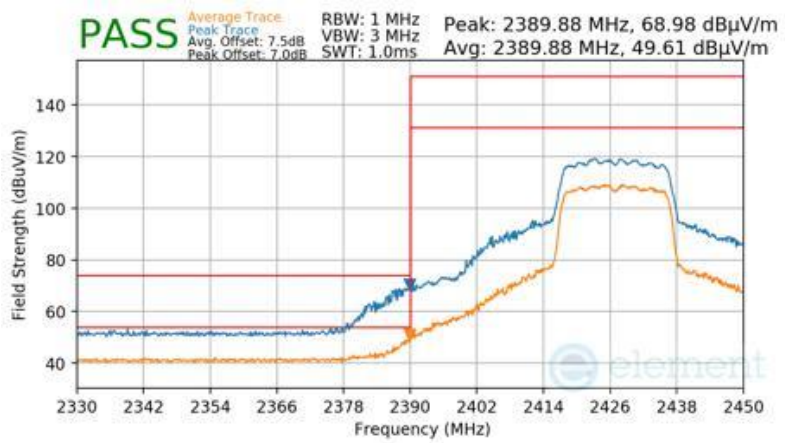
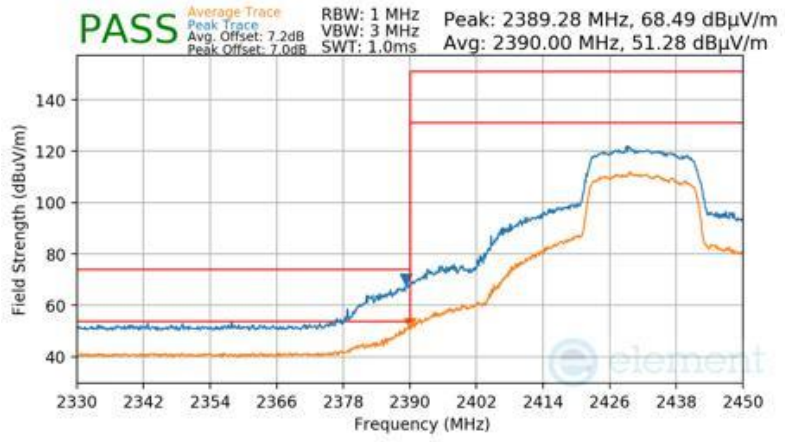
Mode	802.11ax-SU
Data Rate	MCS9
Distance of Measurement	3 Meters
Operating Frequency	2427MHz
Channel	4



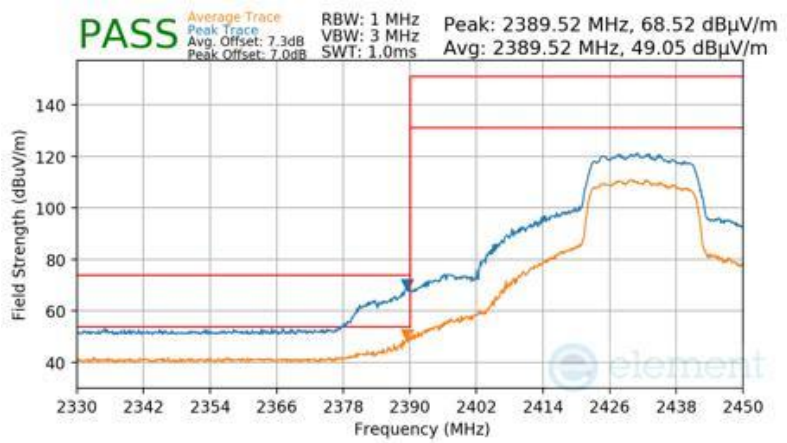
Plot 7-667 Radiated Restricted Lower Band Edge Measurement CDD

Mode	802.11ax-SU
Data Rate	MCS2
Distance of Measurement	3 Meters
Operating Frequency	2432MHz
Channel	5



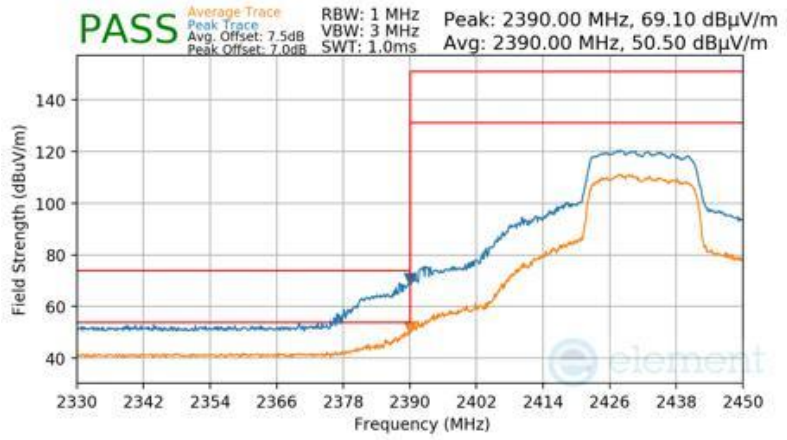
Plot 7-668 Radiated Restricted Lower Band Edge Measurement CDD

Mode	802.11ax-SU
Data Rate	MCS4
Distance of Measurement	3 Meters
Operating Frequency	2432MHz
Channel	5



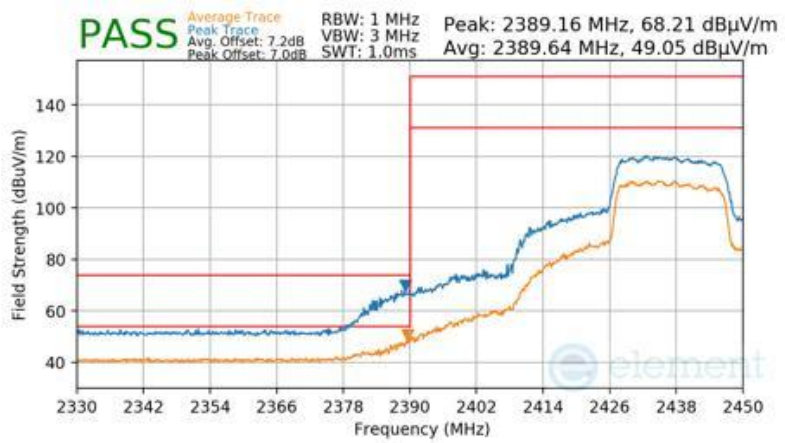
Plot 7-669 Radiated Restricted Lower Band Edge Measurement CDD

Mode	802.11ax-SU
Data Rate	MCS9
Distance of Measurement	3 Meters
Operating Frequency	2432MHz
Channel	5



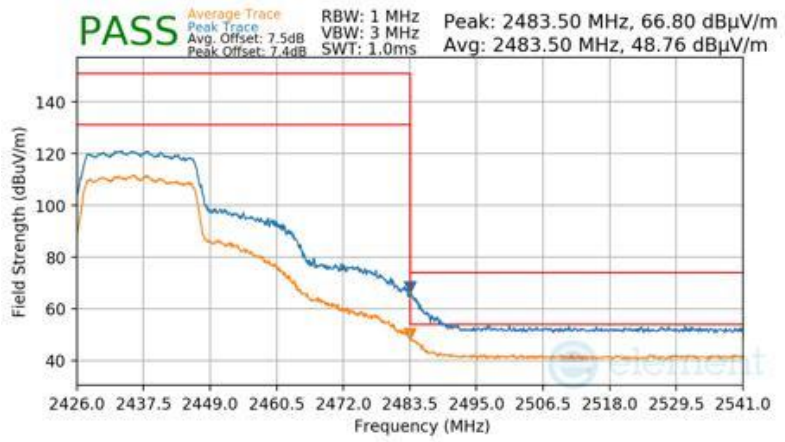
Plot 7-670 Radiated Restricted Lower Band Edge Measurement CDD

Mode	802.11ax-SU
Data Rate	MCS2
Distance of Measurement	3 Meters
Operating Frequency	2437MHz
Channel	6



