

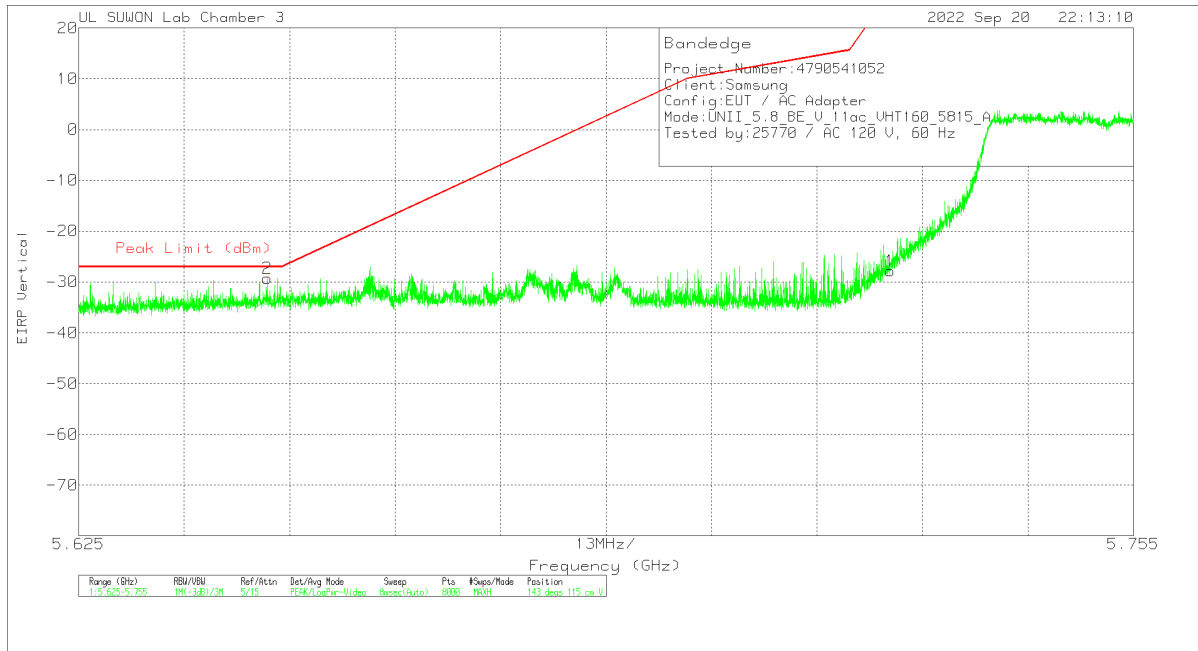
HARMONICS AND SPURIOUS EMISSIONS TEST DATA

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	5500	MIMO	6.600	40.15	PK-U	36.50	-26.30	0.00	50.35	-	-	-	-	68.20	-17.85	233	101	H
			6.600	40.96	PK-U	36.50	-26.30	0.00	51.16	-	-	-	-	68.20	-17.04	162	101	V
			* 7.7028	38.43	PK-U	36.20	-25.10	0.00	49.53	-	-	74.00	-24.47	-	-	185	102	H
			* 7.7028	26.84	ADR	36.20	-25.10	0.15	38.09	54.00	-15.91	-	-	-	-	185	102	H
			* 7.69628	42.65	PK-U	36.20	-25.10	0.00	53.75	-	-	74.00	-20.25	-	-	197	107	V
			* 7.70635	32.34	ADR	36.20	-25.10	0.15	43.59	54.00	-10.41	-	-	-	-	197	107	V
			16.508	33.51	PK-U	42.00	-19.20	0.00	56.31	-	-	-	-	68.20	-11.89	185	102	H
			16.498	32.93	PK-U	42.00	-19.30	0.00	55.63	-	-	-	-	68.20	-12.57	0	100	V
			4.464	44.77	PK-U	34.40	-30.80	0.00	48.37	-	-	-	-	68.20	-19.83	215	141	H
			4.464	45.39	PK-U	34.40	-30.80	0.00	48.99	-	-	-	-	68.20	-19.21	183	289	V
	5580	MIMO	* 4.82382	44.66	PK-U	34.60	-29.90	0.00	49.36	-	-	74.00	-24.64	-	-	159	108	H
			* 4.82392	33.77	ADR	34.60	-29.90	0.15	38.62	54.00	-15.38	-	-	-	-	159	108	H
			* 4.8241	44.51	PK-U	34.60	-29.90	0.00	49.21	-	-	74.00	-24.79	-	-	103	100	V
			* 4.8241	34.90	ADR	34.60	-29.90	0.15	39.75	54.00	-14.25	-	-	-	-	103	100	V
			6.695	39.19	PK-U	36.40	-26.80	0.00	48.79	-	-	-	-	68.20	-19.41	225	100	H
			6.696	39.55	PK-U	36.40	-26.90	0.00	49.05	-	-	-	-	68.20	-19.15	163	106	V
			7.805	39.03	PK-U	36.30	-24.40	0.00	50.93	-	-	-	-	68.20	-17.27	130	100	H
			7.819	43.09	PK-U	36.30	-24.30	0.00	55.09	-	-	-	-	68.20	-13.11	198	115	V
			16.735	31.38	PK-U	42.30	-18.80	0.00	54.88	-	-	-	-	68.20	-13.32	0	100	H
			16.734	31.20	PK-U	42.30	-18.80	0.00	54.70	-	-	-	-	68.20	-13.50	0	100	V
	5700	MIMO	* 4.56	49.87	PK-U	34.40	-30.10	0.00	54.17	-	-	74.00	-19.83	-	-	220	110	H
			* 4.56008	42.83	ADR	34.40	-30.10	0.15	47.28	54.00	-6.72	-	-	-	-	220	110	H
			* 4.55971	47.68	PK-U	34.40	-30.10	0.00	51.98	-	-	74.00	-22.02	-	-	110	325	V
			* 4.56003	40.34	ADR	34.40	-30.10	0.15	44.79	54.00	-9.21	-	-	-	-	110	325	V
			* 4.82402	44.33	PK-U	34.60	-29.90	0.00	49.03	-	-	74.00	-24.97	-	-	221	105	H
			* 4.82398	34.69	ADR	34.60	-29.90	0.15	39.54	54.00	-14.46	-	-	-	-	221	105	H
			* 4.82392	44.47	PK-U	34.60	-29.90	0.00	49.17	-	-	74.00	-24.83	-	-	130	119	V
			* 4.82412	34.70	ADR	34.60	-29.90	0.15	39.55	54.00	-14.45	-	-	-	-	130	119	V
			6.840	41.17	PK-U	36.20	-26.50	0.00	50.87	-	-	-	-	68.20	-17.33	234	330	H
			6.840	40.80	PK-U	36.20	-26.50	0.00	50.50	-	-	-	-	68.20	-17.70	165	116	V
	5720	MIMO	7.980	37.27	PK-U	36.30	-24.30	0.00	49.27	-	-	-	-	68.20	-18.93	123	105	H
			7.972	39.82	PK-U	36.30	-24.30	0.00	51.82	-	-	-	-	68.20	-16.38	190	105	V
			17.101	31.87	PK-U	42.30	-18.00	0.00	56.17	-	-	-	-	68.20	-12.03	0	100	H
			17.101	32.13	PK-U	42.30	-18.00	0.00	56.43	-	-	-	-	68.20	-11.77	0	100	V
			* 4.57594	48.28	PK-U	34.50	-30.10	0.00	52.68	-	-	74.00	-21.32	-	-	218	188	H
			* 4.57596	40.95	ADR	34.50	-30.10	0.15	45.50	54.00	-8.50	-	-	-	-	218	188	H
			* 4.57591	47.77	PK-U	34.50	-30.10	0.00	52.17	-	-	74.00	-21.83	-	-	182	274	V
			* 4.57601	40.64	ADR	34.50	-30.10	0.15	45.19	54.00	-8.81	-	-	-	-	182	274	V
			6.864	40.63	PK-U	36.20	-26.50	0.00	50.33	-	-	-	-	68.20	-17.87	230	326	H
			6.864	40.32	PK-U	36.20	-26.50	0.00	50.02	-	-	-	-	68.20	-18.18	164	100	V
802.11n (HT20) Spot-Check	5720	MIMO	8.007	37.84	PK-U	36.30	-24.20	0.00	49.94	-	-	-	-	68.20	-18.26	134	103	H
			8.001	40.42	PK-U	36.30	-24.20	0.00	52.52	-	-	-	-	68.20	-15.68	195	100	V
			17.160	32.11	PK-U	42.20	-17.90	0.00	56.41	-	-	-	-	68.20	-11.79	0	100	H
			17.151	32.23	PK-U	42.20	-18.00	0.00	56.43	-	-	-	-	68.20	-11.77	0	100	V
			* 4.57605	48.07	PK-U	34.50	-30.10	0.00	52.47	-	-	74.00	-21.53	-	-	213	288	H
			* 4.57605	40.73	ADR	34.50	-30.10	0.17	45.30	54.00	-8.70	-	-	-	-	213	288	H
			* 4.57599	48.29	PK-U	34.50	-30.10	0.00	52.69	-	-	74.00	-21.31	-	-	185	144	V
			* 4.57599	41.28	ADR	34.50	-30.10	0.17	45.85	54.00	-8.15	-	-	-	-	185	144	V
			6.864	39.66	PK-U	36.20	-26.50	0.00	49.36	-	-	-	-	68.20	-18.84	233	326	H
			6.864	40.52	PK-U	36.20	-26.50	0.00	50.22	-	-	-	-	68.20	-17.98	164	114	V
802.11n (HT40) Spot-Check	5710	MIMO	8.003	38.36	PK-U	36.30	-24.30	0.00	50.36	-	-	-	-	68.20	-17.84	132	100	H
			8.004	40.97	PK-U	36.30	-24.30	0.00	52.97	-	-	-	-	68.20	-15.23	201	103	V
			17.167	32.50	PK-U	42.20	-17.90	0.00	56.80	-	-	-	-	68.20	-11.40	0	100	H
			17.157	31.80	PK-U	42.20	-17.90	0.00	56.10	-	-	-	-	68.20	-12.10	0	100	V
			* 4.56801	46.53	PK-U	34.40	-30.10	0.00	50.83	-	-	74.00	-23.17	-	-	217	286	H
			* 4.56793	39.60	ADR	34.40	-30.10	0.17	44.07	54.00	-9.93	-	-	-	-	217	286	H
			* 4.56822	47.18	PK-U	34.40	-30.10	0.00	51.48	-	-	74.00	-22.52	-	-	184	151	V
			* 4.5679	40.18	ADR	34.40	-30.10	0.17	44.65	54.00	-9.35	-	-	-	-	184	151	V
			6.852	39.49	PK-U	36.20	-26.50	0.00	49.19	-	-	-	-	68.20	-19.01	239	277	H
			6.852	39.47	PK-U	36.20	-26.50	0.00	49.17	-	-	-	-	68.20	-19.03	159	124	V
802.11ac (HE20) Spot-Check	5690	MIMO	8.009	36.71	PK-U	36.30	-24.20	0.00	48.81	-	-	-	-	68.20	-19.39	130	100	H
			8.007	38.33	PK-U	36.30	-24.20	0.00	50.43	-	-	-	-	68.20	-17.77	195	103	V
			17.121	31.71	PK-U	42.30	-18.00	0.00	56.01	-	-	-	-	68.20	-12.19	0	100	H
			17.130	31.59	PK-U	42.20	-18.00	0.00	55.79	-	-	-	-	68.20	-12.41	0	100	V
			* 4.55204	45.16	PK-U	34.40	-30.20	0.00	49.38	-	-	74.00	-24.64	-	-	220	114	H
			* 4.5518	37.70	ADR	34.40	-30.20	0.27	42.17	54.00	-11.83	-	-	-	-	220	114	H
			* 4.55193	45.16	PK-U	34.40	-30.20	0.00	49.36	-	-	74.00	-24.64	-	-	178	141	V
			* 4.55192	37.66	ADR	34.40	-30.20	0.27	42.13	54.00	-11.87	-	-	-	-	178	141	V
			6.828	39.88	PK-U	36.20	-26.60	0.00	49.48	-	-	-	-	68.20	-18.72	238	290	H
			6.828	40.48	PK-U	36.20	-26.60	0.00	50.08	-	-	-	-	68.20	-18.12	165	124	V
802.11ac (HE160) Spot-Check	5570	MIMO	* 11.37628	32.40	PK-U	38.60	-21.50	0.00	49.50	-	-	74.00	-24.50	-	-	0	100	H
			* 11.37736	32.35	PK-U	38.60	-21.50	0.00	49.45	-	-	74.00	-24.55	-	-	0	100	V
			17.080	31.54	PK-U	42.30	-17.90	0.00	55.94	-	-	-	-	68.20	-12.26	0	100	H
			17.065	31.78	PK-U	42.30	-17.90	0.00	56.18	-	-	-	-	68.20	-12.02	0	100	V
			6.684	39.31	PK-U	36.40	-26.80	0.00	48.91	-	-	-	-	68.20	-19.29	226	100	H
			6.684	39.07	PK-U	36.40	-26.80	0.00	48.67	-	-	-	-	68.20	-19.53	164	100	V
			* 11.14903	33.81	PK-U	38.50	-21.40	0.00	50.91	-	-	74.00	-23.09	-	-	360	100	H
			* 11.1376	34.64	PK-U	38.50	-21.40	0.00	51.74	-	-	74.00	-22.26	-	-	360	100	V
			16.705	31.97	PK-U	42.30	-19.00	0.00	55.27	-	-	-	-	68.20	-12.93	360	100	H
			16.716	31.68	PK-U	42.30	-18.90	0.00	55.08	-	-	-	-	68.20	-13.12	360	100	V
802.11ax (BRU)	5720	MIMO	6.864	39.95	PK-U	36.20	-26.50	0.00	49.65	-	-	-	-	68.20	-18.55	243	265	H
			6.864	40.30	PK-U	36.20	-26.50	0.00	50.00	-	-	-	-	68.20	-18.20	179	104	V
			7.996	36.27	PK-U	36.30	-24.20	0.00	48.37	-	-	-	-	68.20	-19.83	135	105	H
			6.000	36.40	PK-U	36.20	-24.20	0.00	50.58	-	-	-	-	68.20	-17.62	218	101	V
			7.757	36.39	PK-U	36.20	-24.20	0.00	50.59	-	-	-	-	68.20	-17.65	0	100	H
			17.137	31.39	PK-U	42.30	-17.90	0.00	55.69	-	-	-	-	68.20	-12.51	0	100	H

