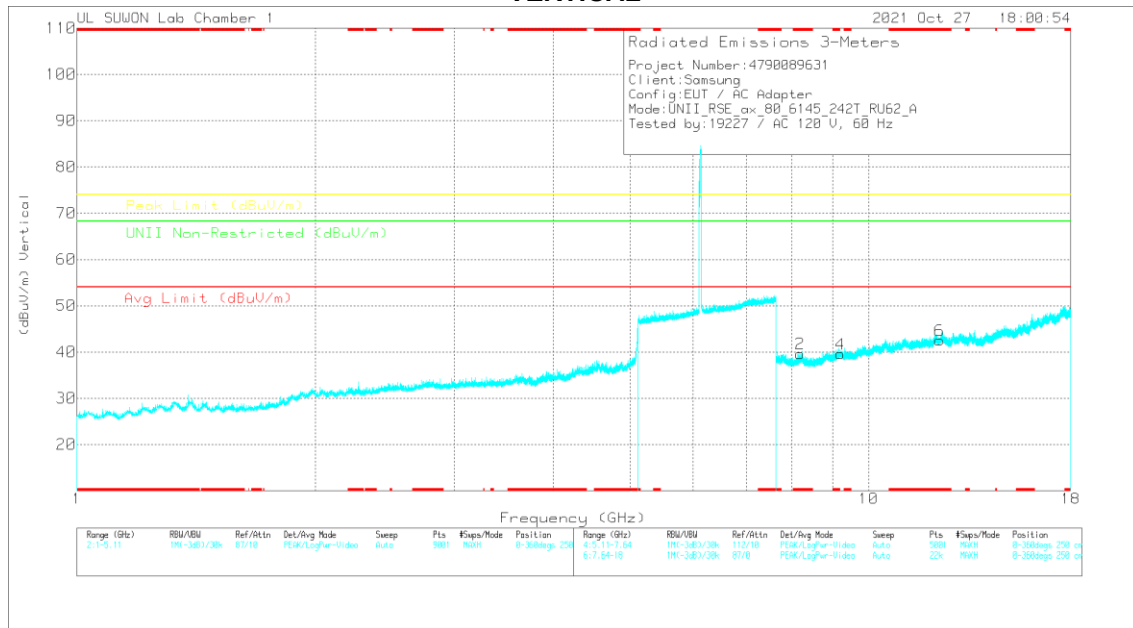
Note1. Pk - Peak detector, RMS - RMS detector

Note2. * - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

**HARMONICS AND SPURIOUS EMISSIONS(WORST CASE: 802.11ax HE80 / 242T / 62RU / 6145 MHz)
HORIZONTAL**



VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Radiated Emissions

Frequency (GHz)	Meas Reading (dBuV)	Det	3127_00168724	60Hz_HF(90)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	UNII Non-Restricted (dBuV/m)	Margin (dB)	Altitude (m)	Height (cm)	Polarity
7.76727	35.11	PK-U	36	-23.2	0	47.91	-	-	-	-	68.2	-20.29	0	100	H
7.76756	35.85	PK-U	36	-23.1	0	48.75	-	-	-	-	68.2	-19.45	0	100	V
10.35812	33.29	PK-U	37.7	-20.1	0	50.89	-	-	-	-	68.2	-17.31	0	100	H
10.3586	33.82	PK-U	37.7	-20.1	0	51.82	-	-	-	-	68.2	-16.38	0	100	V
* 15.53793	34.13	PK-U	40	-19.4	0	54.73	-	-	74	-19.27	-	-	0	100	H
* 15.54028	33.84	PK-U	40	-19.4	0	54.44	-	-	74	-19.56	-	-	0	100	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK-U - U-NII: Maximum Peak

HARMONICS AND SPURIOUS EMISSIONS TEST DATA

Mode	Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBuV]	Detector Mode	ANT Factor	Loss [dB]	DC Corr [dB]	Result [dBuV/m]	AV Limit [dBuV/m]	AV Margin [dB]	PK Limit [dBuV/m]	PK Margin [dB]	Non-Restricted [dBuV/m]	Margin [dB]	Azimuth [Degs]	Height [cm]	Polarity
802.11a	5955	MIMO	7.94010	39.38	PK-U	36.30	-24.20	0.00	51.48	-	-	-	-	68.20	-16.72	130	100	H
			7.93970	37.18	PK-U	36.30	-24.20	0.00	49.28	-	-	-	-	68.20	-18.92	191	101	V
			11.91446	34.42	PK-U	39.10	-22.20	0.00	51.32	-	-	74.00	-22.68	-	-	360	100	H
			* 11.91566	34.17	PK-U	39.10	-22.20	0.00	51.07	-	-	74.00	-22.93	-	-	360	100	V
			* 17.86651	32.57	PK-U	41.80	-16.40	0.00	57.97	-	-	74.00	-16.03	-	-	360	100	H
			* 17.86614	32.03	PK-U	41.80	-16.40	0.00	57.43	-	-	74.00	-16.57	-	-	360	100	V
	6175	MIMO	* 8.23348	37.34	PK-U	36.20	-22.80	0.00	50.74	-	-	74.00	-23.26	-	-	128	106	H
			* 8.23334	29.60	ADR	36.20	-22.80	0.15	43.15	54.00	-10.85	-	-	-	-	128	106	H
			* 8.23291	35.85	PK-U	36.20	-22.80	0.00	49.25	-	-	74.00	-24.75	-	-	192	100	V
			* 8.23347	27.18	ADR	36.20	-22.80	0.15	40.73	54.00	-13.27	-	-	-	-	192	100	V
			9.25910	33.50	PK-U	37.10	-21.70	0.00	48.90	-	-	-	-	68.20	-19.30	0	100	H
			9.26944	34.09	PK-U	37.10	-21.60	0.00	49.59	-	-	-	-	68.20	-18.61	0	100	V
	6415	MIMO	* 12.34988	35.86	PK-U	39.30	-22.30	0.00	52.86	-	-	74.00	-21.14	-	-	0	100	H
			* 12.35966	35.13	PK-U	39.30	-22.40	0.00	52.03	-	-	74.00	-21.97	-	-	0	100	V
			8.55335	36.02	PK-U	36.50	-23.00	0.00	49.52	-	-	-	-	68.20	-18.68	305	199	H
			8.55337	36.20	PK-U	36.50	-23.00	0.00	49.70	-	-	-	-	68.20	-18.50	176	218	V
			9.62129	34.56	PK-U	37.30	-21.90	0.00	49.96	-	-	-	-	68.20	-18.24	0	100	H
			9.62385	35.41	PK-U	37.30	-22.00	0.00	50.71	-	-	-	-	68.20	-17.49	0	100	V
802.11ax (HE20) 4RU Spot-Check	6175	MIMO	12.83314	34.64	PK-U	39.50	-23.20	0.00	50.94	-	-	-	-	68.20	-17.26	0	100	H
			12.82262	35.08	PK-U	39.50	-23.10	0.00	51.48	-	-	-	-	68.20	-16.72	0	100	V
			* 8.23322	37.31	PK-U	35.90	-22.90	0.00	50.31	-	-	74.00	-23.69	-	-	143	104	H
			* 8.23324	28.98	ADR	35.90	-22.90	0.00	41.98	54.00	-12.02	-	-	-	-	143	104	H
			* 8.23364	36.18	PK-U	35.90	-22.90	0.00	49.18	-	-	74.00	-24.82	-	-	198	190	V
			* 8.23326	25.83	ADR	35.90	-22.90	0.00	38.83	54.00	-15.17	-	-	-	-	198	190	V
	6165	MIMO	* 12.35058	33.30	PK-U	38.80	-19.40	0.00	52.70	-	-	74.00	-21.30	-	-	0	100	H
			* 12.35093	34.22	PK-U	38.80	-19.40	0.00	53.62	-	-	74.00	-20.38	-	-	0	100	V
			* 15.42741	34.04	PK-U	39.90	-19.60	0.00	54.34	-	-	74.00	-19.66	-	-	0	100	H
			* 15.42583	33.89	PK-U	39.90	-19.60	0.00	54.19	-	-	74.00	-19.81	-	-	0	100	V
			* 8.21187	35.82	PK-U	36.20	-23.10	0.00	48.92	-	-	74.00	-25.08	-	-	123	308	H
			* 8.22002	24.59	ADR	36.20	-23.00	0.39	38.18	54.00	-15.82	-	-	-	-	123	308	H
802.11ax (HE40) 62RU Spot-Check	6145	MIMO	* 8.21557	36.34	PK-U	36.20	-23.00	0.00	49.54	-	-	74.00	-24.46	-	-	199	103	V
			* 8.21994	27.54	ADR	36.20	-23.00	0.39	41.13	54.00	-12.87	-	-	-	-	199	103	V
			* 12.2994	35.75	PK-U	39.30	-22.20	0.00	52.85	-	-	74.00	-21.15	-	-	360	100	H
			* 12.29895	35.40	PK-U	39.30	-22.20	0.00	52.50	-	-	74.00	-21.50	-	-	360	100	V
			* 15.42298	34.72	PK-U	40.10	-21.70	0.00	53.12	-	-	74.00	-20.88	-	-	360	100	H
			* 15.42155	34.57	PK-U	40.10	-21.70	0.00	52.97	-	-	74.00	-21.03	-	-	360	100	V
	6185	MIMO	* 8.19363	40.02	PK-U	36.30	-24.30	0.00	52.02	-	-	74.00	-21.98	-	-	147	103	H
			* 8.19325	32.22	ADR	36.30	-24.40	0.39	44.51	54.00	-9.49	-	-	-	-	147	103	H
			* 8.19352	30.69	PK-U	36.30	-24.30	0.00	50.69	-	-	74.00	-23.31	-	-	161	191	V
			* 8.19333	27.18	ADR	36.30	-24.40	0.39	39.47	54.00	-14.53	-	-	-	-	161	191	V
			9.21955	36.19	PK-U	36.70	-23.10	0.00	49.79	-	-	-	-	68.20	-18.41	0	100	H
			* 12.1692	36.51	PK-U	36.70	-23.10	0.00	50.11	-	-	-	-	68.20	-18.09	0	100	V
802.11ax (HE160) 64URU Spot-Check	6185	MIMO	* 12.28962	36.02	PK-U	38.90	-22.00	0.00	52.92	-	-	74.00	-21.08	-	-	0	100	H
			* 12.2897	35.96	PK-U	38.90	-22.00	0.00	52.86	-	-	74.00	-21.14	-	-	0	100	V
			* 8.24684	39.66	PK-U	36.30	-24.20	0.00	51.76	-	-	74.00	-22.24	-	-	149	100	H
			* 8.2467	31.72	ADR	36.30	-24.20	0.39	44.21	54.00	-9.79	-	-	-	-	149	100	H
			* 8.24724	37.69	PK-U	36.30	-24.30	0.00	49.69	-	-	74.00	-24.31	-	-	153	117	V
			* 8.24656	26.54	ADR	36.30	-24.20	0.39	39.03	54.00	-14.97	-	-	-	-	153	117	V
	6185	MIMO	9.27719	37.36	PK-U	36.70	-23.80	0.00	50.26	-	-	-	-	68.20	-17.94	0	100	H
			9.27575	36.89	PK-U	36.70	-23.80	0.00	49.79	-	-	-	-	68.20	-18.41	0	100	V
			* 12.37052	35.36	PK-U	38.90	-21.20	0.00	53.06	-	-	74.00	-20.94	-	-	0	100	H
			* 12.36956	35.74	PK-U	38.90	-21.20	0.00	53.44	-	-	74.00	-20.56	-	-	0	100	V