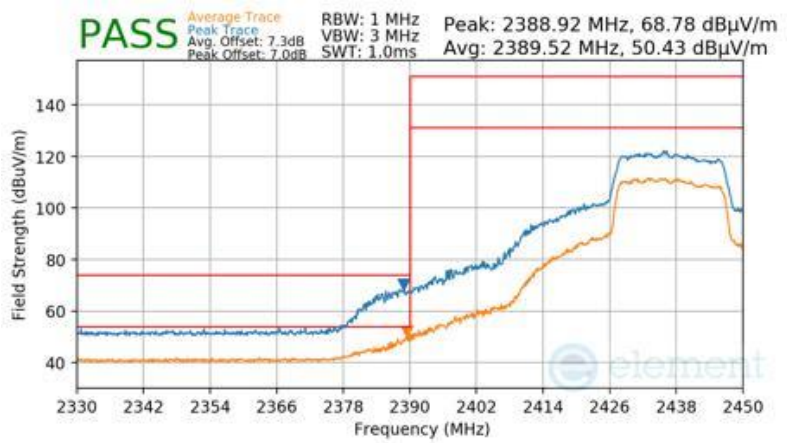
Plot 7-671 Radiated Restricted Lower Band Edge Measurement CDD

Mode	802.11ax-SU
Data Rate	MCS2
Distance of Measurement	3 Meters
Operating Frequency	2437MHz
Channel	6



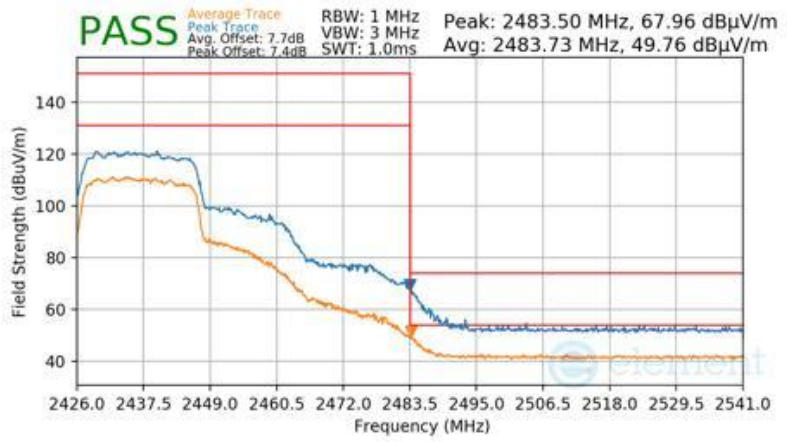
Plot 7-672 Radiated Restricted Upper Band Edge Measurement CDD

Mode	802.11ax-SU
Data Rate	MCS4
Distance of Measurement	3 Meters
Operating Frequency	2437MHz
Channel	6



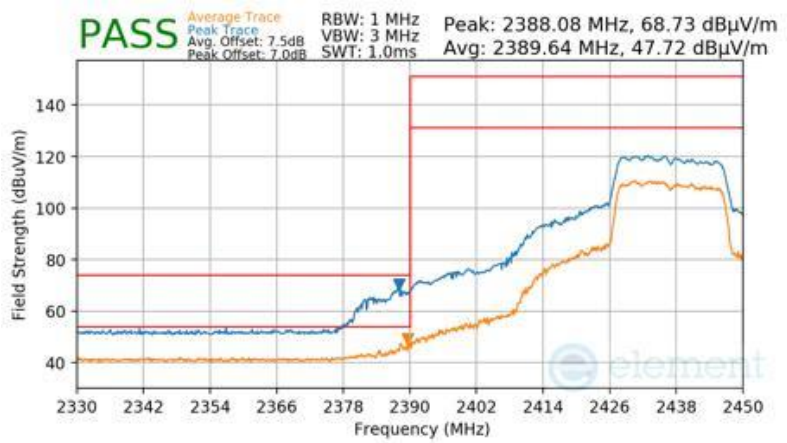
Plot 7-673 Radiated Restricted Lower Band Edge Measurement CDD

Mode	802.11ax-SU
Data Rate	MCS4
Distance of Measurement	3 Meters
Operating Frequency	2437MHz
Channel	6



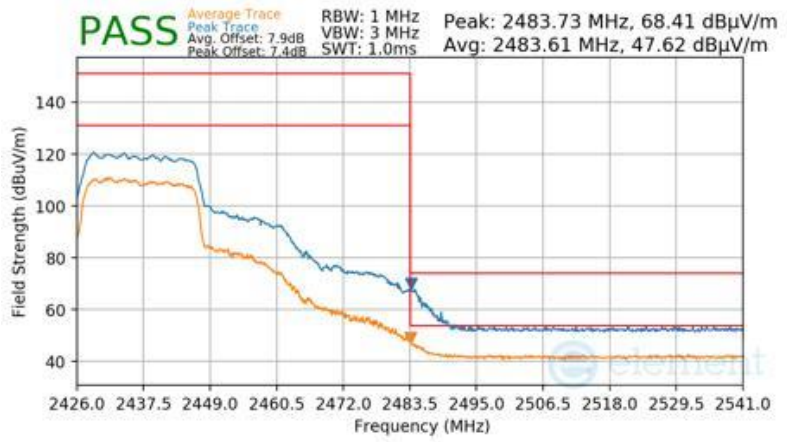
Plot 7-674 Radiated Restricted Upper Band Edge Measurement CDD

Mode	802.11ax-SU
Data Rate	MCS9
Distance of Measurement	3 Meters
Operating Frequency	2437MHz
Channel	6



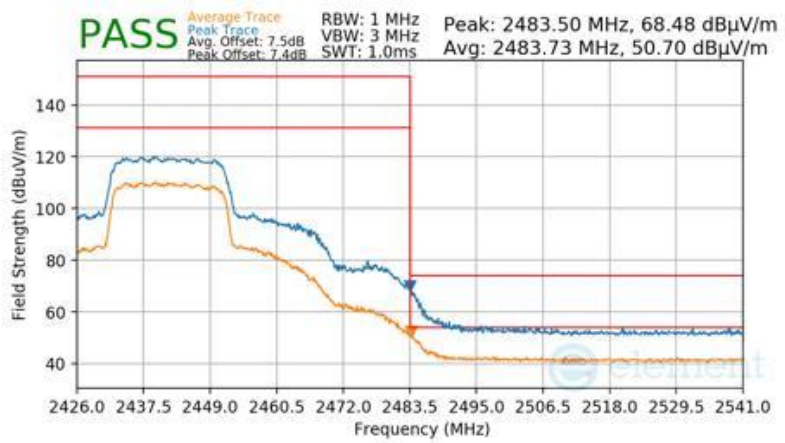
Plot 7-675 Radiated Restricted Lower Band Edge Measurement CDD

Mode	802.11ax-SU
Data Rate	MCS9
Distance of Measurement	3 Meters
Operating Frequency	2437MHz
Channel	6



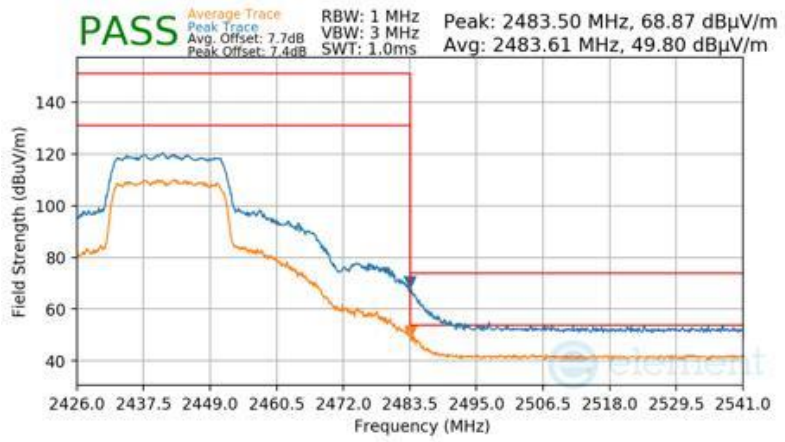
Plot 7-676 Radiated Restricted Upper Band Edge Measurement CDD

Mode	802.11ax-SU
Data Rate	MCS2
Distance of Measurement	3 Meters
Operating Frequency	2442MHz
Channel	7



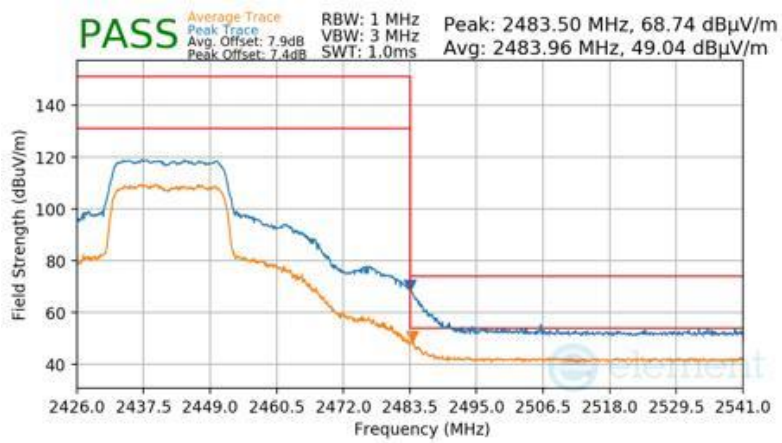
Plot 7-677 Radiated Restricted Upper Band Edge Measurement CDD

