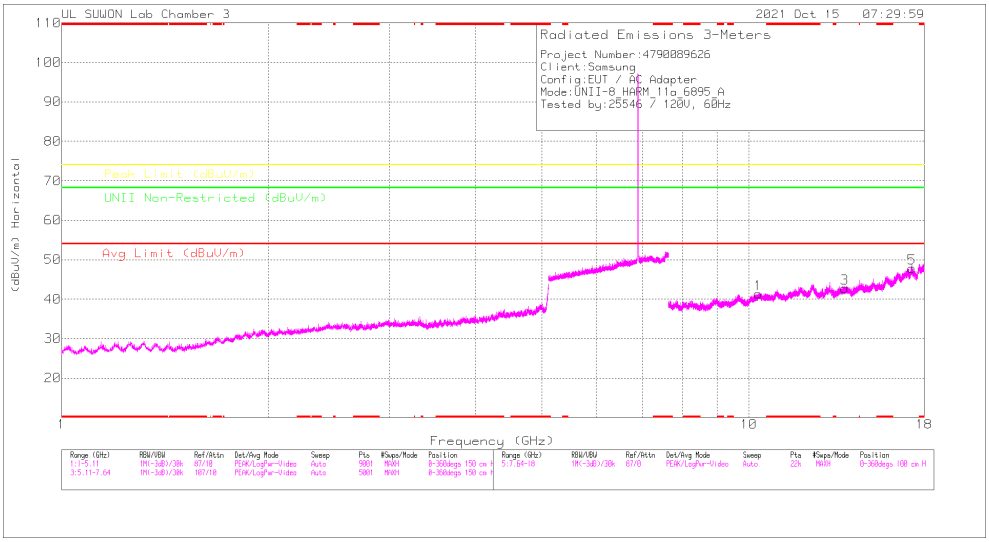
BANDEDGE TEST DATA

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	7.12502	57.25	Pk	36.10	-15.20	0.00	78.15	-	-	88.00	**-9.85**	187	220	**H**
			7.12506	57.04	Pk	36.10	-15.20	0.00	77.94	-	-	88.00	-10.06	187	220	**H**
			7.12502	38.36	RMS	36.10	-15.20	0.16	59.42	68.00	**-8.58**	-	-	187	220	**H**
			7.12516	37.85	RMS	36.10	-15.20	0.16	58.91	68.00	-9.09	-	-	187	220	**H**
			7.12502	56.51	Pk	36.10	-15.20	0.00	77.41	-	-	88.00	-10.59	164	271	**V**
			7.12506	55.95	Pk	36.10	-15.20	0.00	76.85	-	-	88.00	-11.15	164	271	**V**
			7.12502	37.59	RMS	36.10	-15.20	0.16	58.65	68.00	-9.35	-	-	164	271	**V**
			7.12512	37.59	RMS	36.10	-15.20	0.16	58.65	68.00	-9.35	-	-	164	271	**V**
802.11ax (HE20)	7115	MIMO	7.12552	50.44	Pk	36.10	-15.20	0.00	71.34	-	-	88.00	-16.66	231	377	**H**
			7.12558	49.91	Pk	36.10	-15.20	0.00	70.81	-	-	88.00	-17.19	231	377	**H**
			7.12552	30.26	RMS	36.10	-15.20	0.41	51.57	68.00	-16.43	-	-	231	377	**H**
			7.12562	29.61	RMS	36.10	-15.20	0.41	50.92	68.00	-17.08	-	-	231	377	**H**
			7.12552	52.82	Pk	36.10	-15.20	0.00	73.72	-	-	88.00	-14.28	207	101	**V**
			7.12554	54.22	Pk	36.10	-15.20	0.00	75.12	-	-	88.00	-12.88	207	101	**V**
			7.12552	32.66	RMS	36.10	-15.20	0.41	53.97	68.00	-14.03	-	-	207	101	**V**
			7.12558	32.26	RMS	36.10	-15.20	0.41	53.57	68.00	-14.43	-	-	207	101	**V**
802.11ax (HE40)	7085	MIMO	7.12502	35.98	Pk	36.10	-15.20	0.00	56.88	-	-	88.00	-31.12	152	382	**H**
			7.18154	38.94	Pk	36.20	-15.20	0.00	59.94	-	-	88.00	-28.06	152	382	**H**
			7.12502	26.79	RMS	36.10	-15.20	0.41	48.10	68.00	-19.90	-	-	152	382	**H**