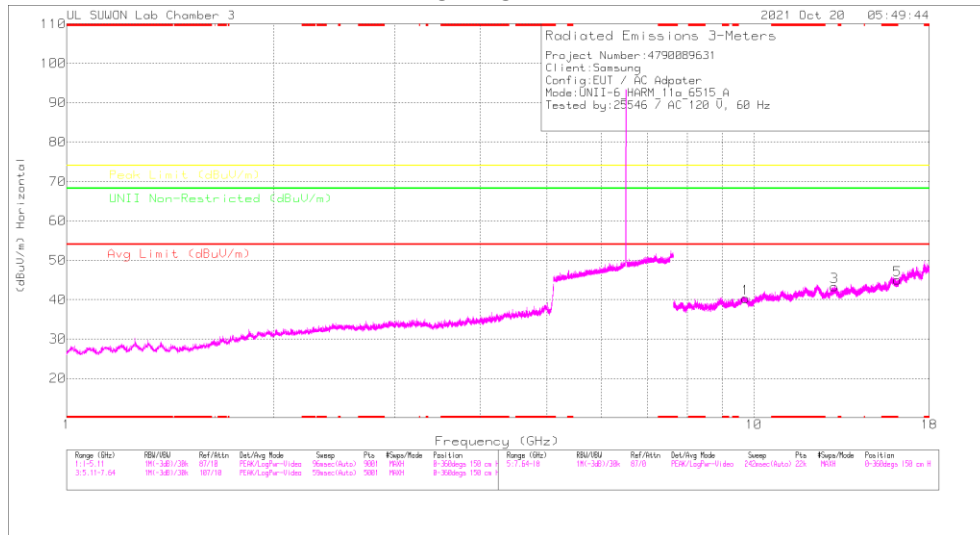
Note1. PK-U - U-NII: Maximum Peak

Note2. * - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

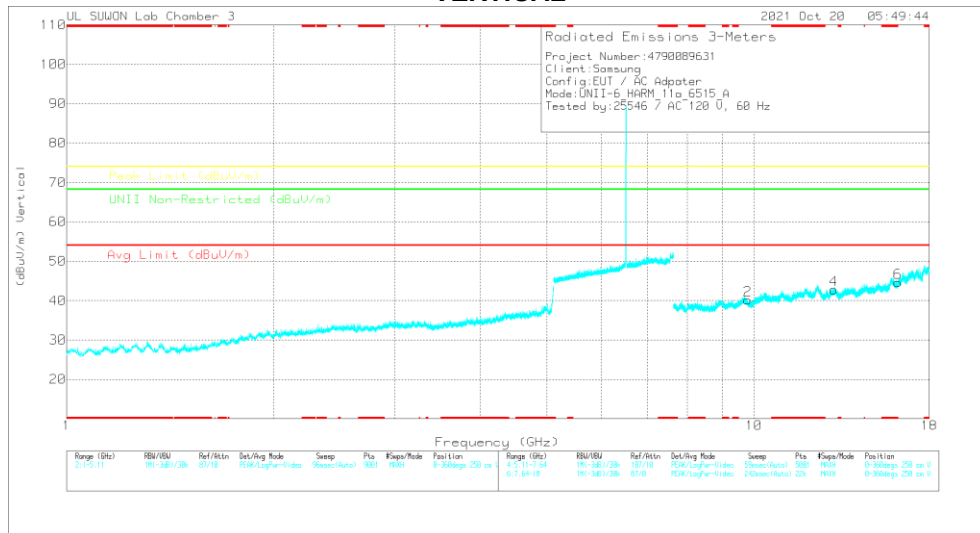
11.2. TX ABOVE 1GHz 2Tx MODE IN U-NII-6 BAND

HARMONICS AND SPURIOUS EMISSIONS(WORST CASE: 802.11a / 6515 MHz)

HORIZONTAL



VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Radiated Emissions

Frequency (GHz)	Mean Reading (dBuV)	Det	3117_90218957	ISPC_HF08	DC Corr (dB)	Corrected Reading (dBuV)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	UNII Non-Restricted (dBuV/m)	Margin (dB)	Altitude (m)	Height (m)	Polarity
9.77096	34.4	PK-U	37.5	-22	0	59.9	-	-	-	-	68.2	-18.3	360	100	H
9.77741	34.49	PK-U	37.6	-22	0	59.09	-	-	-	-	68.2	-18.11	360	100	V
13.02254	35.12	PK-U	39.4	-22.5	0	52.02	-	-	-	-	68.2	-16.18	360	100	H
13.03405	35.25	PK-U	39.4	-22.4	0	52.25	-	-	-	-	68.2	-15.95	360	100	V
16.28949	33.42	PK-U	41.5	-20.7	0	54.22	-	-	-	-	68.2	-13.98	360	100	H
16.28533	33.52	PK-U	41.5	-20.7	0	54.62	-	-	-	-	68.2	-13.58	360	100	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK-U - U-NII: Maximum Peak