Mode	802.11ax-SU
Data Rate	MCS4
Distance of Measurement	3 Meters
Operating Frequency	2442MHz
Channel	7



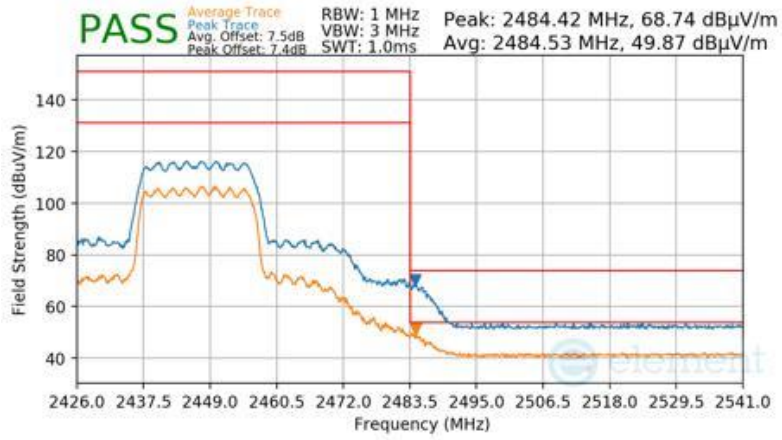
Plot 7-678 Radiated Restricted Upper Band Edge Measurement CDD

Mode	802.11ax-SU
Data Rate	MCS9
Distance of Measurement	3 Meters
Operating Frequency	2442MHz
Channel	7



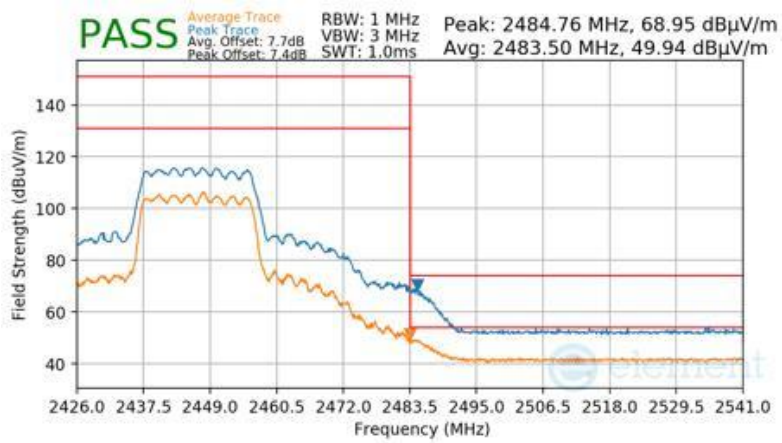
Plot 7-679 Radiated Restricted Upper Band Edge Measurement CDD

Mode	802.11ax-SU
Data Rate	MCS2
Distance of Measurement	3 Meters
Operating Frequency	2447MHz
Channel	8



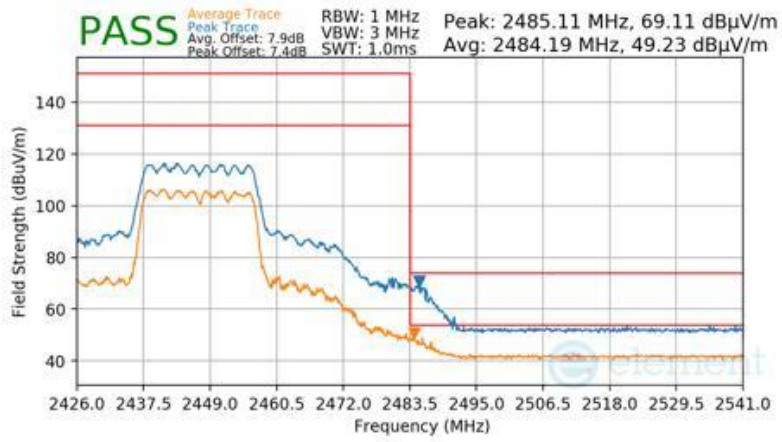
Plot 7-680 Radiated Restricted Upper Band Edge Measurement CDD

Mode	802.11ax-SU
Data Rate	MCS4
Distance of Measurement	3 Meters
Operating Frequency	2447MHz
Channel	8



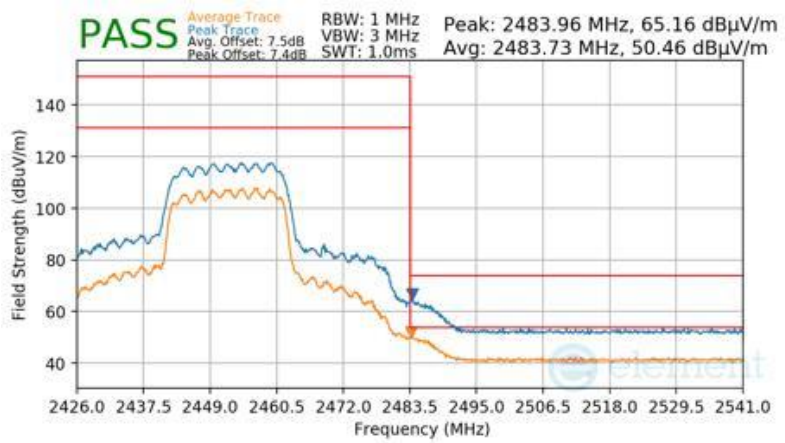
Plot 7-681 Radiated Restricted Upper Band Edge Measurement CDD

Mode	802.11ax-SU
Data Rate	MCS9
Distance of Measurement	3 Meters
Operating Frequency	2447MHz
Channel	8



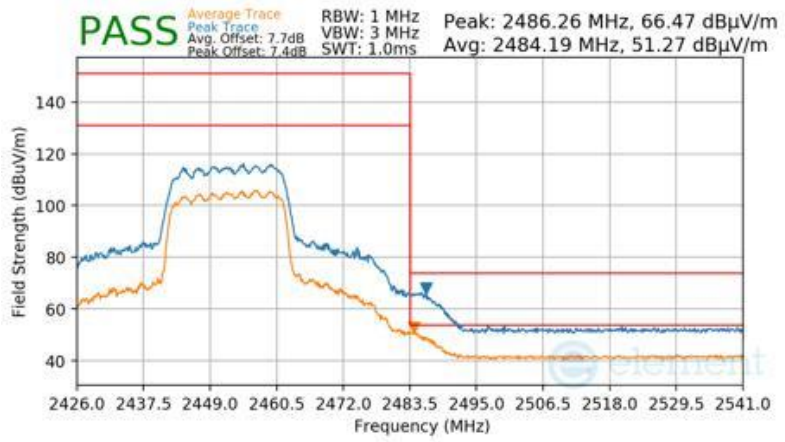
Plot 7-682 Radiated Restricted Upper Band Edge Measurement CDD

Mode	802.11ax-SU
Data Rate	MCS2
Distance of Measurement	3 Meters
Operating Frequency	2452MHz
Channel	9



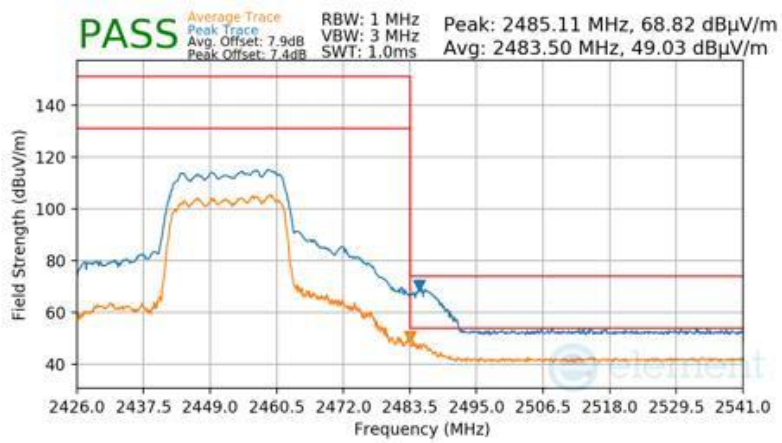
Plot 7-683 Radiated Restricted Upper Band Edge Measurement CDD