11.4. TX ABOVE 1GHz 2Tx MODE IN THE 5.8 GHz BAND

BANDEDGE (WORST CASE: 802.11ac VHT160 / 5815 MHz)

VERTICAL PEAK DATA



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	3117_00218957	10dB_ATT[dB]	Conversion Factor (dB)	DC Corr (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.725	-55.7	Pk	35.6	-19.5	11.8	0	-27.8	27	-54.8	143	115	V
2	5.64826	-56.83	Pk	35.5	-19.8	11.8	0	-29.33	-27	-2.33	143	115	V

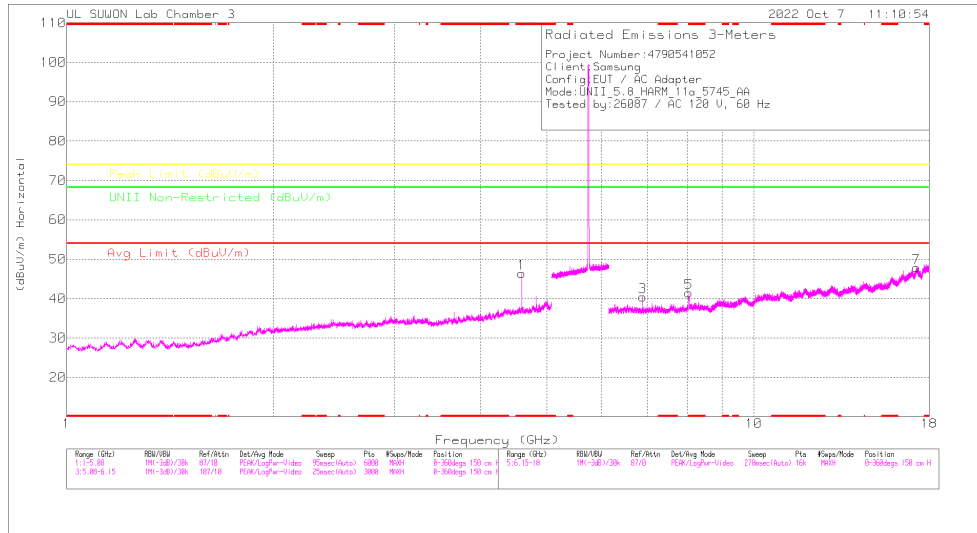
Pk - Peak detector

BANDEDGE TEST DATA

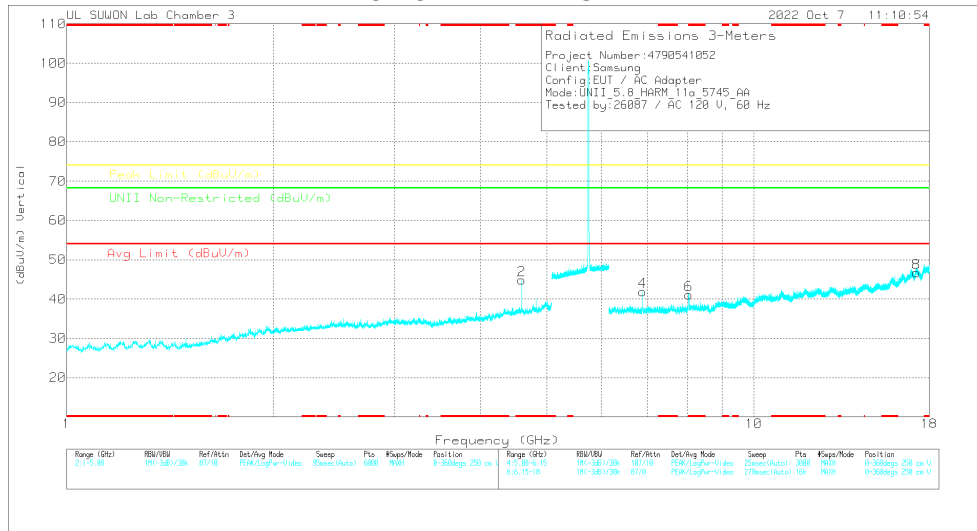
Mode	Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBm]	Detector Mode	ANT Factor	Loss [dB]	Conv. F [dB]	DC Corr [dB]	Result [dBm]	PK Limit [dBm]	PK Margin [dB]	Azimuth [Degs]	Height [cm]	Polarity
802.11a	5745	MIMO	5.72500	-65.00	Pk	35.60	-19.50	11.80	0.00	-37.10	27.00	-64.10	221	101	H
			5.64094	-64.01	Pk	35.50	-19.80	11.80	0.00	-36.51	-27.00	-9.51	221	101	H
			5.72500	-60.80	Pk	35.60	-19.50	11.80	0.00	-32.90	27.00	-59.90	137	110	V
			5.63594	-63.67	Pk	35.50	-19.80	11.80	0.00	-36.17	-27.00	-9.17	137	110	V
802.11n (HT20)	5745	MIMO	5.72500	-65.26	Pk	35.60	-19.50	11.80	0.00	-37.36	27.00	-64.36	242	346	H
			5.62715	-63.84	Pk	35.50	-19.90	11.80	0.00	-36.44	-27.00	-9.44	242	346	H
			5.72500	-63.07	Pk	35.60	-19.50	11.80	0.00	-35.17	27.00	-62.17	207	110	V
			5.62697	-63.37	Pk	35.50	-19.90	11.80	0.00	-35.97	-27.00	-8.97	207	110	V
802.11n (HT40)	5755	MIMO	5.72500	-64.77	Pk	35.60	-19.50	11.80	0.00	-36.87	27.00	-63.87	228	101	H
			5.64725	-62.82	Pk	35.50	-19.80	11.80	0.00	-35.32	-27.00	-8.32	228	101	H
			5.72500	-62.74	Pk	35.60	-19.50	11.80	0.00	-34.84	27.00	-61.84	148	101	V
			5.64814	-63.88	Pk	35.50	-19.80	11.80	0.00	-36.38	-27.00	-9.38	148	101	V
802.11ac (VHT80)	5775	MIMO	5.72500	-59.25	Pk	35.60	-19.50	11.80	0.00	-31.35	27.00	-58.35	245	364	H
			5.64252	-63.52	Pk	35.50	-19.80	11.80	0.00	-36.02	-27.00	-9.02	245	364	H
			5.72500	-53.43	Pk	35.60	-19.50	11.80	0.00	-25.53	27.00	-52.53	212	110	V
			5.62997	-62.90	Pk	35.50	-19.90	11.80	0.00	-35.50	-27.00	-8.50	212	110	V
802.11ac (VHT160)	5815 Lower	MIMO	5.72500	-57.67	Pk	35.60	-19.50	11.80	0.00	-29.77	27.00	-56.77	235	294	H
			5.63699	-60.89	Pk	35.50	-19.80	11.80	0.00	-33.39	-27.00	-6.39	235	294	H
			5.72500	-55.70	Pk	35.60	-19.50	11.80	0.00	-27.80	27.00	-54.80	143	115	V
			5.64826	-56.83	Pk	35.50	-19.80	11.80	0.00	-29.33	-27.00	-2.33	143	115	V
802.11ax (HE20)	5745	MIMO	5.72500	-58.20	Pk	35.60	-19.50	11.80	0.00	-30.30	27.00	-57.30	238	121	H
			5.64757	-63.96	Pk	35.50	-19.80	11.80	0.00	-36.46	-27.00	-9.46	238	121	H
			5.72500	-60.76	Pk	35.60	-19.50	11.80	0.00	-32.86	27.00	-59.86	149	103	V
			5.64601	-63.25	Pk	35.50	-19.80	11.80	0.00	-35.75	-27.00	-8.75	149	103	V
802.11ax (HE40)	5755	MIMO	5.72500	-65.85	Pk	35.60	-19.50	11.80	0.00	-37.95	27.00	-64.95	223	100	H
			5.63886	-63.50	Pk	35.50	-19.80	11.80	0.00	-36.00	-27.00	-9.00	223	100	H
			5.72500	-65.04	Pk	35.60	-19.50	11.80	0.00	-37.14	27.00	-64.14	133	116	V
			5.64382	-63.54	Pk	35.50	-19.80	11.80	0.00	-36.04	-27.00	-9.04	133	116	V
802.11ax (HE80)	5775	MIMO	5.72500	-57.73	Pk	35.60	-19.50	11.80	0.00	-29.83	27.00	-56.83	230	108	H
			5.63254	-63.34	Pk	35.50	-19.90	11.80	0.00	-35.94	-27.00	-8.94	230	108	H
			5.72500	-55.51	Pk	35.60	-19.50	11.80	0.00	-27.61	27.00	-54.61	134	105	V
			5.64738	-63.05	Pk	35.50	-19.80	11.80	0.00	-35.55	-27.00	-8.55	134	105	V
802.11ax (HE160)	5815 Lower	MIMO	5.72500	-58.81	Pk	35.60	-19.50	11.80	0.00	-30.91	27.00	-57.91	252	100	H
			5.62905	-62.83	Pk	35.50	-19.90	11.80	0.00	-35.43	-27.00	-8.43	252	100	H
			5.72500	-63.42	Pk	35.60	-19.50	11.80	0.00	-35.52	27.00	-62.52	253	150	V
			5.64944	-63.67	Pk	35.50	-19.80	11.80	0.00	-36.17	-27.00	-9.17	253	150	V

Note. Pk - Peak detector

HARMONICS AND SPURIOUS EMISSIONS(WORST CASE: 802.11a / 5745 MHz)
5745 MHz HORIZONTAL



5745 MHz 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.

5745 MHz DATA

Radiated Emissions

Frequency (GHz)	Meas Reading (dBuV)	Det	3117_00218957	SGHz_HPBW	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 (Chaps)	Height (cm)	Polarity
* 4.59589	47.41	PK-U	34.5	-30.1	0	51.81	-	-	74	-22.19	-	-	226	285	H
* 4.59593	39.42	ADR	34.5	-30.1	15	43.97	54	-10.03	-	-	-	-	226	285	H
* 4.59592	47.76	PK-U	34.5	-30.1	0	52.16	-	-	74	-21.84	-	-	180	271	V
* 4.5959	40.36	ADR	34.5	-30.1	15	44.91	54	-9.09	-	-	-	-	180	271	V

Frequency (GHz)	Meas Reading (dBuV)	Det	3117_00218957	SGHz_HPBW	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 (Chaps)	Height (cm)	Polarity
6.89389	40.81	PK-U	36.2	-26.6	0	50.41	-	-	-	-	68.2	-17.79	237	338	H
6.89421	40.85	PK-U	36.2	-26.6	0	50.15	-	-	-	-	68.2	-18.05	164	114	V
* 8.03587	38.27	PK-U	36.3	-24.3	0	50.27	-	-	74	-23.73	-	-	137	100	H
* 8.03997	39.74	PK-U	36.3	-24.2	0	51.84	-	-	74	-22.16	-	-	195	101	V
* 8.03613	29.16	ADR	36.3	-24.3	15	41.31	54	-12.69	-	-	-	-	195	101	V
17.23426	32.44	PK-U	42.1	-17.1	0	57.44	-	-	-	-	68.2	-10.76	0	100	H
17.23397	32.51	PK-U	42.1	-17.1	0	57.51	-	-	-	-	68.2	-10.69	0	100	V

