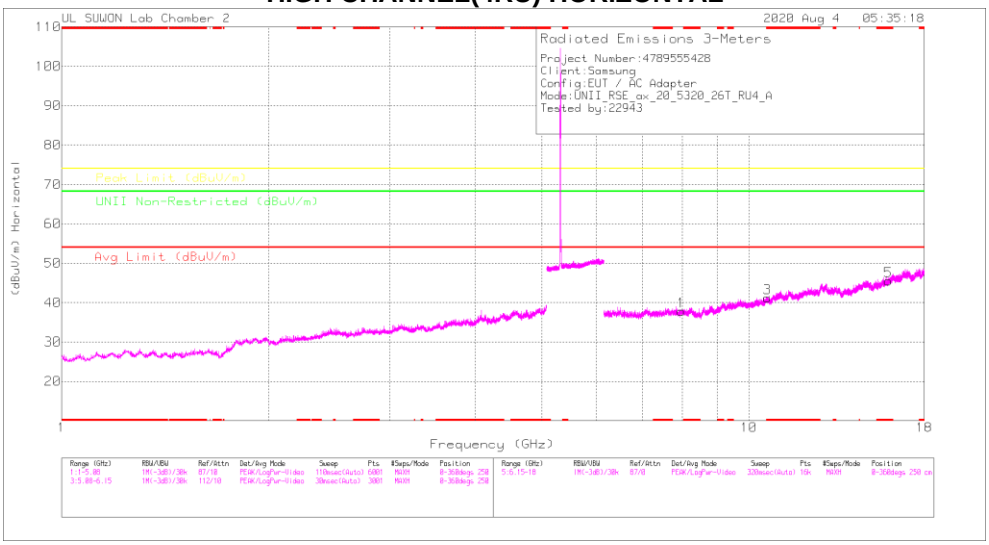
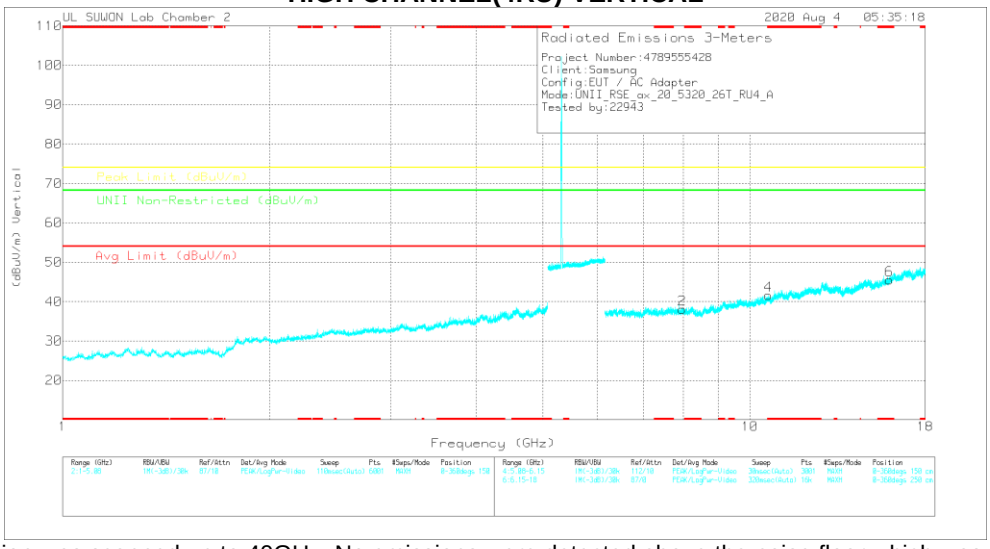
HIGH CHANNEL(4RU) HORIZONTAL



HIGH CHANNEL(4RU) 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.

HIGH CHANNEL(4RU) DATA

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00218957	6GHz_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
7.9791	35.91	PK-U	36.1	-23.7	0	48.31	-	-	-	-	68.2	-19.89	0	100	H
7.98088	36.21	PK-U	36.1	-23.7	0	48.61	-	-	-	-	68.2	-19.59	0	100	V
* 10.63934	33.7	PK-U	37.7	-19.5	0	51.9	-	-	74	-22.1	-	-	0	100	H
* 10.64097	33.35	PK-U	37.7	-19.5	0	51.55	-	-	74	-22.45	-	-	0	100	V
* 15.96181	35.02	PK-U	40.9	-19.5	0	56.42	-	-	74	-17.58	-	-	0	100	H
* 15.96006	34.62	PK-U	40.9	-19.5	0	56.02	-	-	74	-17.98	-	-	0	100	V

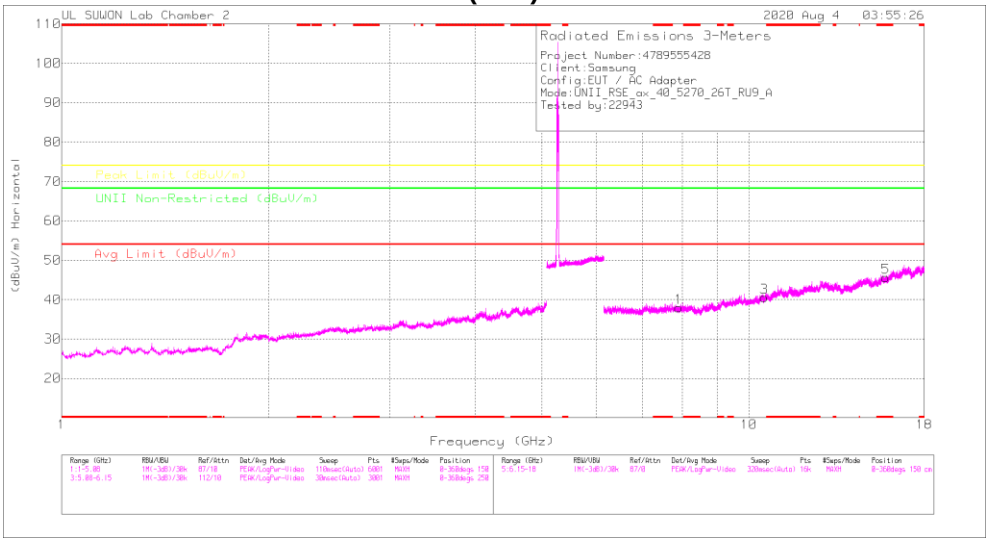
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK-U - U-NII: Maximum Peak

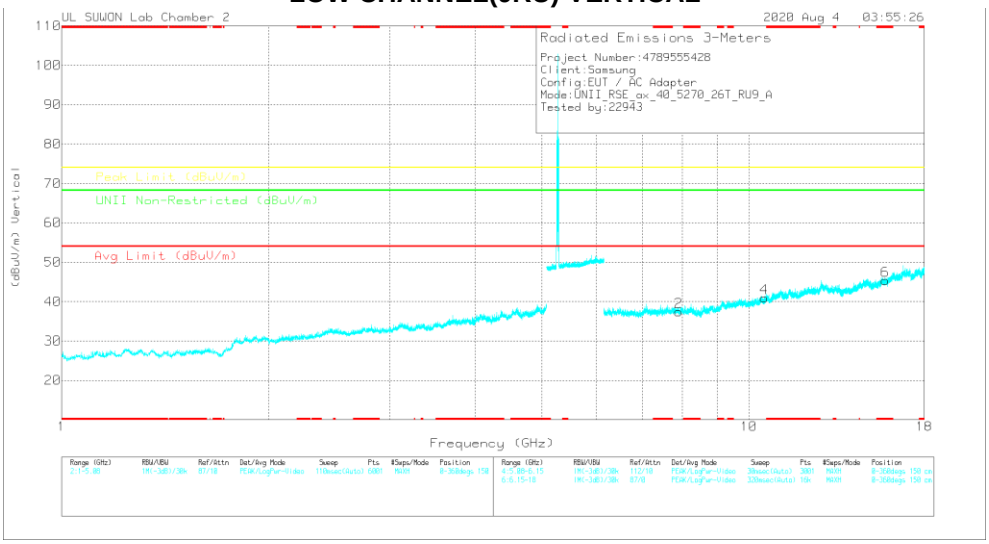
11.6.2. TX ABOVE 1GHz HE40(RU) MODE IN THE 5.3GHz BAND

HARMONICS AND SPURIOUS EMISSIONS – ANT1+ANT2

LOW CHANNEL(9RU) HORIZONTAL



LOW CHANNEL(9RU) 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.

LOW CHANNEL(9RU) DATA

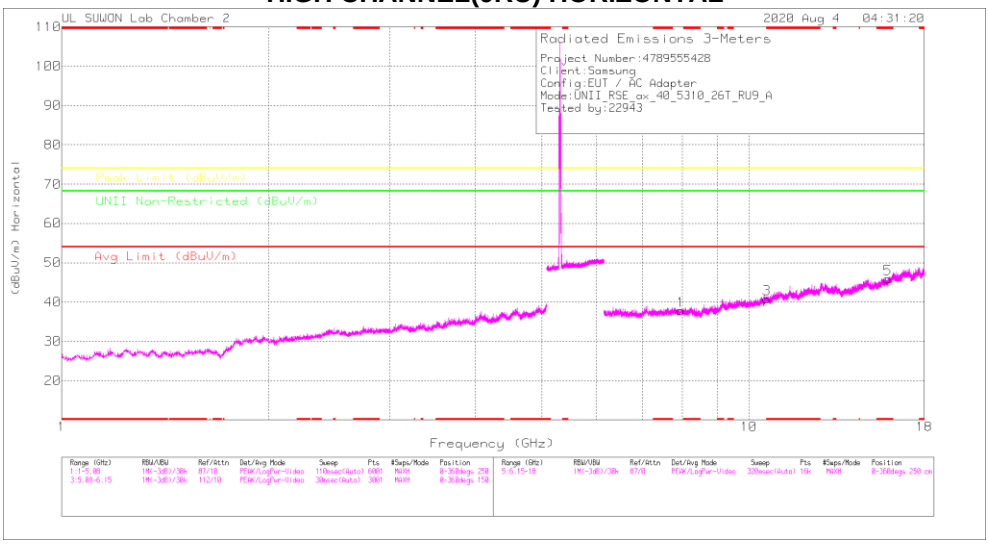
Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00218957	6GHz_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
7.905	37.17	PK-U	36.1	-24	0	49.27	-	-	-	-	68.2	-18.93	0	100	H
7.9065	36.84	PK-U	36.1	-24	0	48.94	-	-	-	-	68.2	-19.26	0	100	V
10.5402	33.32	PK-U	37.6	-20.2	0	50.72	-	-	-	-	68.2	-17.48	0	100	H
10.5388	33.44	PK-U	37.6	-20.2	0	50.84	-	-	-	-	68.2	-17.36	0	100	V
* 15.81104	34.9	PK-U	40.7	-19.7	0	55.9	-	-	74	-18.1	-	-	0	100	H
* 15.81172	34.72	PK-U	40.7	-19.7	0	55.72	-	-	74	-18.28	-	-	0	100	V

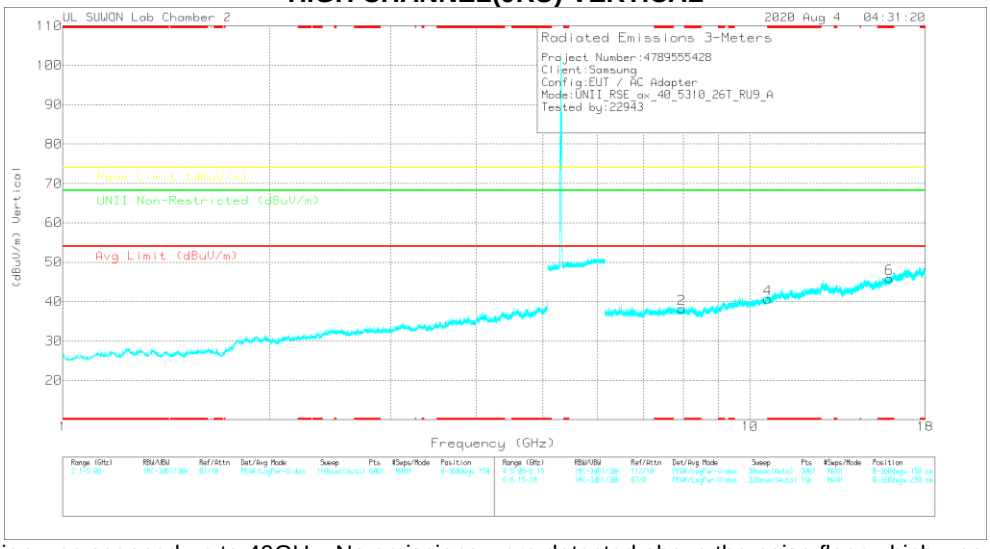
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK-U - U-NII: Maximum Peak

HIGH CHANNEL(9RU) HORIZONTAL



HIGH CHANNEL(9RU) 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.

HIGH CHANNEL(9RU) DATA

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00218957	6GHz_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
7.96588	36.86	PK-U	36.1	-23.6	0	49.36	-	-	-	-	68.2	-18.84	0	100	H
7.96544	36.28	PK-U	36.1	-23.6	0	48.78	-	-	-	-	68.2	-19.42	0	100	V
* 10.62136	33.35	PK-U	37.7	-19.3	0	51.75	-	-	74	-22.25	-	-	0	100	H
* 10.61885	33.87	PK-U	37.7	-19.3	0	52.27	-	-	74	-21.73	-	-	0	100	V
* 15.92967	34.26	PK-U	40.9	-19.3	0	55.86	-	-	74	-18.14	-	-	0	100	H
* 15.93115	34.41	PK-U	40.9	-19.4	0	55.91	-	-	74	-18.09	-	-	0	100	V

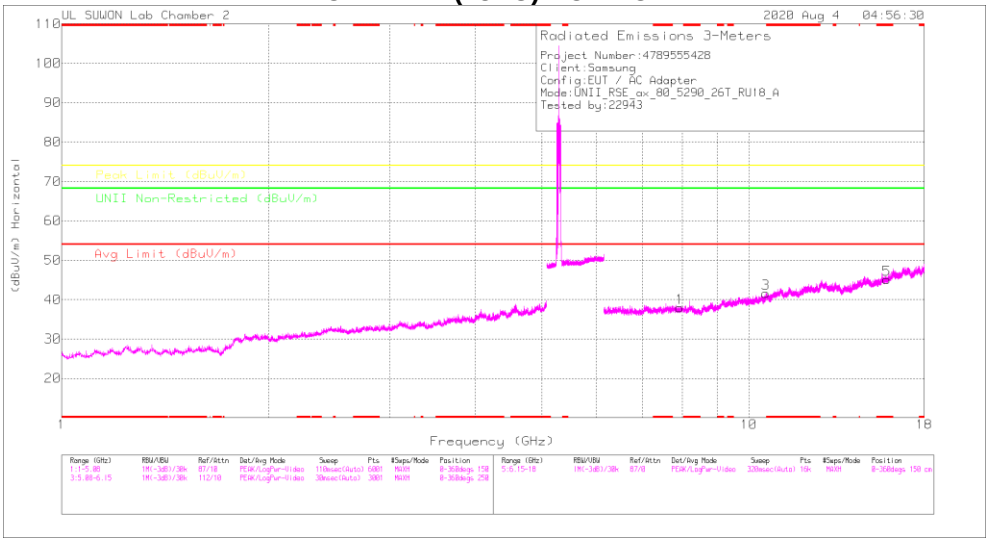
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK-U - U-NII: Maximum Peak

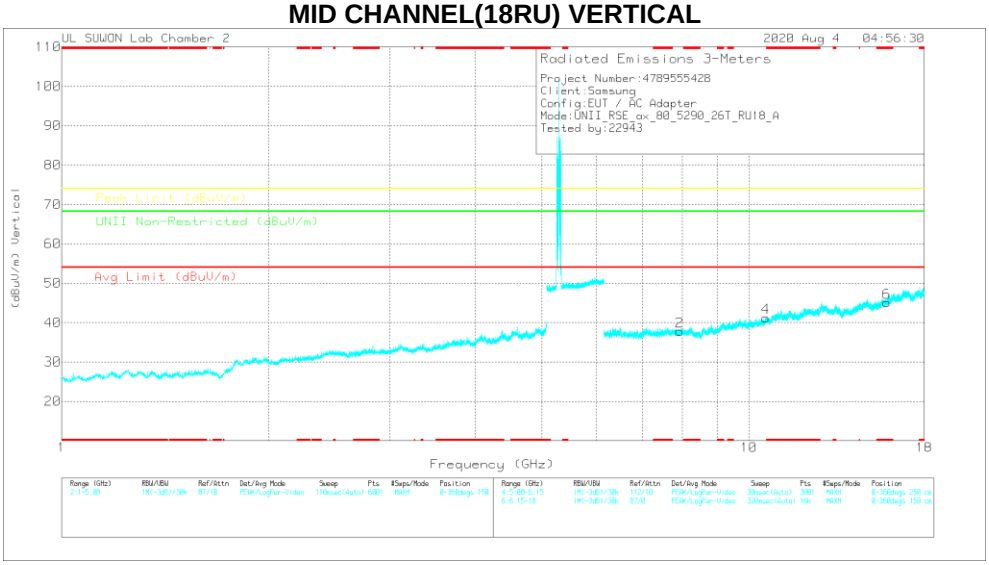
11.6.3. TX ABOVE 1GHz HE80(RU) MODE IN THE 5.3GHz BAND

HARMONICS AND SPURIOUS EMISSIONS – ANT1+ANT2

MID CHANNEL(18RU) HORIZONTAL



MID CHANNEL(18RU) 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.