Mode	802.11ax-SU
Data Rate	MCS4
Distance of Measurement	3 Meters
Operating Frequency	2452MHz
Channel	9



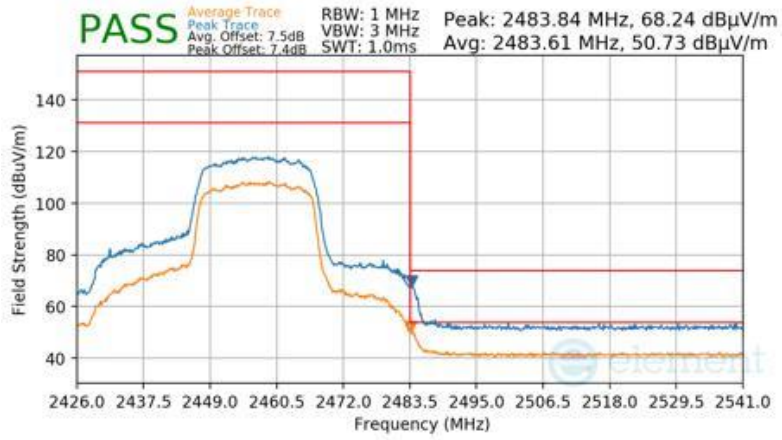
Plot 7-684 Radiated Restricted Upper Band Edge Measurement CDD

Mode	802.11ax-SU
Data Rate	MCS9
Distance of Measurement	3 Meters
Operating Frequency	2452MHz
Channel	9



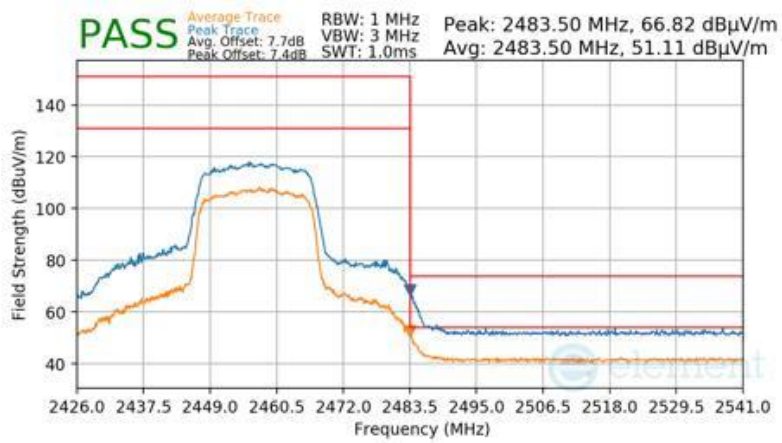
Plot 7-685 Radiated Restricted Upper Band Edge Measurement CDD

Mode	802.11ax-SU
Data Rate	MCS2
Distance of Measurement	3 Meters
Operating Frequency	2457MHz
Channel	10



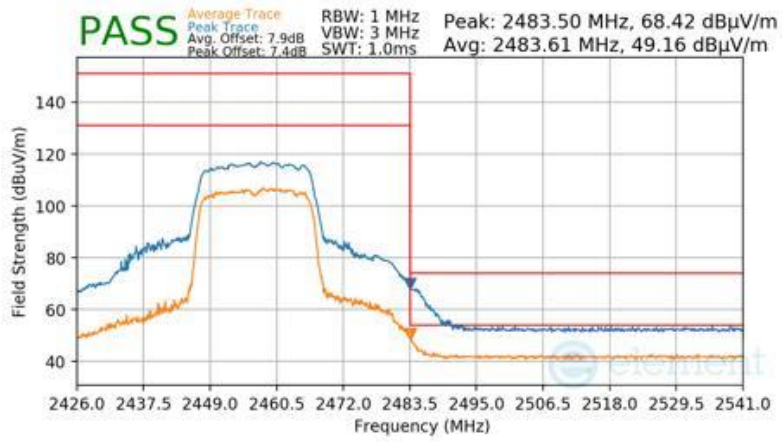
Plot 7-686 Radiated Restricted Upper Band Edge Measurement CDD

Mode	802.11ax-SU
Data Rate	MCS4
Distance of Measurement	3 Meters
Operating Frequency	2457MHz
Channel	10



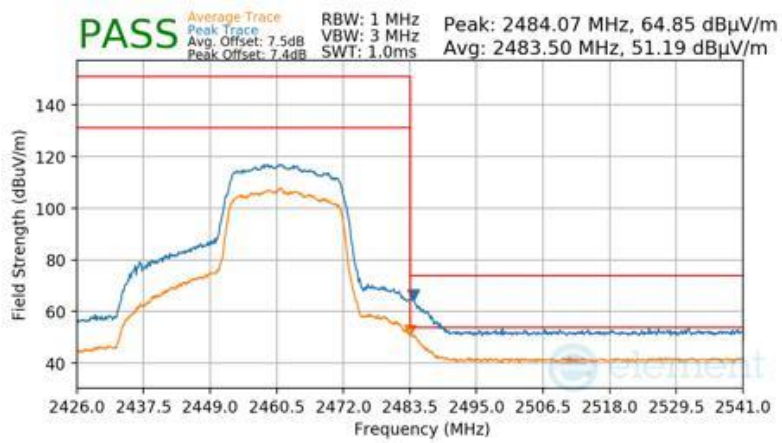
Plot 7-687 Radiated Restricted Upper Band Edge Measurement CDD

Mode	802.11ax-SU
Data Rate	MCS9
Distance of Measurement	3 Meters
Operating Frequency	2457MHz
Channel	10



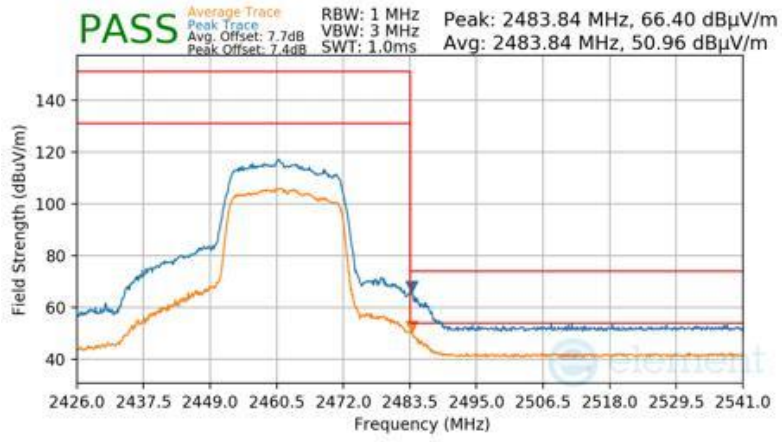
Plot 7-688 Radiated Restricted Upper Band Edge Measurement CDD

Mode	802.11ax-SU
Data Rate	MCS2
Distance of Measurement	3 Meters
Operating Frequency	2462MHz
Channel	11



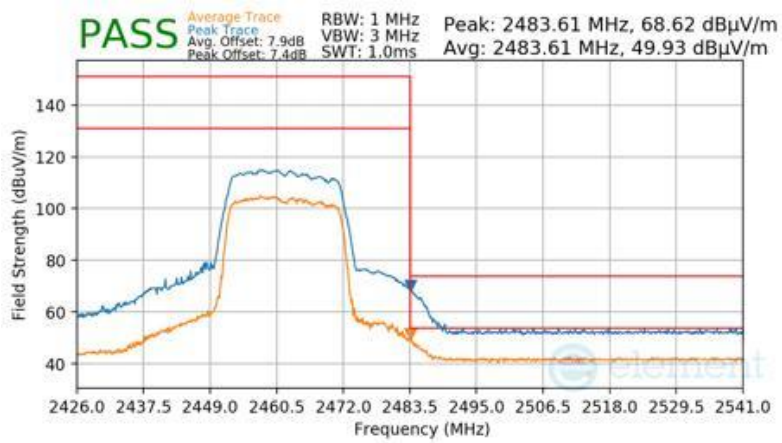
Plot 7-689 Radiated Restricted Upper Band Edge Measurement CDD

Mode	802.11ax-SU
Data Rate	MCS4
Distance of Measurement	3 Meters
Operating Frequency	2462MHz
Channel	11