			7.17096	27.20	RMS	36.10	-15.20	0.41	48.51	68.00	-19.49	-	-	152	382	**H**
			7.12502	36.58	Pk	36.10	-15.20	0.00	57.48	-	-	88.00	-30.52	207	103	**V**
			7.19974	39.71	Pk	36.20	-15.30	0.00	60.61	-	-	88.00	-27.39	207	103	**V**
			7.12502	26.48	RMS	36.10	-15.20	0.41	47.79	68.00	-20.21	-	-	207	103	**V**
			7.15922	27.34	RMS	36.10	-15.20	0.41	48.65	68.00	-19.35	-	-	207	103	**V**
802.11ax (HE80)	7025	MIMO	7.12552	35.67	Pk	36.10	-15.20	0.00	56.57	-	-	88.00	-31.43	234	353	**H**
			7.13072	39.51	Pk	36.10	-15.10	0.00	60.51	-	-	88.00	-27.49	234	353	**H**
			7.12552	26.10	RMS	36.10	-15.20	0.30	47.30	68.00	-20.70	-	-	234	353	**H**
			7.18202	27.09	RMS	36.20	-15.10	0.30	48.49	68.00	-19.51	-	-	234	353	**H**
			7.12552	36.61	Pk	36.10	-15.20	0.00	57.51	-	-	88.00	-30.49	207	100	**V**
			7.20500	39.77	Pk	36.20	-15.30	0.00	60.67	-	-	88.00	-27.33	207	100	**V**
			7.12552	26.66	RMS	36.10	-15.20	0.30	47.86	68.00	-20.14	-	-	207	100	**V**
			7.13932	27.18	RMS	36.10	-15.10	0.30	48.48	68.00	-19.52	-	-	207	100	**V**
802.11ax (HE160)	6985	MIMO	7.12552	35.60	Pk	36.10	-15.20	0.00	56.50	-	-	88.00	-31.50	233	365	**H**
			7.17966	39.01	Pk	36.20	-15.10	0.00	60.11	-	-	88.00	-27.89	233	365	**H**
			7.12552	26.47	RMS	36.10	-15.20	0.34	47.71	68.00	-20.29	-	-	233	365	**H**
			7.17292	27.05	RMS	36.10	-15.10	0.34	48.39	68.00	-19.61	-	-	233	365	**H**
			7.12552	35.83	Pk	36.10	-15.20	0.00	56.73	-	-	88.00	-31.27	206	100	**V**
			7.14752	39.88	Pk	36.10	-15.20	0.00	60.78	-	-	88.00	-27.22	206	100	**V**
			7.12552	26.63	RMS	36.10	-15.20	0.34	47.87	68.00	-20.13	-	-	206	100	**V**
			7.18018	27.13	RMS	36.20	-15.10	0.34	48.57	68.00	-19.43	-	-	206	100	**V**