MID CHANNEL(18RU) DATA

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00218957	6GHz_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
7.93502	35.59	PK-U	36.1	-23.7	0	47.99	-	-	-	-	68.2	-20.21	0	100	H
7.93448	35.79	PK-U	36.1	-23.7	0	48.19	-	-	-	-	68.2	-20.01	0	100	V
10.57917	33.08	PK-U	37.7	-19.6	0	51.18	-	-	-	-	68.2	-17.02	0	100	H
10.57803	33.06	PK-U	37.7	-19.5	0	51.26	-	-	-	-	68.2	-16.94	0	100	V
* 15.86921	34.49	PK-U	40.8	-19.7	0	55.59	-	-	74	-18.41	-	-	0	100	H
* 15.86942	34.92	PK-U	40.8	-19.7	0	56.02	-	-	74	-17.98	-	-	0	100	V

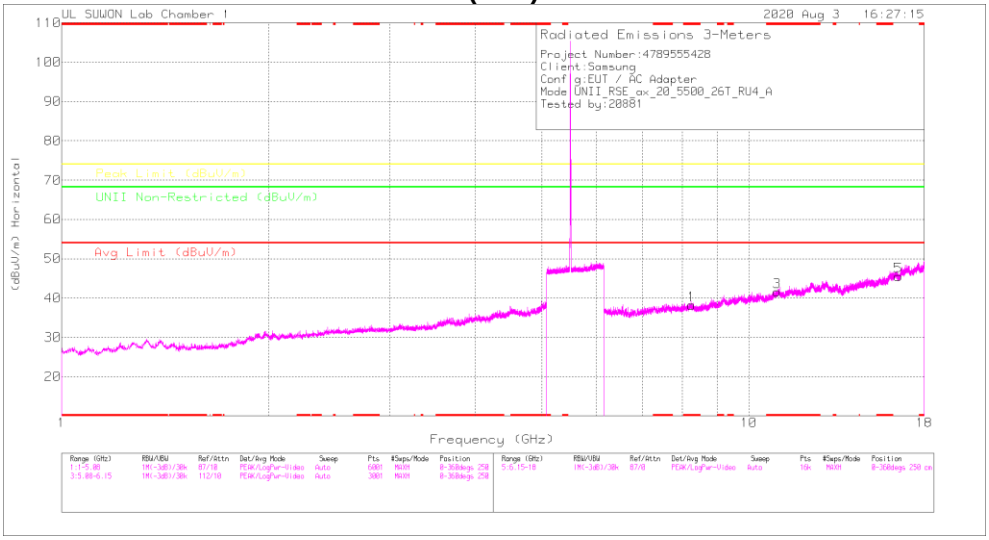
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK-U - U-NII: Maximum Peak

11.7. 5.5-5.6 GHz(802.11ax RU mode)

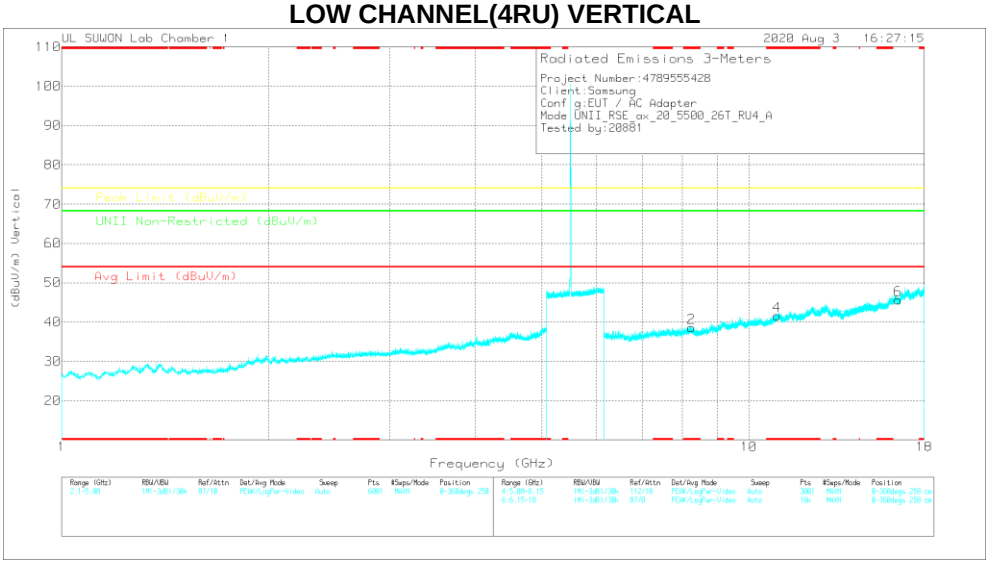
11.7.1. TX ABOVE 1 GHz HE20(RU) MODE IN THE 5.5 GHz BAND

HARMONICS AND SPURIOUS EMISSIONS – ANT1+ANT2

LOW CHANNEL(4RU) HORIZONTAL



LOW CHANNEL(4RU) 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.

LOW CHANNEL(4RU) DATA

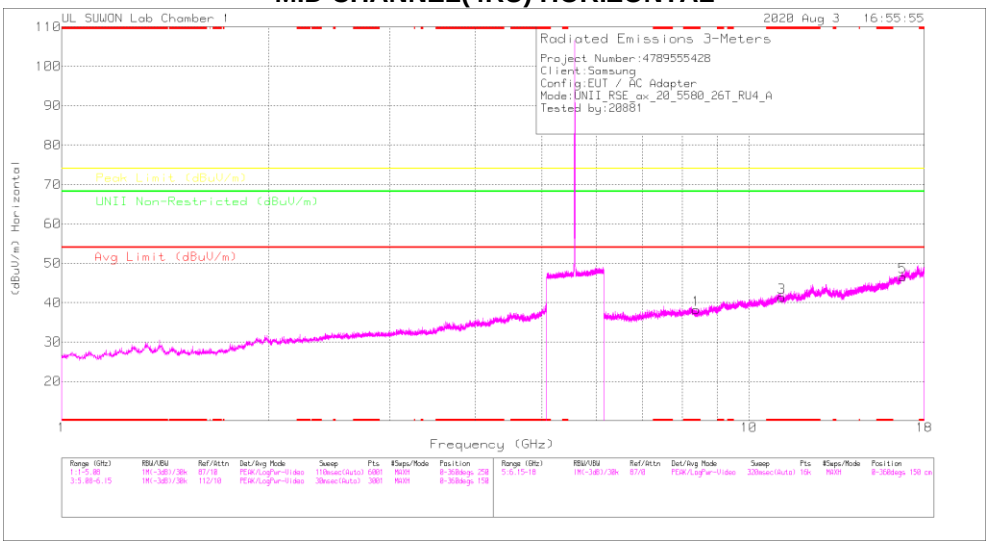
Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168717	6GHz_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
* 8.25203	38.36	PK-U	36.4	-25.4	0	49.36	-	-	74	-24.64	-	-	0	100	H
* 8.2514	37.63	PK-U	36.4	-25.4	0	48.63	-	-	74	-25.37	-	-	0	100	V
* 11.00002	35.97	PK-U	38.2	-21.9	0	52.27	-	-	74	-21.73	-	-	0	100	H
* 11.00035	35.84	PK-U	38.2	-21.9	0	52.14	-	-	74	-21.86	-	-	0	100	V
16.49827	35.69	PK-U	40.9	-19.7	0	56.89	-	-	-	-	68.2	-11.31	0	100	H
16.49966	35.66	PK-U	40.9	-19.7	0	56.86	-	-	-	-	68.2	-11.34	0	100	V

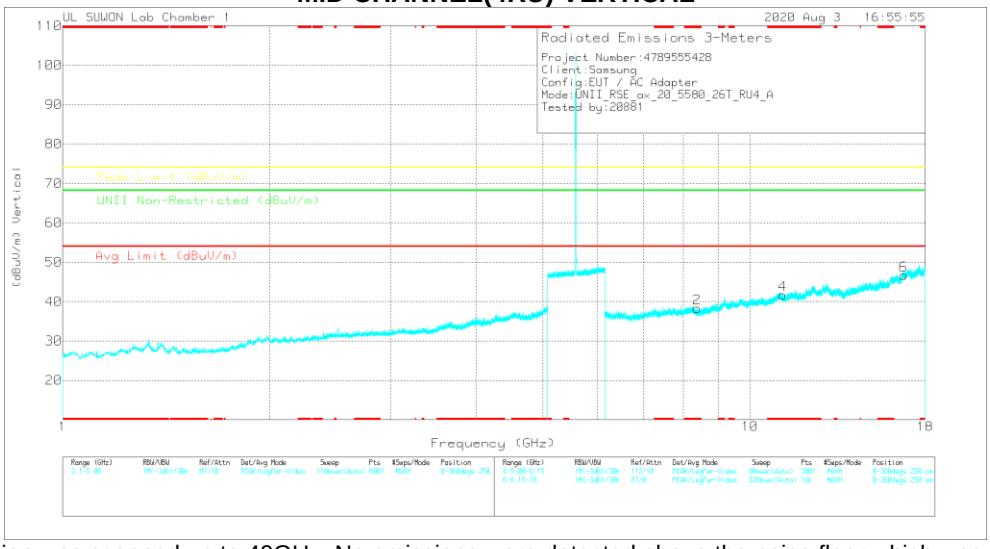
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK-U - U-NII: Maximum Peak

MID CHANNEL(4RU) HORIZONTAL



MID CHANNEL(4RU) 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.

MID CHANNEL(4RU) DATA

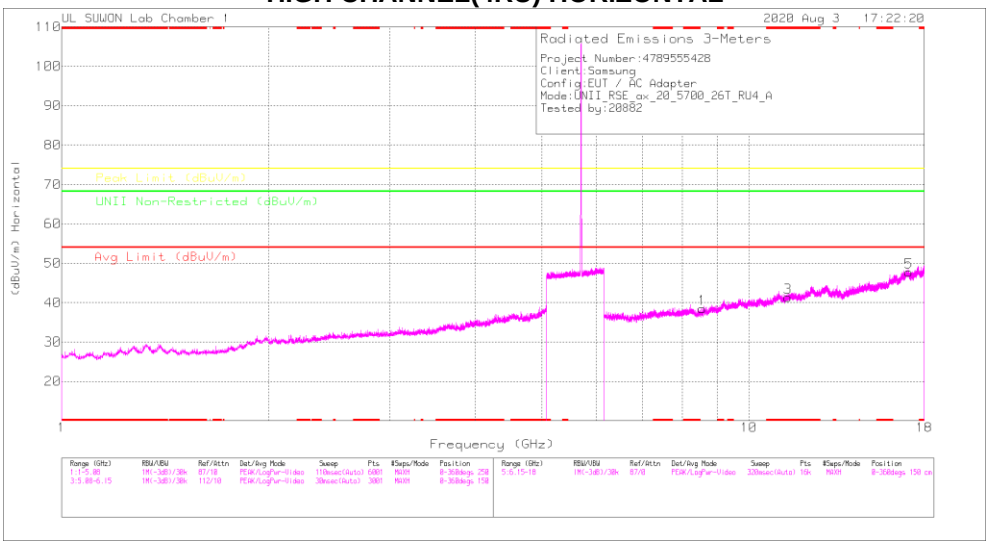
Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168717	6GHz_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
* 8.37666	37.6	PK-U	36.3	-25.8	0	48.1	-	-	74	-25.9	-	-	0	100	H
* 8.37141	37.48	PK-U	36.3	-25.8	0	47.98	-	-	74	-26.02	-	-	0	100	V
* 11.1607	36.97	PK-U	38.3	-22.6	0	52.67	-	-	74	-21.33	-	-	0	100	H
* 11.16155	36.93	PK-U	38.3	-22.6	0	52.63	-	-	74	-21.37	-	-	0	100	V
16.74013	34.12	PK-U	41.3	-18.1	0	57.32	-	-	-	-	68.2	-10.88	0	100	H
16.73979	34.66	PK-U	41.3	-18.1	0	57.86	-	-	-	-	68.2	-10.34	0	100	V

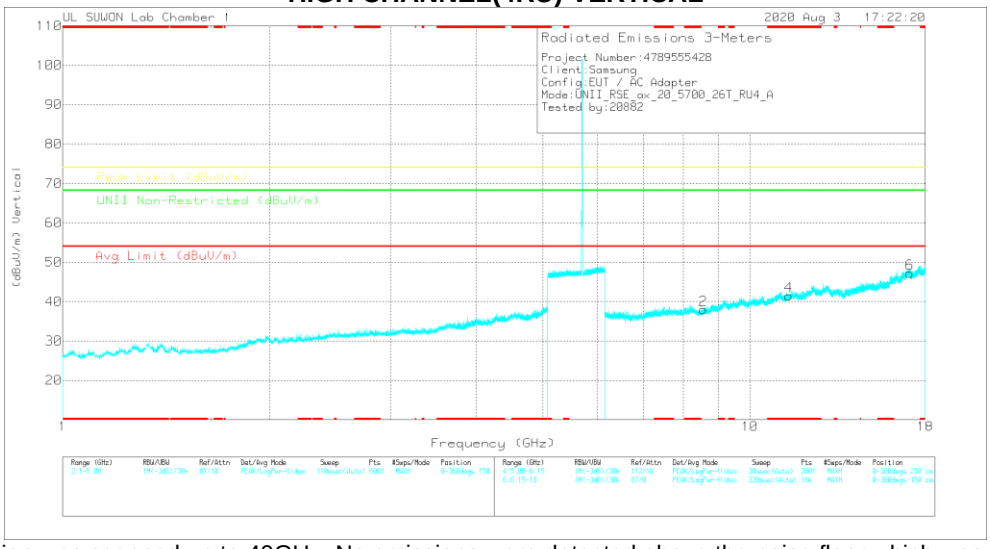
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK-U - U-NII: Maximum Peak

HIGH CHANNEL(4RU) HORIZONTAL



HIGH CHANNEL(4RU) 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.

HIGH CHANNEL(4RU) DATA

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168717	6GHz_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
8.55227	37.22	PK-U	36.3	-24.9	0	48.62	-	-	-	-	68.2	-19.58	0	100	H
8.55019	37.8	PK-U	36.3	-25	0	49.1	-	-	-	-	68.2	-19.1	0	100	V
* 11.40079	35.99	PK-U	38.5	-22.3	0	52.19	-	-	74	-21.81	-	-	0	100	H
* 11.39831	36.82	PK-U	38.4	-22.4	0	52.82	-	-	74	-21.18	-	-	0	100	V
17.10162	34.25	PK-U	41.6	-17.7	0	58.15	-	-	-	-	68.2	-10.05	0	100	H
17.10154	34.29	PK-U	41.6	-17.6	0	58.29	-	-	-	-	68.2	-9.91	0	100	V

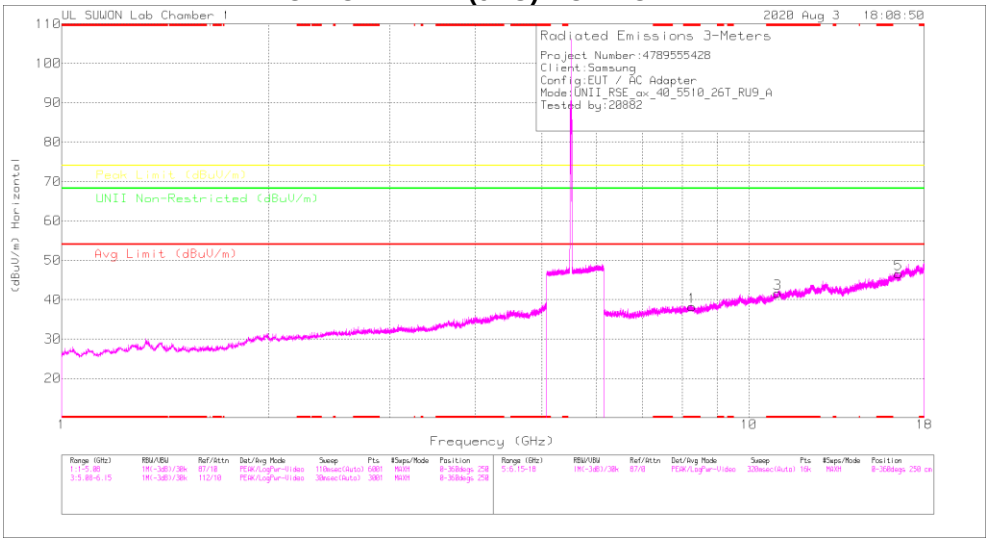
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK-U - U-NII: Maximum Peak

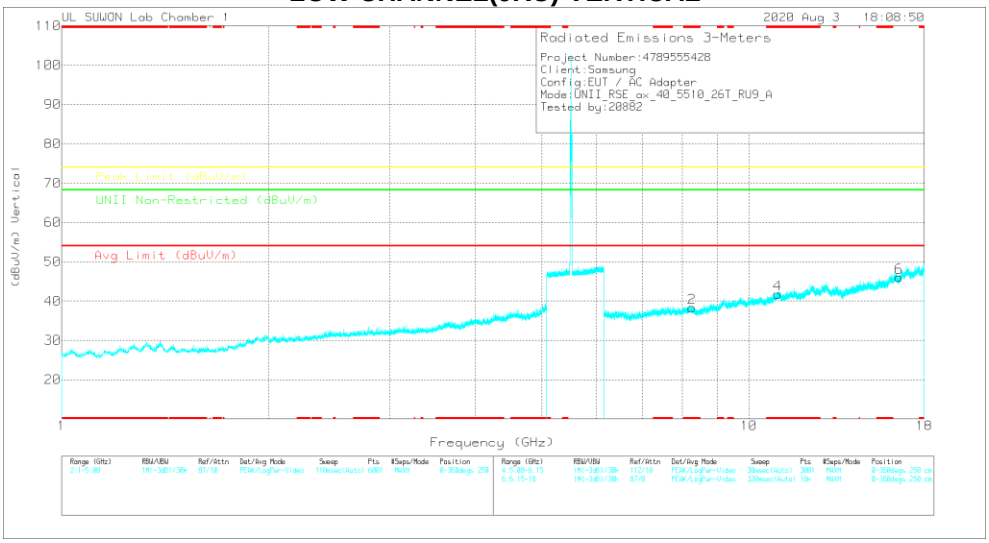
11.7.2. TX ABOVE 1GHz HE40(RU) MODE IN THE 5.5GHz BAND

HARMONICS AND SPURIOUS EMISSIONS – ANT1+ANT2

LOW CHANNEL(9RU) HORIZONTAL



LOW CHANNEL(9RU) 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.