HARMONICS AND SPURIOUS EMISSIONS TEST DATA

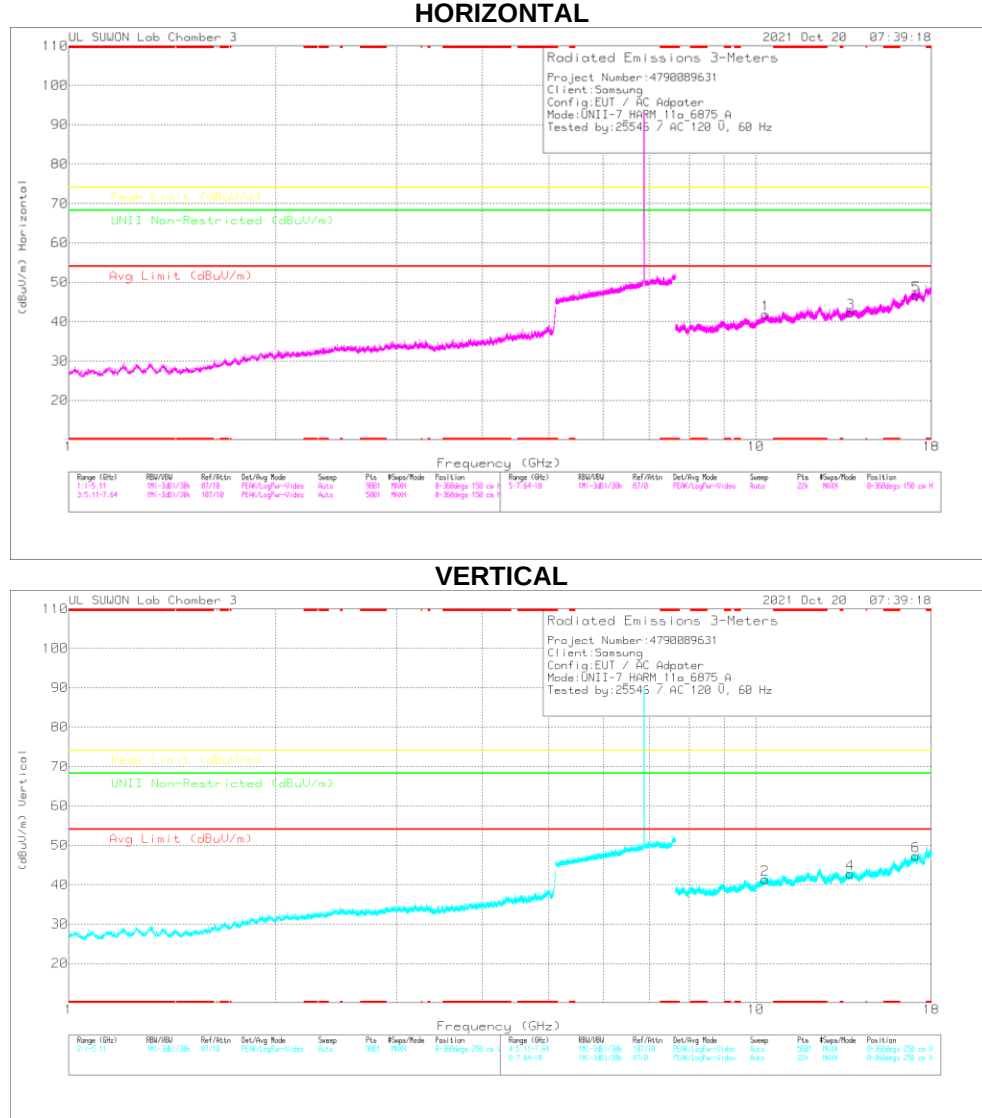
Mode	Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBuV]	Detector Mode	ANT Factor	Loss [dB]	DC Corr [dB]	Result [dBuV/m]	AV Limit [dBuV/m]	AV Margin [dB]	PK Limit [dBuV/m]	PK Margin [dB]	Non-Restricted [dBuV/m]	Margin [dB]	Azimuth [Degs]	Height [cm]	Polarity
802.11a	6435	MIMO	8.57980	34.96	PK-U	36.50	-22.90	0.00	48.56	-	-	-	-	68.20	-19.64	317	187	H
			8.57980	35.58	PK-U	36.50	-22.90	0.00	49.18	-	-	-	-	68.20	-19.02	197	215	V
			9.64433	34.01	PK-U	37.40	-21.80	0.00	49.61	-	-	-	-	68.20	-18.59	360	100	H
			9.65239	34.33	PK-U	37.40	-21.80	0.00	49.93	-	-	-	-	68.20	-18.27	360	100	V
			12.87292	34.74	PK-U	39.50	-23.00	0.00	51.24	-	-	-	-	68.20	-16.96	360	100	H
			12.86732	35.60	PK-U	39.50	-23.00	0.00	52.10	-	-	-	-	68.20	-16.10	360	100	V
	6475	MIMO	7.76978	40.91	PK-U	36.30	-24.70	0.00	52.51	-	-	-	-	68.20	-15.69	160	100	H
			7.77035	38.99	PK-U	36.30	-24.60	0.00	50.69	-	-	-	-	68.20	-17.51	196	129	V
			9.71690	34.02	PK-U	37.40	-21.90	0.00	49.52	-	-	-	-	68.20	-18.68	0	100	H
			9.71913	34.79	PK-U	37.40	-21.90	0.00	50.29	-	-	-	-	68.20	-17.91	0	100	V
			12.94243	34.44	PK-U	39.50	-22.60	0.00	51.34	-	-	-	-	68.20	-16.86	0	100	H
			12.95744	34.91	PK-U	39.40	-22.40	0.00	51.91	-	-	-	-	68.20	-16.29	0	100	V
	6515	MIMO	9.77096	34.40	PK-U	37.50	-22.00	0.00	49.90	-	-	-	-	68.20	-18.30	360	100	H
			9.77741	34.49	PK-U	37.60	-22.00	0.00	50.09	-	-	-	-	68.20	-18.11	360	100	V
			13.02254	35.12	PK-U	39.40	-22.50	0.00	52.02	-	-	-	-	68.20	-16.18	360	100	H
			13.03405	35.25	PK-U	39.40	-22.40	0.00	52.25	-	-	-	-	68.20	-15.95	360	100	V
			16.28949	33.42	PK-U	41.50	-20.70	0.00	54.22	-	-	-	-	68.20	-13.98	360	100	H
			16.28533	33.82	PK-U	41.50	-20.70	0.00	54.62	-	-	-	-	68.20	-13.58	360	100	V
802.11ax (HE40) 61RU Spot-Check	6445	MIMO	8.58811	34.33	PK-U	36.50	-23.00	0.00	47.83	-	-	-	-	68.20	-20.37	126	217	H
			8.59325	35.69	PK-U	36.50	-23.00	0.00	49.19	-	-	-	-	68.20	-19.01	180	252	V
			12.89960	34.38	PK-U	39.50	-22.70	0.00	51.18	-	-	-	-	68.20	-17.02	0	100	H
			12.89940	34.68	PK-U	39.50	-22.70	0.00	51.48	-	-	-	-	68.20	-16.72	0	100	V
			* 16.10796	33.20	PK-U	41.20	-20.60	0.00	53.80	-	-	74.00	-20.20	-	-	0	100	H
			* 16.10875	33.24	PK-U	41.20	-20.60	0.00	53.84	-	-	74.00	-20.16	-	-	0	100	V

Note1. PK-U - U-NII: Maximum Peak / ADR - U-NII AD primary method, RMS average

Note2. * - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

11.3. TX ABOVE 1GHz 2Tx MODE IN U-NII-7 BAND

HARMONICS AND SPURIOUS EMISSIONS(WORST CASE: 802.11a / 6875 MHz)



Note. Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Radiated Emissions

Frequency (GHz)	Meas Reading (dBuV)	Det	3117_00218967	dBHz_HF(0dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	UNII Non-Restricted (dBuV/m)	Margin (dB)	Altitude (m)	Height (m)	Polarity
10.3055	34.44	PK-U	38	-21.4	0	51.04	-	-	-	-	68.2	-17.16	0	100	H
10.3091	34.48	PK-U	38	-21.4	0	51.08	-	-	-	-	68.2	-17.32	0	100	V
13.75172	35.99	PK-U	38.9	-23.4	0	51.49	-	-	-	-	68.2	-16.71	0	100	H
13.74173	36.08	PK-U	38.9	-23.1	0	51.88	-	-	-	-	68.2	-16.32	0	100	V
17.19231	33.22	PK-U	42.1	-18.3	0	57.02	-	-	-	-	68.2	-11.18	0	100	H
17.18346	32.94	PK-U	42.1	-18.4	0	56.64	-	-	-	-	68.2	-11.56	0	100	V