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

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	5745	MIMO	* 4.59589	47.41	PK-U	34.50	-30.10	0.00	51.81	-	-	74.00	-22.19	-	-	226	285	H
			* 4.59593	39.42	ADR	34.50	-30.10	0.15	43.97	54.00	-10.03	-	-	-	-	226	285	H
			* 4.59592	47.76	PK-U	34.50	-30.10	0.00	52.16	-	-	74.00	-21.84	-	-	180	271	V
			* 4.59599	40.36	ADR	34.50	-30.10	0.15	44.91	54.00	-9.09	-	-	-	-	180	271	V
			6.894	40.81	PK-U	36.20	-26.60	0.00	50.41	-	-	-	-	68.20	-17.79	237	338	H
			6.894	40.55	PK-U	36.20	-26.60	0.00	50.15	-	-	-	-	68.20	-18.05	164	114	V
			* 8.03587	38.27	PK-U	36.30	-24.30	0.00	50.27	-	-	74.00	-23.73	-	-	137	100	H
			* 8.03997	39.74	PK-U	36.30	-24.20	0.00	51.84	-	-	74.00	-22.16	-	-	195	101	V
			* 8.03613	29.16	ADR	36.30	-24.30	0.15	41.31	54.00	-12.69	-	-	-	-	195	101	V
			17.234	32.44	PK-U	42.10	-17.10	0.00	57.44	-	-	-	-	68.20	-10.76	0	100	H
			17.234	32.51	PK-U	42.10	-17.10	0.00	57.51	-	-	-	-	68.20	-10.69	0	100	V
	5785	MIMO	* 4.6278	47.54	PK-U	34.50	-30.20	0.00	51.84	-	-	74.00	-22.16	-	-	223	236	H
			* 4.62794	39.51	ADR	34.50	-30.20	0.15	43.96	54.00	-10.04	-	-	-	-	223	236	H
			* 4.62825	47.13	PK-U	34.50	-30.20	0.00	51.43	-	-	74.00	-22.57	-	-	193	159	V
			* 4.62799	38.83	ADR	34.50	-30.20	0.15	43.28	54.00	-10.72	-	-	-	-	193	159	V
			6.942	40.04	PK-U	36.20	-26.30	0.00	49.94	-	-	-	-	68.20	-18.26	233	334	H
			6.942	41.22	PK-U	36.20	-26.30	0.00	51.12	-	-	-	-	68.20	-17.08	205	105	V
			* 8.09816	37.43	PK-U	36.30	-23.90	0.00	49.83	-	-	74.00	-24.17	-	-	136	104	H
			* 8.09402	26.38	ADR	36.30	-23.90	0.15	38.93	54.00	-15.07	-	-	-	-	136	104	H
			* 8.09701	39.37	PK-U	36.30	-23.90	0.00	51.77	-	-	74.00	-22.23	-	-	204	135	V
			* 8.09202	28.86	ADR	36.30	-23.90	0.15	41.41	54.00	-12.59	-	-	-	-	204	135	V
			17.355	31.53	PK-U	42.00	-17.20	0.00	56.33	-	-	-	-	68.20	-11.87	0	100	H
			17.353	31.63	PK-U	42.00	-17.20	0.00	56.43	-	-	-	-	68.20	-11.77	0	100	V
	5825	MIMO	* 4.66	46.92	PK-U	34.50	-30.30	0.00	51.12	-	-	74.00	-22.88	-	-	224	248	H
			* 4.66002	38.86	ADR	34.50	-30.30	0.15	43.21	54.00	-10.79	-	-	-	-	224	248	H
			* 4.6599	46.13	PK-U	34.50	-30.30	0.00	50.33	-	-	74.00	-23.67	-	-	193	169	V
			* 4.6599	37.82	ADR	34.50	-30.30	0.15	42.17	54.00	-11.83	-	-	-	-	193	169	V
			6.990	38.74	PK-U	36.20	-25.90	0.00	49.04	-	-	-	-	68.20	-19.16	233	327	H
			6.988	37.60	PK-U	36.20	-26.00	0.00	47.80	-	-	-	-	68.20	-20.40	0	100	V
			* 8.1484	35.99	PK-U	36.20	-23.40	0.00	48.79	-	-	74.00	-25.21	-	-	145	158	H
			* 8.14872	25.20	ADR	36.20	-23.40	0.15	38.15	54.00	-15.85	-	-	-	-	145	158	H
			* 8.15762	38.24	PK-U	36.20	-23.40	0.00	51.04	-	-	74.00	-22.96	-	-	201	100	V
			* 8.1483	27.76	ADR	36.20	-23.40	0.15	40.71	54.00	-13.29	-	-	-	-	201	100	V
			17.468	31.49	PK-U	42.00	-16.80	0.00	56.69	-	-	-	-	68.20	-11.51	0	100	H
	802.11ax (HE20) 8RU Spot-check	MIMO	6.894	39.72	PK-U	36.20	-26.60	0.00	49.32	-	-	-	-	68.20	-18.88	124	101	H
			6.894	39.61	PK-U	36.20	-26.60	0.00	49.21	-	-	-	-	68.20	-18.99	154	114	V
			* 8.03503	38.82	PK-U	36.30	-24.30	0.00	50.82	-	-	74.00	-23.18	-	-	129	100	H
			* 8.03407	27.83	ADR	36.30	-24.30	0.00	39.83	54.00	-14.17	-	-	-	-	129	100	H
			* 8.03457	39.46	PK-U	36.30	-24.30	0.00	51.46	-	-	74.00	-22.54	-	-	193	124	V
			* 8.03453	29.60	ADR	36.30	-24.30	0.00	41.60	54.00	-12.40	-	-	-	-	193	124	V
			17.248	31.68	PK-U	42.10	-17.10	0.00	56.68	-	-	-	-	68.20	-11.52	0	100	H
			17.230	32.24	PK-U	42.10	-17.10	0.00	57.24	-	-	-	-	68.20	-10.96	0	100	V

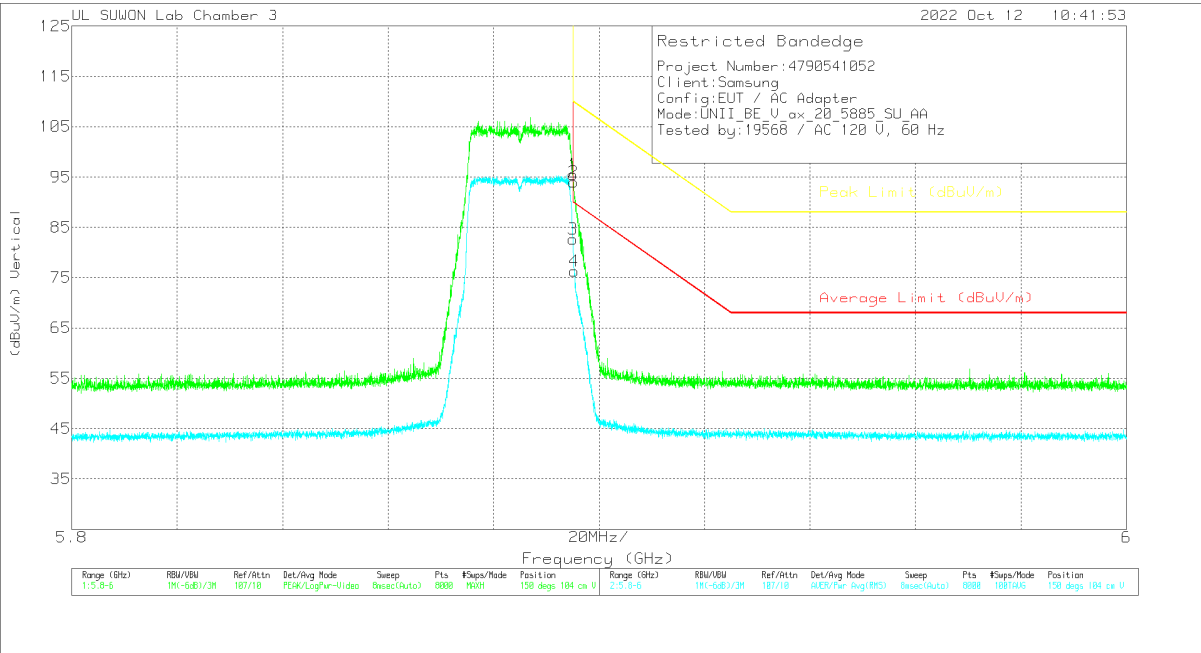
Note1. PK-U - U-NII: Maximum Peak / ADR - U-NII AD primary method, RMS average

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

11.5. TX ABOVE 1GHz 2Tx MODE IN THE 5.9 GHz BAND

BANDEDGE (WORST CASE: 802.11ax HE20 / 5885 MHz)

VERTICAL 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)	Azimuth (Degs)	Height (m)	Polarity
1	5.89501	78.61	PK	36	-19.3	0	95.51	-	-	109.99	-14.48	150	104	V
2	5.89514	77.26	PK	36	-19.3	0	93.95	-	-	109.9	-15.94	150	104	V
3	5.89501	65.95	RMS	36	-19.3	0	82.65	89.99	-7.34	-	-	150	104	V
4	5.89531	59.63	RMS	36	-19.3	0	76.33	89.77	-13.44	-	-	150	104	V