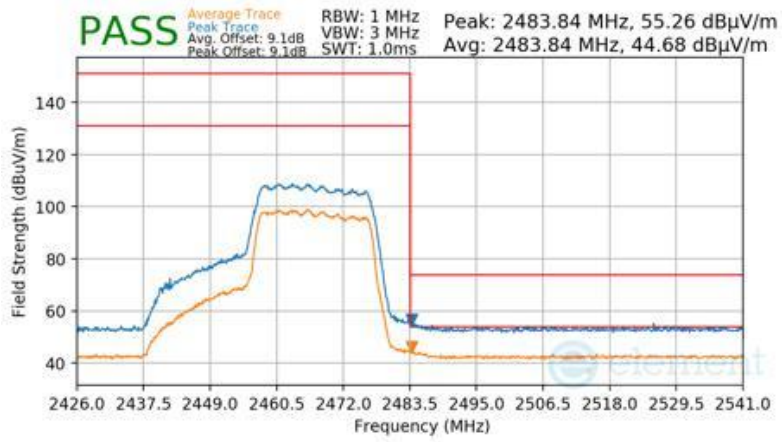
Plot 7-690 Radiated Restricted Upper Band Edge Measurement CDD

Mode	802.11ax-SU
Data Rate	MCS9
Distance of Measurement	3 Meters
Operating Frequency	2462MHz
Channel	11



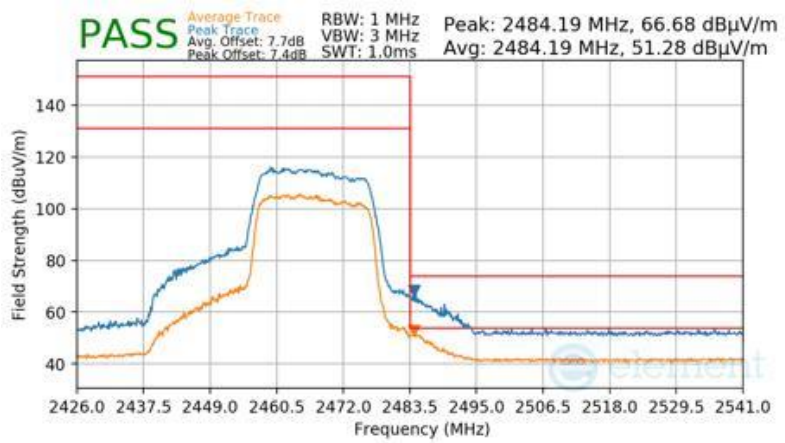
Plot 7-691 Radiated Restricted Upper Band Edge Measurement CDD

Mode	802.11ax-SU
Data Rate	MCS2
Distance of Measurement	3 Meters
Operating Frequency	2467MHz
Channel	12



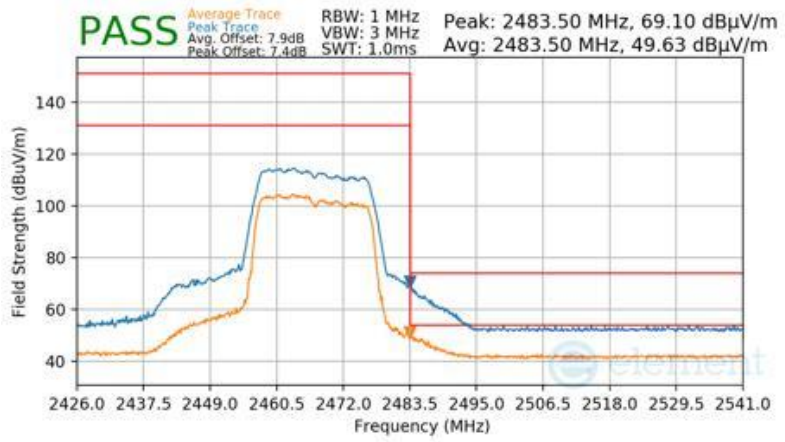
Plot 7-692 Radiated Restricted Upper Band Edge Measurement CDD

Mode	802.11ax-SU
Data Rate	MCS4
Distance of Measurement	3 Meters
Operating Frequency	2467MHz
Channel	12



Plot 7-693 Radiated Restricted Upper Band Edge Measurement CDD

Mode	802.11ax-SU
Data Rate	MCS9
Distance of Measurement	3 Meters
Operating Frequency	2467MHz
Channel	12



Plot 7-694 Radiated Restricted Upper Band Edge Measurement CDD

7.8 Radiated Spurious Emissions – Below 1GHz

§15.209; RSS-Gen [8.9]

Test Overview and Limit

All out of band radiated spurious emissions are measured with a spectrum analyzer connected to a receive antenna while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates and modes were investigated for radiated spurious emissions. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR and Table 7 of RSS-Gen (8.10) must not exceed the limits shown in Table 7-66 per Section 15.209 and RSS-Gen (8.9).

Frequency	Field Strength [µV/m]	Measured Distance [Meters]
0.009 – 0.490 MHz	2400/F (kHz)	300
0.490 – 1.705 MHz	24000/F (kHz)	30
1.705 – 30.00 MHz	30	30
30.00 – 88.00 MHz	100	3
88.00 – 216.0 MHz	150	3
216.0 – 960.0 MHz	200	3
Above 960.0 MHz	500	3

Table 7-66. Radiated Limits

Test Procedures Used

ANSI C63.10-2013

Test Settings

Quasi-Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 120kHz (for emissions from 30MHz – 1GHz)
3. Detector = quasi-peak
4. Sweep time = auto couple
5. Trace mode = max hold
6. Trace was allowed to stabilize

Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 120kHz (for emissions from 30MHz – 1GHz)
3. VBW = 300kHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold

Test Setup

The EUT and measurement equipment were set up as shown in the diagrams below.