PK-U - U-NII: Maximum Peak

HARMONICS AND SPURIOUS EMISSIONS TEST DATA

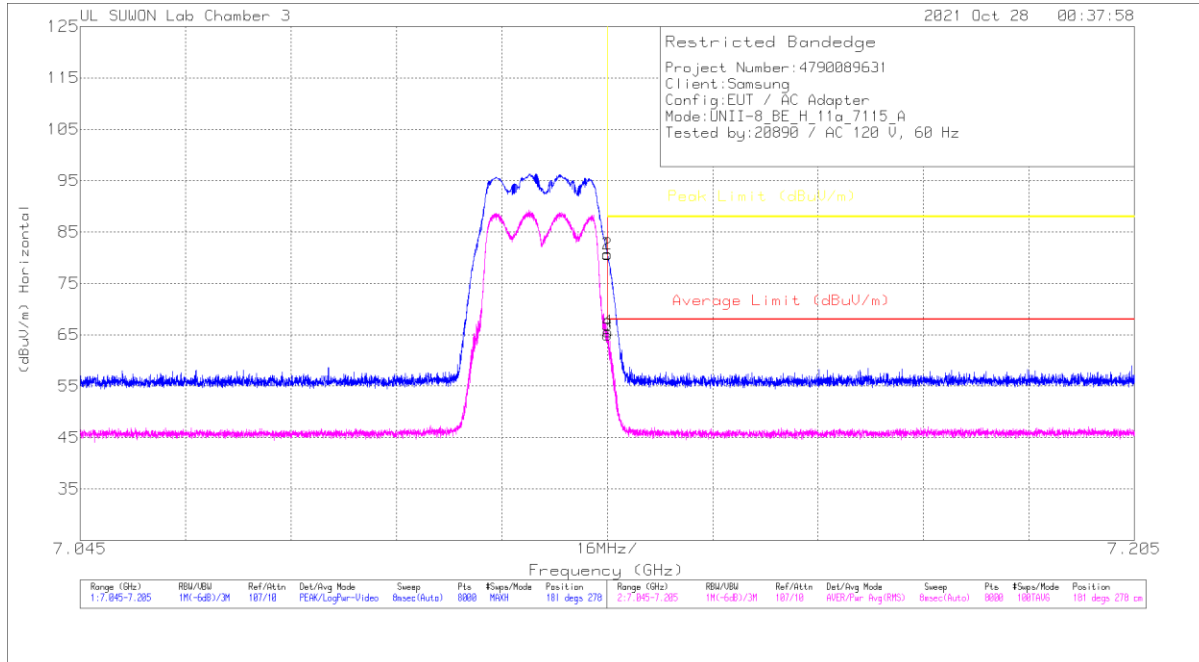
Mode	Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBuV]	Detector Mode	ANT Factor	Loss [dB]	DC Corr [dB]	Result [dBuV/m]	AV Limit [dBuV/m]	AV Margin [dB]	PK Limit [dBuV/m]	PK Margin [dB]	Non-Restricted [dBuV/m]	Margin [dB]	Azimuth [Degs]	Height [cm]	Polarity
802.11a	6535	MIMO	9.79410	34.15	PK-U	37.60	-22.00	0.00	49.75	-	-	-	-	68.20	-18.45	0	100	H
			9.79674	34.26	PK-U	37.60	-22.00	0.00	49.86	-	-	-	-	68.20	-18.34	0	100	V
			13.07570	35.14	PK-U	39.30	-22.50	0.00	51.94	-	-	-	-	68.20	-16.26	0	100	H
			13.07364	36.08	PK-U	39.30	-22.50	0.00	52.88	-	-	-	-	68.20	-15.32	0	100	V
			16.34397	33.37	PK-U	41.60	-20.70	0.00	54.27	-	-	-	-	68.20	-13.93	0	100	H
			16.34111	32.86	PK-U	41.60	-20.70	0.00	53.76	-	-	-	-	68.20	-14.44	0	100	V
	6695	MIMO	10.03350	33.16	PK-U	37.90	-21.30	0.00	49.76	-	-	-	-	68.20	-18.44	0	100	H
			10.03401	33.29	PK-U	37.90	-21.30	0.00	49.89	-	-	-	-	68.20	-18.31	0	100	V
			* 13.39969	33.88	PK-U	39.20	-22.80	0.00	50.28	-	-	74.00	-23.72	-	-	0	100	H
			* 13.39592	33.83	PK-U	39.20	-22.80	0.00	50.23	-	-	74.00	-23.77	-	-	0	100	V
			16.72787	32.88	PK-U	42.30	-19.40	0.00	55.78	-	-	-	-	68.20	-12.42	0	100	H
			16.72991	32.43	PK-U	42.30	-19.30	0.00	55.43	-	-	-	-	68.20	-12.77	0	100	V
	6875	MIMO	10.30550	34.44	PK-U	38.00	-21.40	0.00	51.04	-	-	-	-	68.20	-17.16	0	100	H
			10.30991	34.48	PK-U	38.00	-21.40	0.00	51.08	-	-	-	-	68.20	-17.12	0	100	V
			13.75172	35.99	PK-U	38.90	-23.40	0.00	51.49	-	-	-	-	68.20	-16.71	0	100	H
			13.74173	36.08	PK-U	38.90	-23.10	0.00	51.88	-	-	-	-	68.20	-16.32	0	100	V
			17.19231	33.22	PK-U	42.10	-18.30	0.00	57.02	-	-	-	-	68.20	-11.18	0	100	H
			17.18346	32.94	PK-U	42.10	-18.40	0.00	56.64	-	-	-	-	68.20	-11.56	0	100	V
802.11ax (HE40) 62RU Spot-Check	6845	MIMO	10.27471	34.25	PK-U	38.00	-21.60	0.00	50.65	-	-	-	-	68.20	-17.55	360	100	H
			10.27560	34.33	PK-U	38.00	-21.60	0.00	50.73	-	-	-	-	68.20	-17.47	360	100	V
			13.70417	36.87	PK-U	38.90	-23.30	0.00	52.47	-	-	-	-	68.20	-15.73	360	100	H
			13.70713	37.13	PK-U	38.90	-23.30	0.00	52.73	-	-	-	-	68.20	-15.47	360	100	V
			17.12496	32.87	PK-U	42.30	-18.40	0.00	56.77	-	-	-	-	68.20	-11.43	360	100	H
			17.12768	33.06	PK-U	42.20	-18.30	0.00	56.96	-	-	-	-	68.20	-11.24	360	100	V

Note1. PK-U - U-NII: Maximum Peak / ADR - U-NII AD primary method, RMS average
Note2. * - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

11.4. TX ABOVE 1GHz 2Tx MODE IN U-NII-8 BAND

BANDEDGE (WORST CASE: 802.11a / 7115 MHz)

HORIZONTAL PEAK DATA



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV/m)	Det	3117_00218957	10dB_ATT(dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Altitude (Degs)	Height (cm)	Polarity
1	7.12501	61.44	PK	36.1	-16.9	0	80.64	-	-	88	-7.36	181	278	H
2	7.12503	61.51	PK	36.1	-16.9	0	80.71	-	-	88	-7.29	181	278	H
3	7.12501	45.58	RMS	36.1	-16.9	-15	64.93	68	-3.07	-	-	181	278	H
4	7.12515	46.25	RMS	36.1	-16.9	-15	65.6	68	-2.4	-	-	181	278	H