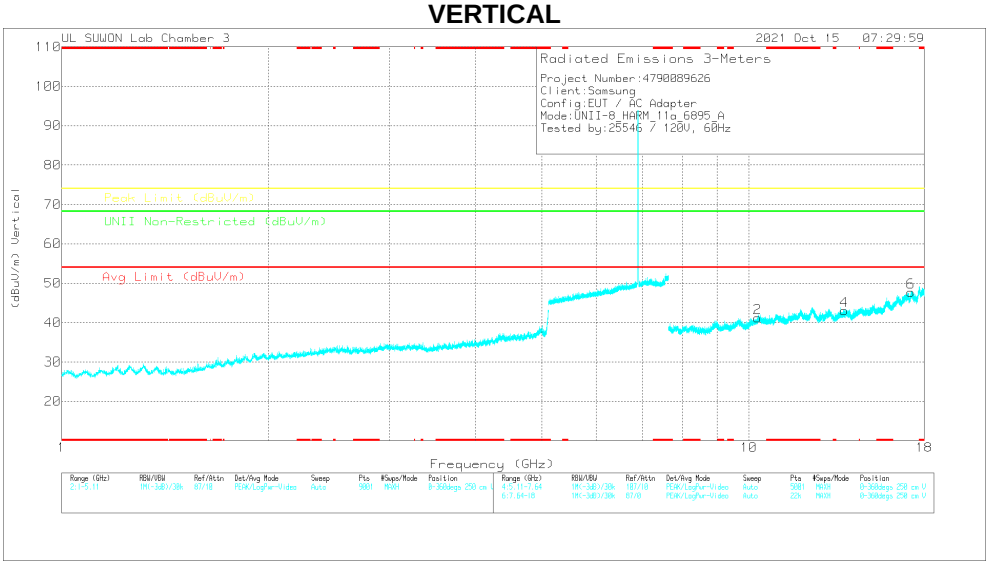
Note1. PK-U - U-NII: Maximum Peak / ADR - U-NII AD primary method, RMS average

HARMONICS AND SPURIOUS EMISSIONS(WORST CASE: 802.11a / 6895 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)	Meter Reading (dBuV)	Det	3117_00218957	8GHz_HP[dB]	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)	Azimuth (Degs)	Height (cm)	Polarity
10.34653	34.15	PK-U	38	-21	0	51.15	-	-	-	-	68.2	-17.05	360	100	H
10.3487	34.19	PK-U	38	-21	0	51.19	-	-	-	-	68.2	-17.01	360	100	V
13.78485	36.17	PK-U	38.9	-23.2	0	51.87	-	-	-	-	68.2	-16.33	360	100	H
13.78758	35.94	PK-U	38.9	-23.2	0	51.64	-	-	-	-	68.2	-16.56	360	100	V
17.24398	32.94	PK-U	42.1	-17.9	0	57.14	-	-	-	-	68.2	-11.06	360	100	H
17.22774	33.11	PK-U	42.1	-18.1	0	57.11	-	-	-	-	68.2	-11.09	360	100	V