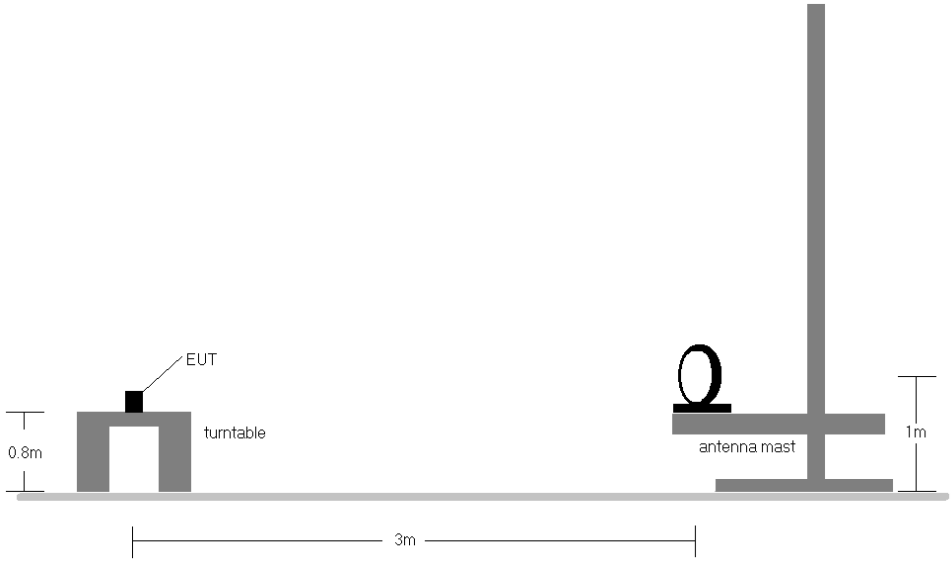


Figure 7-7. Radiated Test Setup < 30Mhz

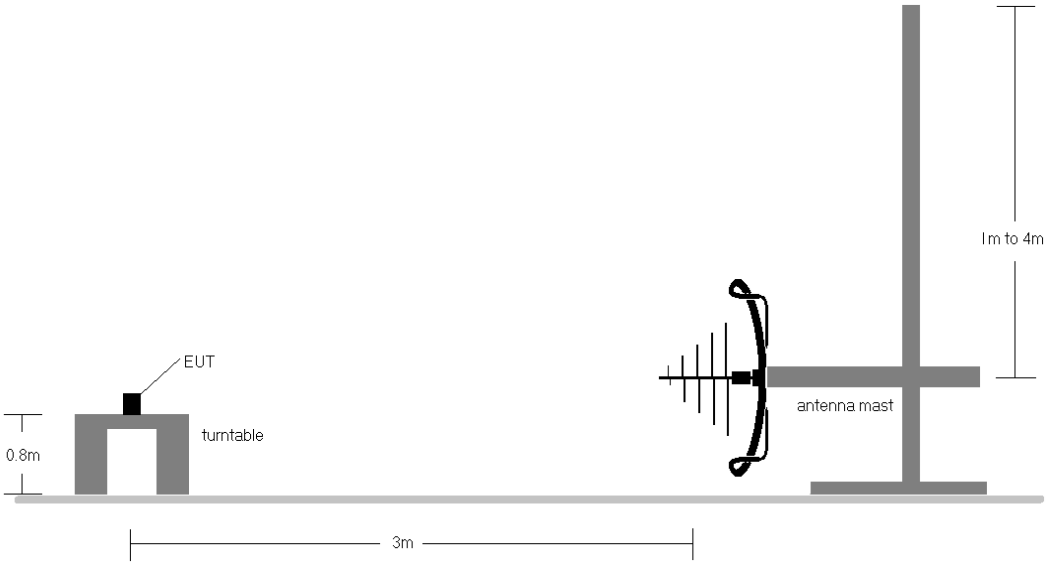


Figure 7-8. Radiated Test Setup < 1GHz

Test Notes

1. All emissions lying in restricted bands specified in §15.205 and RSS-Gen(8.10) are below the limit shown in Table 7-66.
2. The broadband receive antenna is manipulated through vertical and horizontal polarizations during the tests. The EUT is manipulated through three orthogonal planes. For below 30MHz the loop antenna was positioned in 3 orthogonal planes (X front, Y side, Z top) to determine the orientation resulting in the worst case emissions.
3. This unit was tested with its standard battery.
4. The spectrum is investigated using a peak detector and final measurements are recorded using CISPR quasi peak detector for emissions within 6dB of the limit.
5. Emissions were measured at a 3 meter test distance.
6. Emissions are investigated while operating on the center channel of the mode, band, and modulation that produced the worst case results during the transmitter spurious emissions testing.
7. No spurious emissions were detected within 20dB of the limit below 30MHz.
8. Both configurations below were investigated, and the worst case has been reported.
    a. EUT powered by AC/DC adaptor via USB-C cable with wire charger
    b. EUT powered by host PC via USB-C cable with wire charger
9. The results recorded using the broadband antenna is known to correlate with the results obtained by using a tuned dipole with an acceptable degree of accuracy. The VSWR for the measurement antenna was found to be less than 2:1.
10. The wide spectrum spurious emissions plots shown on the following pages are used only for the purpose of emission identification.
11. The unit was tested with all possible modes and only the highest emission is reported.
12. All antenna configurations were investigated and only the worst case is reported.

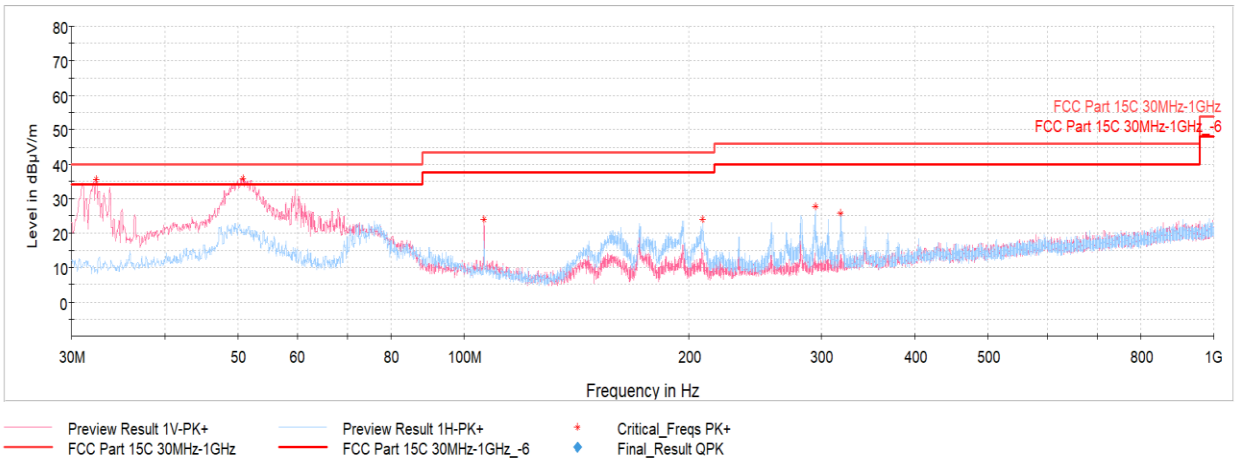
Sample Calculations

Determining Spurious Emissions Levels

- Field Strength Level $_{[dB\mu V/m]}$ = Analyzer Level $_{[dBm]}$ + 107 + AFCL $_{[dB/m]}$
- AFCL $_{[dB/m]}$ = Antenna Factor $_{[dB/m]}$ + Cable Loss $_{[dB]}$ – Preamplifier Gain $_{[dB]}$
- Margin $_{[dB]}$ = Field Strength Level $_{[dB\mu V/m]}$ – Limit $_{[dB\mu V/m]}$

CDD Radiated Spurious Emissions Measurements (Below 1GHz)

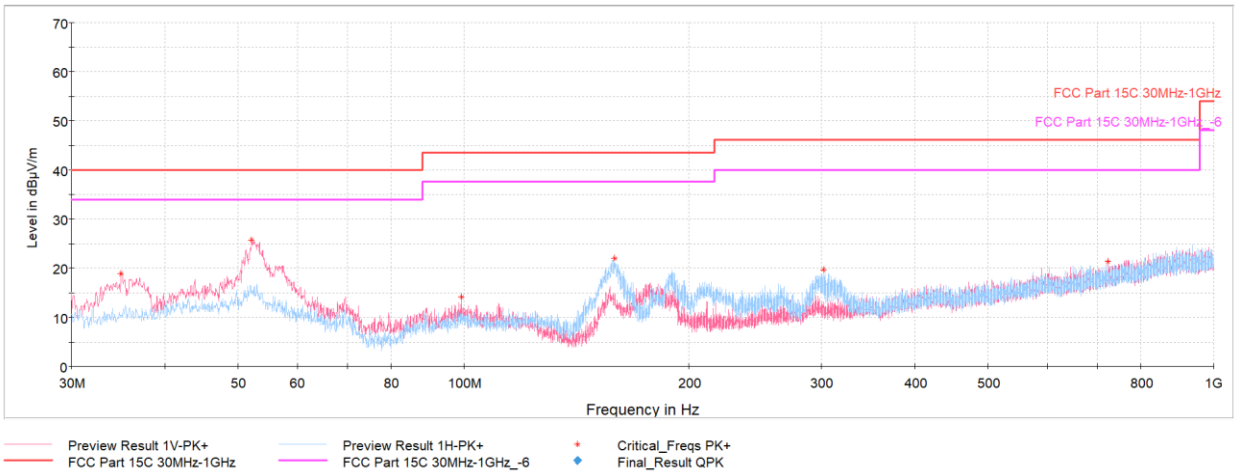
§15.209; RSS-Gen [8.9]



Plot 7-695. Radiated Spurious Emissions below 1GHz CDD 11n Ch.6, with AC/DC Adapter

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
32.38	Quasi-Peak	V	100	24	-55.77	-15.79	35.44	40.00	-4.56
50.76	Quasi-Peak	V	100	323	-60.37	-12.69	33.94	40.00	-6.06
106.44	Max-Peak	V	200	83	-66.62	-16.52	23.86	43.52	-19.66
208.38	Max-Peak	H	100	127	-65.89	-17.17	23.94	43.52	-19.58
294.37	Max-Peak	H	100	244	-64.75	-14.54	27.71	46.02	-18.31
318.14	Max-Peak	H	100	70	-67.75	-13.67	25.58	46.02	-20.44

Table 7-67. Radiated Spurious Emissions below 1GHz CDD 11n Ch.6, with AC/DC Adapter



Plot 7-696. Radiated Spurious Emissions below 1GHz CDD 11ax - SU Ch.6, with AC/DC Adapter

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
34.95	Max-Peak	V	100	27	-72.36	-15.71	18.93	40.00	-21.07
52.16	Max-Peak	V	100	27	-68.11	-13.17	25.72	40.00	-14.28
99.36	Max-Peak	V	100	223	-76.34	-16.50	14.16	43.52	-29.36
158.86	Max-Peak	H	200	181	-65.58	-19.50	21.92	43.52	-21.60
301.79	Max-Peak	H	100	122	-72.74	-14.53	19.73	46.02	-26.29
722.24	Max-Peak	V	200	16	-79.69	-5.99	21.32	46.02	-24.70

Table 7-68. Radiated Spurious Emissions below 1GHz CDD 11ax - SU Ch.6, with AC/DC Adapter

7.9 AC Line-Conducted Emissions Measurement

§15.207; RSS-Gen [8.8]

Test Overview and Limit

All AC line conducted spurious emissions are measured with a receiver connected to a grounded LISN while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates and modes were investigated for AC Line conducted spurious emissions. Only the conducted emissions of the configuration that produced the worst case emissions are reported in this section.