PK - Peak detector
RMS - RMS detection

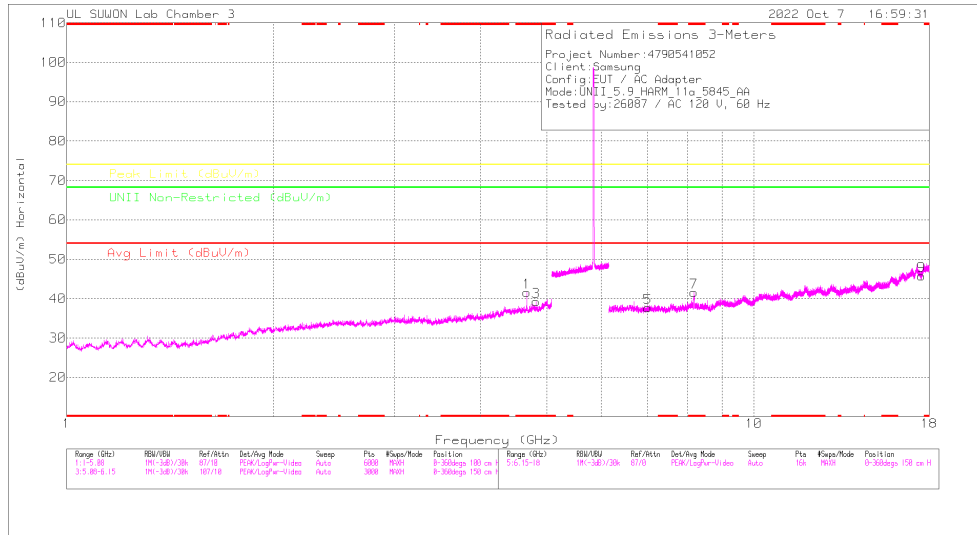
BANDEDGE TEST DATA

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	5885	MIMO	5.895	69.57	Pk	36.00	-19.30	0.00	86.27	-	-	109.99	-23.72	233	266	H
			5.895	71.92	Pk	36.00	-19.30	0.00	88.62	-	-	109.86	-21.24	233	266	H
			5.895	56.53	RMS	36.00	-19.30	0.15	73.38	89.99	-16.61	-	-	233	266	H
			5.895	56.38	RMS	36.00	-19.30	0.15	73.23	89.95	-16.72	-	-	233	266	H
			5.895	73.49	Pk	36.00	-19.30	0.00	90.19	-	-	109.99	-19.80	150	124	V
			5.895	74.55	Pk	36.00	-19.30	0.00	91.25	-	-	109.88	-18.63	150	124	V
			5.895	58.95	RMS	36.00	-19.30	0.15	75.80	89.99	-14.19	-	-	150	124	V
			5.895	60.00	RMS	36.00	-19.30	0.15	76.85	89.86	-13.01	-	-	150	124	V
802.11n (HT20)	5885	MIMO	5.895	69.57	Pk	36.00	-19.30	0.00	86.27	-	-	109.99	-23.72	235	391	H
			5.895	70.17	Pk	36.00	-19.30	0.00	86.87	-	-	109.73	-22.86	235	391	H
			5.895	55.92	RMS	36.00	-19.30	0.17	72.79	89.99	-17.20	-	-	235	391	H
			5.895	57.20	RMS	36.00	-19.30	0.17	74.07	89.94	-15.87	-	-	235	391	H
			5.895	75.05	Pk	36.00	-19.30	0.00	91.75	-	-	109.99	-18.24	214	119	V
			5.895	75.11	Pk	36.00	-19.30	0.00	91.81	-	-	109.97	-18.16	214	119	V
			5.895	60.98	RMS	36.00	-19.30	0.17	77.85	89.99	-12.14	-	-	214	119	V
			5.895	61.85	RMS	36.00	-19.30	0.17	78.72	89.94	-11.22	-	-	214	119	V
802.11n (HT40)	5875	MIMO	5.895	64.63	Pk	36.00	-19.30	0.00	81.33	-	-	109.99	-28.66	226	100	H
			5.895	65.04	Pk	36.00	-19.30	0.00	81.74	-	-	109.97	-28.23	226	100	H
			5.895	49.75	RMS	36.00	-19.30	0.17	66.62	89.99	-23.37	-	-	226	100	H
			5.995	27.76	RMS	36.00	-19.20	0.17	44.73	68.00	-23.27	-	-	226	100	H
			5.895	66.52	Pk	36.00	-19.30	0.00	83.22	-	-	109.99	-26.77	150	114	V
			5.895	67.08	Pk	36.00	-19.30	0.00	83.78	-	-	109.97	-26.19	150	114	V
			5.895	52.02	RMS	36.00	-19.30	0.17	68.89	89.99	-21.10	-	-	150	114	V
			5.895	52.10	RMS	36.00	-19.30	0.17	68.97	89.92	-20.95	-	-	150	114	V
802.11ac (VHT80)	5855	MIMO	5.895	59.49	Pk	36.00	-19.30	0.00	76.19	-	-	109.99	-33.80	241	371	H
			5.982	39.85	Pk	36.00	-19.20	0.00	56.65	-	-	88.00	-31.35	241	371	H
			5.895	44.76	Pk	36.00	-19.30	0.27	61.73	89.99	-28.26	-	-	241	371	H
			5.938	28.46	RMS	36.00	-19.30	0.27	45.43	68.00	-22.57	-	-	241	371	H
			5.895	64.13	Pk	36.00	-19.30	0.00	80.83	-	-	109.99	-29.16	217	101	V
			5.896	64.59	Pk	36.00	-19.30	0.00	81.29	-	-	109.46	-28.17	217	101	V
			5.895	46.46	RMS	36.00	-19.30	0.27	63.43	89.99	-26.56	-	-	217	100	V
			5.925	28.94	RMS	36.00	-19.30	0.27	45.91	68.00	-22.09	-	-	217	100	V
802.11ac (VHT160)	5815 Upper	MIMO	5.895	61.36	Pk	36.00	-19.30	0.00	78.06	-	-	109.99	-31.93	239	258	H
			5.929	46.42	Pk	36.00	-19.30	0.00	63.12	-	-	88.00	-24.88	239	258	H
			5.895	42.67	RMS	36.00	-19.30	0.32	59.69	89.99	-30.30	-	-	239	258	H
			5.949	30.97	RMS	36.00	-19.30	0.32	47.99	68.00	-20.01	-	-	239	258	H
			5.895	62.70	Pk	36.00	-19.30	0.00	79.40	-	-	109.99	-30.59	203	114	V
			5.932	46.17	Pk	36.00	-19.30	0.00	62.87	-	-	88.00	-25.13	203	114	V
			5.895	45.58	RMS	36.00	-19.30	0.32	62.60	89.99	-27.39	-	-	203	114	V
			5.932	31.24	RMS	36.00	-19.30	0.32	48.26	68.00	-19.74	-	-	203	114	V
802.11ax (HE20)	5885	MIMO	5.895	76.97	Pk	36.00	-19.30	0.00	93.67	-	-	109.99	-16.32	231	267	H
			5.895	78.53	Pk	36.00	-19.30	0.00	95.23	-	-	109.97	-14.74	231	267	H
			5.895	65.10	RMS	36.00	-19.30	0.00	81.80	89.99	-8.19	-	-	231	267	H
			5.895	62.32	RMS	36.00	-19.30	0.00	79.02	89.88	-10.86	-	-	231	267	H
			5.895	78.81	Pk	36.00	-19.30	0.00	95.51	-	-	109.99	-14.48	150	104	V
			5.895	77.26	Pk	36.00	-19.30	0.00	93.96	-	-	109.90	-15.94	150	104	V
			5.895	65.95	RMS	36.00	-19.30	0.00	82.55	89.99	-7.34	-	-	150	104	V
			5.895	59.63	RMS	36.00	-19.30	0.00	76.33	89.77	-13.44	-	-	150	104	V
802.11ax (HE40)	5875	MIMO	5.895	70.09	Pk	36.00	-19.30	0.00	86.79	-	-	109.99	-23.20	229	253	H
			5.895	68.15	Pk	36.00	-19.30	0.00	84.85	-	-	109.77	-24.92	229	253	H
			5.895	47.05	RMS	36.00	-19.30	0.00	63.75	89.99	-26.24	-	-	229	253	H
			5.980	28.08	RMS	36.00	-19.20	0.00	44.88	68.00	-23.12	-	-	229	253	H
			5.895	70.45	Pk	36.00	-19.30	0.00	87.15	-	-	109.99	-22.84	154	101	V
			5.895	67.75	Pk	36.00	-19.30	0.00	84.45	-	-	109.88	-25.43	154	101	V
			5.895	50.35	RMS	36.00	-19.30	0.00	67.05	89.99	-22.94	-	-	154	101	V
			5.895	50.15	RMS	36.00	-19.30	0.00	66.85	89.84	-22.99	-	-	154	101	V
802.11ax (HE80)	5855	MIMO	5.895	64.44	Pk	36.00	-19.30	0.00	81.14	-	-	109.99	-28.85	220	190	H
			5.895	66.48	Pk	36.00	-19.30	0.00	83.18	-	-	109.97	-26.79	220	190	H
			5.895	44.60	RMS	36.00	-19.30	0.00	61.30	89.99	-28.69	-	-	220	190	H
			5.943	28.18	RMS	36.00	-19.30	0.00	44.88	68.00	-23.12	-	-	220	190	H
			5.895	68.17	Pk	36.00	-19.30	0.00	84.87	-	-	109.99	-25.12	162	100	V
			5.895	68.33	Pk	36.00	-19.30	0.00	85.03	-	-	109.97	-24.94	162	100	V
			5.895	46.06	RMS	36.00	-19.30	0.00	62.76	89.99	-27.23	-	-	162	100	V
			5.927	28.48	RMS	36.00	-19.30	0.00	45.18	68.00	-22.82	-	-	162	100	V
802.11ax (HE160)	5815 Upper	MIMO	5.895	60.00	Pk	36.00	-19.30	0.00	76.70	-	-	109.99	-33.29	245	263	H
			5.923	42.94	Pk	36.00	-19.30	0.00	59.64	-	-	89.24	-29.60	245	263	H
			5.895	38.38	RMS	36.00	-19.30	0.00	55.08	89.99	-34.91	-	-	245	263	H
			5.942	29.20	RMS	36.00	-19.30	0.00	45.90	68.00	-22.10	-	-	245	263	H
			5.895	61.04	Pk	36.00	-19.30	0.00	77.74	-	-	109.99	-32.25	161	110	V
			5.926	42.70	Pk	36.00	-19.30	0.00	59.40	-	-	88.00	-28.60	161	110	V
			5.895	44.32	RMS	36.00	-19.30	0.00	61.02	89.99	-28.97	-	-	161	110	V
			5.943	29.59	RMS	36.00	-19.30	0.00	46.29	68.00	-21.71	-	-	161	110	V

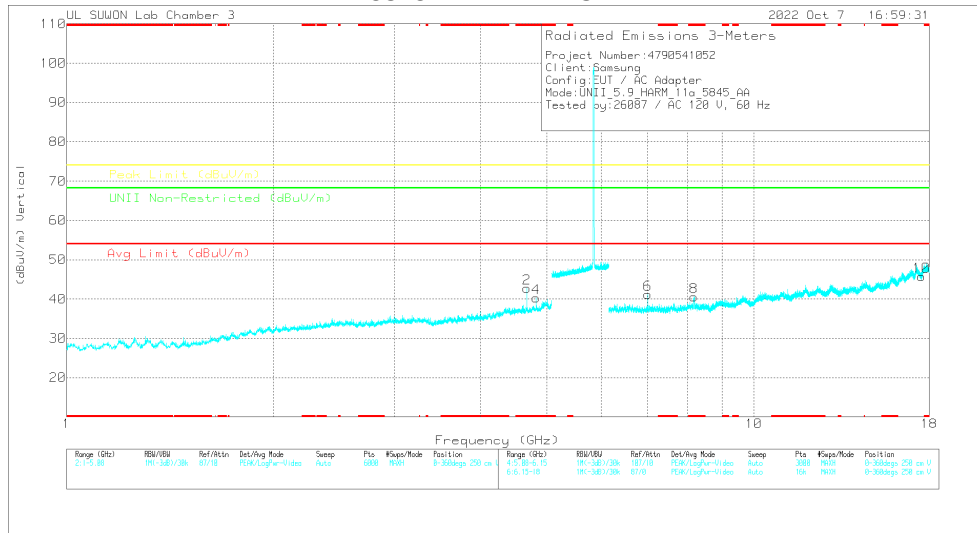
Note1. PK: Maximum Peak / ADR - U-NII AD primary method, RMS average

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

HARMONICS AND SPURIOUS EMISSIONS(WORST CASE: 802.11a / 5845 MHz)
5845 MHz HORIZONTAL



5845 MHz 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.

5845 MHz DATA

Radiated Emissions

Frequency (GHz)	Meas. Reading (dBuV)	Det	3117_00218957	5GHz_LF5dB	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
* 4.67592	46.37	PK-U	34.5	-30.4	0	50.47	-	-	74	-23.53	-	-	226	261	H
* 4.67598	37.84	ADR	34.5	-30.4	15	42.09	54	-11.91	-	-	-	-	226	261	H
* 4.67574	46.49	PK-U	34.5	-30.4	0	50.59	-	-	74	-23.41	-	-	191	278	V
* 4.67584	37.24	ADR	34.5	-30.4	15	41.49	54	-12.51	-	-	-	-	191	278	V
* 4.8238	44.31	PK-U	34.6	-29.9	0	49.01	-	-	74	-24.99	-	-	221	101	H
* 4.8241	34.54	ADR	34.6	-29.9	15	39.39	54	-14.61	-	-	-	-	221	101	H
* 4.8241	44.91	PK-U	34.6	-29.9	0	49.61	-	-	74	-24.39	-	-	92	100	V
* 4.82388	35.13	ADR	34.6	-29.9	15	39.98	54	-14.02	-	-	-	-	92	100	V
Frequency (GHz)	Meas. Reading (dBuV)	Det	3117_00218957	5GHz_HF5dB	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
7.00638	38.15	PK-U	36.2	-25.9	0	48.45	-	-	-	-	68.2	-19.75	360	100	H
7.01386	38.85	PK-U	36.2	-25.9	0	49.15	-	-	-	-	68.2	-19.05	210	103	V
* 8.18981	26.09	ADR	36.2	-23.3	15	39.14	54	-14.86	-	-	-	-	142	100	H
* 8.17872	37.3	PK-U	36.2	-23.4	0	50.1	-	-	74	-23.9	-	-	142	100	H
* 8.17632	28.56	ADR	36.2	-23.4	15	41.51	54	-12.49	-	-	-	-	209	103	V
* 8.17897	38.51	PK-U	36.2	-23.4	0	51.31	-	-	74	-22.69	-	-	209	103	V
17.54549	31.52	PK-U	42	-17.1	0	56.42	-	-	-	-	68.2	-11.78	0	100	H
17.53202	31.22	PK-U	42	-17	0	56.22	-	-	-	-	68.2	-11.98	0	100	V