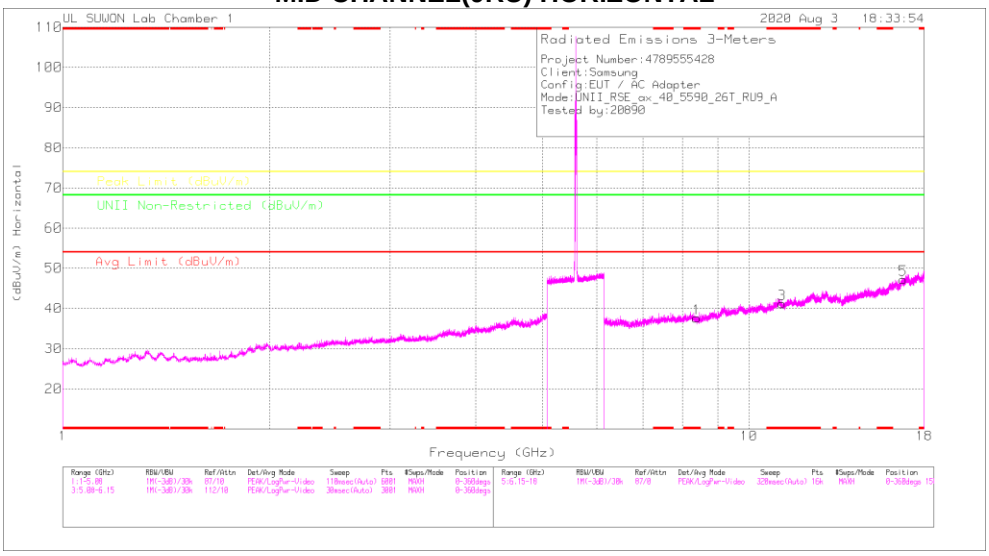
LOW CHANNEL(9RU) DATA

Radiated Emissions

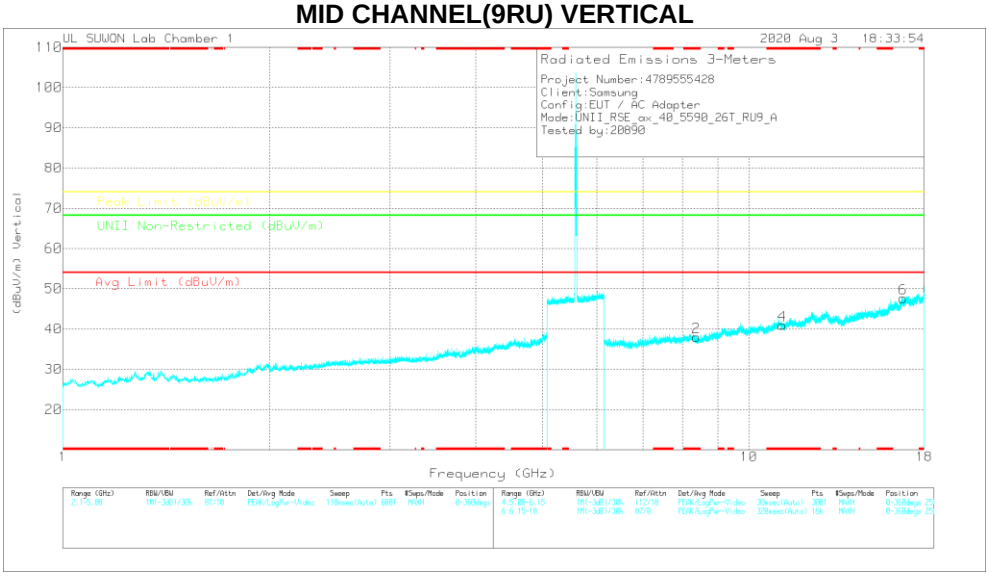
Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168717	6GHz_HP[dB]	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	UNII Non-Restricted (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 8.26297	37.53	PK-U	36.4	-25.5	0	48.43	-	-	74	-25.57	-	-	0	100	H
* 8.26303	38.33	PK-U	36.4	-25.5	0	49.23	-	-	74	-24.77	-	-	0	100	V
* 11.01989	35.91	PK-U	38.2	-21.8	0	52.31	-	-	74	-21.69	-	-	0	100	H
* 11.02104	35.94	PK-U	38.2	-21.8	0	52.34	-	-	74	-21.66	-	-	0	100	V
16.5298	35.54	PK-U	40.9	-19.5	0	56.94	-	-	-	-	68.2	-11.26	0	100	H
16.52916	35.82	PK-U	40.9	-19.5	0	57.22	-	-	-	-	68.2	-10.98	0	100	V

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

MID CHANNEL(9RU) HORIZONTAL



MID CHANNEL(9RU) 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.

MID CHANNEL(9RU) DATA

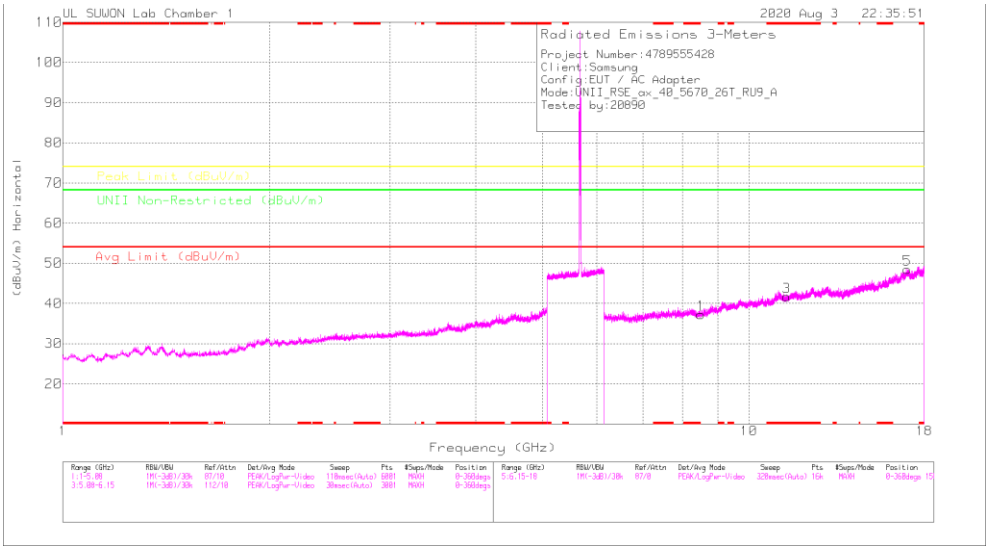
Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168717	6GHz_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
* 8.39641	38.09	PK-U	36.3	-26	0	48.39	-	-	74	-25.61	-	-	0	100	H
* 8.38067	37.67	PK-U	36.3	-25.8	0	48.17	-	-	74	-25.83	-	-	0	100	V
* 11.17541	36.05	PK-U	38.3	-22.4	0	51.95	-	-	74	-22.05	-	-	0	100	H
* 11.17088	36.02	PK-U	38.3	-22.5	0	51.82	-	-	74	-22.18	-	-	0	100	V
16.7717	34.57	PK-U	41.4	-17.9	0	58.07	-	-	-	-	68.2	-10.13	0	100	H
16.77092	34.64	PK-U	41.4	-17.9	0	58.14	-	-	-	-	68.2	-10.06	0	100	V

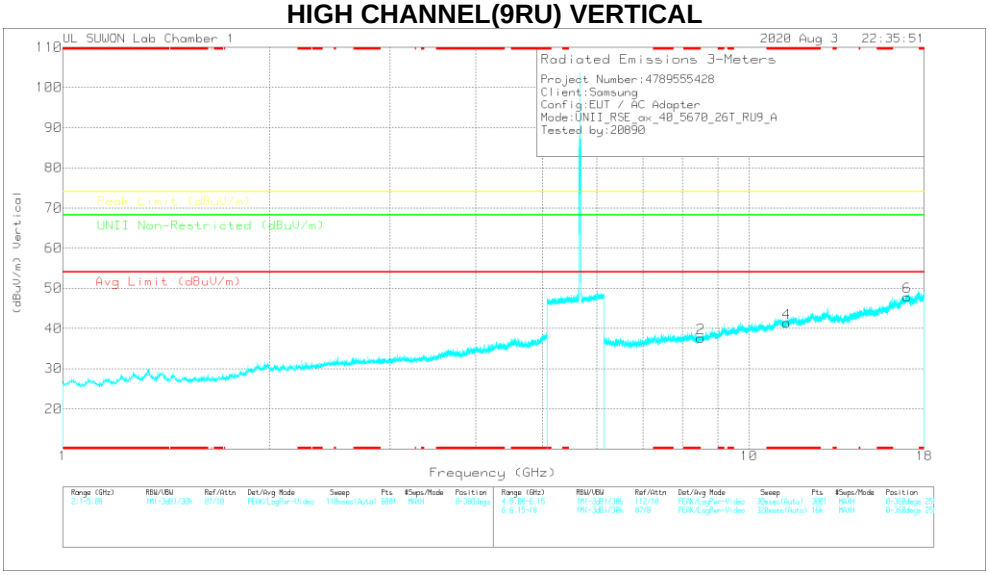
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK-U - U-NII: Maximum Peak

HIGH CHANNEL(9RU) HORIZONTAL



HIGH CHANNEL(9RU) 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.

HIGH CHANNEL(9RU) DATA

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168717	6GHz_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
8.50426	37.85	PK-U	36.3	-25.4	0	48.75	-	-	-	-	68.2	-19.45	0	100	H
8.50239	37.87	PK-U	36.3	-25.5	0	48.67	-	-	-	-	68.2	-19.53	0	100	V
* 11.34562	36.75	PK-U	38.4	-22.4	0	52.75	-	-	74	-21.25	-	-	0	100	H
* 11.33624	36.12	PK-U	38.4	-22.4	0	52.12	-	-	74	-21.88	-	-	0	100	V
17.01332	34.97	PK-U	41.7	-17.6	0	59.07	-	-	-	-	68.2	-9.13	0	100	H
17.01359	34.63	PK-U	41.7	-17.6	0	58.73	-	-	-	-	68.2	-9.47	0	100	V

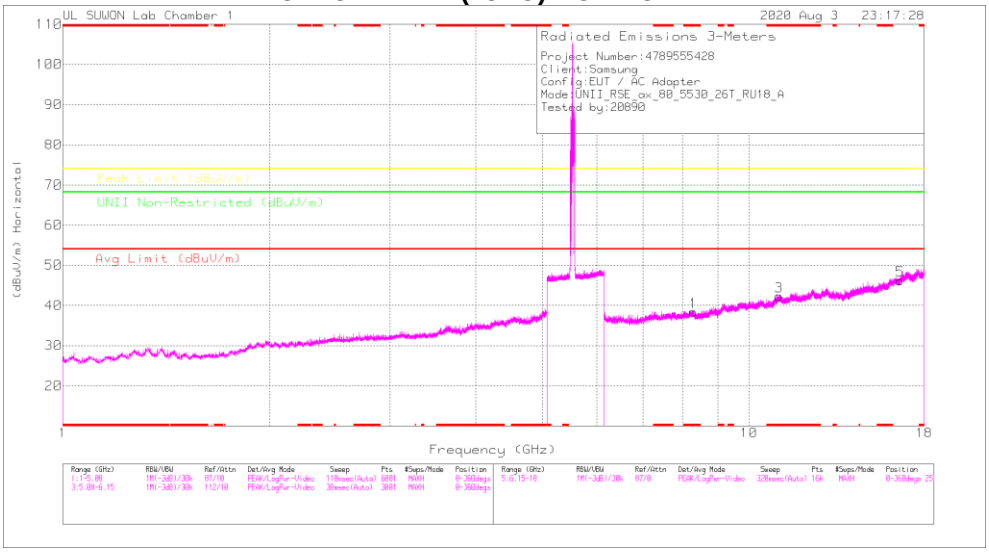
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK-U - U-NII: Maximum Peak

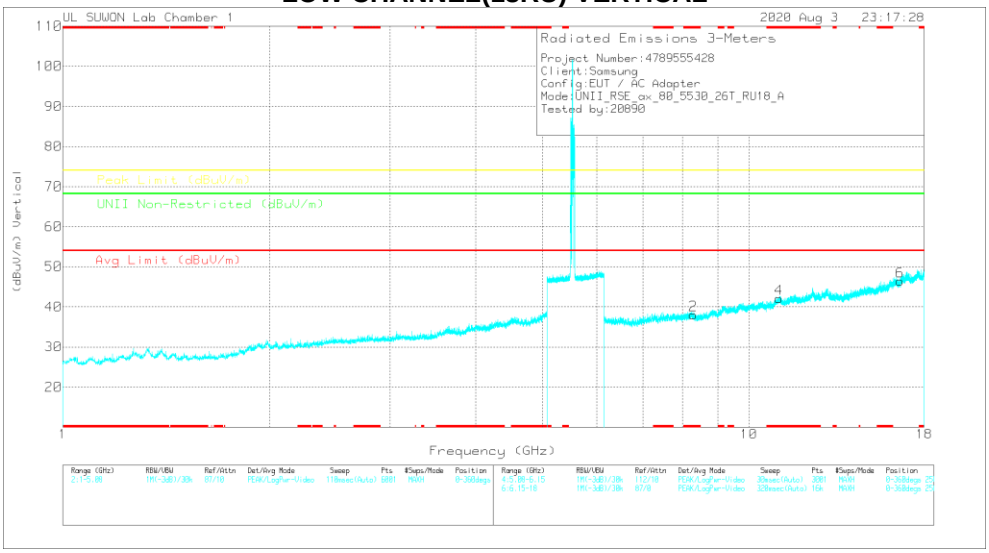
11.7.3. TX ABOVE 1GHz HE80(RU) MODE IN THE 5.5GHz BAND

HARMONICS AND SPURIOUS EMISSIONS – ANT1+ANT2

LOW CHANNEL(18RU) HORIZONTAL



LOW CHANNEL(18RU) 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.

LOW CHANNEL(18RU) DATA

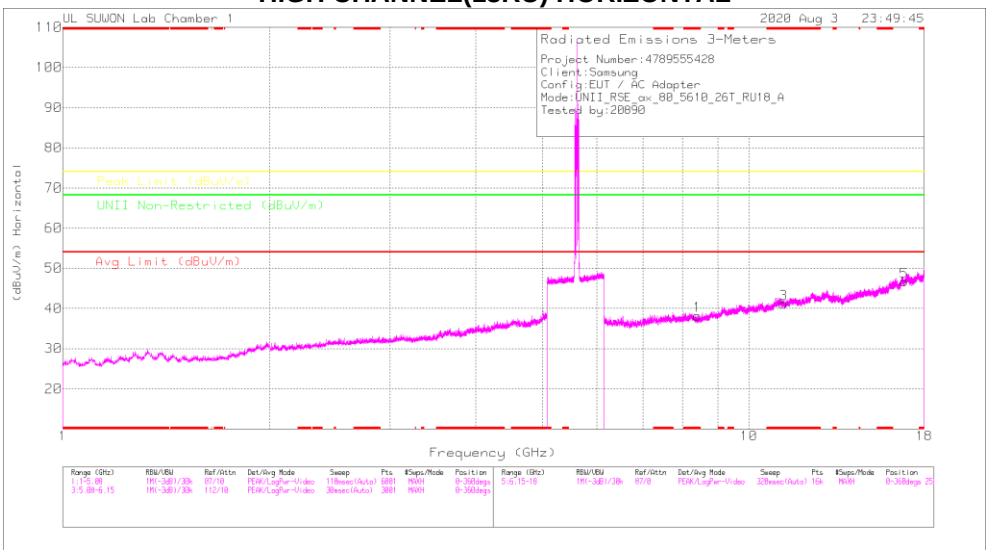
Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168717	6GHz_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
* 8.30397	37.04	PK-U	36.4	-25.2	0	48.24	-	-	74	-25.76	-	-	0	100	H
* 8.2934	37.36	PK-U	36.4	-25	0	48.76	-	-	74	-25.24	-	-	0	100	V
* 11.05353	36.17	PK-U	38.2	-21.7	0	52.67	-	-	74	-21.33	-	-	0	100	H
* 11.0533	35.69	PK-U	38.2	-21.7	0	52.19	-	-	74	-21.81	-	-	0	100	V
16.59513	35.2	PK-U	41	-19.2	0	57	-	-	-	-	68.2	-11.2	0	100	H
16.58257	35.92	PK-U	40.9	-19.1	0	57.72	-	-	-	-	68.2	-10.48	0	100	V

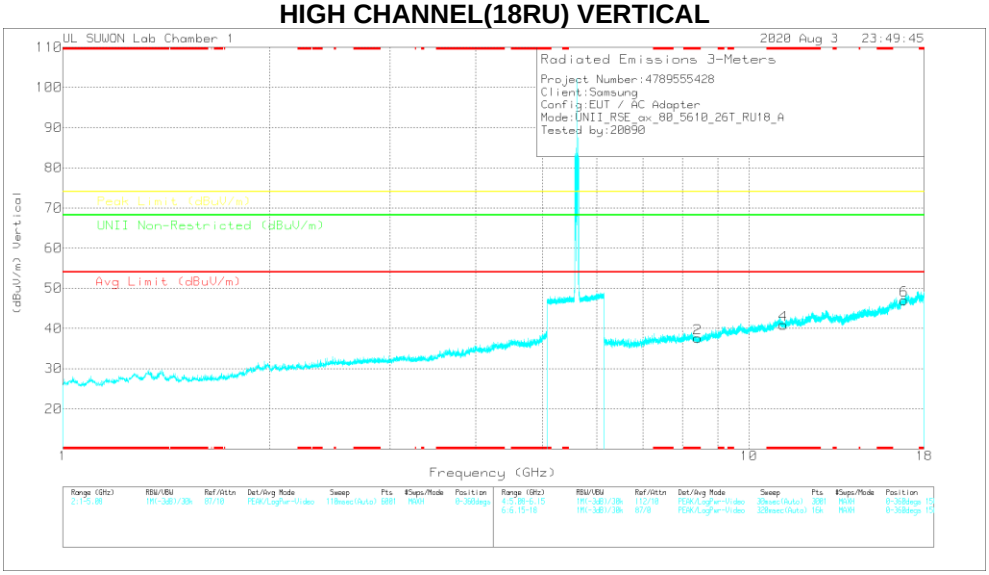
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK-U - U-NII: Maximum Peak

HIGH CHANNEL(18RU) HORIZONTAL



HIGH CHANNEL(18RU) 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.