All conducted emissions must not exceed the limits shown in the table below, per Section 15.207 and RSS-Gen (8.8).

Frequency of emission (MHz)	Conducted Limit (dBμV)	
	Quasi-peak	Average
0.15 – 0.5	66 to 56*	56 to 46*
0.5 – 5	56	46
5 – 30	60	50

Table 7-69. Conducted Limits

*Decreases with the logarithm of the frequency.

Test Procedures Used

ANSI C63.10-2013, Subclause 6.2

Test Settings

Quasi-Peak Measurements

1. Analyzer center frequency was set to the frequency of the spurious emission of interest
2. RBW = 9kHz (for emissions from 150kHz – 30MHz)
3. Detector = quasi-peak
4. Sweep time = auto couple
5. Trace mode = max hold
6. Trace was allowed to stabilize

Average Measurements

1. Analyzer center frequency was set to the frequency of the spurious emission of interest
2. RBW = 9kHz (for emissions from 150kHz – 30MHz)
3. Detector = RMS
4. Sweep time = auto couple
5. Trace mode = max hold
6. Trace was allowed to stabilize

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

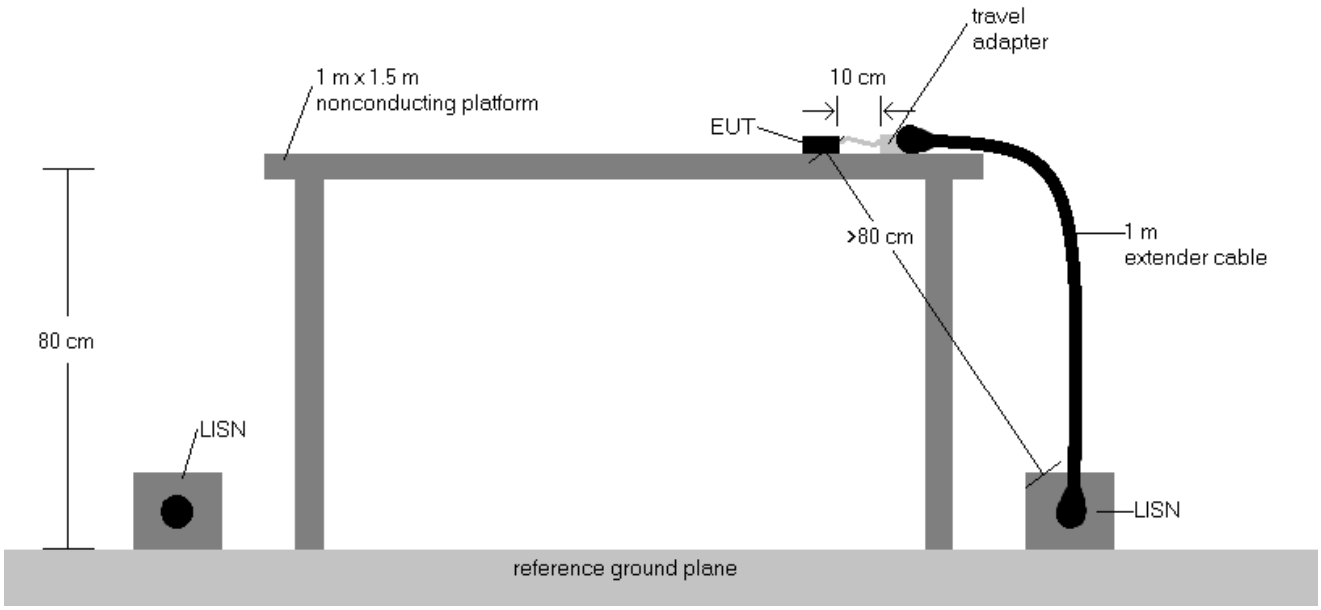
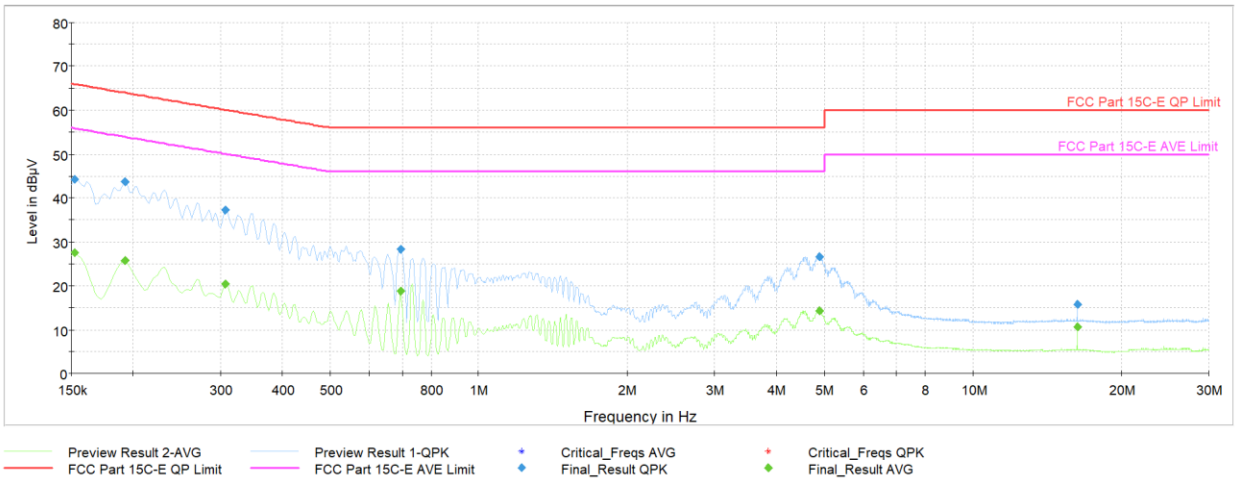


Figure 7-9. Test Instrument & Measurement Setup

Test Notes

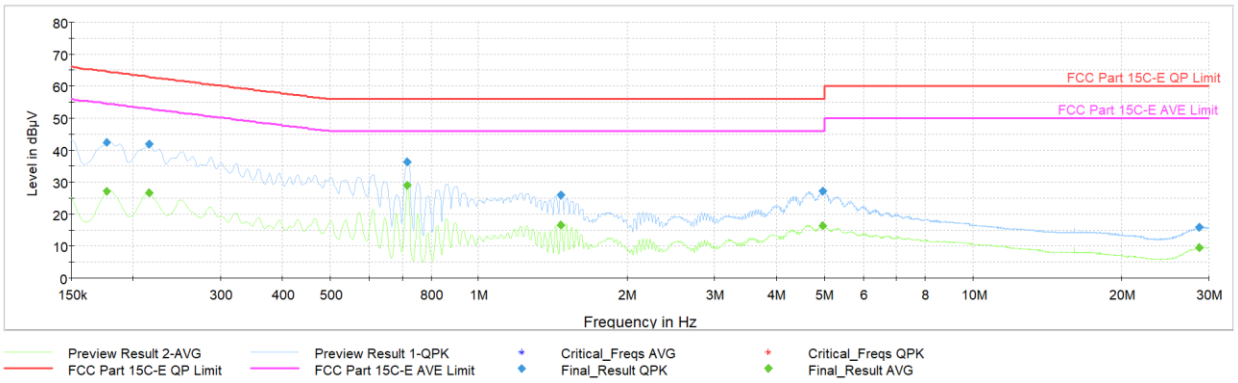
1. All modes of operation were investigated and the worst-case emissions are reported. The emissions found were not affected by the choice of channel used during testing.
2. Both configurations below were investigated, and the worst case has been reported.
   a. EUT powered by AC/DC adaptor via USB-C cable with wire charger
   b. EUT powered by host PC via USB-C cable with wire charger
3. The limit for an intentional radiator from 150kHz to 30MHz are specified in Part 15.207 and RSS-Gen(8.8).
4. Corr. (dB) = Cable loss (dB) + LISN insertion factor (dB)
5. QP/AV Level (dBμV) = QP/AV Analyzer/Receiver Level (dBμV) + Corr. (dB)
6. Margin (dB) = QP/AV Level (dBμV) - QP/AV Limit (dBμV)
7. Traces shown in plot are made using quasi peak and average detectors.
8. Deviations to the Specifications: None.
9. The unit was tested with all possible modes and only the highest emission is reported.