PK-U - U-NII: Maximum Peak

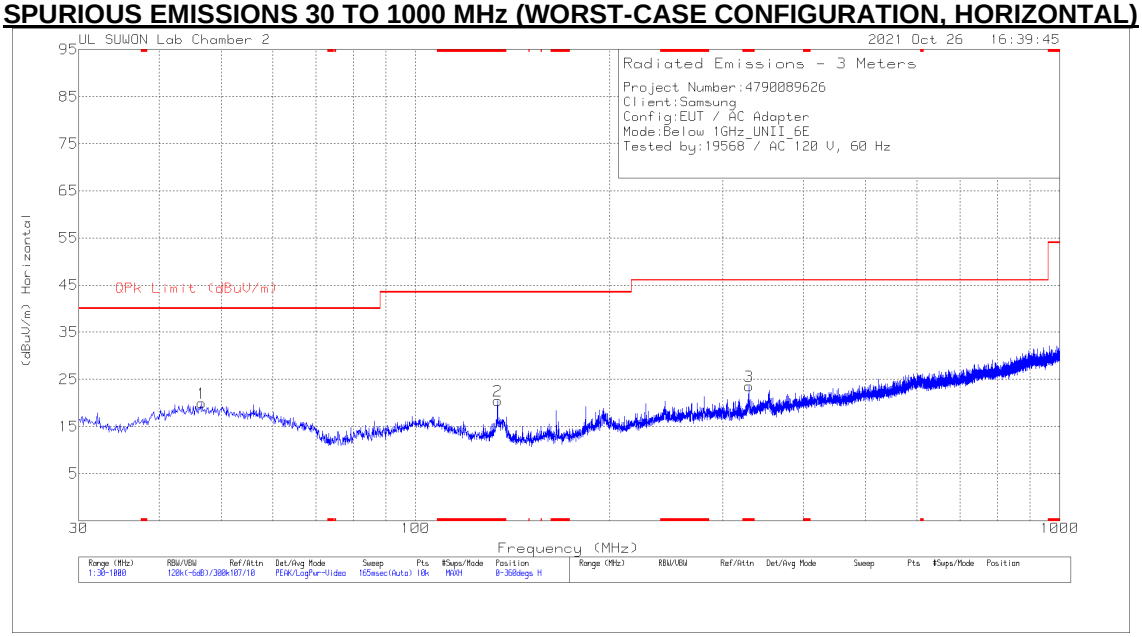
HARMONICS AND SPURIOUS EMISSIONS TEST DATA

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
6895	MIMO	10.34653	34.15	PK-U	38.00	-21.00	0.00	51.15	-	-	-	-	68.20	-17.05	360	100	H
		10.34870	34.19	PK-U	38.00	-21.00	0.00	51.19	-	-	-	-	68.20	-17.01	360	100	V
		13.78485	36.17	PK-U	38.90	-23.20	0.00	51.87	-	-	-	-	68.20	-16.33	360	100	H
		13.78758	35.94	PK-U	38.90	-23.20	0.00	51.64	-	-	-	-	68.20	-16.56	360	100	V
		17.24398	32.94	PK-U	42.10	-17.90	0.00	57.14	-	-	-	-	68.20	**-11.06**	360	100	H
		17.22774	33.11	PK-U	42.10	-18.10	0.00	57.11	-	-	-	-	68.20	-11.09	360	100	V
6995	MIMO	10.49340	34.03	PK-U	38.20	-21.50	0.00	50.73	-	-	-	-	68.20	-17.47	360	100	H
		10.49707	33.63	PK-U	38.20	-21.50	0.00	50.33	-	-	-	-	68.20	-17.87	360	100	V
		13.98902	36.08	PK-U	39.10	-23.10	0.00	52.08	-	-	-	-	68.20	-16.12	360	100	H
		13.98609	36.28	PK-U	39.10	-23.20	0.00	52.18	-	-	-	-	68.20	-16.02	360	100	V
		17.49089	31.79	PK-U	42.00	-17.50	0.00	56.29	-	-	-	-	68.20	-11.91	360	100	H
		17.49487	31.60	PK-U	42.00	-17.40	0.00	56.20	-	-	-	-	68.20	-12.00	360	100	V
7115	MIMO	* 10.67527	33.47	PK-U	38.40	-21.30	0.00	50.57	-	-	74.00	-23.43	-	-	0	100	H
		* 10.67786	34.21	PK-U	38.40	-21.30	0.00	51.31	-	-	74.00	-22.69	-	-	0	100	V
		14.22565	35.76	PK-U	39.50	-23.40	0.00	51.86	-	-	-	-	68.20	-16.34	0	100	H
		14.23173	36.40	PK-U	39.50	-23.40	0.00	52.50	-	-	-	-	68.20	-15.70	0	100	V
		* 17.79749	31.65	PK-U	41.90	-17.00	0.00	56.55	-	-	74.00	-17.45	-	-	0	100	H
		* 17.79116	31.85	PK-U	41.90	-16.90	0.00	56.85	-	-	74.00	-17.15	-	-	0	100	V
7115	MIMO	* 10.67187	33.60	PK-U	38.40	-21.30	0.00	50.70	-	-	74.00	-23.30	-	-	0	100	H
		* 10.66517	34.14	PK-U	38.40	-21.30	0.00	51.24	-	-	74.00	-22.76	-	-	0	100	V
		14.23579	36.04	PK-U	39.50	-23.40	0.00	52.14	-	-	-	-	68.20	-16.06	0	100	H
		14.23571	36.04	PK-U	39.50	-23.40	0.00	52.14	-	-	-	-	68.20	-16.06	0	100	V
		* 17.79662	32.11	PK-U	41.90	-17.00	0.00	57.01	-	-	74.00	-16.99	-	-	0	100	H
		* 17.78331	32.09	PK-U	41.90	-16.80	0.00	57.19	-	-	74.00	**-16.81**	-	-	0	100	V