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

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	5845	MIMO	* 4.67592	46.37	PK-U	34.50	-30.40	0.00	50.47	-	-	74.00	-23.53	-	-	226	261	H
			* 4.67598	37.84	ADR	34.50	-30.40	0.15	42.09	54.00	-11.91	-	-	-	-	226	261	H
			* 4.67574	46.49	PK-U	34.50	-30.40	0.00	50.59	-	-	74.00	-23.41	-	-	191	278	V
			* 4.67584	37.24	ADR	34.50	-30.40	0.15	41.49	54.00	-12.51	-	-	-	-	191	278	V
			* 4.8238	44.31	PK-U	34.60	-29.90	0.00	49.01	-	-	74.00	-24.99	-	-	221	101	H
			* 4.8241	34.54	ADR	34.60	-29.90	0.15	39.39	54.00	-14.61	-	-	-	-	221	101	H
			* 4.8241	44.91	PK-U	34.60	-29.90	0.00	49.61	-	-	74.00	-24.39	-	-	92	100	V
			* 4.82388	35.13	ADR	34.60	-29.90	0.15	39.98	54.00	-14.02	-	-	-	-	92	100	V
			7.006	38.15	PK-U	36.20	-25.90	0.00	48.45	-	-	-	-	68.20	-19.75	360	100	H
			7.014	38.85	PK-U	36.20	-25.90	0.00	49.15	-	-	-	-	68.20	-19.05	210	103	V
			* 8.18981	26.09	ADR	36.20	-23.30	0.15	39.14	54.00	-14.86	-	-	-	-	142	100	H
			* 8.17872	37.30	PK-U	36.20	-23.40	0.00	50.10	-	-	74.00	-23.90	-	-	142	100	H
			* 8.17632	28.56	ADR	36.20	-23.40	0.15	41.51	54.00	-12.49	-	-	-	-	209	103	V
			* 8.17897	38.51	PK-U	36.20	-23.40	0.00	51.31	-	-	74.00	-22.69	-	-	209	103	V
			17.545	31.52	PK-U	42.00	-17.10	0.00	56.42	-	-	-	-	68.20	-11.78	0	100	H
			17.532	31.22	PK-U	42.00	-17.00	0.00	56.22	-	-	-	-	68.20	-11.98	0	100	V
	5865	MIMO	* 4.69179	45.56	PK-U	34.50	-30.50	0.00	49.56	-	-	74.00	-24.44	-	-	235	310	H
			* 4.69231	44.02	PK-U	34.50	-30.50	0.00	48.02	-	-	74.00	-25.98	-	-	195	343	V
			* 4.69209	36.36	ADR	34.50	-30.50	0.15	40.51	54.00	-13.49	-	-	-	-	235	310	H
			* 4.69203	34.76	ADR	34.50	-30.50	0.15	38.91	54.00	-15.09	-	-	-	-	195	343	V
			* 8.21766	25.81	ADR	36.20	-23.60	0.15	38.56	54.00	-15.44	-	-	-	-	252	115	H
			* 8.20926	37.05	PK-U	36.20	-23.50	0.00	49.75	-	-	74.00	-24.25	-	-	252	115	H
			* 8.20934	26.76	ADR	36.20	-23.60	0.15	39.51	54.00	-14.49	-	-	-	-	207	101	V
			* 8.21501	37.66	PK-U	36.20	-23.60	0.00	50.26	-	-	74.00	-23.74	-	-	207	101	V
			* 11.72868	34.99	PK-U	38.90	-21.60	0.00	52.29	-	-	74.00	-21.71	-	-	0	100	H
			* 11.73153	34.69	PK-U	38.90	-21.60	0.00	51.99	-	-	74.00	-22.01	-	-	0	100	V
			17.605	31.11	PK-U	42.00	-16.50	0.00	56.61	-	-	-	-	68.20	-11.59	0	100	H
			17.605	31.31	PK-U	42.00	-16.50	0.00	56.81	-	-	-	-	68.20	-11.39	0	100	V
	5885	MIMO	* 4.70812	45.03	PK-U	34.50	-30.30	0.00	49.23	-	-	74.00	-24.77	-	-	226	274	H
			* 4.70802	36.20	ADR	34.50	-30.30	0.15	40.55	54.00	-13.45	-	-	-	-	226	274	H
			* 4.70778	44.08	PK-U	34.50	-30.30	0.00	48.28	-	-	74.00	-25.72	-	-	129	103	V
			* 4.70792	34.49	ADR	34.50	-30.30	0.15	38.84	54.00	-15.16	-	-	-	-	129	103	V
			* 8.24542	25.97	ADR	36.20	-23.60	0.15	38.72	54.00	-15.28	-	-	-	-	146	100	H
			* 8.23303	37.51	PK-U	36.20	-23.70	0.00	50.01	-	-	74.00	-23.99	-	-	146	100	H
			* 8.23176	27.99	ADR	36.20	-23.70	0.15	40.64	54.00	-13.36	-	-	-	-	208	100	V
			* 8.24185	38.77	PK-U	36.20	-23.70	0.00	51.27	-	-	74.00	-22.73	-	-	208	100	V
			* 11.691	34.80	PK-U	38.90	-21.50	0.00	52.20	-	-	74.00	-21.80	-	-	0	100	H
			* 11.70506	34.16	PK-U	38.90	-21.50	0.00	51.56	-	-	74.00	-22.44	-	-	360	100	V
			17.653	30.67	PK-U	41.90	-15.70	0.00	56.87	-	-	-	-	68.20	-11.33	0	100	H
			17.660	31.19	PK-U	41.90	-15.50	0.00	57.59	-	-	-	-	68.20	-10.61	360	100	V
	802.11ax (HE20) 8RU Spot-check	MIMO	7.014	38.86	PK-U	36.20	-25.90	0.00	49.16	-	-	-	-	68.20	-19.04	249	382	H
			7.014	39.90	PK-U	36.20	-25.90	0.00	50.20	-	-	-	-	68.20	-18.00	183	104	V
			* 11.68913	34.65	PK-U	38.90	-21.50	0.00	52.05	-	-	74.00	-21.95	-	-	0	100	H
			* 11.6879	35.50	PK-U	38.90	-21.50	0.00	52.90	-	-	74.00	-21.10	-	-	0	100	V
			17.544	31.15	PK-U	42.00	-17.00	0.00	56.15	-	-	-	-	68.20	-12.05	0	100	H
			17.541	31.79	PK-U	42.00	-17.00	0.00	56.79	-	-	-	-	68.20	-11.41	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

11.6. Spurious Emissions for Simultaneous Transmission

11.6.1. Worst test case RSDB condition

Case 1	2.4 GHz WLAN ANT1 + ANT2	5GHz WLAN ANT1 + ANT2
Mode	802.11b	802.11a
Channel	1	40
Frequency[MHz]	2412	5200
Tone	-	-
RU	-	-
Data Rate	1 Mbps	MCS 0
Axis (Worst)	Z	

NOTE

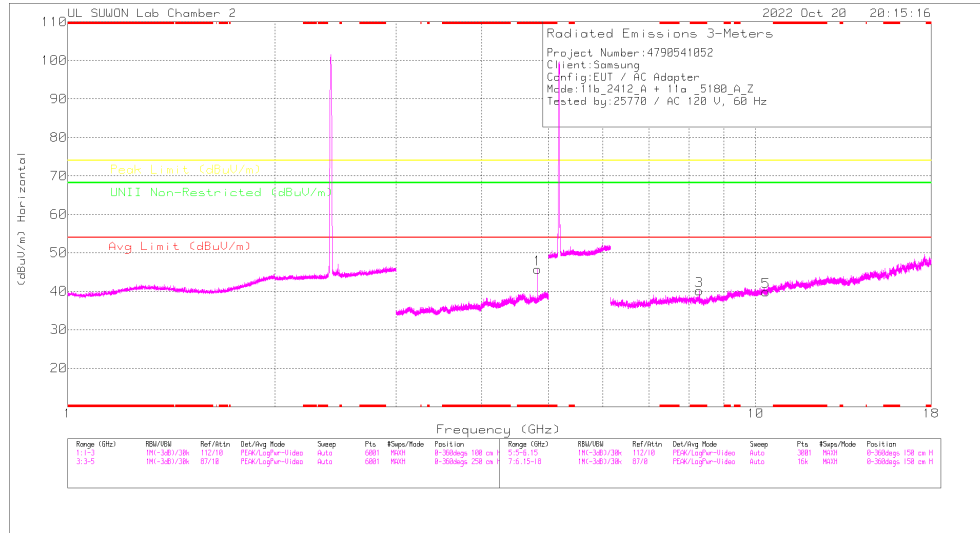
The lowest margin condition among the channels and modes were selected for test. Low, mid, and high channels of 2.4GH WLAN were tested, and the worst case configuration & data were listed in the test report.

11.6.2. Test Results

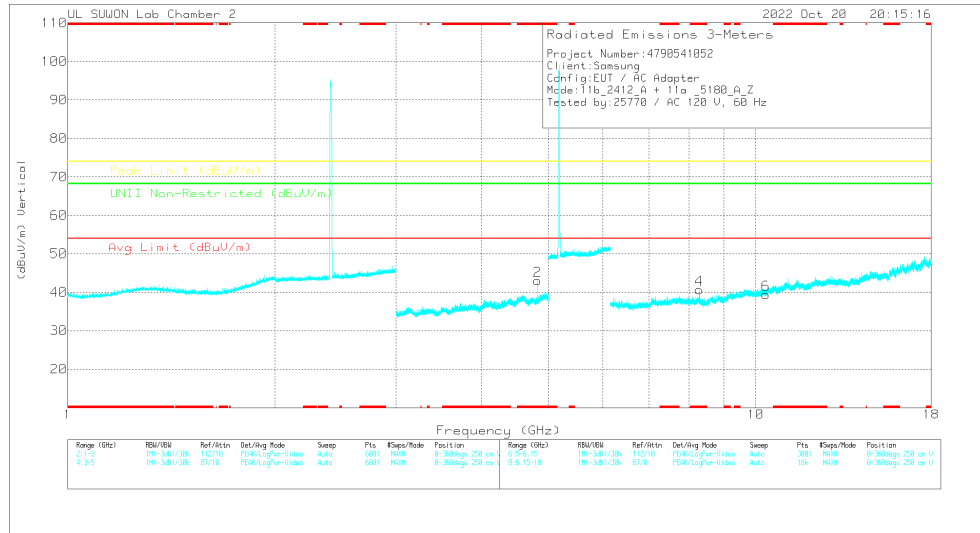
Spurious emission for Simultaneous Transmission

Case1. – Z axis

HORIZONTAL



VERTICAL



Radiated Emissions

Frequency (GHz)	Meas Reading (dBuV)	Det	3117_00160724	SGHz_LFdB	DTS Noise(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)	Acctm (deg)	Height (cm)	Polarity
* 4.82408	45.83	PK2	34	-27.5	.6	0	52.93	-	-	74	-21.07	-	-	152	103	H
* 4.82396	38.6	MAV1	34	-27.5	.6	15	46.05	54	-7.95	-	-	-	-	152	103	H
* 4.82418	44.54	PK2	34	-27.5	.6	0	51.64	-	-	74	-22.36	-	-	231	390	V
* 4.82396	36.53	MAV1	34	-27.5	.6	15	43.88	54	-10.12	-	-	-	-	231	390	V

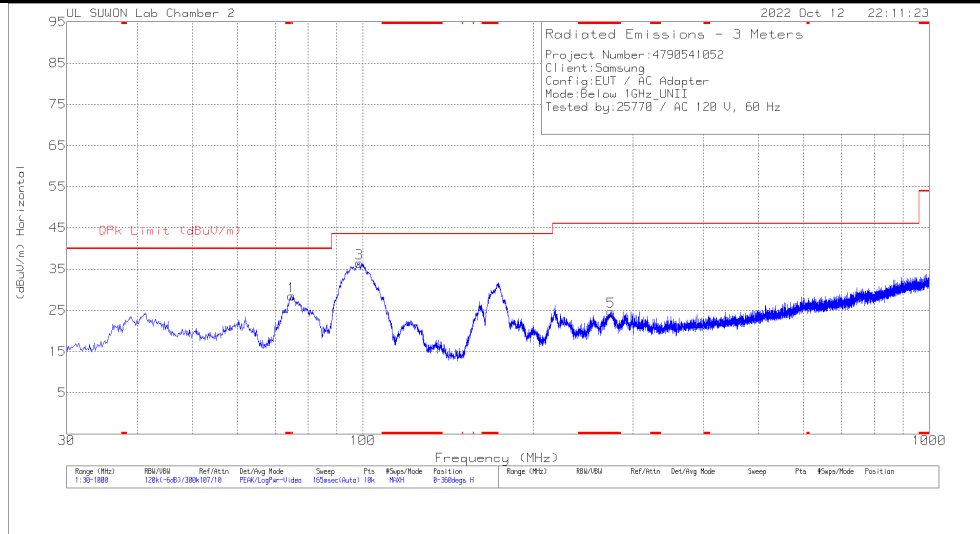
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK2 - KDB558074 Method: Maximum Peak

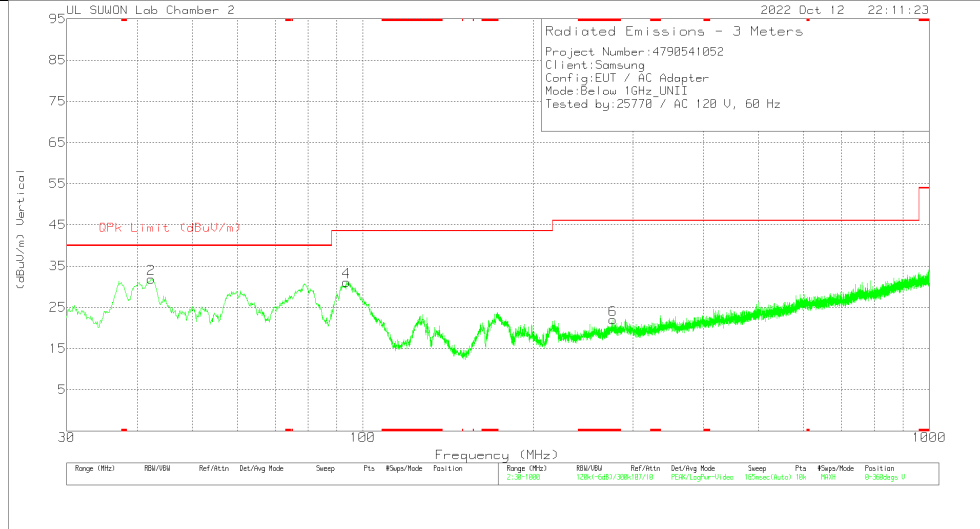
MAV1 - KDB558074 Option 1 Maximum RMS Average

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	* 74.814	45.72	Pk	13.7	-30.9	0	28.52	40	-11.48	0-360	100	H
2	42.319	43.91	Pk	19.4	-31.4	0	31.91	40	-8.09	0-360	100	V
3	98.482	49.81	Pk	17.2	-30.6	0	36.41	43.52	-7.11	0-360	200	H
4	93.632	45.36	Pk	16.4	-30.6	0	31.16	43.52	-12.36	0-360	100	V
5	* 274.246	35.43	Pk	18.5	-29.2	0	24.73	46.02	-21.29	0-360	100	H
6	* 276.477	32.58	Pk	18.6	-29.2	0	21.98	46.02	-24.04	0-360	100	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)

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.