HIGH CHANNEL(18RU) DATA

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168717	6GHz_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
* 8.40711	38.2	PK-U	36.3	-25.9	0	48.6	-	-	74	-25.4	-	-	0	100	H
* 8.41036	37.99	PK-U	36.3	-25.9	0	48.39	-	-	74	-25.61	-	-	0	100	V
* 11.23105	36.62	PK-U	38.4	-22.2	0	52.82	-	-	74	-21.18	-	-	0	100	H
* 11.22807	36.1	PK-U	38.4	-22.2	0	52.3	-	-	74	-21.7	-	-	0	100	V
16.83229	34.54	PK-U	41.5	-18.7	0	57.34	-	-	-	-	68.2	-10.86	0	100	H
16.83887	34.52	PK-U	41.5	-18.7	0	57.32	-	-	-	-	68.2	-10.88	0	100	V

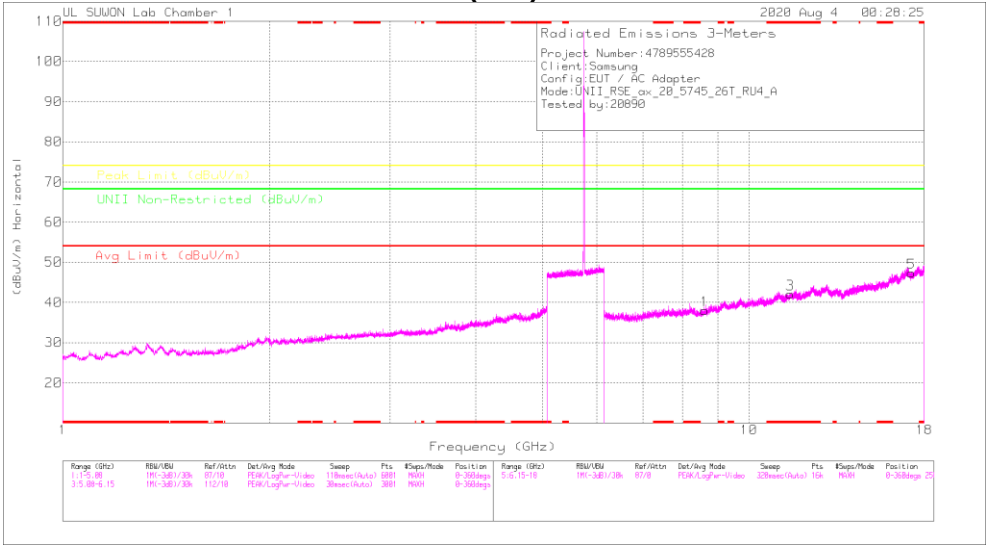
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK-U - U-NII: Maximum Peak

11.8. 5.8 GHz(802.11ax RU mode)

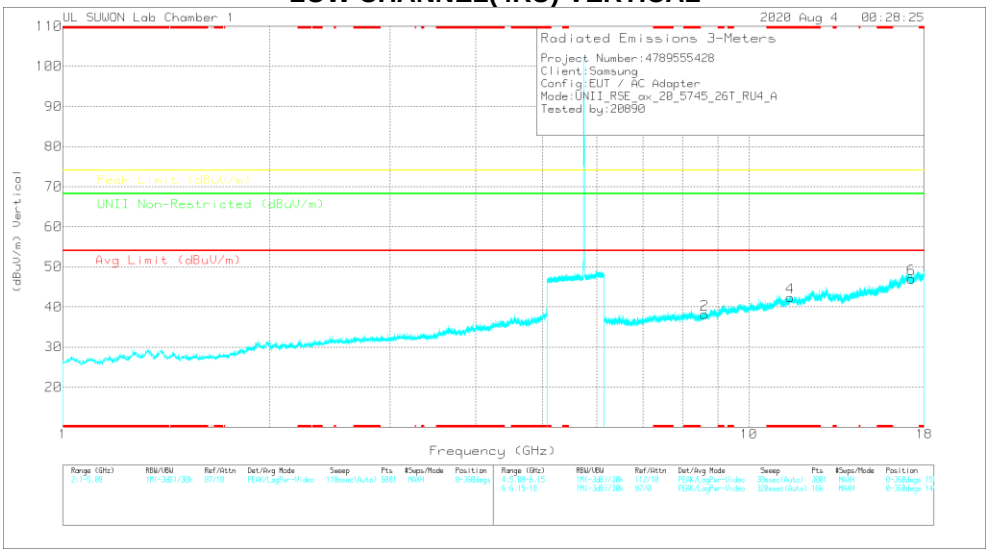
11.8.1. TX ABOVE 1GHz HE20(RU) MODE IN THE 5.8GHz BAND

HARMONICS AND SPURIOUS EMISSIONS – ANT1+ANT2

LOW CHANNEL(4RU) HORIZONTAL



LOW CHANNEL(4RU) 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.

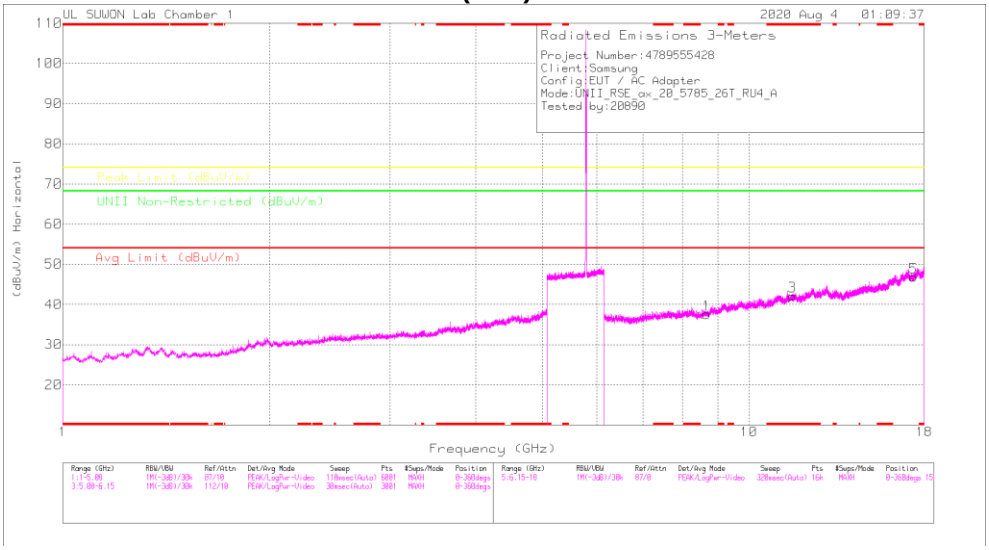
LOW CHANNEL(4RU) DATA

Radiated Emissions

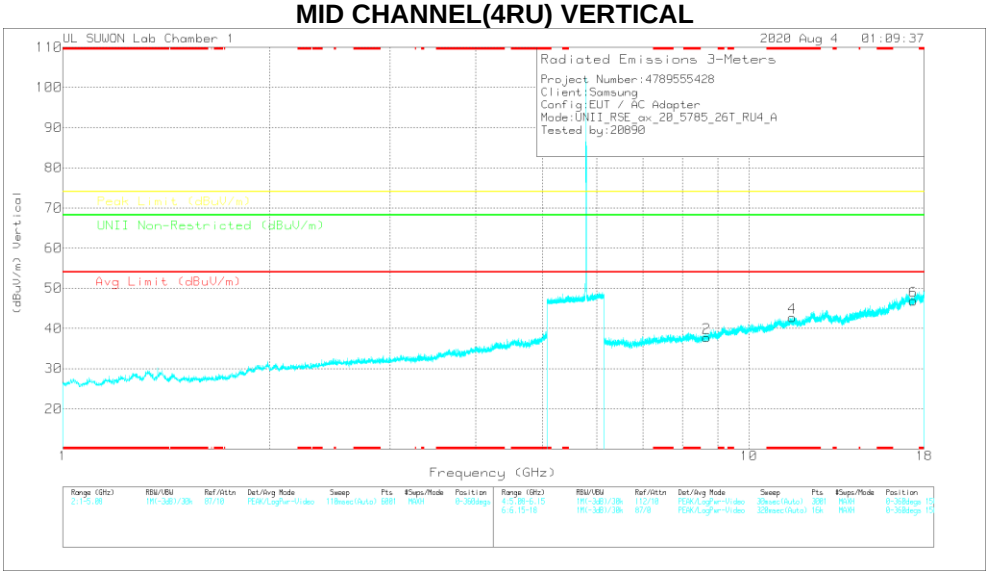
Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168717	6GHz_HP[dB]	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	UNII Non-Restricted (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
8.62126	37.14	PK-U	36.3	-24.9	0	48.54	-	-	-	-	68.2	-19.66	0	100	H
8.60819	36.78	PK-U	36.3	-24.8	0	48.28	-	-	-	-	68.2	-19.92	0	100	V
* 11.47474	35.95	PK-U	38.5	-22.2	0	52.25	-	-	74	-21.75	-	-	0	100	H
* 11.47659	35.75	PK-U	38.5	-22.2	0	52.05	-	-	74	-21.95	-	-	0	100	V
17.23005	34.33	PK-U	41.3	-17.5	0	58.13	-	-	-	-	68.2	-10.07	0	100	H
17.23702	35.61	PK-U	41.3	-17.5	0	59.41	-	-	-	-	68.2	-8.79	0	100	V

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

MID CHANNEL(4RU) HORIZONTAL



MID CHANNEL(4RU) 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.

MID CHANNEL(4RU) DATA

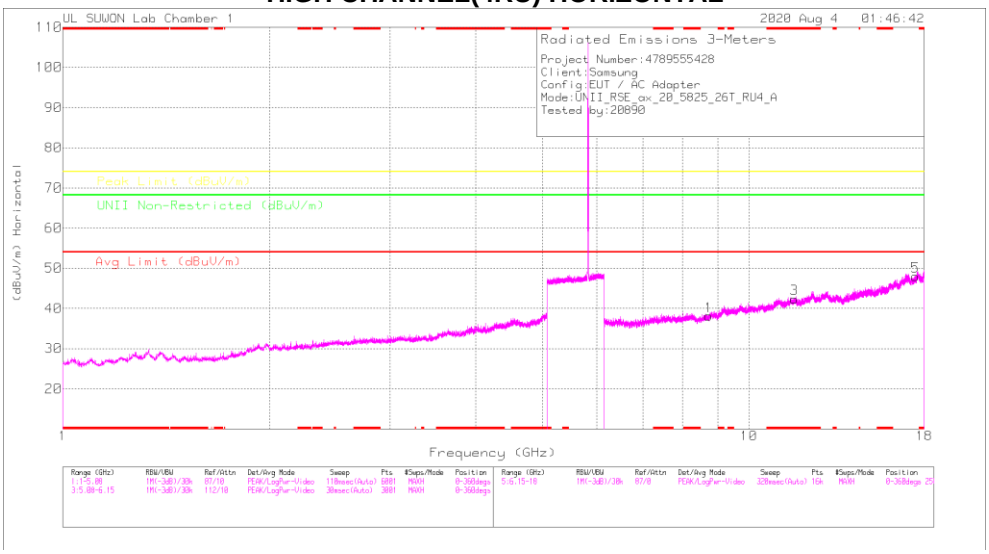
Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168717	6GHz_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
8.67667	37.56	PK-U	36.4	-25.5	0	48.46	-	-	-	-	68.2	-19.74	0	100	H
8.67959	37.26	PK-U	36.4	-25.5	0	48.16	-	-	-	-	68.2	-20.04	0	100	V
* 11.56879	36.05	PK-U	38.6	-22.3	0	52.35	-	-	74	-21.65	-	-	0	100	H
* 11.57668	36.77	PK-U	38.6	-22.2	0	53.17	-	-	74	-20.83	-	-	0	100	V
17.36325	34.44	PK-U	41.2	-17.7	0	57.94	-	-	-	-	68.2	-10.26	0	100	H
17.35382	34.23	PK-U	41.2	-17.8	0	57.63	-	-	-	-	68.2	-10.57	0	100	V

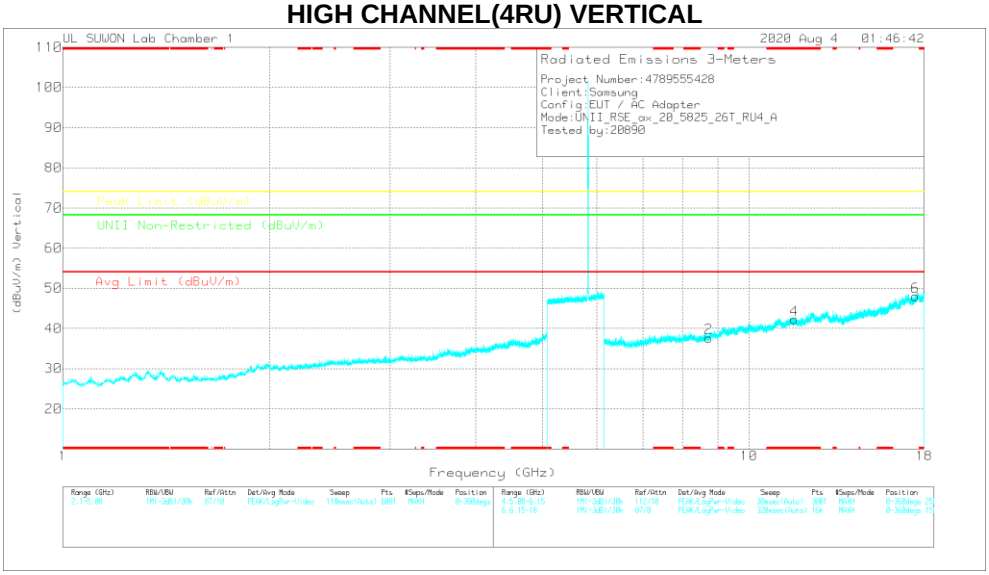
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK-U - U-NII: Maximum Peak

HIGH CHANNEL(4RU) HORIZONTAL



HIGH CHANNEL(4RU) 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.

HIGH CHANNEL(4RU) DATA

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168717	6GHz_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
8.7303	37.94	PK-U	36.4	-25.7	0	48.64	-	-	-	-	68.2	-19.56	0	100	H
8.72904	37.64	PK-U	36.4	-25.7	0	48.34	-	-	-	-	68.2	-19.86	0	100	V
* 11.64512	36.1	PK-U	38.7	-21.8	0	53	-	-	74	-21	-	-	0	100	H
* 11.64221	36.09	PK-U	38.7	-21.9	0	52.89	-	-	74	-21.11	-	-	0	100	V
17.46663	34.98	PK-U	41.2	-17.6	0	58.58	-	-	-	-	68.2	-9.62	0	100	H
17.48001	34.68	PK-U	41.2	-17.6	0	58.28	-	-	-	-	68.2	-9.92	0	100	V

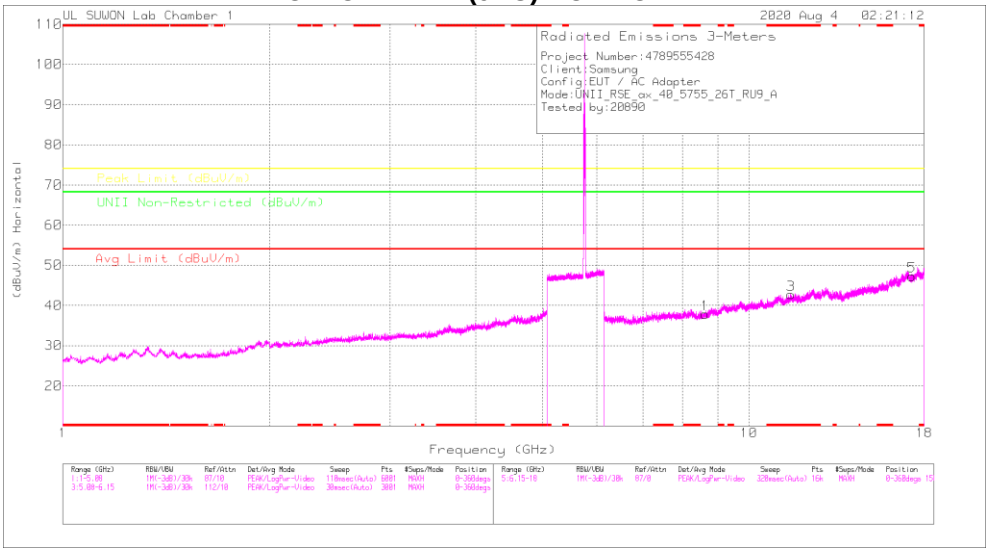
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK-U - U-NII: Maximum Peak

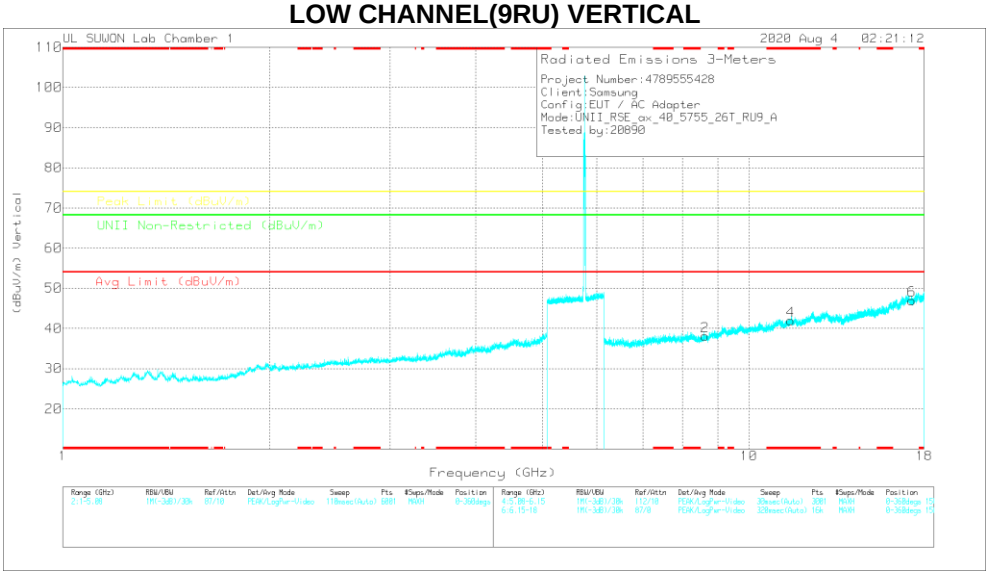
11.8.2. TX ABOVE 1GHz HE40(RU) MODE IN THE 5.8GHz BAND

HARMONICS AND SPURIOUS EMISSIONS – ANT1+ANT2

LOW CHANNEL(9RU) HORIZONTAL



LOW CHANNEL(9RU) 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.