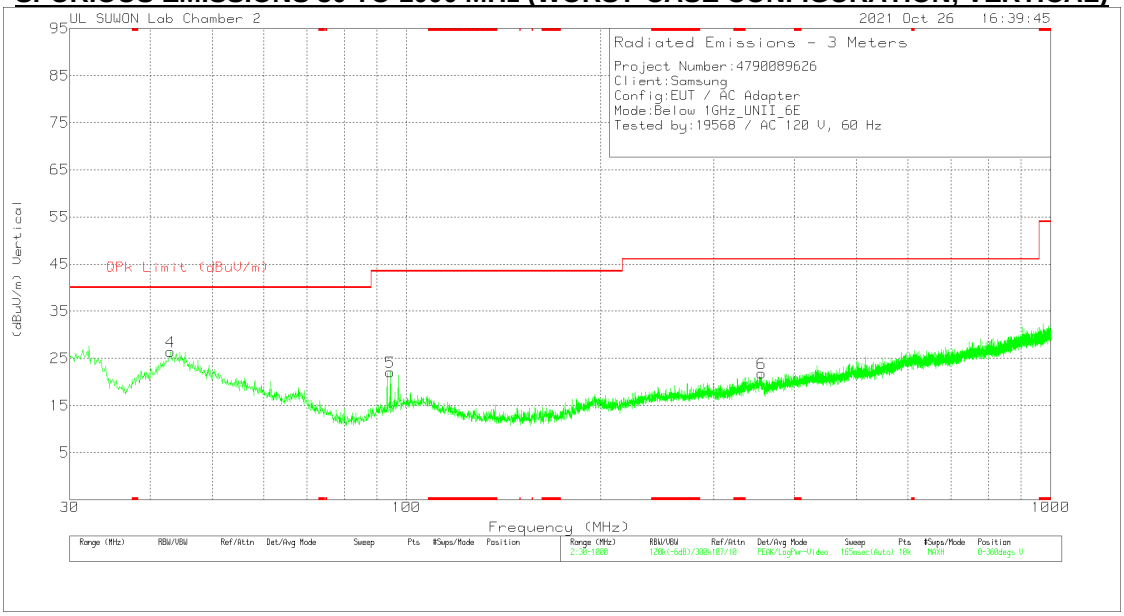
Note1. PK-U - U-NII: Maximum Peak / ADR - U-NII AD primary method, RMS average
Note2. * - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

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)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	46.587	31.91	Pk	19.8	-31.7	0	20.01	40	-19.99	0-360	100	H
2	* 134.081	37.6	Pk	13.9	-31.1	0	20.4	43.52	-23.12	0-360	100	H
3	* 329.051	33.83	Pk	19.9	-30.2	0	23.53	46.02	-22.49	0-360	100	H
4	42.998	38.76	Pk	19.3	-31.7	0	26.36	40	-13.64	0-360	100	V
5	94.408	37.1	Pk	16.4	-31.4	0	22.1	43.52	-21.42	0-360	100	V
6	355.435	31.04	Pk	20.9	-30.1	0	21.84	46.02	-24.18	0-360	300	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.