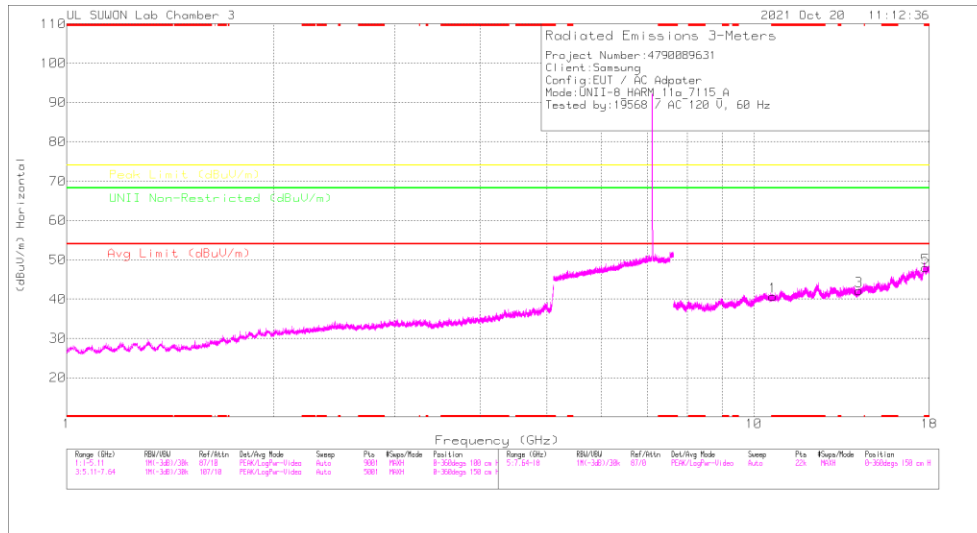
PK - Peak detector
RMS - RMS detection

BANDEDGE TEST DATA

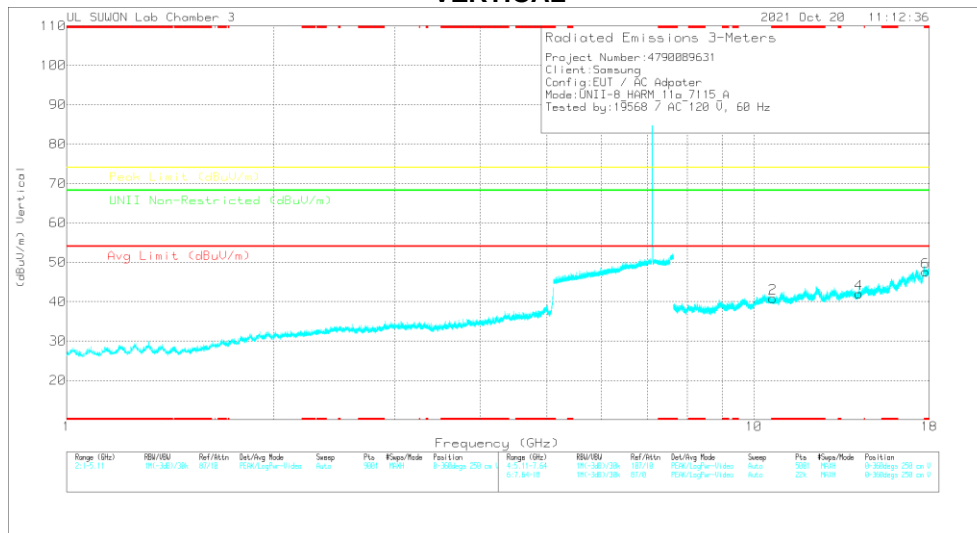
Mode	Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBuV]	Detector Mode	ANT Factor	Loss [dB]	DC Corr [dB]	Result [dBuV/m]	AV Limit [dBuV/m]	AV Margin [dB]	PK Limit [dBuV/m]	PK Margin [dB]	Azimuth [Degs]	Height [cm]	Polarity
802.11a	7115	MIMO	7.12501	61.44	Pk	36.10	-16.90	0.00	86.64	-	-	88.00	-7.36	181	278	H
			7.12503	61.51	Pk	36.10	-16.90	0.00	80.71	-	-	88.00	-7.29	181	278	H
			7.12501	45.58	RMS	36.10	-16.90	0.15	64.93	68.00	-3.07	-	-	181	278	H
			7.12515	46.25	RMS	36.10	-16.90	0.15	65.60	68.00	-2.40	-	-	181	278	H
			7.12501	57.47	Pk	36.10	-16.90	0.00	76.67	-	-	88.00	-11.33	182	108	V
			7.12505	57.52	Pk	36.10	-16.90	0.00	76.72	-	-	88.00	-11.28	182	108	V
			7.12501	39.43	RMS	36.10	-16.90	0.15	58.78	68.00	-9.22	-	-	182	108	V
			7.12513	41.49	RMS	36.10	-16.90	0.15	60.84	68.00	-7.16	-	-	182	108	V
802.11ax (HE20)	7115	MIMO	7.12551	56.41	Pk	36.10	-16.90	0.00	75.61	-	-	88.00	-12.39	171	255	H
			7.12561	56.85	Pk	36.10	-16.90	0.00	76.05	-	-	88.00	-11.95	171	255	H
			7.12551	36.42	RMS	36.10	-16.90	0.41	56.03	68.00	-11.97	-	-	171	255	H
			7.12553	37.52	RMS	36.10	-16.90	0.41	57.13	68.00	-10.87	-	-	171	255	H
			7.12551	51.23	Pk	36.10	-16.90	0.00	70.43	-	-	88.00	-17.57	178	199	V
			7.12555	51.21	Pk	36.10	-16.90	0.00	70.41	-	-	88.00	-17.59	178	199	V
			7.12551	29.99	RMS	36.10	-16.90	0.41	49.60	68.00	-18.40	-	-	178	199	V
			7.12565	31.28	RMS	36.10	-16.90	0.41	50.89	68.00	-17.11	-	-	178	199	V
802.11ax (HE40)	7085	MIMO	7.12501	37.73	Pk	36.10	-16.90	0.00	56.93	-	-	88.00	-31.07	351	113	H
			7.19210	39.29	Pk	36.10	-16.50	0.00	58.89	-	-	88.00	-29.11	351	113	H
			7.12501	26.50	RMS	36.10	-16.90	0.42	46.12	68.00	-21.88	-	-	351	113	H
			7.16404	27.39	RMS	36.10	-16.60	0.42	47.31	68.00	-20.69	-	-	351	113	H
			7.12501	38.32	Pk	36.10	-16.90	0.00	57.52	-	-	88.00	-30.48	354	125	V
			7.19400	38.53	Pk	36.10	-16.50	0.00	58.13	-	-	88.00	-29.87	354	125	V
			7.12501	25.96	RMS	36.10	-16.90	0.42	45.58	68.00	-22.42	-	-	354	125	V
			7.19092	27.26	RMS	36.10	-16.50	0.42	47.28	68.00	-20.72	-	-	354	125	V
802.11ax (HE80)	7025	MIMO	7.12501	36.95	Pk	36.10	-16.90	0.00	56.15	-	-	88.00	-31.85	135	100	H
			7.15662	39.34	Pk	36.10	-16.70	0.00	58.74	-	-	88.00	-29.26	135	100	H
			7.12501	26.77	RMS	36.10	-16.90	0.31	46.28	68.00	-21.72	-	-	135	100	H
			7.19012	27.22	RMS	36.10	-16.50	0.31	47.13	68.00	-20.87	-	-	135	100	H
			7.12501	36.27	Pk	36.10	-16.90	0.00	55.47	-	-	88.00	-32.53	181	106	V
			7.19442	39.18	Pk	36.10	-16.50	0.00	58.78	-	-	88.00	-29.22	181	106	V
			7.12501	26.31	RMS	36.10	-16.90	0.31	45.82	68.00	-22.18	-	-	181	106	V
			7.19690	27.34	RMS	36.10	-16.50	0.31	47.25	68.00	-20.75	-	-	181	106	V
802.11ax (HE160)	6985	MIMO	7.12501	37.04	Pk	36.10	-16.90	0.00	56.24	-	-	88.00	-31.76	134	100	H
			7.15470	39.65	Pk	36.10	-16.70	0.00	59.05	-	-	88.00	-28.95	134	100	H
			7.12501	25.68	RMS	36.10	-16.90	0.35	45.23	68.00	-22.77	-	-	134	100	H
			7.19618	27.27	RMS	36.10	-16.50	0.35	47.22	68.00	-20.78	-	-	134	100	H
			7.12501	36.47	Pk	36.10	-16.90	0.00	55.67	-	-	88.00	-32.33	170	274	V
			7.12851	39.42	Pk	36.10	-16.80	0.00	58.72	-	-	88.00	-29.28	170	274	V
			7.12501	25.99	RMS	36.10	-16.90	0.35	45.54	68.00	-22.46	-	-	170	274	V
			7.15558	27.54	RMS	36.10	-16.70	0.35	47.29	68.00	-20.71	-	-	170	274	V

Note1. Pk - Peak detector, RMS - RMS detector

HARMONICS AND SPURIOUS EMISSIONS(WORST CASE: 802.11a / 7115 MHz) **HORIZONTAL**



VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Radiated Emissions

Frequency (GHz)	Meas Reading (dBm)	Det	3117_00218957	802.11a/11b/g/n	DC Cor (dB)	Corrected Reading (dBm)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Limit Non-Restricted (dBuV/m)	Margin (dB)	Antenna (dBi)	Height (m)	Polarity
* 10.67345	33.95	PK-U	38.4	-21.3	0	51.05	-	-	74	-22.94	-	-	360	100	H
* 10.6724	33.27	PK-U	38.4	-21.3	0	50.37	-	-	74	-23.63	-	-	360	100	V
14.22853	35.32	PK-U	39.5	-23.3	0	51.52	-	-	-	-	68.2	-16.68	360	100	H
14.22867	35.78	PK-U	39.5	-23.4	0	51.88	-	-	-	-	68.2	-16.32	360	100	V
* 17.78864	32.08	PK-U	41.9	-16.9	0	57.08	-	-	74	-16.92	-	-	360	100	H
* 17.78804	32.51	PK-U	41.9	-16.9	0	57.51	-	-	74	-16.49	-	-	360	100	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK-U - U-NII: Maximum Peak