LOW CHANNEL(9RU) DATA

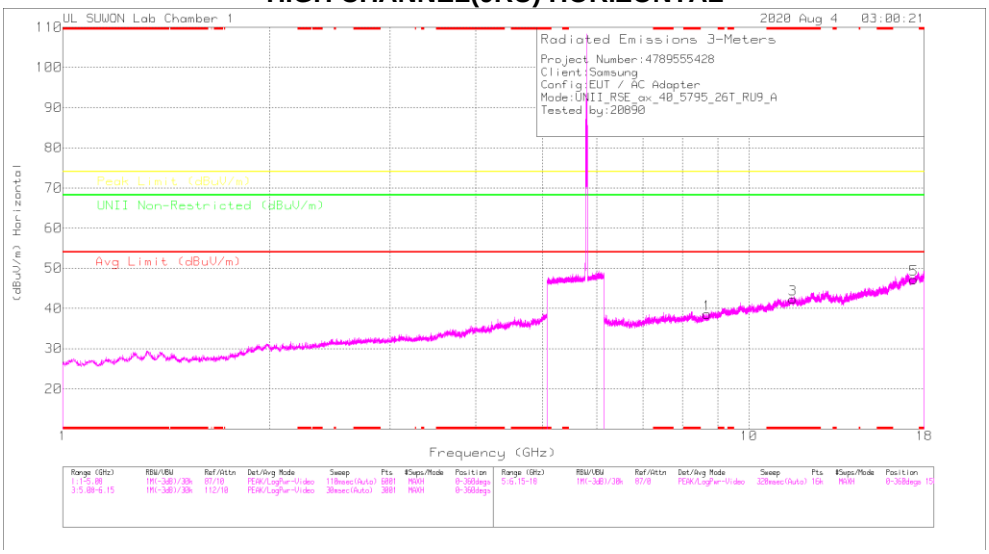
Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168717	6GHz_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
8.63538	36.87	PK-U	36.3	-25	0	48.17	-	-	-	-	68.2	-20.03	0	100	H
8.63878	36.87	PK-U	36.3	-25	0	48.17	-	-	-	-	68.2	-20.03	0	100	V
* 11.51772	36.56	PK-U	38.5	-22.4	0	52.66	-	-	74	-21.34	-	-	0	100	H
* 11.5046	36.21	PK-U	38.5	-22.4	0	52.31	-	-	74	-21.69	-	-	0	100	V
17.25727	34.28	PK-U	41.3	-17.4	0	58.18	-	-	-	-	68.2	-10.02	0	100	H
17.25887	34.63	PK-U	41.3	-17.4	0	58.53	-	-	-	-	68.2	-9.67	0	100	V

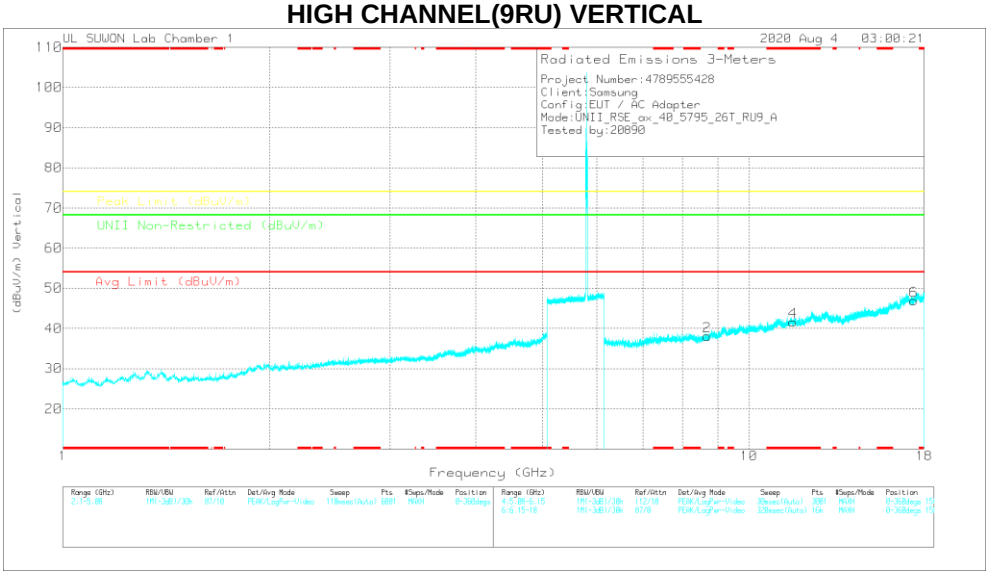
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK-U - U-NII: Maximum Peak

HIGH CHANNEL(9RU) HORIZONTAL



HIGH CHANNEL(9RU) 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.

HIGH CHANNEL(9RU) DATA

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168717	6GHz_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
8.69659	38.09	PK-U	36.4	-25.6	0	48.89	-	-	-	-	68.2	-19.31	0	100	H
8.69281	37.46	PK-U	36.4	-25.5	0	48.36	-	-	-	-	68.2	-19.84	0	100	V
* 11.59222	36.27	PK-U	38.6	-22.1	0	52.77	-	-	74	-21.23	-	-	0	100	H
* 11.59818	36.36	PK-U	38.6	-22	0	52.96	-	-	74	-21.04	-	-	0	100	V
17.39212	34.08	PK-U	41.2	-17.8	0	57.48	-	-	-	-	68.2	-10.72	0	100	H
17.38193	33.9	PK-U	41.2	-17.7	0	57.4	-	-	-	-	68.2	-10.8	0	100	V

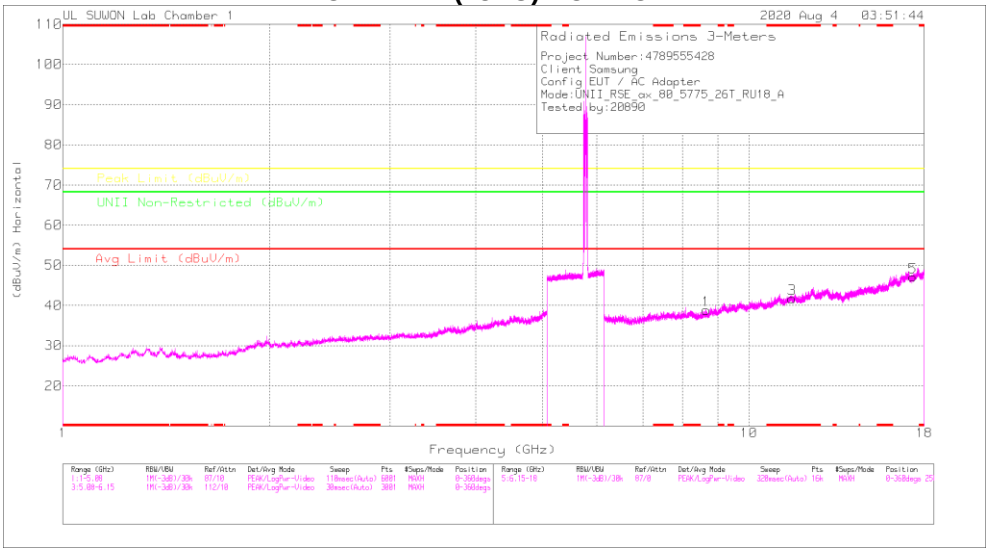
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK-U - U-NII: Maximum Peak

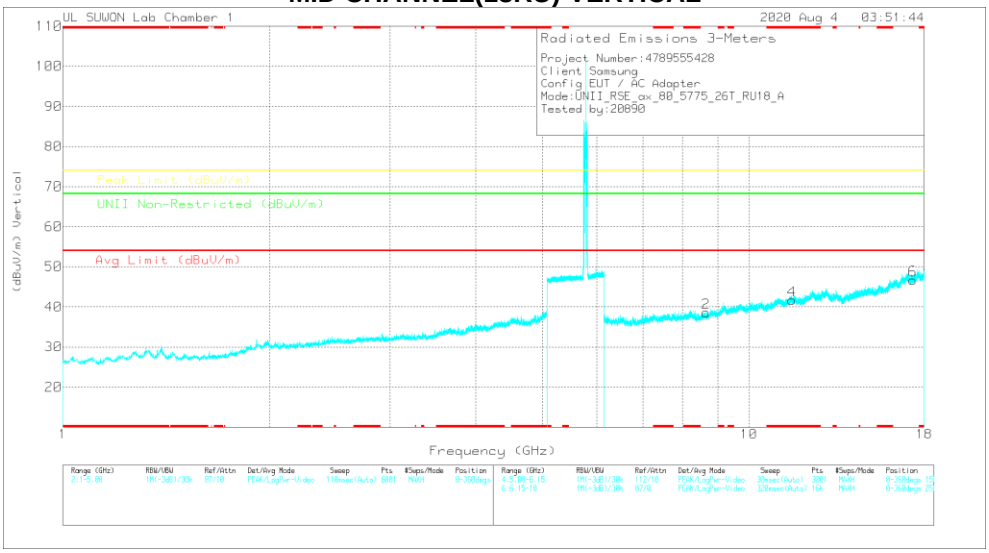
11.8.3. TX ABOVE 1GHz HE80(RU) MODE IN THE 5.8GHz BAND

HARMONICS AND SPURIOUS EMISSIONS – ANT1+ANT2

MID CHANNEL(18RU) HORIZONTAL



MID CHANNEL(18RU) 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.

MID CHANNEL(18RU) DATA

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168717	6GHz_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
8.66479	37.38	PK-U	36.4	-25.1	0	48.68	-	-	-	-	68.2	-19.52	0	100	H
8.67213	37.42	PK-U	36.4	-25.4	0	48.42	-	-	-	-	68.2	-19.78	0	100	V
* 11.54508	35.99	PK-U	38.5	-22.3	0	52.19	-	-	74	-21.81	-	-	0	100	H
* 11.56085	35.74	PK-U	38.6	-22.3	0	52.04	-	-	74	-21.96	-	-	0	100	V
17.32223	34.72	PK-U	41.3	-17.5	0	58.52	-	-	-	-	68.2	-9.68	0	100	H
17.33072	34.14	PK-U	41.2	-17.7	0	57.64	-	-	-	-	68.2	-10.56	0	100	V

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

PK-U - U-NII: Maximum Peak

11.9. Spurious Emissions for Simultaneous Transmission

11.9.1. Worst test case RSDB condition

Case 1	2.4 GHz WLAN ANT1 + ANT2	5GHz WLAN ANT1 + ANT2
Mode	802.11b	802.11a
Channel	1 Note.	165
Frequency[MHz]	2412	5825
Data Rate	1Mbps	6Mbps
Axis (Worst)	X & Y	

Note. All low, middle, and high channels of 11b mode were checked, and only the worst test case was listed in the report.

11.9.2. Worst test case non-DBS + Bluetooth condition

Case 2	2.4 GHz Bluetooth ANT1	2.4 GHz WLAN ANT2	5GHz WLAN ANT1 + ANT2
Mode	BDR	802.11b	802.11a
Channel	78	1	165
Frequency[MHz]	2480	2412	5825
Data Rate	1 Mbps	1 Mbps	6Mbps
Axis (Worst)	X & Y		

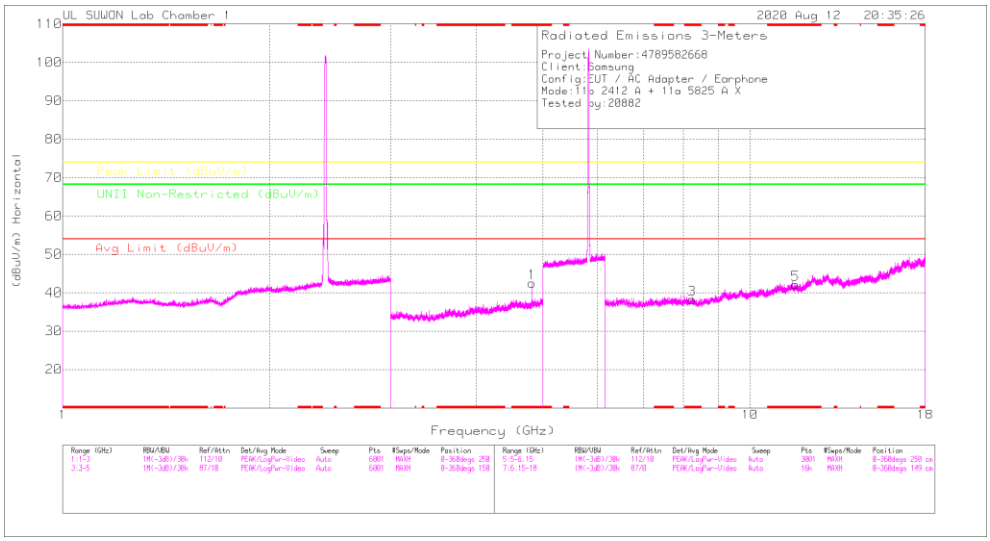
NOTE
The lowest margin condition among the channels and modes were selected for test.
Low, mid, and high channels of 2.4GH WLAN were tested, and the worst case configuration & data were listed in the test report.