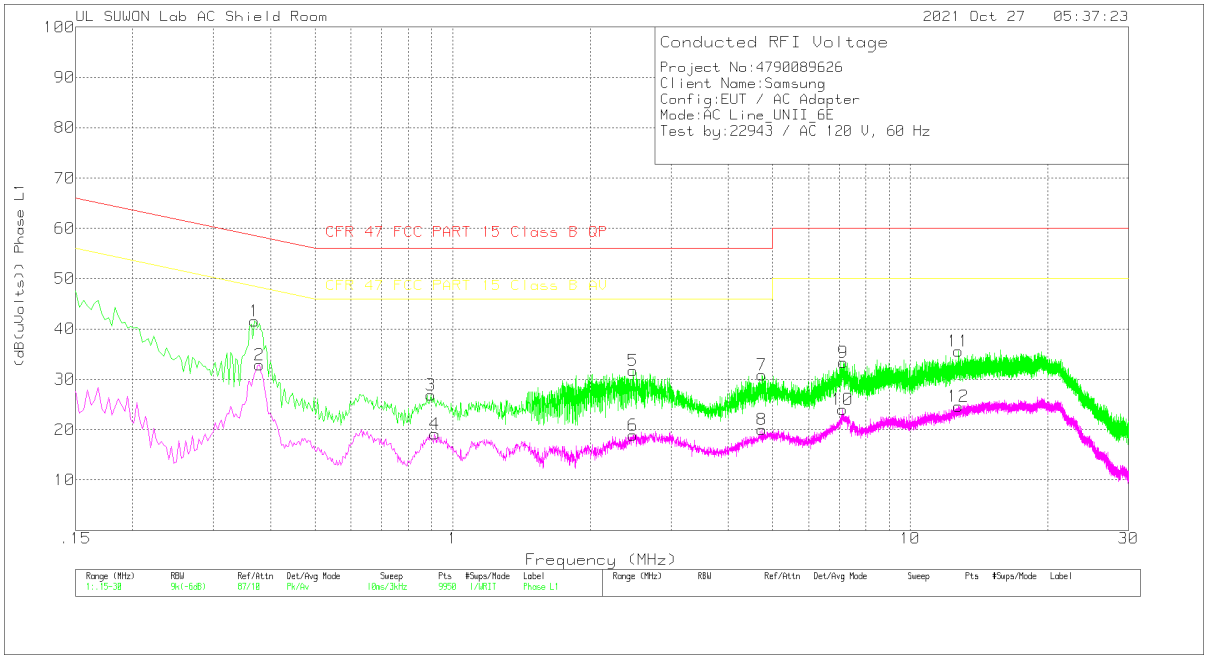
The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