Plot 7-697. AC Line Conducted Plot with CDD 11n Ch.6 (L1, with AC/DC Adapter)

Frequency [MHz]	Process State	QuasiPeak [dBµV]	Average [dBµV]	Limit [dBµV]	Margin [dB]	Line	PE
0.152	FINAL	—	27.53	55.88	-28.34	L1	GND
0.152	FINAL	44.3	—	65.88	-21.60	L1	GND
0.193	FINAL	—	25.77	53.92	-28.14	L1	GND
0.193	FINAL	43.7	—	63.92	-20.23	L1	GND
0.308	FINAL	—	20.45	50.04	-29.59	L1	GND
0.308	FINAL	37.3	—	60.04	-22.73	L1	GND
0.695	FINAL	28.3	—	56.00	-27.70	L1	GND
0.695	FINAL	—	18.75	46.00	-27.25	L1	GND
4.900	FINAL	26.6	—	56.00	-29.39	L1	GND
4.900	FINAL	—	14.28	46.00	-31.72	L1	GND
16.247	FINAL	—	10.69	50.00	-39.31	L1	GND
16.247	FINAL	15.8	—	60.00	-44.23	L1	GND

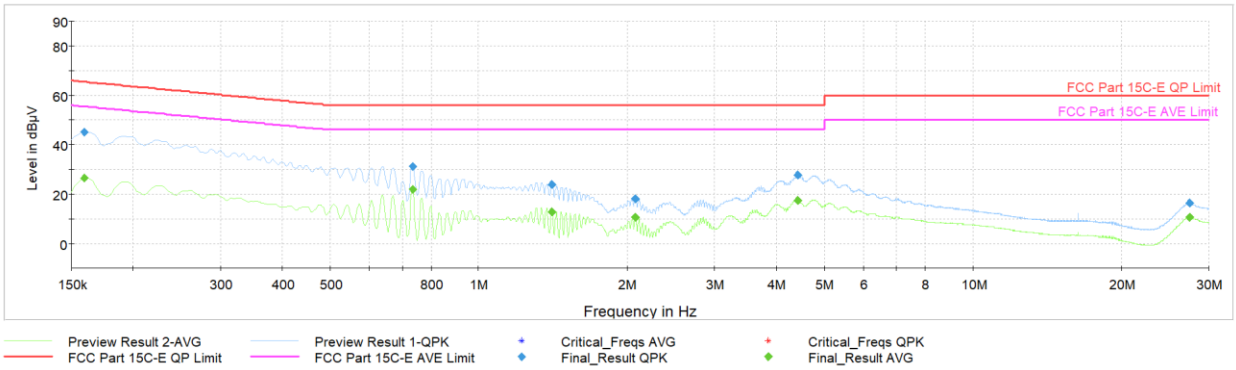
Table 7-70. AC Line Conducted Data with CDD 11n Ch.6 (L1, with AC/DC Adapter)



Plot 7-698. AC Line Conducted Plot with CDD 11n Ch.6 (N, with AC/DC Adapter)

Frequency [MHz]	Process State	QuasiPeak [dBµV]	Average [dBµV]	Limit [dBµV]	Margin [dB]	Line	PE
0.177	FINAL	—	27.37	54.63	-27.25	N	GND
0.177	FINAL	42.4	—	64.63	-22.24	N	GND
0.215	FINAL	—	26.72	53.00	-26.28	N	GND
0.215	FINAL	41.9	—	63.00	-21.07	N	GND
0.717	FINAL	—	29.11	46.00	-16.89	N	GND
0.717	FINAL	36.2	—	56.00	-19.76	N	GND
1.469	FINAL	26.0	—	56.00	-30.04	N	GND
1.469	FINAL	—	16.76	46.00	-29.24	N	GND
4.961	FINAL	27.3	—	56.00	-28.69	N	GND
4.961	FINAL	—	16.49	46.00	-29.51	N	GND
28.685	FINAL	—	9.50	50.00	-40.50	N	GND
28.685	FINAL	15.9	—	60.00	-44.11	N	GND

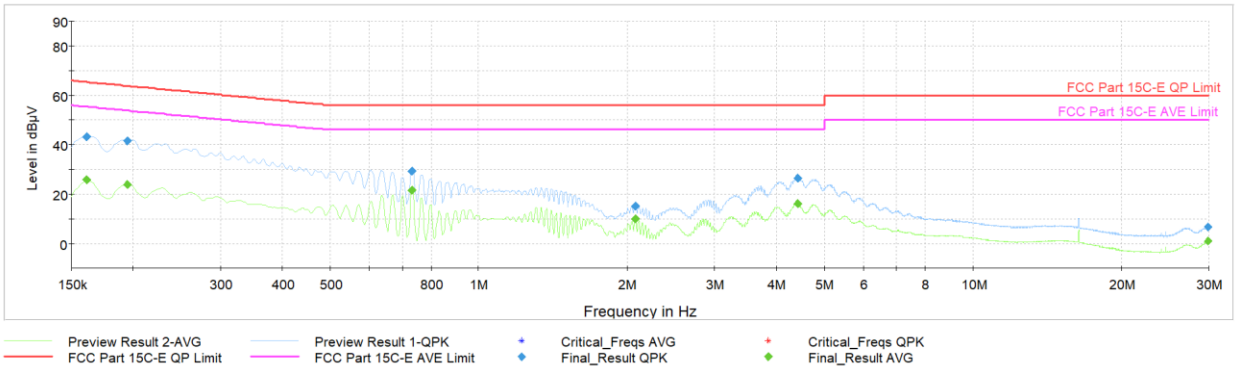
Table 7-71. AC Line Conducted Data with CDD 11n Ch.6 (N, with AC/DC Adapter)



Plot 7-699. AC Line Conducted Plot with CDD 11ax - SU Ch.6 (L1, with AC/DC Adapter)

Frequency [MHz]	Process State	QuasiPeak [dBµV]	Average [dBµV]	Limit [dBµV]	Margin [dB]	Line	PE
0.159	FINAL	—	26.57	55.52	-28.95	L1	GND
0.159	FINAL	45.1	—	65.52	-20.43	L1	GND
0.735	FINAL	—	21.78	46.00	-24.22	L1	GND
0.735	FINAL	31.2	—	56.00	-24.80	L1	GND
1.408	FINAL	—	12.84	46.00	-33.16	L1	GND
1.408	FINAL	23.9	—	56.00	-32.09	L1	GND
2.076	FINAL	18.1	—	56.00	-37.86	L1	GND
2.076	FINAL	—	10.54	46.00	-35.46	L1	GND
4.425	FINAL	27.8	—	56.00	-28.24	L1	GND
4.425	FINAL	—	17.56	46.00	-28.44	L1	GND
27.389	FINAL	—	10.80	50.00	-39.20	L1	GND
27.391	FINAL	16.4	—	60.00	-43.61	L1	GND

Table 7-72. AC Line Conducted Data with CDD 11ax - SU Ch.6 (L1, with AC/DC Adapter)



Plot 7-700. AC Line Conducted Plot with CDD 11ax - SU Ch.6 (N, with AC/DC Adapter)

Frequency [MHz]	Process State	QuasiPeak [dBµV]	Average [dBµV]	Limit [dBµV]	Margin [dB]	Line	PE
0.161	FINAL	—	25.74	55.40	-29.66	N	GND
0.161	FINAL	43.4	—	65.40	-22.02	N	GND
0.195	FINAL	—	24.03	53.82	-29.79	N	GND
0.195	FINAL	41.8	—	63.82	-22.06	N	GND
0.733	FINAL	—	21.73	46.00	-24.27	N	GND
0.733	FINAL	29.5	—	56.00	-26.49	N	GND
2.074	FINAL	15.2	—	56.00	-40.77	N	GND
2.074	FINAL	—	9.89	46.00	-36.11	N	GND
4.416	FINAL	26.6	—	56.00	-29.39	N	GND
4.416	FINAL	—	16.26	46.00	-29.74	N	GND
29.904	FINAL	—	0.82	50.00	-49.18	N	GND
29.904	FINAL	6.9	—	60.00	-53.12	N	GND

Table 7-73. AC Line Conducted Data with CDD 11ax - SU Ch.6 (N, with AC/DC Adapter)

8.0 CONCLUSION

The data collected relate only the item(s) tested and show that the **Apple Tablet Device FCC ID: BCGA2903, IC: 579C-A2903** is in compliance with Part 15 Subpart C (15.247) of the FCC Rules and RSS-247 of the Innovation, Science and Economic Development Canada Rules.