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15E(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

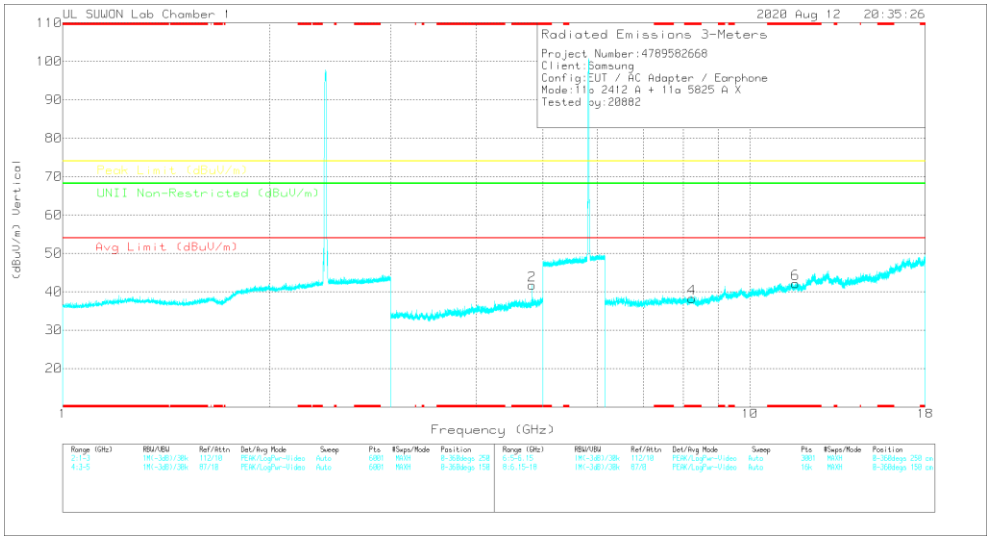
11.9.3. Test Results

Spurious emission for Simultaneous Transmission
Case1. – X axis

HORIZONTAL



VERTICAL



Radiated Emissions

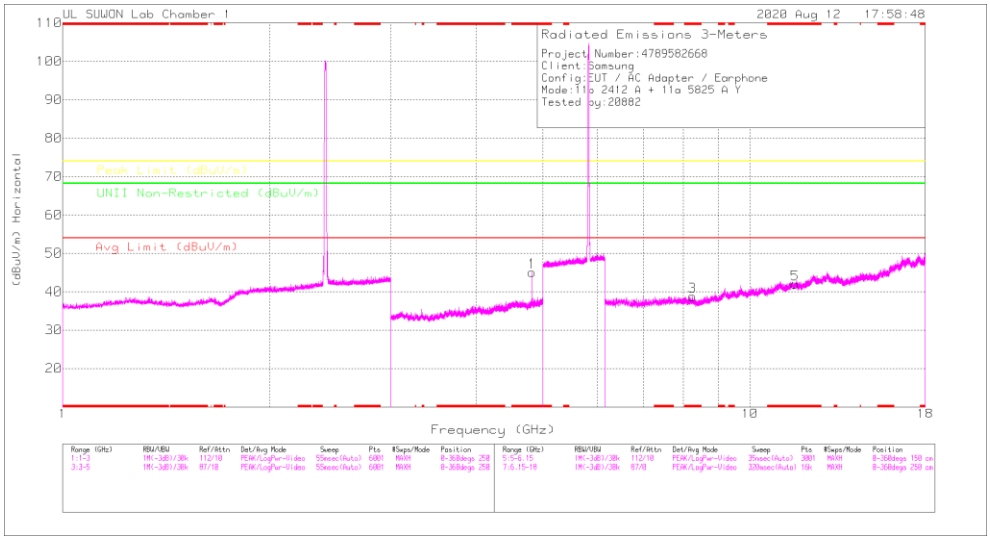
Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00218957	5GHz_LP[dB]	DTS_Notch[dB]	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	UNII Non-Restricted (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.82378	47.89	PK2	34.2	-30.6	.3	0	51.79	-	-	74	-22.21	-	-	149	155	H
* 4.82396	40.06	MAv1	34.2	-30.6	.3	0	43.96	54	-10.04	-	-	-	-	149	155	H
* 4.8239	47.67	PK2	34.2	-30.6	.3	0	51.57	-	-	74	-22.43	-	-	204	100	V
* 4.82398	40.89	MAv1	34.2	-30.6	.3	0	44.79	54	-9.21	-	-	-	-	204	100	V

Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00218957	6GHz_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
* 8.23762	38.16	PK-U	36	-25.6	0	48.56	-	-	74	-25.44	-	-	0	100	H
* 8.23804	37.49	PK-U	36	-25.6	0	47.89	-	-	74	-26.11	-	-	0	100	V
* 11.64851	37.2	PK-U	38.5	-21.8	0	53.9	-	-	74	-20.1	-	-	0	100	H
* 11.64998	35.97	PK-U	38.5	-21.9	0	52.57	-	-	74	-21.43	-	-	0	100	V

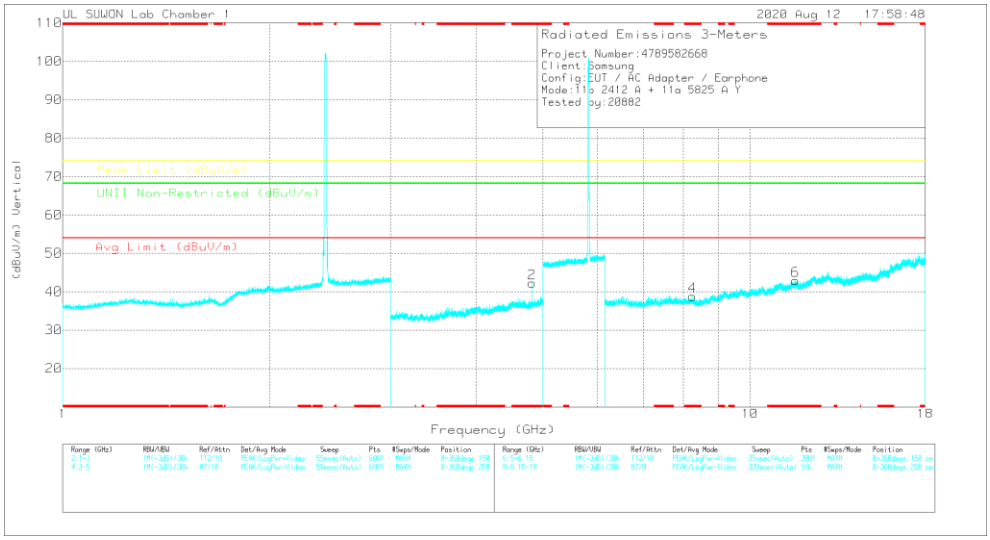
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK2 - KDB558074 Method: Maximum Peak
MAv1 - KDB558074 Option 1 Maximum RMS Average
PK-U - U-NII: Maximum Peak

Case1. – Y axis

HORIZONTAL



VERTICAL



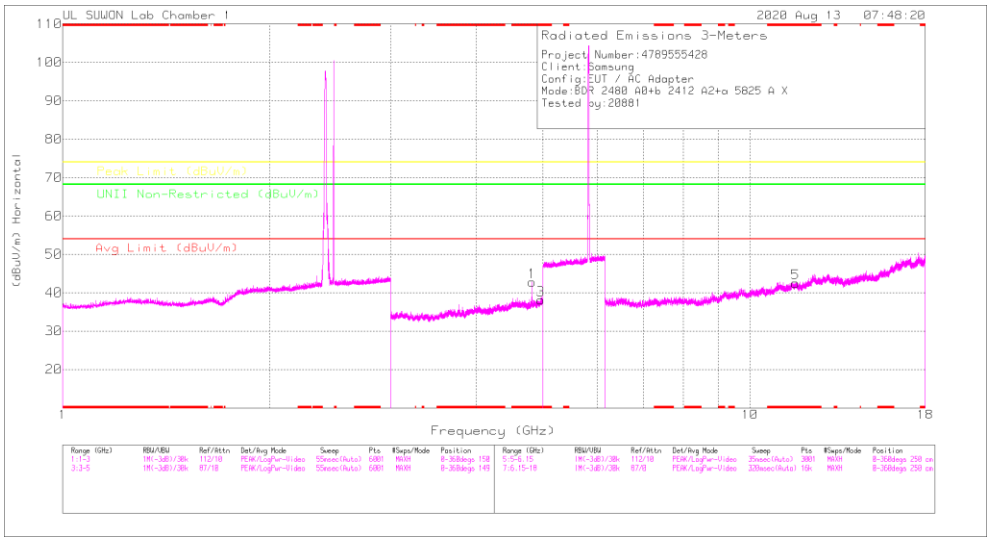
Radiated Emissions

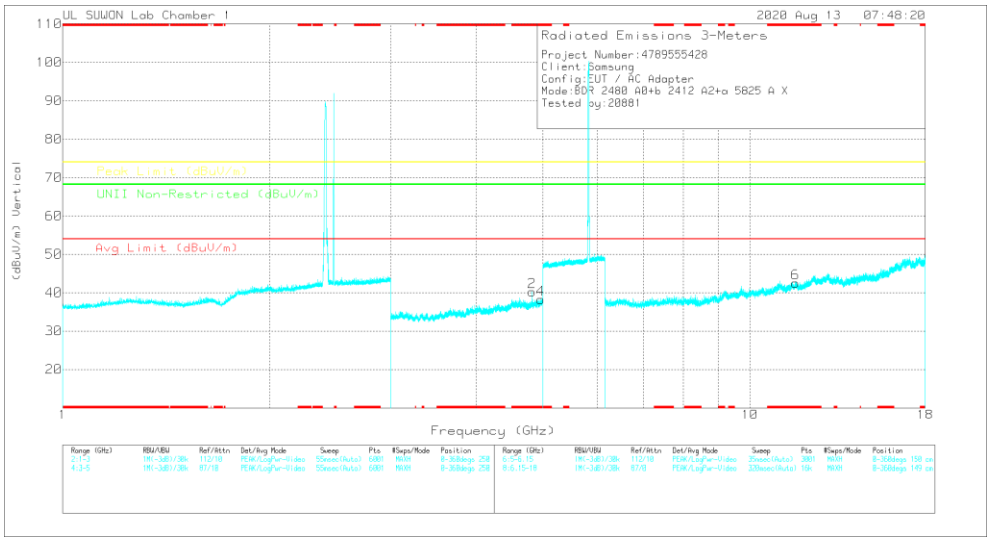
Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00218957	5GHz_LP[dB]	DTS_Notch[dB]	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	UNII Non-Restricted (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.82408	49.88	PK2	34.2	-30.6	.3	0	53.78	-	-	74	-20.22	-	-	116	279	H
* 4.82392	44.54	MAv1	34.2	-30.6	.3	0	48.44	54	-5.56	-	-	-	-	116	279	H
* 4.8274	48.31	PK2	34.2	-30.6	.3	0	52.21	-	-	74	-21.79	-	-	96	156	V
* 4.82398	39.93	MAv1	34.2	-30.6	.3	0	43.83	54	-10.17	-	-	-	-	96	156	V

Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00218957	6GHz_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
* 8.24979	38.65	PK-U	36	-25.5	0	49.15	-	-	74	-24.85	-	-	0	100	H
* 8.25168	38.11	PK-U	36	-25.4	0	48.71	-	-	74	-25.29	-	-	0	100	V
* 11.64904	35.88	PK-U	38.5	-21.8	0	52.58	-	-	74	-21.42	-	-	0	100	H
* 11.64849	36.11	PK-U	38.5	-21.8	0	52.81	-	-	74	-21.19	-	-	0	100	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK2 - KDB558074 Method: Maximum Peak
MAv1 - KDB558074 Option 1 Maximum RMS Average
PK-U - U-NII: Maximum Peak

Case2. – X axis





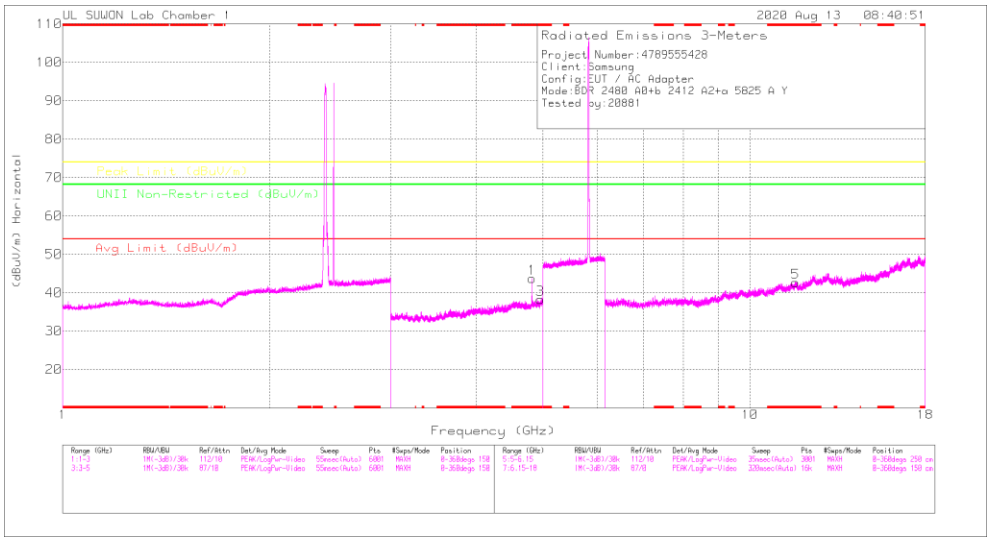
Radiated Emissions

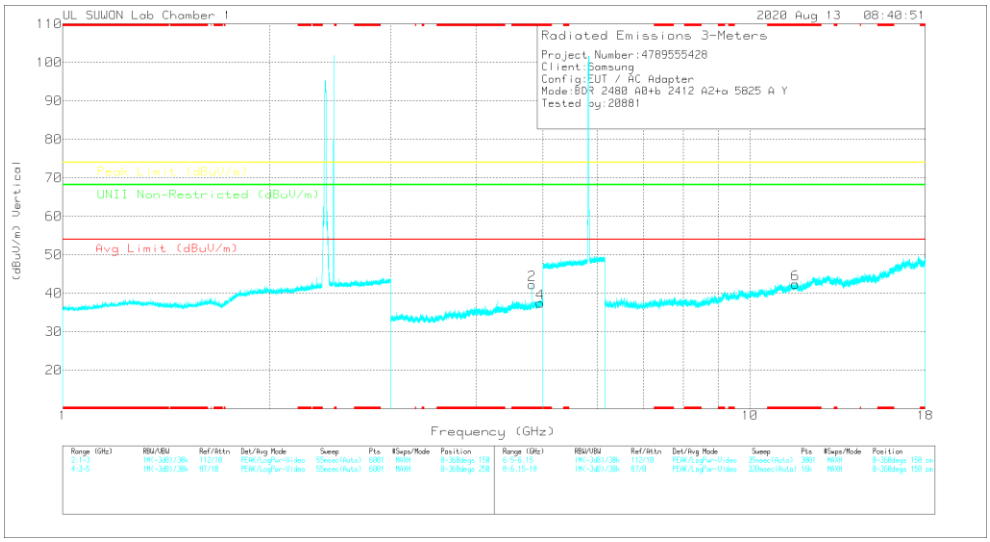
Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00218957	5GHz_LP[dB]	DTS_Notch[dB]	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	UNII Non-Restricted (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.8238	49.43	PK2	34.2	-30.6	.3	0	53.33	-	-	74	-20.67	-	-	148	155	H
* 4.82398	39.42	MAv1	34.2	-30.6	.3	0	43.32	54	-10.68	-	-	-	-	148	155	H
* 4.82414	47.97	PK2	34.2	-30.6	.3	0	51.87	-	-	74	-22.13	-	-	189	100	V
* 4.82388	38.01	MAv1	34.2	-30.6	.3	0	41.91	54	-12.09	-	-	-	-	189	100	V
* 4.95917	42.79	PKFH	34.1	-30.3	.3	0	46.89	-	-	74	-27.11	-	-	360	100	H
* 4.95834	43.93	PKFH	34.1	-30.4	.3	0	47.93	-	-	74	-26.07	-	-	360	100	V

Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00218957	6GHz_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
* 11.65506	36.59	PK-U	38.5	-21.8	0	53.29	-	-	74	-20.71	-	-	360	100	H
* 11.65587	36.08	PK-U	38.5	-21.8	0	52.78	-	-	74	-21.22	-	-	360	100	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK2 - KDB558074 Method: Maximum Peak
MAv1 - KDB558074 Option 1 Maximum RMS Average
PKFH FHSS/BT RB=100k for Frequencies<1GHz / RB=1MHz for Frequencies>1GHz, VB=3 x RB, Peak
PK-U - U-NII: Maximum Peak

Case2. – Y axis





Radiated Emissions

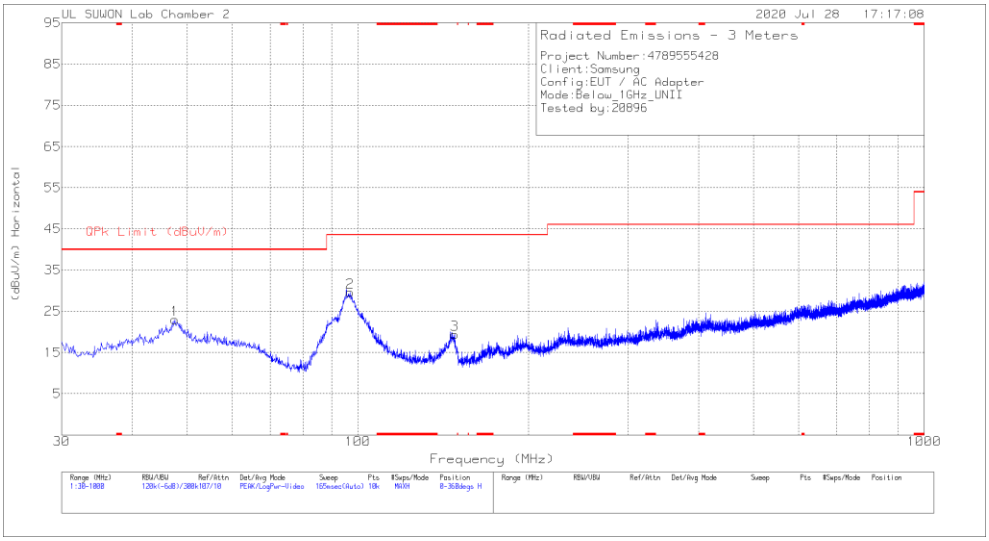
Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00218957	5GHz_LP[dB]	DTS_Notch[dB]	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	UNII Non-Restricted (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.82394	43.22	PK2	34.2	-30.6	.3	0	47.12	-	-	74	-26.88	-	-	106	145	H
* 4.82402	38.82	MAv1	34.2	-30.6	.3	0	42.72	54	-11.28	-	-	-	-	106	145	H
* 4.82396	48.23	PK2	34.2	-30.6	.3	0	52.13	-	-	74	-21.87	-	-	103	127	V
* 4.82396	38.41	MAv1	34.2	-30.6	.3	0	42.31	54	-11.69	-	-	-	-	103	127	V
* 4.9598	43.04	PKFH	34.1	-30.3	.3	0	47.14	-	-	74	-26.86	-	-	0	100	H
* 4.96081	43.43	PKFH	34.1	-30.3	.3	0	47.53	-	-	74	-26.47	-	-	0	100	V

Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00218957	6GHz_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
* 11.66212	30.35	PK-U	38.5	-21.7	0	47.15	-	-	74	-26.85	-	-	0	100	H
* 11.66209	30.29	PK-U	38.5	-21.7	0	47.09	-	-	74	-26.91	-	-	0	100	V

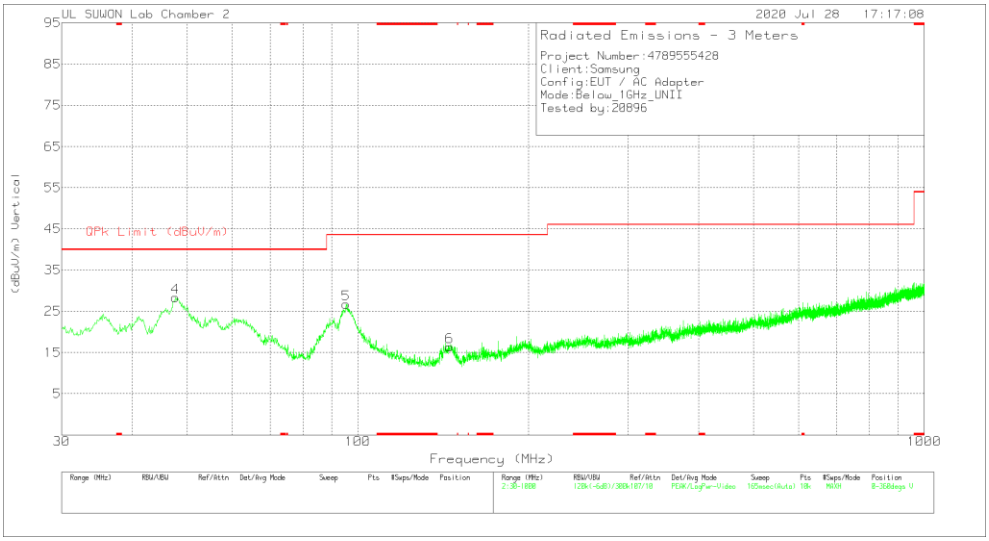
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK2 - KDB558074 Method: Maximum Peak
MAv1 - KDB558074 Option 1 Maximum RMS Average
PKFH FHSS/BT RB=100k for Frequencies<1GHz / RB=1MHz for Frequencies>1GHz, VB=3 x RB, Peak
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK-U - U-NII: Maximum Peak

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)



Below 1G Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163_749	Below_1G[dB]	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	47.557	35.04	Pk	19.8	-31.8	23.04	40	-16.96	0-360	400	H
2	97.027	43.66	Pk	17.4	-31.4	29.66	43.52	-13.86	0-360	300	H
3	148.146	36.47	Pk	14	-31.1	19.37	43.52	-24.15	0-360	200	H
4	47.654	40.39	Pk	19.8	-31.8	28.39	40	-11.61	0-360	100	V
5	95.378	40.85	Pk	17.3	-31.4	26.75	43.52	-16.77	0-360	100	V
6	145.139	33.34	Pk	14.1	-31.1	16.34	43.52	-27.18	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)
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.