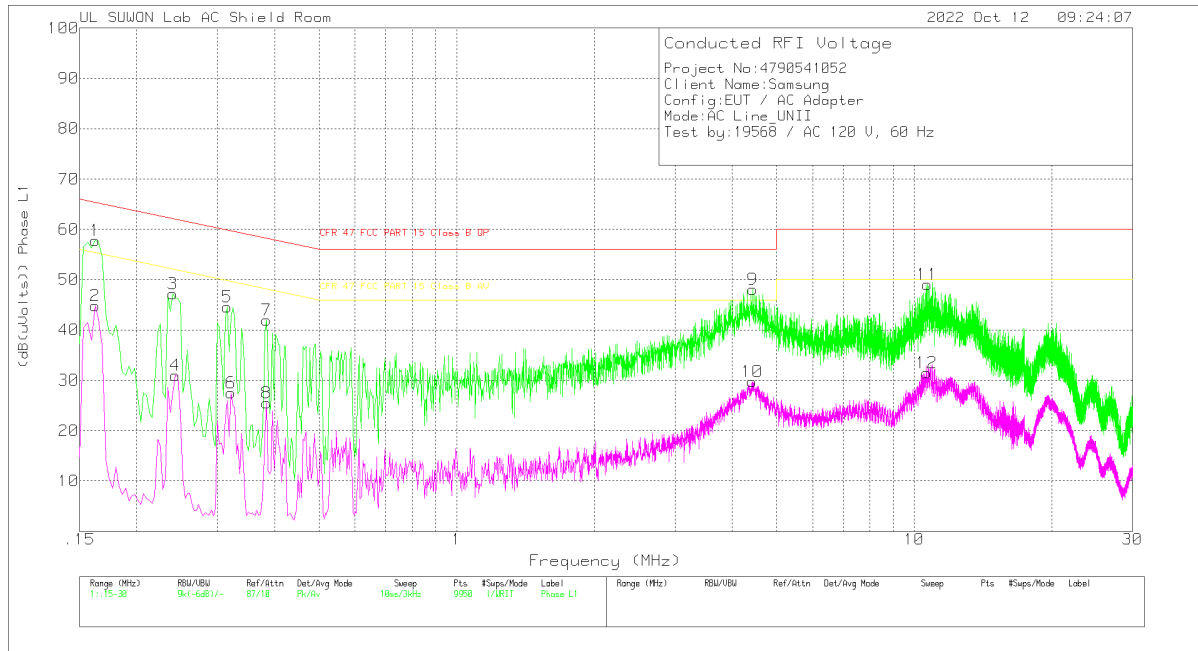
The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

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]	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	.162	47.76	Pk	9.9	.1	57.76	65.36	-7.6	-	-
2	.162	34.82	Av	9.9	.1	44.82	-	-	55.36	-10.54
3	.24	37.31	Pk	9.7	.2	47.21	62.1	-14.89	-	-
4	.243	21.19	Av	9.6	.2	30.99	-	-	51.99	-21
5	.315	34.72	Pk	9.7	.2	44.62	59.84	-15.22	-	-
6	.321	17.64	Av	9.7	.2	27.54	-	-	49.68	-22.14
7	.384	31.98	Pk	9.8	.2	41.98	58.19	-16.21	-	-
8	.384	15.55	Av	9.8	.2	25.55	-	-	48.19	-22.64
9	4.443	38.1	Pk	9.7	.3	48.1	56	-7.9	-	-
10	4.425	19.73	Av	9.7	.3	29.73	-	-	46	-16.27
11	10.689	38.75	Pk	9.9	.4	49.05	60	-10.95	-	-
12	10.641	21.17	Av	9.9	.4	31.47	-	-	50	-18.53

Pk - Peak detector

Av - Average detection

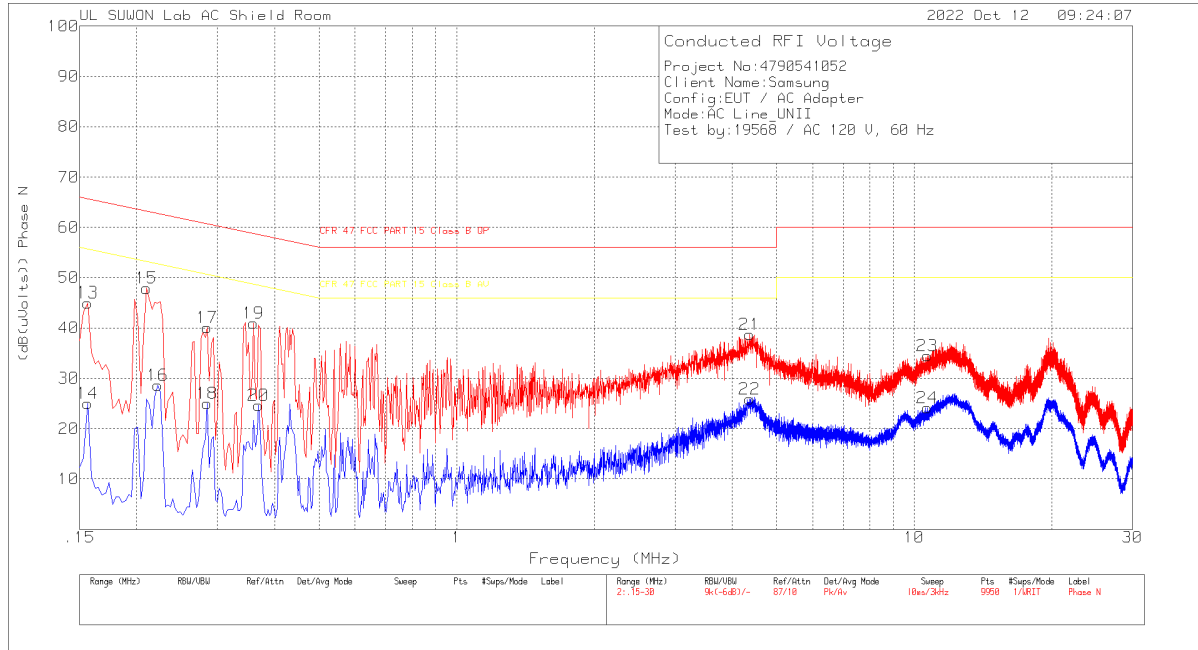
Quasi-Peak Emissions

Range 1: Phase L1 15 - 30MHz

Frequency (MHz)	Meter Reading (dBuV)	Det	101836_With 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)
.16125	22.72	Qp	9.9	.1	32.72	65.4	-32.68	-	-
4.44315	26.73	Qp	9.7	.3	36.73	56	-19.27	-	-

Qp - Quasi-Peak detector

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	.156	35.11	Pk	9.8	.1	45.01	65.67	-20.66	-	-
14	.156	15.07	Av	9.8	.1	24.97	-	-	55.67	-30.7
15	.21	37.88	Pk	9.8	.2	47.88	63.21	-15.33	-	-
16	.222	18.74	Av	9.7	.2	28.64	-	-	52.74	-24.1
17	.285	30.19	Pk	9.7	.2	40.09	60.67	-20.58	-	-
18	.285	15.09	Av	9.7	.2	24.99	-	-	50.67	-25.68
19	.36	30.94	Pk	9.8	.2	40.94	58.73	-17.79	-	-
20	.369	14.63	Av	9.8	.2	24.63	-	-	48.52	-23.89
21	4.374	28.7	Pk	9.7	.3	38.7	56	-17.3	-	-
22	4.374	15.88	Av	9.7	.3	25.88	-	-	46	-20.12
23	10.695	24.18	Pk	9.9	.4	34.48	60	-25.52	-	-
24	10.692	13.89	Av	9.9	.4	24.19	-	-	50	-25.81

Pk - Peak detector

Av - Average detection

14. DYNAMIC FREQUENCY SELECTION

14.1. OVERVIEW

14.1.1. LIMITS

FCC

§15.407 (h), FCC KDB 905462 D02 “COMPLIANCE MEASUREMENT PROCEDURES FOR UNLICENSED-NATIONAL INFORMATION INFRASTRUCTURE DEVICES OPERATING IN THE 5250-5350 MHz AND 5470-5725 MHz BANDS INCORPORATING DYNAMIC FREQUENCY SELECTION” and KDB 905462 D03 “U-NII CLIENT DEVICES WITHOUT RADAR DETECTION CAPABILITY”.

Table 1: Applicability of DFS requirements prior to use of a channel

Requirement	Operational Mode		
	Master	Client (without radar detection)	Client (with radar detection)
Non-Occupancy Period	Yes	Not required	Yes
DFS Detection Threshold	Yes	Not required	Yes
Channel Availability Check Time	Yes	Not required	Not required
U-NII Detection Bandwidth	Yes	Not required	Yes

Table 2: Applicability of DFS requirements during normal operation

Requirement	Operational Mode		
	Master	Client (without DFS)	Client (with DFS)
DFS Detection Threshold	Yes	Not required	Yes
Channel Closing Transmission Time	Yes	Yes	Yes
Channel Move Time	Yes	Yes	Yes
U-NII Detection Bandwidth	Yes	Not required	Yes

Additional requirements for devices with multiple bandwidth modes	Master Device or Client with Radar DFS	Client (without DFS)
U-NII Detection Bandwidth and Statistical Performance Check	All BW modes must be tested	Not required
Channel Move Time and Channel Closing Transmission Time	Test using widest BW mode available	Test using the widest BW mode available for the link
All other tests	Any single BW mode	Not required

Note: Frequencies selected for statistical performance check (Section 7.8.4) should include several frequencies within the radar detection bandwidth and frequencies near the edge of the radar detection bandwidth. For 802.11 devices it is suggested to select frequencies in all 20 MHz channel blocks and a null frequency between the bonded 20 MHz channel blocks.

Table 3: Interference Threshold values, Master or Client incorporating In-Service Monitoring

Maximum Transmit Power	Value (see notes)
E.I.R.P. $\geq$ 200 mill watt	-64 dBm
E.I.R.P. < 200 mill watt and power spectral density < 10 dBm/MHz	-62 dBm
E.I.R.P. < 200 mill watt that do not meet power spectral density requirement	-64 dBm
Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response. Note 3: E.I.R.P. is based on the highest antenna gain. For MIMO devices refer to KDB publication 662911 D01.	

Table 4: DFS Response requirement values

Parameter	Value
<i>Non-occupancy period</i>	30 minutes
<i>Channel Availability Check Time</i>	60 seconds
<i>Channel Move Time</i>	10 seconds (See Note 1)
<i>Channel Closing Transmission Time</i>	200 milliseconds + approx. 60 milliseconds over remaining 10 second period. (See Notes 1 and 2)
<i>U-NII Detection Bandwidth</i>	Minimum 100% of the U- NII 99% transmission power bandwidth. (See Note 3)
Note 1: <i>Channel Move Time</i> and the <i>Channel Closing Transmission Time</i> should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst. Note 2: The <i>Channel Closing Transmission Time</i> is comprised of 200 milliseconds starting at the beginning of the <i>Channel Move Time</i> plus any additional intermittent control signals required to facilitate a <i>Channel</i> move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions. Note 3: During the <i>U-NII Detection Bandwidth</i> detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.	

Table 5 – Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (usec)	PRI (usec)	Pulses	Minimum Percentage of Successful Detection	Minimum Trials
0	1	1428	18	See Note 1	See Note 1
1	1	Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in table 5a	Roundup: $\{(1/360) \times (19 \times 10^6 \text{ PRI}_{\text{usec}})\}$	60%	30
		Test B: 15 unique PRI values randomly selected within the range of 518-3066 usec. With a minimum increment of 1 usec, excluding PRI values selected in Test A			
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120
Note 1: Short Pulse Radar Type 0 should be used for the <i>Detection Bandwidth</i> test, <i>Channel Move Time</i> , and <i>Channel Closing Time</i> tests.					