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

RESULTS

WORST EMISSIONS

LINE 1 DATA



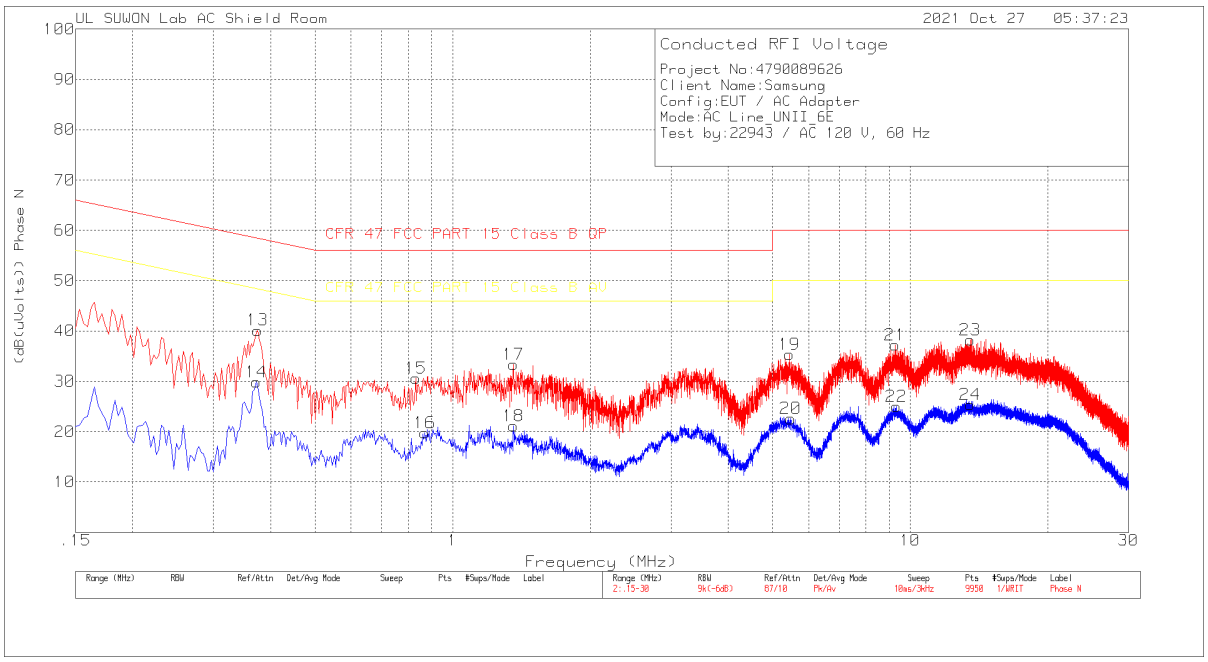
Trace Markers

Range 1: Phase L1 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	101836_With EX_L1[dB]	CABLELOSS(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	.369	31.6	Pk	9.8	.2	41.6	58.52	-16.92	-	-
2	.378	22.81	Av	9.8	.2	32.81	-	-	48.32	-15.51
3	.897	16.83	Pk	9.8	.3	26.93	56	-29.07	-	-
4	.915	9.01	Av	9.8	.3	19.11	-	-	46	-26.89
5	2.478	21.7	Pk	9.7	.3	31.7	56	-24.3	-	-
6	2.478	8.88	Av	9.7	.3	18.88	-	-	46	-27.12
7	4.746	20.88	Pk	9.7	.3	30.88	56	-25.12	-	-
8	4.74	10.07	Av	9.7	.3	20.07	-	-	46	-25.93
9	7.14	23.29	Pk	9.8	.3	33.39	60	-26.61	-	-
10	7.125	13.91	Av	9.8	.3	24.01	-	-	50	-25.99
11	12.738	25.41	Pk	9.9	.3	35.61	60	-24.39	-	-
12	12.753	14.42	Av	9.9	.3	24.62	-	-	50	-25.38

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]	CABLELOSS(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	.375	30.15	Pk	9.8	.2	40.15	58.39	-18.24	-	-
14	.372	19.91	Av	9.8	.2	29.91	-	-	48.46	-18.55
15	.831	20.55	Pk	9.8	.3	30.65	56	-25.35	-	-
16	.87	9.7	Av	9.8	.3	19.8	-	-	46	-26.2
17	1.359	23.34	Pk	9.7	.3	33.34	56	-22.66	-	-
18	1.359	11.09	Av	9.7	.3	21.09	-	-	46	-24.91
19	5.439	25.4	Pk	9.7	.3	35.4	60	-24.6	-	-
20	5.472	12.58	Av	9.7	.3	22.58	-	-	50	-27.42
21	9.282	26.93	Pk	9.9	.4	37.23	60	-22.77	-	-
22	9.321	14.66	Av	9.9	.4	24.96	-	-	50	-25.04
23	13.509	27.87	Pk	10	.4	38.27	60	-21.73	-	-
24	13.509	14.94	Av	10	.4	25.34	-	-	50	-24.66

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

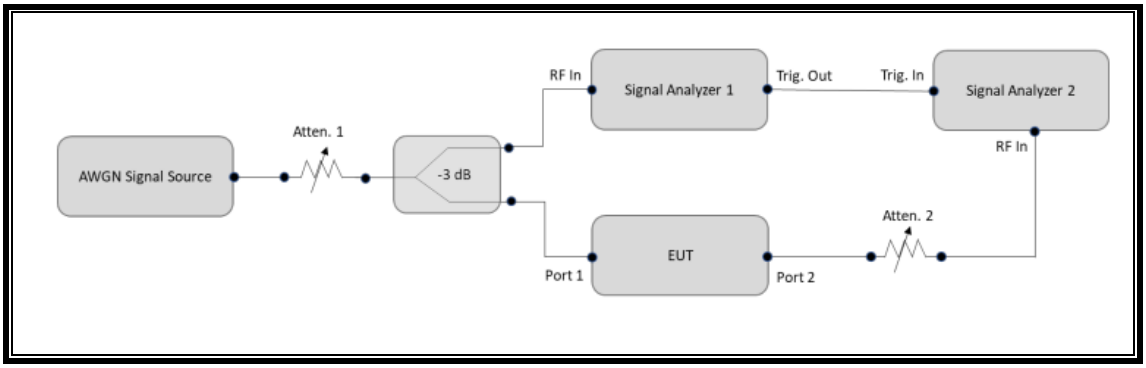
Indoor access points, subordinate devices and client devices operating in the 5.925-7.125 GHz band (herein referred to as unlicensed devices) are required to use technologies that include a contention-based protocol to avoid co-channel interference with incumbent devices sharing the band. To ensure incumbent 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 EEUT 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	WEINSCHEL	WA1534	UL001	2022-01-27
Attenuator	WEINSCHEL	WA76-30-21	A015	2022-08-03
Attenuator	PASTERNACK	PE7087-10	A001	2022-08-03
Attenuator	PASTERNACK	PE7087-10	A008	2022-08-03