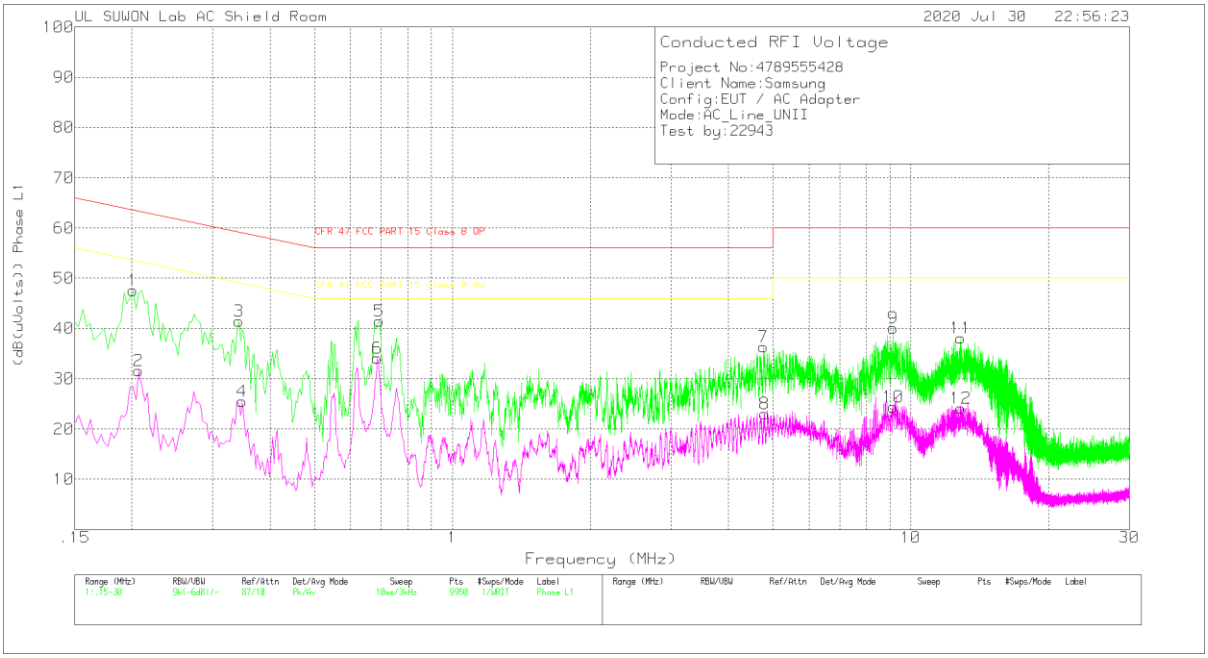
The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

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

RESULTS

WORST EMISSIONS

LINE 1 DATA



Trace Markers

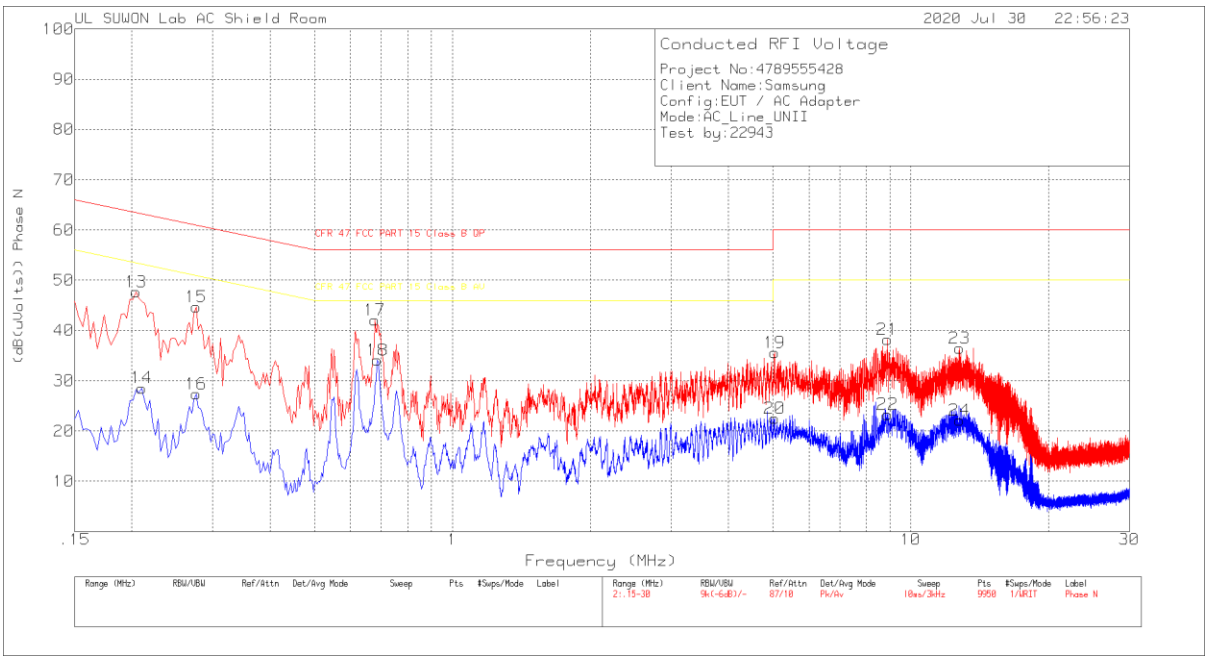
Range 1: Phase L1 .15 - 30MHz

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	.201	37.52	Pk	9.9	.2	47.62	63.57	-15.95	-	-
2	.207	21.54	Av	9.9	.2	31.64	-	-	53.32	-21.68
3	.342	31.31	Pk	9.9	.2	41.41	59.15	-17.74	-	-
4	.348	15.46	Av	9.9	.2	25.56	-	-	49.01	-23.45
5	.693	31.39	Pk	9.9	.2	41.49	56	-14.51	-	-
6	.687	24.05	Av	9.9	.2	34.15	-	-	46	-11.85
7	4.77	26.2	Pk	9.8	.3	36.3	56	-19.7	-	-
8	4.794	12.97	Av	9.8	.3	23.07	-	-	46	-22.93
9	9.165	29.81	Pk	9.9	.4	40.11	60	-19.89	-	-
10	9.15	14.08	Av	9.9	.4	24.38	-	-	50	-25.62
11	12.867	27.74	Pk	10	.4	38.14	60	-21.86	-	-
12	12.876	13.68	Av	10	.4	24.08	-	-	50	-25.92

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	.204	37.62	Pk	9.9	.2	47.72	63.45	-15.73	-	-
14	.21	18.46	Av	9.9	.2	28.56	-	-	53.21	-24.65
15	.276	34.79	Pk	9.7	.2	44.69	60.94	-16.25	-	-
16	.276	17.46	Av	9.7	.2	27.36	-	-	50.94	-23.58
17	.678	32	Pk	9.9	.2	42.1	56	-13.9	-	-
18	.687	23.97	Av	9.9	.2	34.07	-	-	46	-11.93
19	5.043	25.45	Pk	9.8	.3	35.55	60	-24.45	-	-
20	5.043	12.4	Av	9.8	.3	22.5	-	-	50	-27.5
21	8.886	27.92	Pk	9.9	.4	38.22	60	-21.78	-	-
22	8.889	13.02	Av	9.9	.4	23.32	-	-	50	-26.68
23	12.783	26.04	Pk	10.1	.3	36.44	60	-23.56	-	-
24	12.78	11.71	Av	10.1	.3	22.11	-	-	50	-27.89

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. ≥ 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
Non-occupancy period	30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds (See Note 1)
Channel Closing Transmission Time	200 milliseconds + approx. 60 milliseconds over remaining 10 second period. (See Notes 1 and 2)
U-NII Detection Bandwidth	Minimum 100% of the U-NII 99% transmission power bandwidth. (See Note 3)
Note 1: *Channel Move Time* and the *Channel Closing Transmission Time* should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst. **Note 2:** The *Channel Closing Transmission Time* is comprised of 200 milliseconds starting at the beginning of the *Channel Move Time* plus any additional intermittent control signals required to facilitate a *Channel* 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 *U-NII Detection Bandwidth* 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) x (19 x 10^6 PRI_{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 *Detection Bandwidth* test, *Channel Move Time*, and *Channel Closing Time* tests.

Table 6 – Long Pulse Radar Test Signal

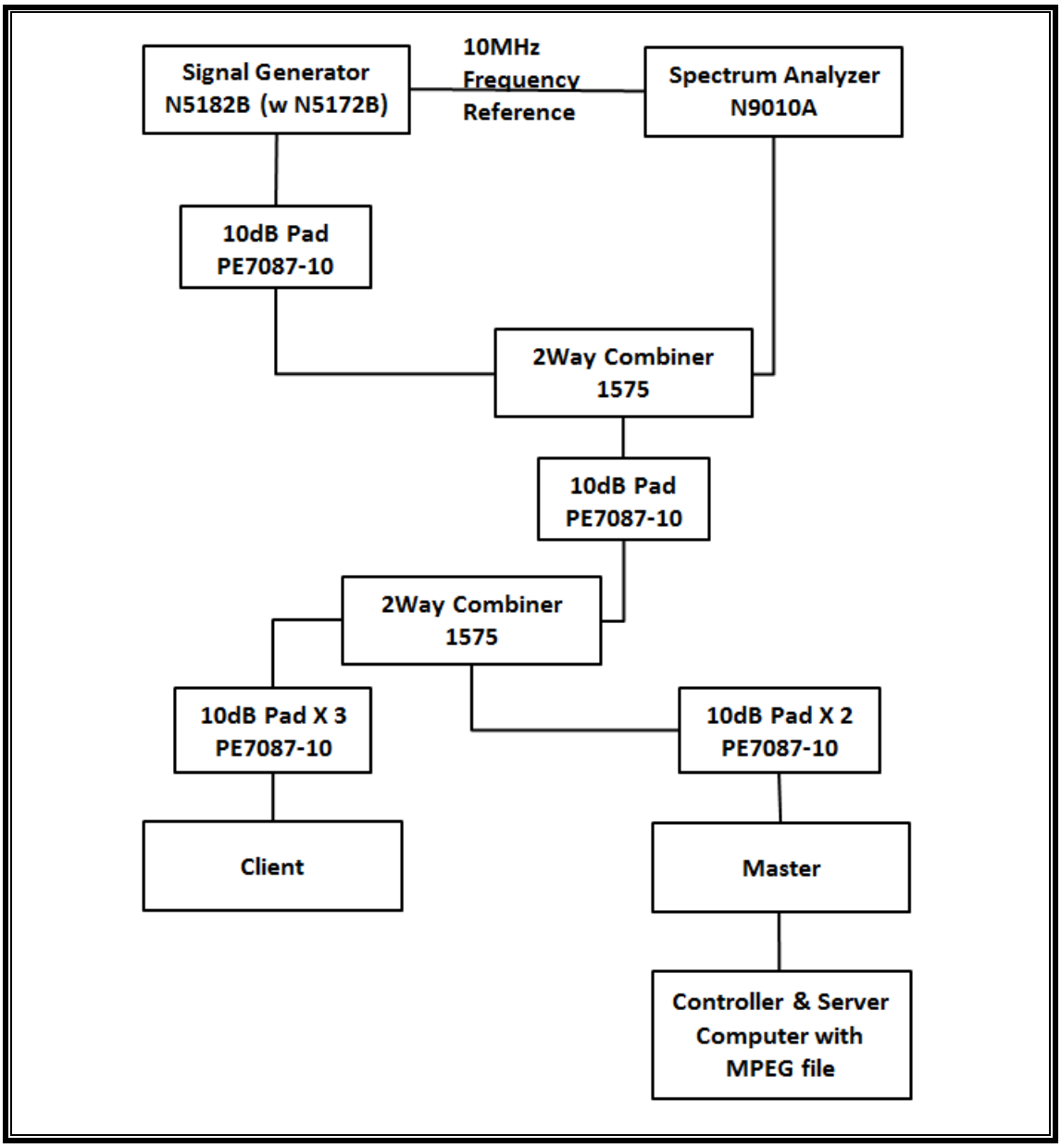
Radar Waveform Type	Pulse Width (µsec)	Chirp Width (MHz)	PRI (µsec)	Pulses per Burst	Number of Bursts	Minimum Percentage of Successful Detection	Minimum Trials
5	50-100	5-20	1000-2000	1-3	8-20	80%	30

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.

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15E(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

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.

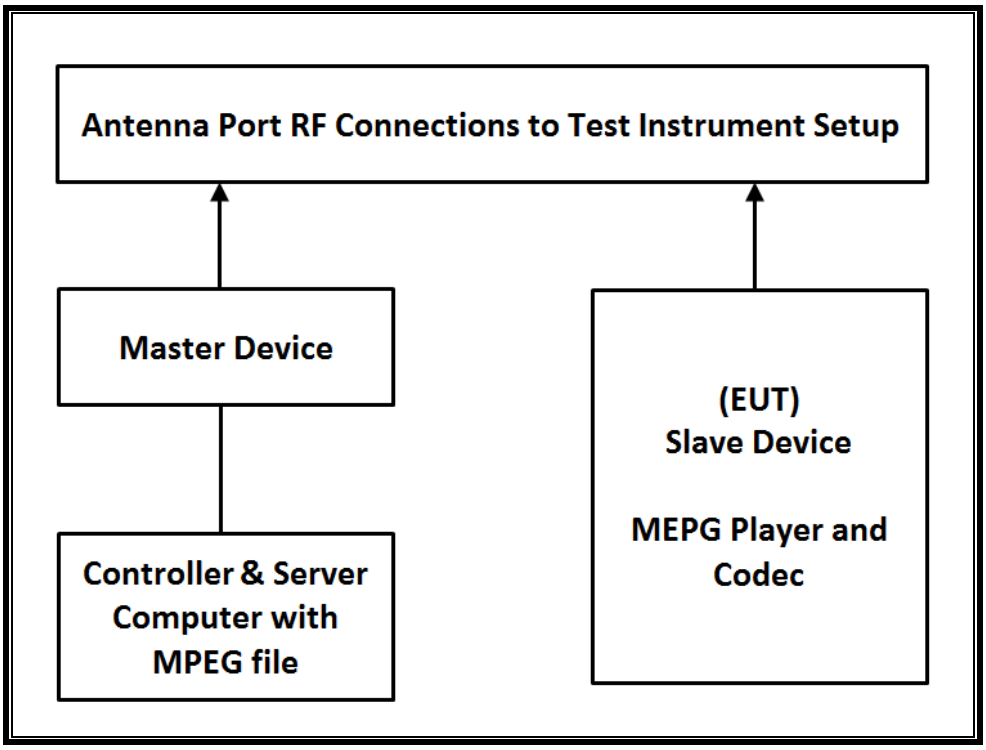
TEST AND MEASUREMENT EQUIPMENT

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	08-05-21
Vector Signal Generator, 6GHz	Agilent / HP	N5182B	MY53051241	08-03-21
Combiner	WEINSCHEL	WA1534	UL001	02-05-21
Combiner	WEINSCHEL	WA1535	UL002	02-05-21

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 13.78 dBm in the 5250-5350 MHz band and 14.13 dBm in the 5470-5725 MHz band.

The antenna assembly utilized two antenna.
Gain of ANT1 : -6.72 dBi for UNII 2A and -6.47 dBi for UNII 2C.
Gain of ANT2 : -6.31 dBi for UNII 2A and -6.27 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.