Table 6 – Long Pulse Radar Test Signal

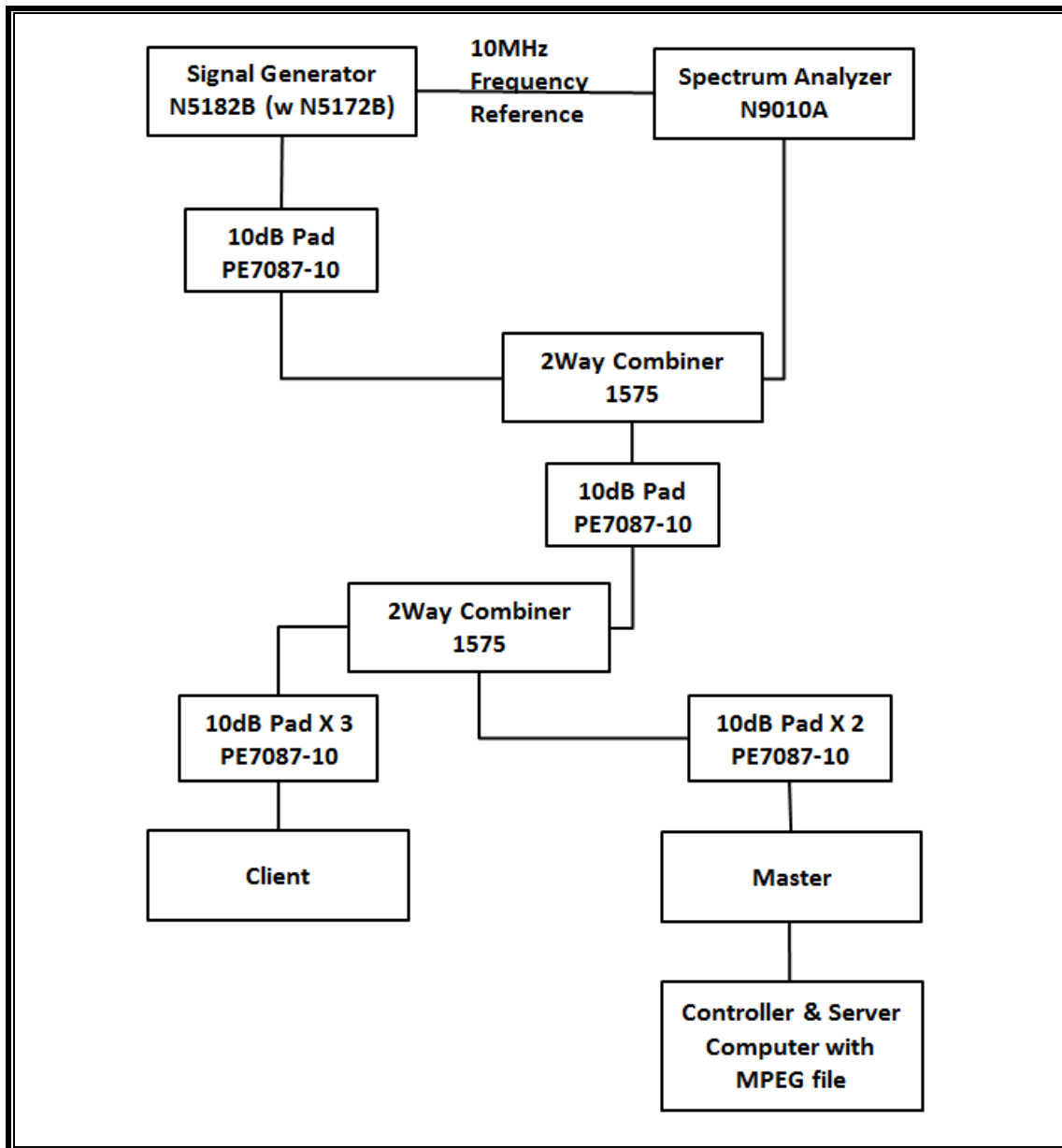
Radar Waveform Type	Pulse Width (μsec)	Chirp Width (MHz)	PRI (μsec)	Pulses per Burst	Number of Bursts	Minimum Percentage of Successful Detection	Minimum Trials
5	50-100	5-20	1000-2000	1-3	8-20	80%	30

Table 7 – Frequency Hopping Radar Test Signal

Radar Waveform Type	Pulse Width (μsec)	PRI (μsec)	Pulses per Hop	Hopping Rate (kHz)	Hopping Sequence Length (msec)	Minimum Percentage of Successful Detection	Minimum Trials
6	1	333	9	0.333	300	70%	30

14.1.2. TEST AND MEASUREMENT SYSTEM

CONDUCTED METHOD SYSTEM BLOCK DIAGRAM



SYSTEM OVERVIEW

The short pulse and long pulse signal generating system utilizes the Keysite Signal Studio for Pulse Building as N5172B. The Vector Signal Generator has been validated by the NTIA. The hopping signal generating system utilizes the CCS simulated hopping method and system, which has been validated by the DoD, FCC and NTIA. The software selects waveform parameters from within the bounds of the signal type on a random basis using uniform distribution.

The short pulse types 1, 2, 3 and 4, and the long pulse type 5 parameters are randomized at run-time.

The hopping type 6 pulse parameters are fixed while the hopping sequence is based on the August 2005 NTIA Hopping Frequency List. The initial starting point randomized at run-time and each subsequent starting point is incremented by 475. Each frequency in the 100-length segment is compared to the boundaries of the EUT Detection Bandwidth and the software creates a hopping burst pattern in accordance with Section 7.4.1.3 Method #2 Simulated Frequency Hopping Radar Waveform Generating Subsystem of KDB 905462 D02. The frequency of the signal generator is incremented in 1 MHz steps from F_L to F_H for each successive trial. This incremental sequence is repeated as required to generate a minimum of 30 total trials and to maintain a uniform frequency distribution over the entire Detection Bandwidth.

The signal monitoring equipment consists of a spectrum analyzer. The aggregate ON time is calculated by multiplying the number of bins above a threshold during a particular observation period by the dwell time per bin, with the analyzer set to peak detection and max hold.

SYSTEM CALIBRATION

A 50-ohm load is connected in place of the spectrum analyzer, and the spectrum analyzer is connected to a horn antenna via a coaxial cable, with the reference level offset set to (horn antenna gain – coaxial cable loss). The signal generator is set to CW mode. The amplitude of the signal generator is adjusted to yield a level of –64 dBm as measured on the spectrum analyzer.

Without changing any of the instrument settings, the spectrum analyzer is reconnected to the Common port of the Spectrum Analyzer Combiner/Divider. The Reference Level Offset of the spectrum analyzer is adjusted so that the displayed amplitude of the signal is –64 dBm.

The spectrum analyzer displays the level of the signal generator as received at the antenna ports of the Master Device. The interference detection threshold may be varied from the calibrated value of –64 dBm and the spectrum analyzer will still indicate the level as received by the Master Device.

ADJUSTMENT OF DISPLAYED TRAFFIC LEVEL

A link is established between the Master and Slave and the distance between the units is adjusted as needed to provide a suitable received level at the Master and Slave devices. The video test file is streamed to generate WLAN traffic. The monitoring antenna is adjusted so that the WLAN traffic level, as displayed on the spectrum analyzer, is at lower amplitude than the radar detection threshold.

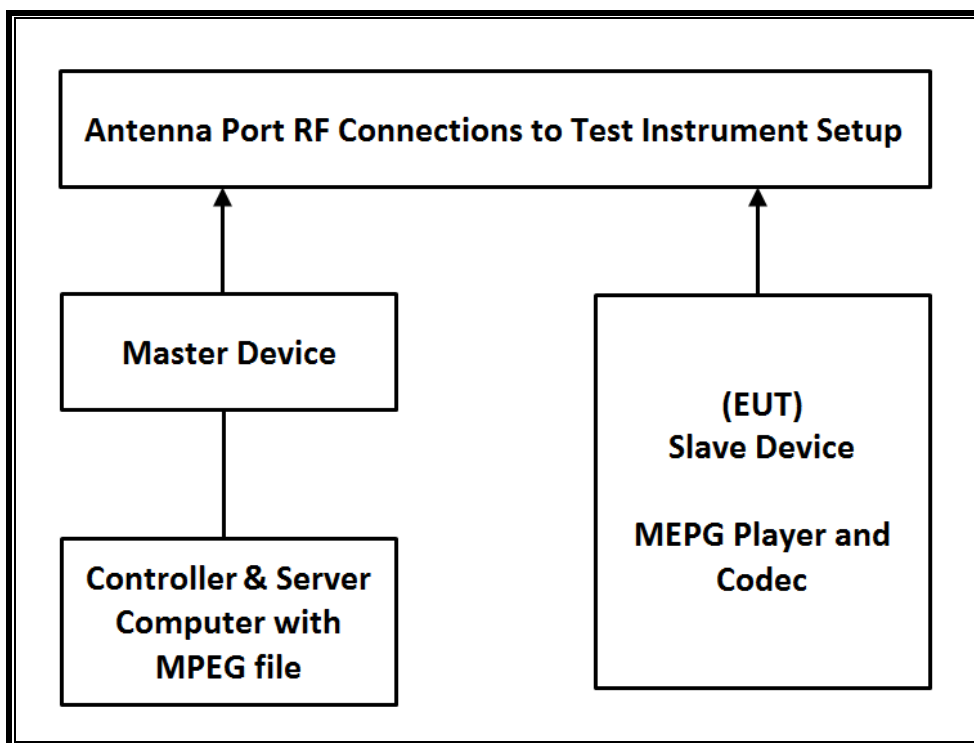
TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	S/N	Next Cal Due
Spectrum Analyzer, 7 GHz	Agilent / HP	N9010A	MY54200580	08-01-23
Vector Signal Generator, 6GHz	Agilent / HP	N5182B	MY53051241	08-01-23
Combiner	WEINSCHEL	WA1534	UL001	01-20-23
Combiner	WEINSCHEL	WA1534	UL003	01-11-23

14.1.3. SETUP OF EUT

CONDUCTED METHOD EUT TEST SETUP



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	Cisco	AIR-CAP3702E-A-K9	FTX182276QX	LDK102087
Notebook PC (Controller/Server)	HP	HP EliteDesk 800 G1 TWR	CZC4125J25	DoC

14.1.4. DESCRIPTION OF EUT

The EUT operates over the 5250-5350 MHz and 5470-5725 MHz ranges.

The EUT is a Slave Device without Radar Detection.

The highest power level of the widest bandwidth (802.11ac VHT80) within these bands is 15.85 dBm in the 5250-5350 MHz band and 15.20 dBm in the 5470-5725 MHz band.

The antenna assembly utilized two antenna.

Gain of ANT1 : -4.86 dBi for UNII 2A and -4.66 dBi for UNII 2C.

Gain of ANT2 : -4.22 dBi for UNII 2A and -3.88 dBi for UNII 2C.

The rated output power of the Master unit is > 23dBm (EIRP). Therefore the required interference threshold level is -64 dBm. After correction for procedural adjustments, the required conducted threshold at the antenna port is $-64 + 1 = -63$ dBm.

The calibrated radiated DFS Detection Threshold level is set to -64 dBm. The tested level is lower than the required level hence it provides a margin to the limit.

The EUT uses one transmitter/receiver chain connected to an antenna to perform radiated tests. WLAN traffic that meets or exceeds the minimum required loading was generated by transferring a data stream from the controller/server PC to the EUT using iPerf version 2.0.5 software package.

TPC is not required since the maximum EIRP is less than 500 mW (27 dBm).

The EUT utilizes the 802.11 architecture. Three nominal channel bandwidths are implemented: 20 MHz, 40 MHz and 80 MHz.

The software installed in the access point is 12.4(25d)JA1.

UNIFORM CHANNEL SPREADING

This requirement is not applicable to Slave radio devices.

CHANNEL PUNCTURING(802.11ax)

This EUT does not support channel puncturing.

OVERVIEW OF MASTER DEVICE WITH RESPECT TO §15.407 (h) REQUIREMENTS

The Master Device is a Cisco Access Point, FCC ID: LDK102087. The minimum antenna gain for the Master Device is 6 dBi.

The rated output power of the Master unit is > 23dBm (EIRP). Therefore the required interference threshold level is -64 dBm. After correction for procedural adjustments, the required radiated threshold at the antenna port is $-64 + 1 = -63$ dBm.

The calibrated radiated DFS Detection Threshold level is set to -64 dBm. The tested level is lower than the required level hence it provides a margin to the limit.

14.2. RESULTS FOR 80 MHz BANDWIDTH (UNII-2A BAND)

14.2.1. TEST CHANNEL

All tests were performed at a channel center frequency of 5290 MHz.

14.2.2. RADAR WAVEFORM AND TRAFFIC

RADAR WAVEFORM



14.2.3. OVERLAPPING CHANNEL TESTS

RESULTS

These tests are not applicable.

14.2.4. MOVE AND CLOSING TIME

REPORTING NOTES

The reference marker is set at the end of last radar pulse.

The delta marker is set at the end of the last WLAN transmission following the radar pulse. This delta is the channel move time.