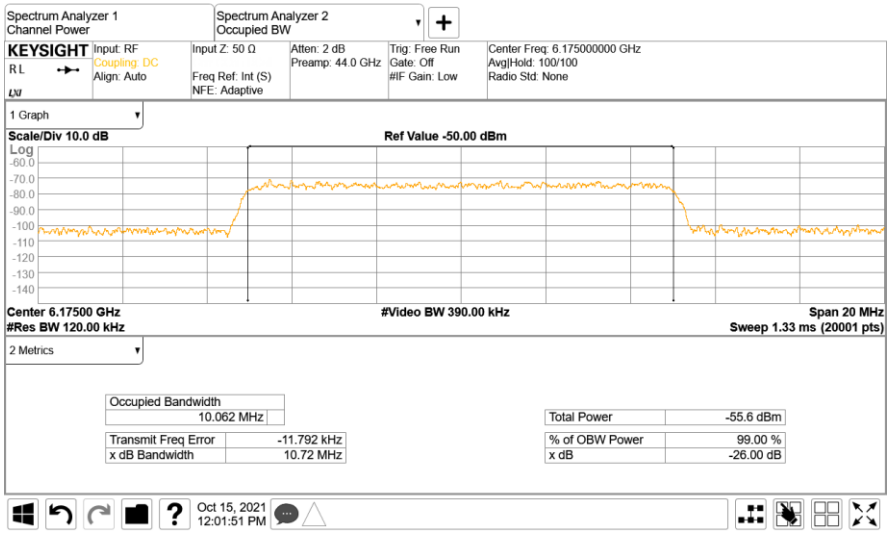
SUPPORT EQUIPMENT

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	Detection limit	Gain	Detection limit (include Gain)	Margin
5	45	6175	20	6175	-70.08	-62	-7.1	-69.1	-0.98
	47	6185	160	6110	-69.95	-62	-7.1	-69.1	-0.85
				6185	-70.04	-62	-7.1	-69.1	-0.94
				6250	**-69.87**	**-62**	**-7.1**	**-69.1**	**-0.77**
6	105	6475	20	6475	-69.89	-62	-7.1	-69.1	-0.79
	111	6505	160	6435	-71.85	-62	-7.1	-69.1	-2.75
				6495	-73.87	-62	-7.1	-69.1	-4.77
				6575	-69.94	-62	-7.1	-69.1	-0.84
7	149	6695	20	6695	-70.08	-62	-6.9	-68.9	-1.18
	143	6665	160	6595	-72.04	-62	-6.9	-68.9	-3.14
				6655	-74.08	-62	-6.9	-68.9	-5.18
				6735	-71.25	-62	-6.9	-68.9	-2.35
8	209	6995	20	6995	-70.05	-62	-6.8	-68.8	-1.25
	207	6985	160	6915	-72.16	-62	-6.8	-68.8	-3.36
				6975	-73.09	-62	-6.8	-68.8	-4.29
				7055	-70.09	-62	-6.8	-68.8	-1.29

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
	47	6185	160	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
	111	6505	160	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
	143	6665	160	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
	207	6985	160	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

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