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

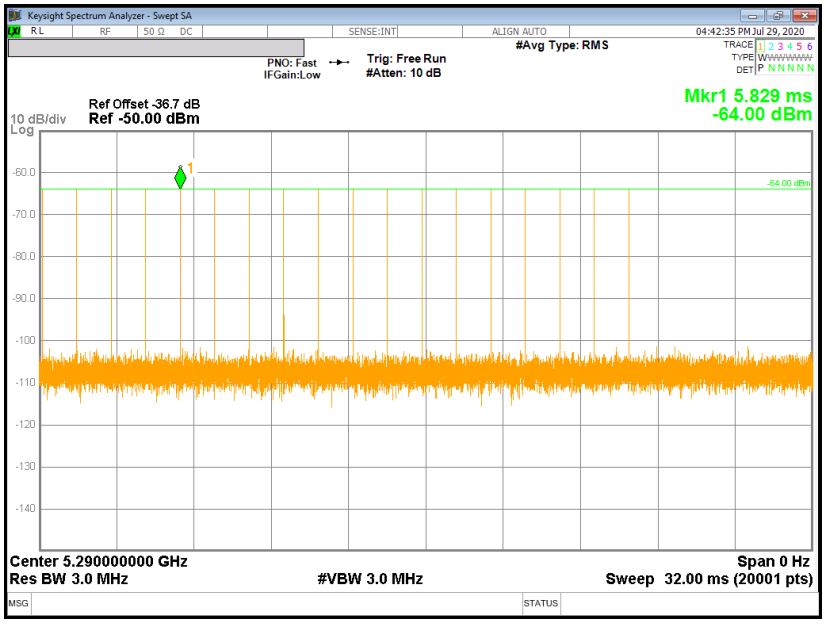
14.1.1. TEST CHANNEL

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

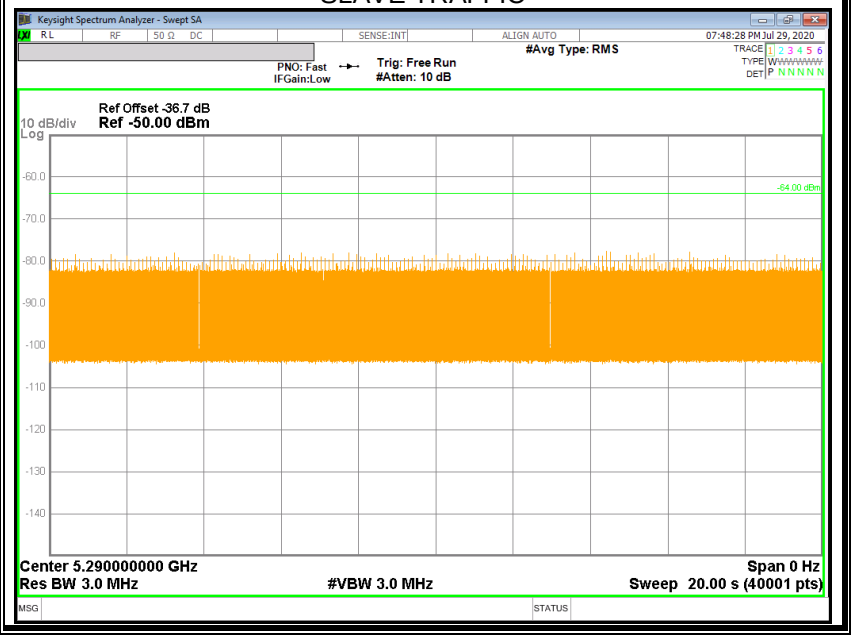
14.1.2. RADAR WAVEFORM AND TRAFFIC

RADAR WAVEFORM

RADAR WAVEFORM:SHORT PULSE RADAR TYPE 0 AT MASTER



SLAVE TRAFFIC



14.1.3. OVERLAPPING CHANNEL TESTS

RESULTS

These tests are not applicable.

14.1.4. 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)
0.711	10

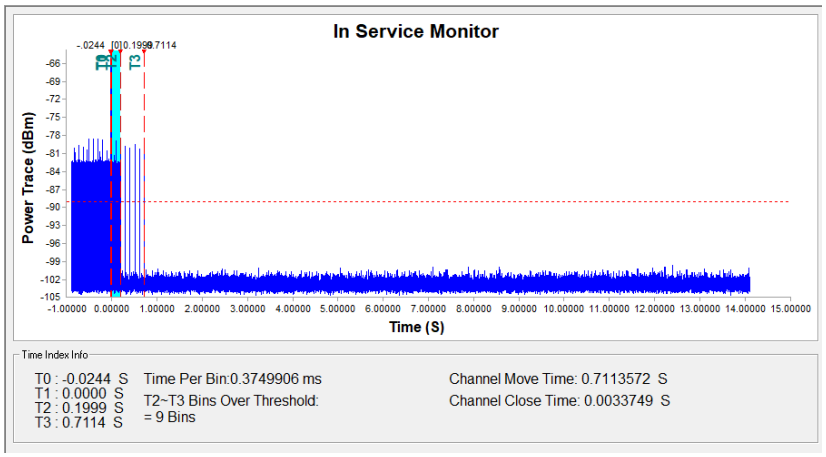
Aggregate Channel Closing Transmission Time (msec)	Limit (msec)
3.375	60

MOVE TIME & CHANNEL CLOSING TIME

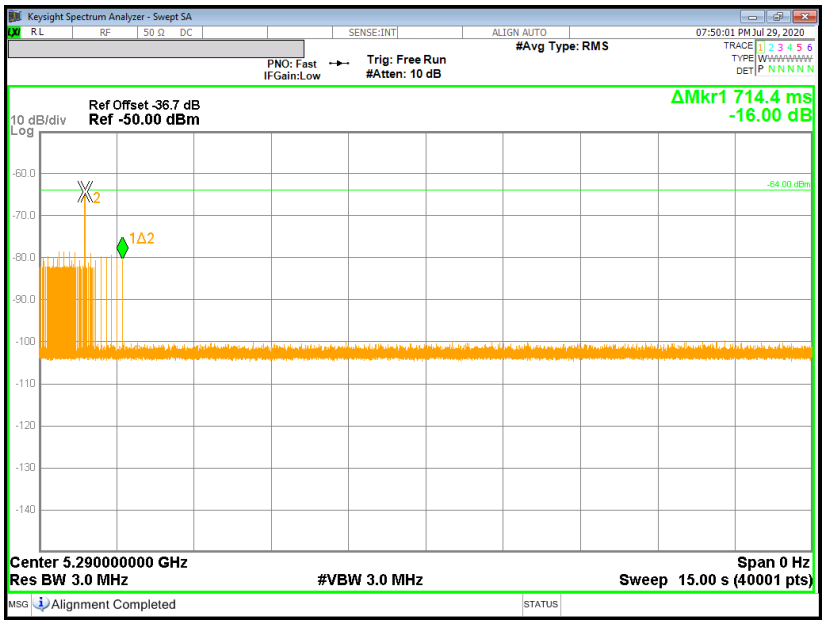
AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

No transmissions are observed during the aggregate monitoring period.

MOVE TIME & AGGREGATE CHANNEL CLOSING TRANSMISSION TIME



MOVE TIME & CLOSING TIME AT IN SERVICE MONITOR

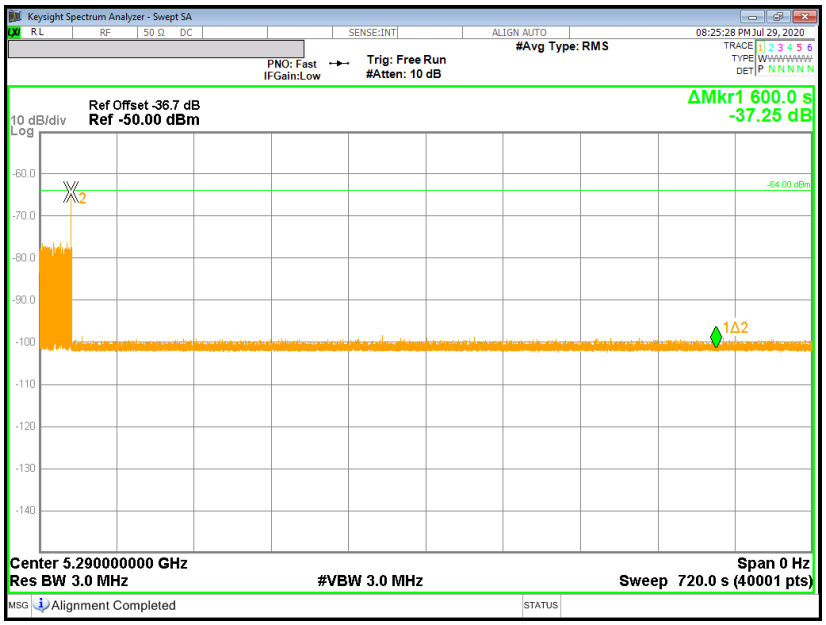


NON-OCCUPANCY PERIOD

RESULTS

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

10-MINUTE BEACON MONITORING PERIOD



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

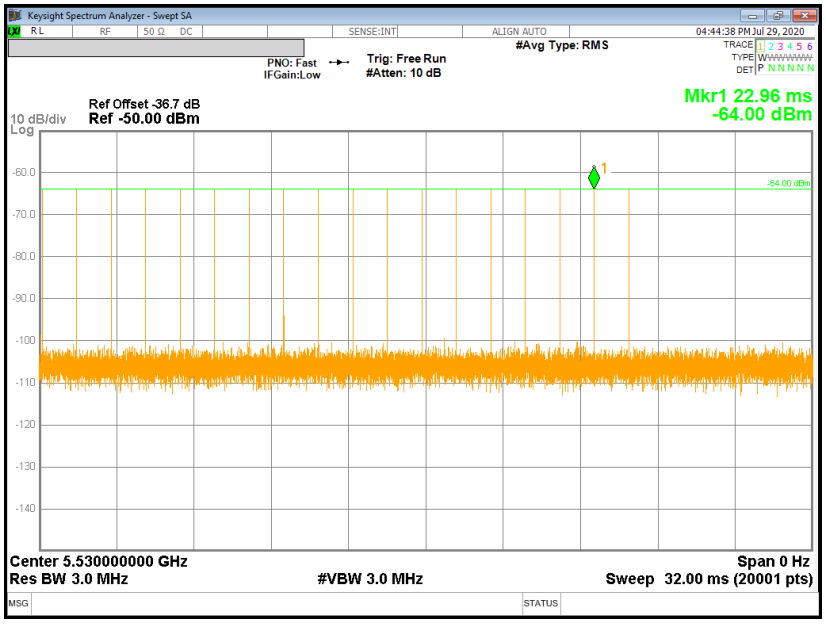
14.2.1. TEST CHANNEL

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

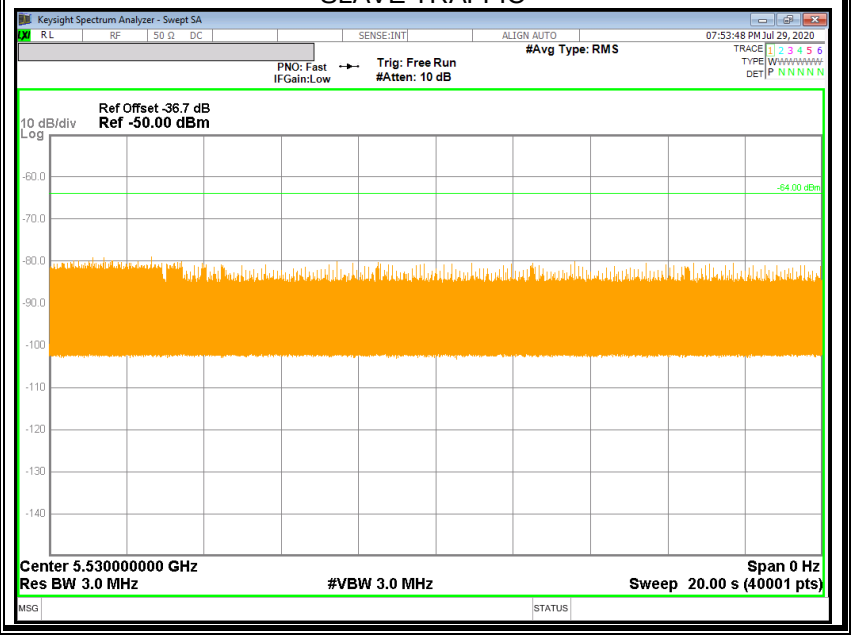
14.2.2. RADAR WAVEFORM AND TRAFFIC

RADAR WAVEFORM

RADAR WAVEFORM:SHORT PULSE RADAR TYPE 0 AT MASTER



SLAVE TRAFFIC



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)
0.783	10

Aggregate Channel Closing Transmission Time (msec)	Limit (msec)
4.125	60

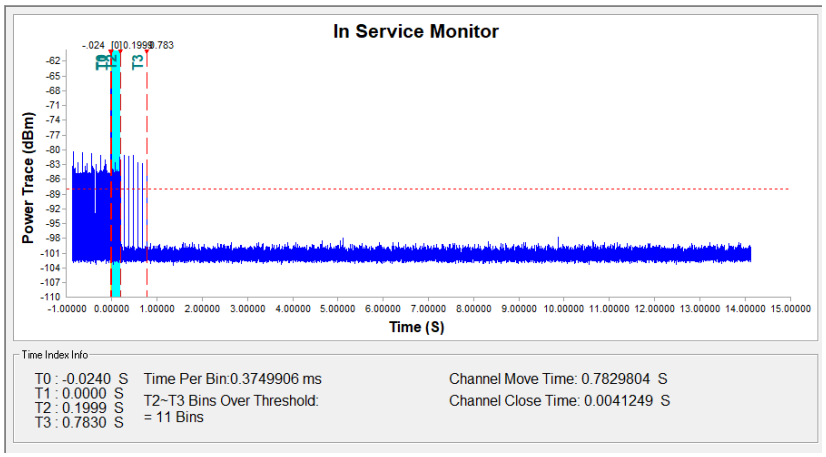
UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15E(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

MOVE TIME & CHANNEL CLOSING TIME

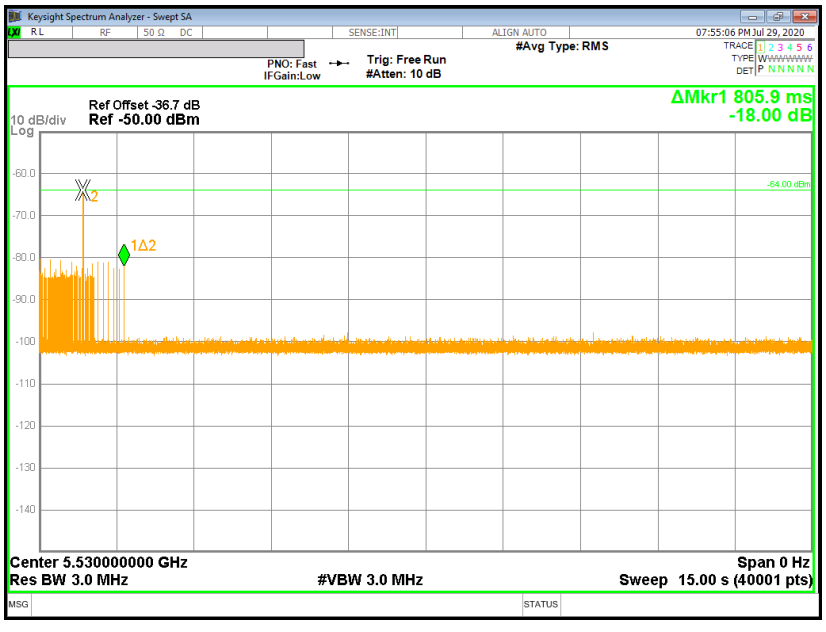
AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

No transmissions are observed during the aggregate monitoring period.

MOVE TIME & AGGREGATE CHANNEL CLOSING TRANSMISSION TIME



MOVE TIME & CLOSING TIME AT IN SERVICE MONITOR

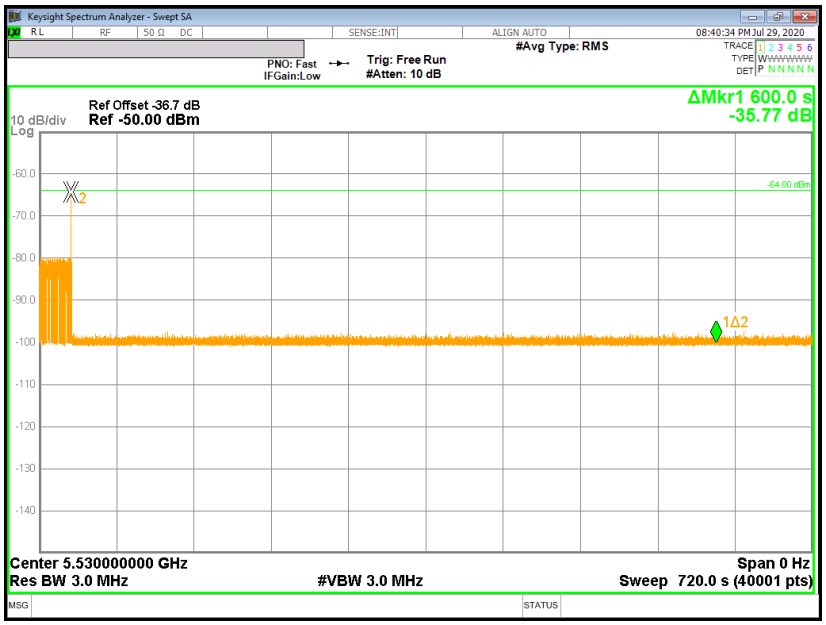


NON-OCCUPANCY PERIOD

RESULTS

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

10-MINUTE BEACON MONITORING PERIOD



END OF TEST REPORT