The aggregate channel closing transmission time is calculated as follows:

Aggregate Transmission Time =
(Number of analyzer bins showing transmission) * (dwell time per bin)

The observation period over which the aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

RESULTS

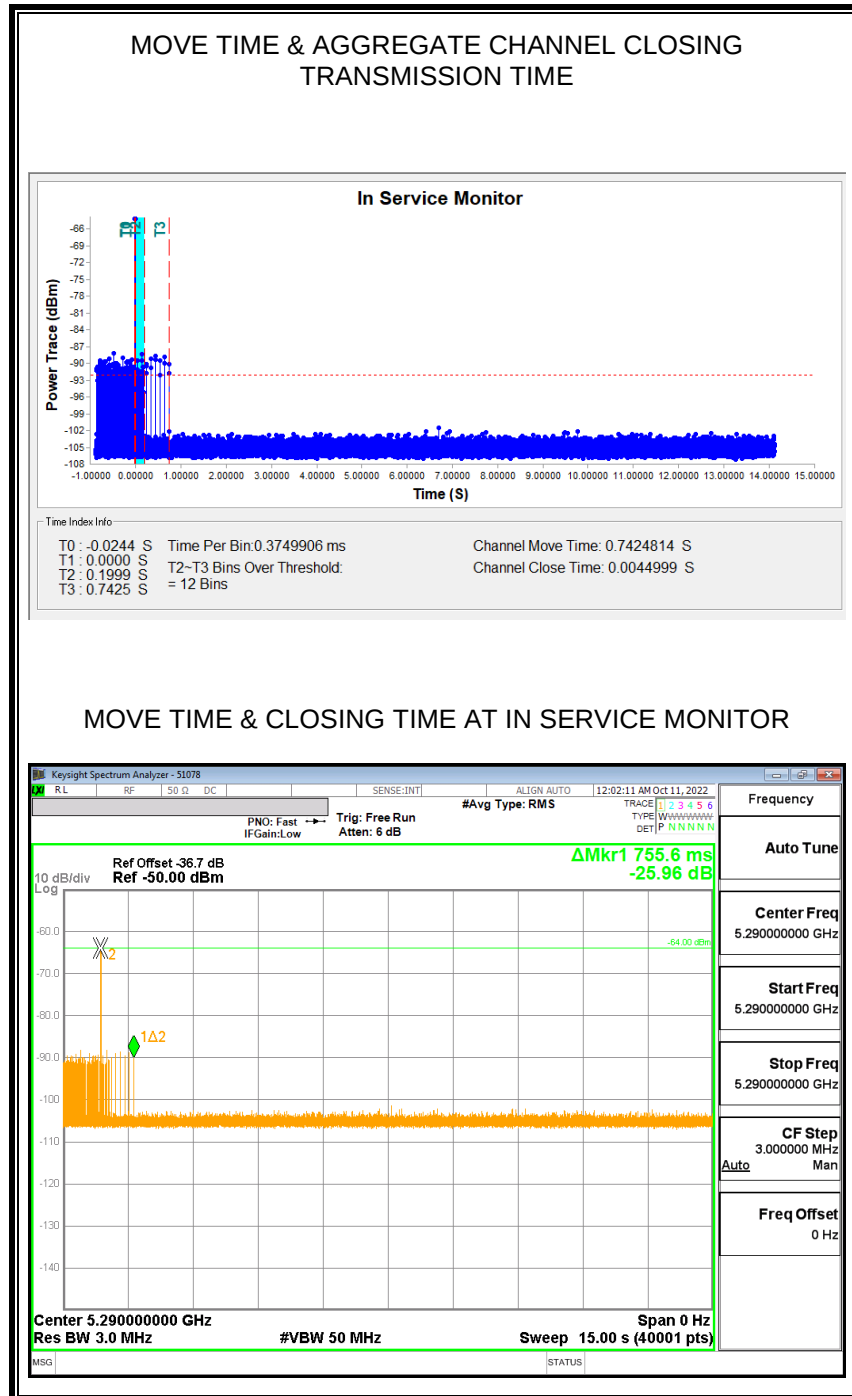
Channel Move Time (sec)	Limit (sec)
0.742	10

Aggregate Channel Closing Transmission Time (msec)	Limit (msec)
4.500	60

MOVE TIME & CHANNEL CLOSING TIME

AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

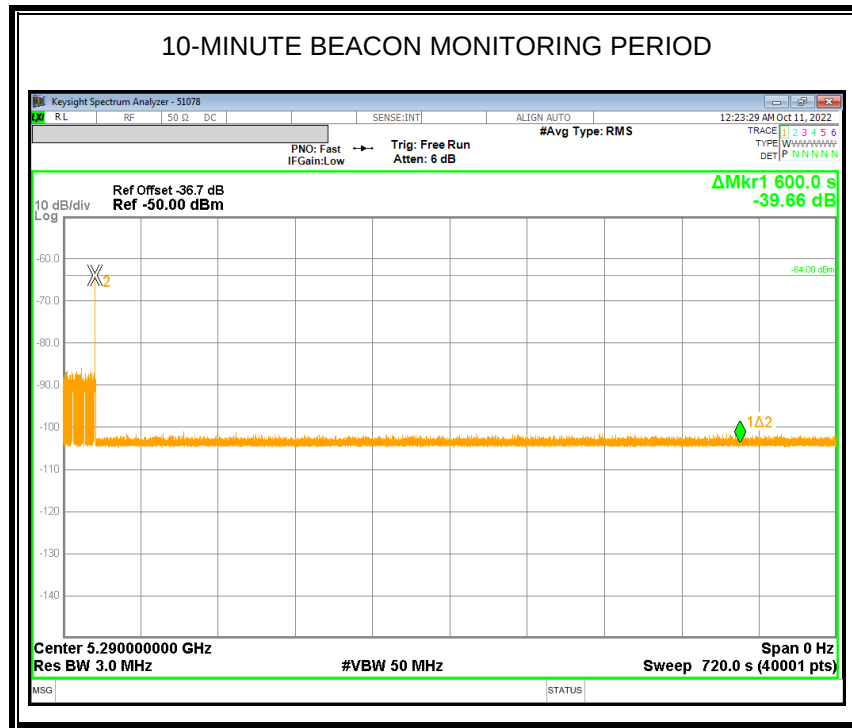
No transmissions are observed during the aggregate monitoring period.



NON-OCCUPANCY PERIOD

RESULTS

No EUT transmissions were observed on the test channel during the 10-minute observation time.



14.3. RESULTS FOR 80 MHz BANDWIDTH (UNII-2C BAND)

14.3.1. TEST CHANNEL

All tests were performed at a channel center frequency of 5530 MHz.

14.3.2. RADAR WAVEFORM AND TRAFFIC

RADAR WAVEFORM



14.3.3. OVERLAPPING CHANNEL TESTS

RESULTS

These tests are not applicable.

14.3.4. MOVE AND CLOSING TIME

REPORTING NOTES

The reference marker is set at the end of last radar pulse.

The delta marker is set at the end of the last WLAN transmission following the radar pulse. This delta is the channel move time.

The aggregate channel closing transmission time is calculated as follows:

Aggregate Transmission Time =
(Number of analyzer bins showing transmission) * (dwell time per bin)

The observation period over which the aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

RESULTS

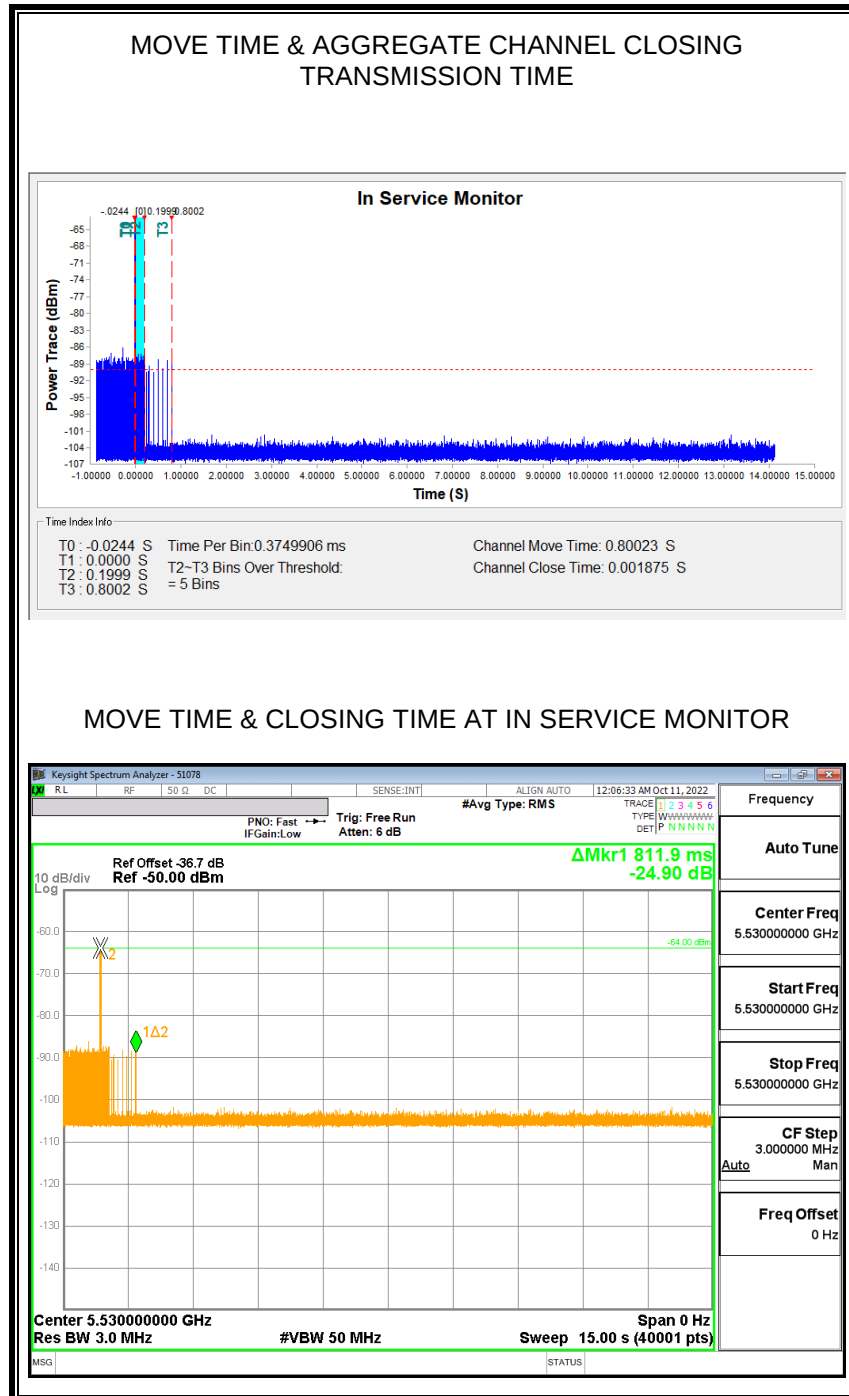
Channel Move Time (sec)	Limit (sec)
0.800	10

Aggregate Channel Closing Transmission Time (msec)	Limit (msec)
1.875	60

MOVE TIME & CHANNEL CLOSING TIME

AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

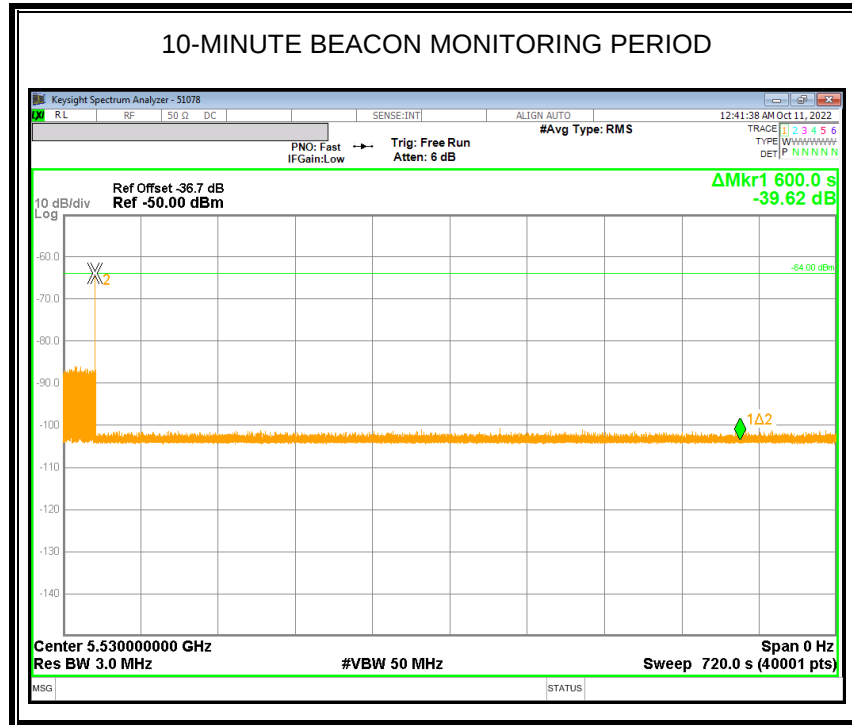
No transmissions are observed during the aggregate monitoring period.



NON-OCCUPANCY PERIOD

RESULTS

No EUT transmissions were observed on the test channel during the 10-minute observation time.



END OF TEST REPORT