HARMONICS AND SPURIOUS EMISSIONS TEST DATA

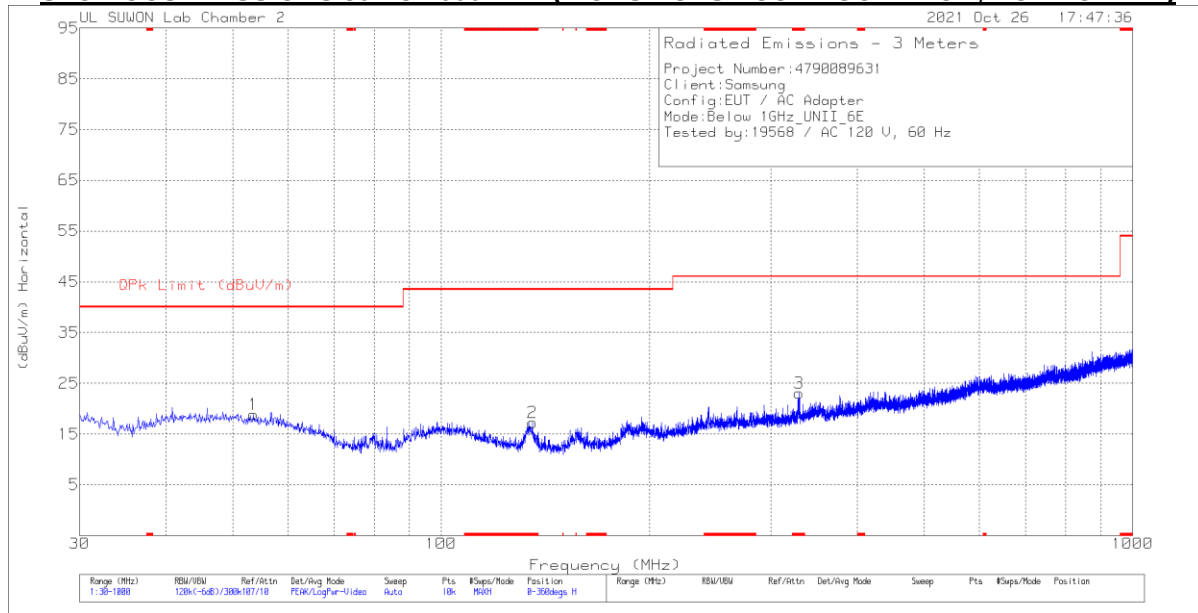
Mode	Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBuV]	Detector Mode	ANT Factor	Loss [dB]	DC Corr [dB]	Result [dBuV/m]	AV Limit [dBuV/m]	AV Margin [dB]	PK Limit [dBuV/m]	PK Margin [dB]	Non-Restricted [dBuV/m]	Margin [dB]	Azimuth [Degs]	Height [cm]	Polarity
802.11a	6895	MIMO	8.62221	35.14	PK-U	36.50	-22.90	0.00	48.74	-	-	-	-	68.20	-19.46	352	151	H
			8.61876	35.98	PK-U	36.50	-23.00	0.00	49.48	-	-	-	-	68.20	-18.72	187	225	V
			10.35179	34.61	PK-U	38.10	-21.00	0.00	51.71	-	-	-	-	68.20	-16.49	360	100	H
			10.35217	34.42	PK-U	38.10	-21.00	0.00	51.52	-	-	-	-	68.20	-16.68	360	100	V
			13.78474	36.59	PK-U	38.90	-23.20	0.00	52.29	-	-	-	-	68.20	-15.91	360	100	H
			13.78649	35.69	PK-U	38.90	-23.10	0.00	51.49	-	-	-	-	68.20	-16.71	360	100	V
	6995	MIMO	10.48856	34.24	PK-U	38.20	-21.50	0.00	50.94	-	-	-	-	68.20	-17.26	360	100	H
			10.48708	33.91	PK-U	38.20	-21.50	0.00	50.61	-	-	-	-	68.20	-17.59	360	100	V
			13.99735	36.21	PK-U	39.10	-23.20	0.00	52.11	-	-	-	-	68.20	-16.09	360	100	H
			13.99754	36.20	PK-U	39.10	-23.20	0.00	52.10	-	-	-	-	68.20	-16.10	360	100	V
			17.45105	32.54	PK-U	42.00	-17.30	0.00	57.24	-	-	-	-	68.20	-10.96	360	100	H
			17.44999	32.48	PK-U	42.00	-17.30	0.00	57.18	-	-	-	-	68.20	-11.02	360	100	V
	7115	MIMO	* 10.67345	33.96	PK-U	38.40	-21.30	0.00	51.06	-	-	74.00	-22.94	-	-	360	100	H
			* 10.6724	33.27	PK-U	38.40	-21.30	0.00	50.37	-	-	74.00	-23.63	-	-	360	100	V
			14.22853	35.32	PK-U	39.50	-23.30	0.00	51.52	-	-	-	-	68.20	-16.68	360	100	H
			14.22987	35.78	PK-U	39.50	-23.40	0.00	51.88	-	-	-	-	68.20	-16.32	360	100	V
			* 17.78864	32.08	PK-U	41.90	-16.90	0.00	57.08	-	-	74.00	-16.92	-	-	360	100	H
			* 17.78804	32.51	PK-U	41.90	-16.90	0.00	57.51	-	-	74.00	-16.49	-	-	360	100	V
802.11ax (HE40) 61RU Spot-check	6965	MIMO	10.43796	33.01	PK-U	37.70	-20.10	0.00	50.61	-	-	-	-	68.20	-17.59	0	100	H
			10.43942	32.76	PK-U	37.70	-20.10	0.00	50.36	-	-	-	-	68.20	-17.84	0	100	V
			13.93126	33.70	PK-U	39.00	-19.90	0.00	52.80	-	-	-	-	68.20	-15.40	0	100	H
			13.93302	33.81	PK-U	39.00	-19.80	0.00	53.01	-	-	-	-	68.20	-15.19	0	100	V
			17.40431	34.41	PK-U	41.00	-18.70	0.00	56.71	-	-	-	-	68.20	-11.49	0	100	H
			17.40244	33.61	PK-U	41.00	-18.70	0.00	55.91	-	-	-	-	68.20	-12.29	0	100	V

Note1. Pk - Peak detector, RMS - RMS detector

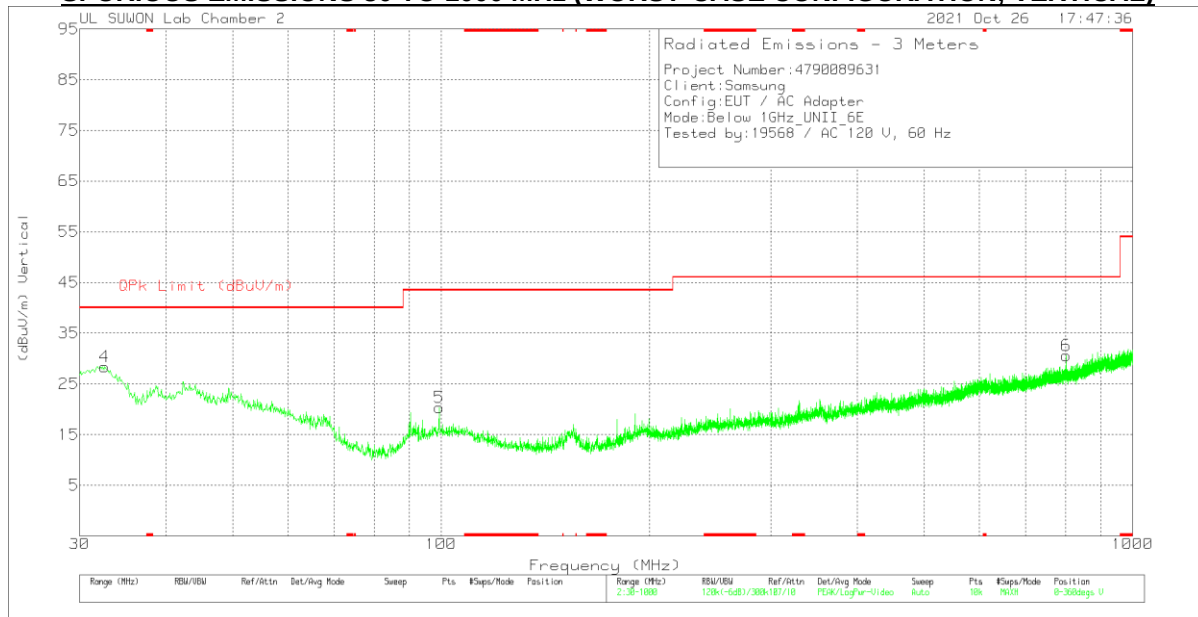
Note2. * - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

12. WORST-CASE BELOW 1 GHz

SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)



SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, VERTICAL)



Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163_749	Below 1G[dB]	DC Corr (dB)	Corrected Reading (dBuV/m)	OPK Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	53.571	30.99	Pk	19.5	-31.7	0	18.79	40	-21.21	0-360	100	H
2	* 135.439	34.43	Pk	13.9	-31.1	0	17.23	43.52	-26.29	0-360	100	H
3	* 329.633	33.4	Pk	19.9	-30.2	0	23.1	46.02	-22.92	0-360	100	H
4	32.619	44.74	Pk	15.5	-31.9	0	28.34	40	-11.66	0-360	100	V
5	99.355	34.33	Pk	17.3	-31.3	0	20.33	43.52	-23.19	0-360	100	V
6	801.15	32.57	Pk	26.8	-28.8	0	30.57	46.02	-15.45	0-360	200	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector

13. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)
IC RSS-GEN Clause 8.8

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 ⁺	56 to 46 ⁺
0.5-5	56	46
5-30	60	50

⁺ Decreases with the logarithm of the frequency.

TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.10.

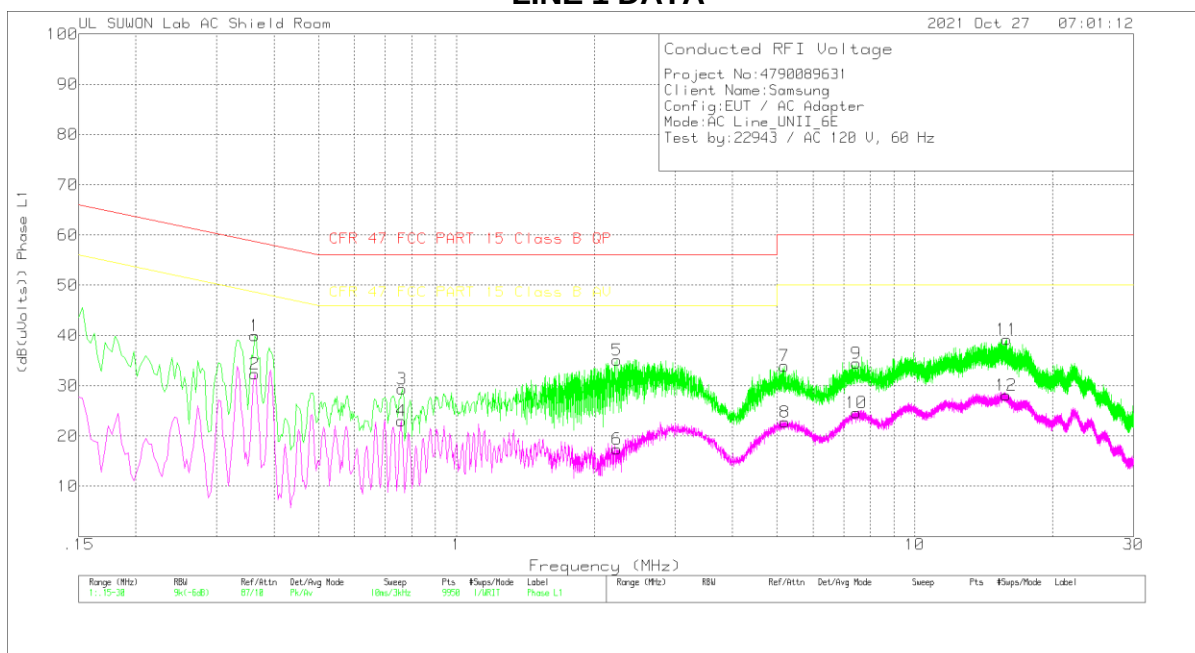
The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

Line conducted data is recorded for both NEUTRAL and HOT lines.

RESULTS

WORST EMISSIONS

LINE 1 DATA



Trace Markers

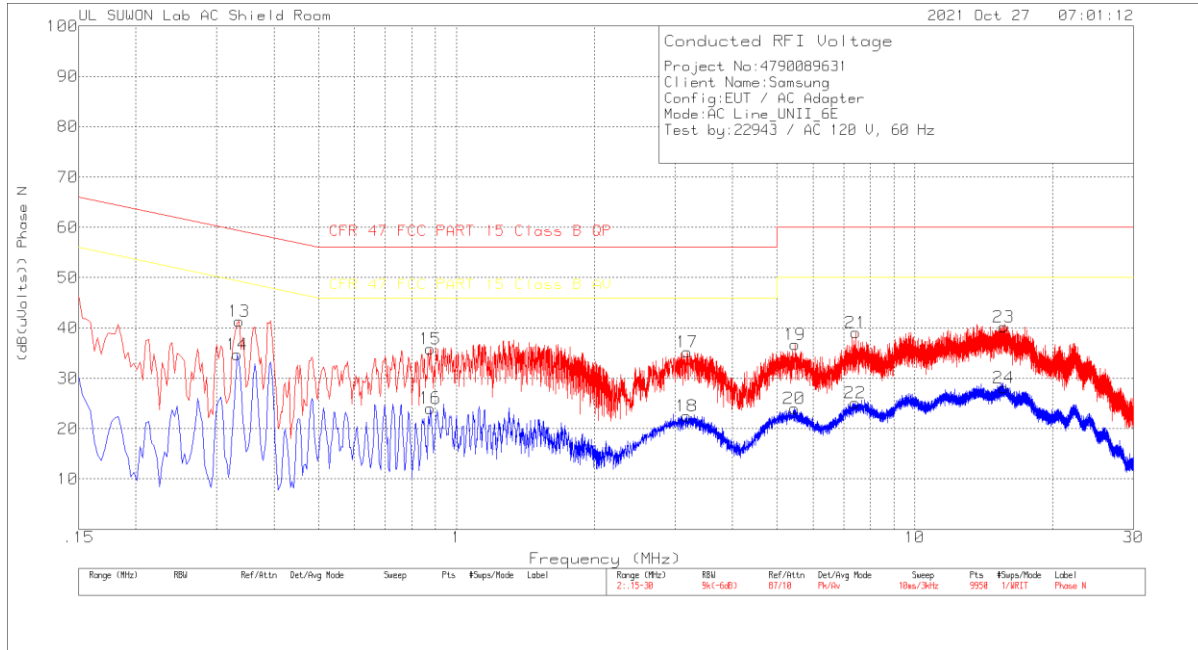
Range 1: Phase L1 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	101836_Wit h EX_L1[dB]	CABLELOS S(dB)	Corrected Reading (dB(uVolts))	CFR 47 FCC PART 15 Class B QP	Margin (dB)	CFR 47 FCC PART 15 Class B AV	Margin (dB)
1	.363	30.01	Pk	9.8	.2	40.01	58.66	-18.65	-	-
2	.363	22.4	Av	9.8	.2	32.4	-	-	48.66	-16.26
3	.762	19.42	Pk	9.8	.2	29.42	56	-26.58	-	-
4	.759	13.04	Av	9.8	.2	23.04	-	-	46	-22.96
5	2.238	25.08	Pk	9.7	.3	35.08	56	-20.92	-	-
6	2.238	7.4	Av	9.7	.3	17.4	-	-	46	-28.6
7	5.187	23.92	Pk	9.7	.3	33.92	60	-26.08	-	-
8	5.208	12.81	Av	9.7	.3	22.81	-	-	50	-27.19
9	7.464	24.38	Pk	9.8	.3	34.48	60	-25.52	-	-
10	7.449	14.5	Av	9.8	.3	24.6	-	-	50	-25.4
11	15.858	28.76	Pk	10	.4	39.16	60	-20.84	-	-
12	15.81	17.77	Av	10	.4	28.17	-	-	50	-21.83

Pk - Peak detector

Av - Average detection

LINE 2 DATA



Trace Markers

Range 2: Phase N .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	101836 With EX_N[dB]	CABLELOS S(dB)	Corrected Reading (dB(uVolts))	CFR 47 FCC PART 15 Class B QP	Margin (dB)	CFR 47 FCC PART 15 Class B AV	Margin (dB)
13	.336	31.28	Pk	9.8	.2	41.28	59.3	-18.02	-	-
14	.333	24.75	Av	9.8	.2	34.75	-	-	49.38	-14.63
15	.876	25.78	Pk	9.8	.3	35.88	56	-20.12	-	-
16	.876	13.97	Av	9.8	.3	24.07	-	-	46	-21.93
17	3.192	25.28	Pk	9.7	.3	35.28	56	-20.72	-	-
18	3.183	12.54	Av	9.7	.3	22.54	-	-	46	-23.46
19	5.487	26.74	Pk	9.7	.3	36.74	60	-23.26	-	-
20	5.454	14.03	Av	9.7	.3	24.03	-	-	50	-25.97
21	7.434	28.98	Pk	9.8	.3	39.08	60	-20.92	-	-
22	7.404	15	Av	9.8	.3	25.1	-	-	50	-24.9
23	15.654	29.72	Pk	10.1	.4	40.22	60	-19.78	-	-
24	15.642	17.65	Av	10.1	.4	28.15	-	-	50	-21.85

Pk - Peak detector

Av - Average detection

14. Contention Based Protocol

14.1. OVERVIEW

14.1.1. LIMITS

FCC

§15.407 (d) (6)
KDB 987594 D02

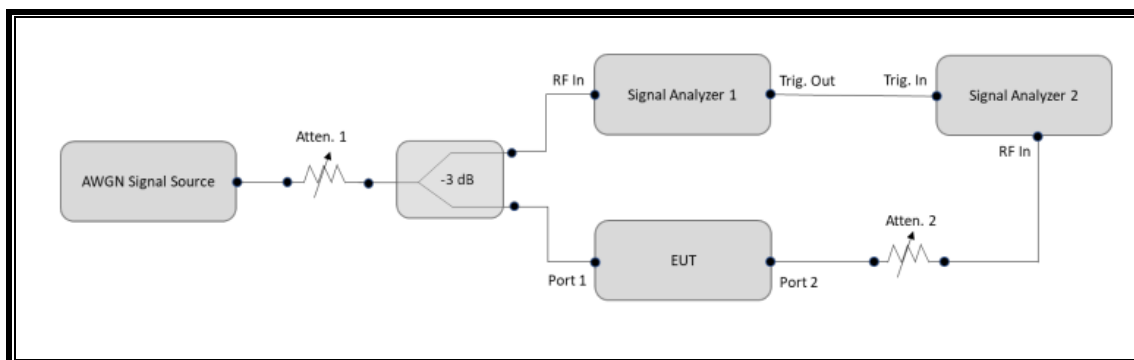
Indoor access points, subordinate devices and client devices operating in the 5.925-7.125 GHz band (herein referred to as unlicensed devices) are required to use technologies that include a contention-based protocol to avoid co-channel interference with incumbent devices sharing the band. To ensure incumbent co-channel operations are detected in a technology-agnostic manner, unlicensed devices are required to detect co-channel radio frequency energy (energy detect) and avoid simultaneous transmission.

Unlicensed low-power indoor devices must detect co-channel radio frequency power that is at least -62 dBm or lower. Upon detection of energy in the band, unlicensed low power indoor devices must vacate the channel (in which incumbent signal is transmitted) and stay off the incumbent channel as long as detected radio frequency power is equal to or greater than the threshold (-62 dBm)¹. The -62 dBm (or lower) threshold is referenced to a 0 dBi antenna gain.

To ensure incumbent operations are reliably detected in the band, low power indoor devices must detect RF energy throughout their intended operating channel. For example, an 802.11 device that plans to transmit a 40 MHz- wide signal (on a primary 20 MHz channel and a secondary 20 MHz channel) must detect energy throughout the entire 40 MHz channel. Additionally, low-power indoor devices must detect co-channel energy with 90% or greater certainty.

14.1.2. TEST AND MEASUREMENT SYSTEM

CONDUCTED METHOD SYSTEM BLOCK DIAGRAM



TEST SETTING

- 1) Configure the EUT to transmit with a constant duty cycle.
- 2) Set the operating parameters of the EUT including power level, operating frequency, modulation and bandwidth.
- 3) Set the signal analyzer center frequency to the nominal EUT channel center frequency. The span range of the signal analyzer shall be between two times and five times the OBW of the EUT. Connect the output port of the EUT to the signal analyzer 2, as shown in Figure 2. Ensure that the attenuator 2 provides enough attenuation to not overload the signal analyzer 2 receiver.
- 4) Monitoring the signal analyzer 2, verify the EUT is operating and transmitting with the parameters set at step two.
- 5) Using an AWGN signal source, generate (but do not transmit, i.e., RF OFF) a 10 MHz-wide AWGN signal. Use Table 1 to determine the center frequency of the 10 MHz AWGN signal relative to the EUT's channel bandwidth and center frequency.
- 6) Set the AWGN signal power to an extremely low level (more than 20 dB below the -62 dBm threshold). Connect the AWGN signal source, via a 3-dB splitter, to the signal analyzer 1 and the EUT as shown in Figure 2.
- 7) Transmit the AWGN signal (RF ON) and verify its characteristics on the signal analyzer 1.
- 8) Monitor the signal analyzer 2 to verify if the AWGN signal has been detected and the EUT has ceased transmission. If the EUT continues to transmit, then incrementally increase the AWGN signal power level until the EUT stops transmitting.
- 9) (Including all losses in the RF paths) Determine and record the AWGN signal power level (at the EUT's antenna port) at which the EUT ceased transmission. Repeat the procedure at least 10 times to verify the EUT can detect an AWGN signal with 90% (or better) level of certainty.
- 10) Refer to Table 1 to determine number of times the detection threshold testing needs to be repeated. If testing is required more than once, then go back to step 5, choose a different center frequency for the AWGN signal and repeat the process.

TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	S/N	Next Cal Due
Spectrum Analyzer	Keysight	N9030B	MY60070693	2022-01-03
Spectrum Analyzer	Agilent	N9030A	MY54170614	2022-08-04
Vector Signal Generator	R&S	SMW200A	107161	2022-06-24
Combiner	WEINSCHL	WA1534	UL001	2022-01-27
Attenuator	WEINSCHL	WA76-30-21	A015	2022-08-03
Attenuator	PASTERNAK	PE7087-10	A001	2022-08-03
Attenuator	PASTERNAK	PE7087-10	A008	2022-08-03

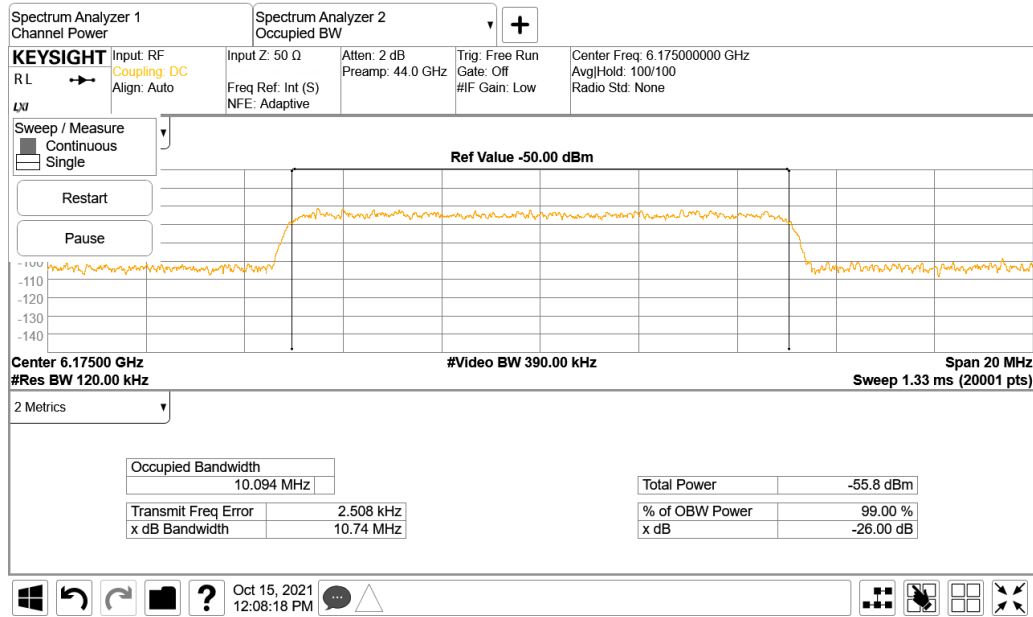
SUPPORT EQUIPMENT

The following support equipment was utilized for the DFS tests documented in this report:

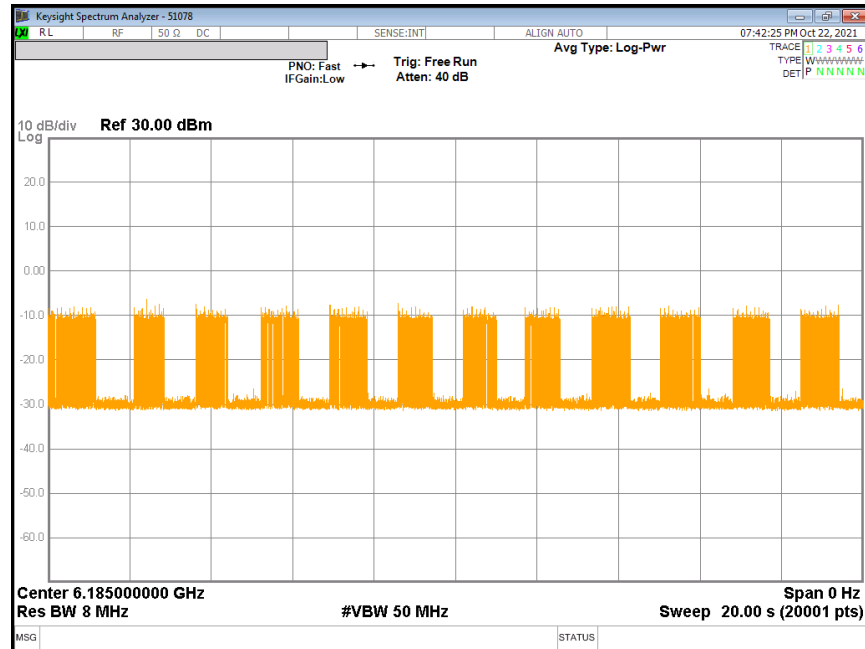
PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
Wireless Access Point	ASUS	GT-AXE11000	M3IAJF200742	MSQ-RTAXJF00
Notebook PC (Controller/Server)	HP	HP EliteDesk 800 G1 TWR	CZC4125J25	DoC

14.2. TEST RESULTS

14.2.1. AWGN Sample signal



14.2.2. Contention Based Protocol Timing Plot



14.2.3. Contention Based Protocol – Incumbent Detection & Trial Results

Band	Channel	Freq	BW	Inc. Freq	Detection power level	Siggen	Detection limit	Gain	Detection limit (include Gain)	Margin
5	45	6175	20	6175	-74.17	-26	-62	-9.29	-71.29	-2.88
				6110	-74.24	-26	-62	-9.29	-71.29	-2.95
				6185	-77	-29	-62	-9.29	-71.29	-5.71
				6250	-75.08	-27	-62	-9.29	-71.29	-3.79
6	105	6475	20	6475	-72.98	-25	-62	-8.33	-70.33	-2.65
				6435	-75.99	-28	-62	-8.33	-70.33	-5.66
				6495	-78.01	-30	-62	-8.33	-70.33	-7.68
				6575	-73.91	-26	-62	-8.33	-70.33	-3.58
7	149	6695	20	6695	-74.15	-26	-62	-8.59	-70.59	-3.56
				6595	-75	-27	-62	-8.59	-70.59	-4.41
				6655	-78.07	-30	-62	-8.59	-70.59	-7.48
				6735	-74.36	-26	-62	-8.59	-70.59	-3.77
8	209	6995	20	6995	-73.13	-25	-62	-8.32	-70.32	-2.81
				6915	-76.35	-28	-62	-8.32	-70.32	-6.03
				6975	-77.24	-29	-62	-8.32	-70.32	-6.92
				7055	-74.15	-26	-62	-8.32	-70.32	-3.83

Band	Channel	Freq	BW	Inc. Freq	1	2	3	4	5	6	7	8	9	10	Detection Rate (%)
5	45	6175	20	6175	O	O	O	O	O	O	O	O	O	O	100
				6110	O	O	O	O	O	O	O	O	O	O	100
				6185	O	O	O	O	O	O	O	O	O	O	100
				6250	O	O	O	O	O	O	O	O	O	O	100
6	105	6475	20	6475	O	O	O	O	O	O	O	O	O	O	100
				6435	O	O	O	O	O	O	O	O	O	O	100
				6495	O	O	O	O	O	O	O	O	O	O	100
				6575	O	O	O	O	O	O	O	O	O	O	100
7	149	6695	20	6695	O	O	O	O	O	O	O	O	O	O	100
				6595	O	O	O	O	O	O	O	O	O	O	100
				6655	O	O	O	O	O	O	O	O	O	O	100
				6735	O	O	O	O	O	O	O	O	O	O	100
8	209	6995	20	6995	O	O	O	O	O	O	O	O	O	O	100
				6915	O	O	O	O	O	O	O	O	O	O	100
				6975	O	O	O	O	O	O	O	O	O	O	100
				7055	O	O	O	O	O	O	O	O	O	O	100

END OF TEST REPORT