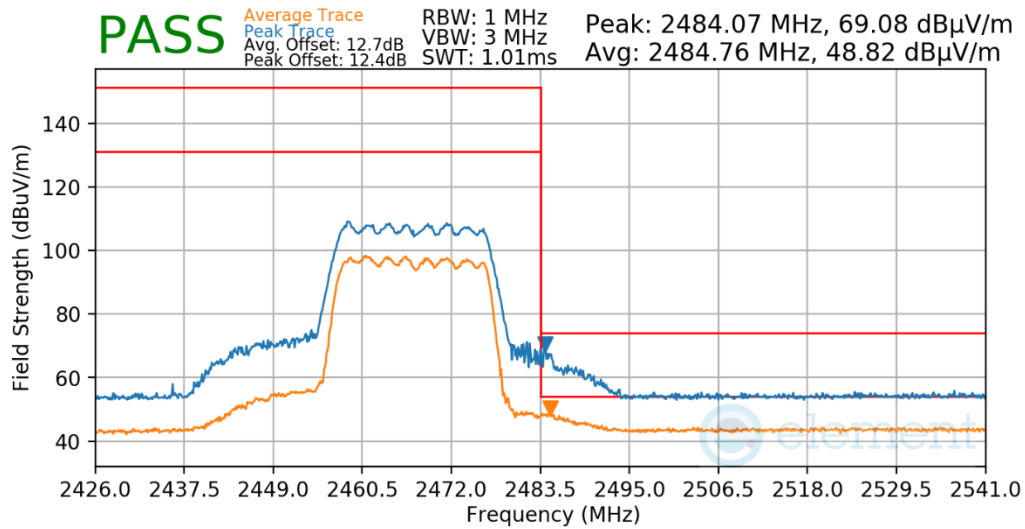


Mode: 802.11ax - SU  
 Data Rate: MCS5  
 Distance of Measurements: 3 Meters  
 Operating Frequency: 2467MHz  
 Channel: 12



**Plot 7-711. Radiated Restricted Upper Band Edge Measurement CDD**

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## 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

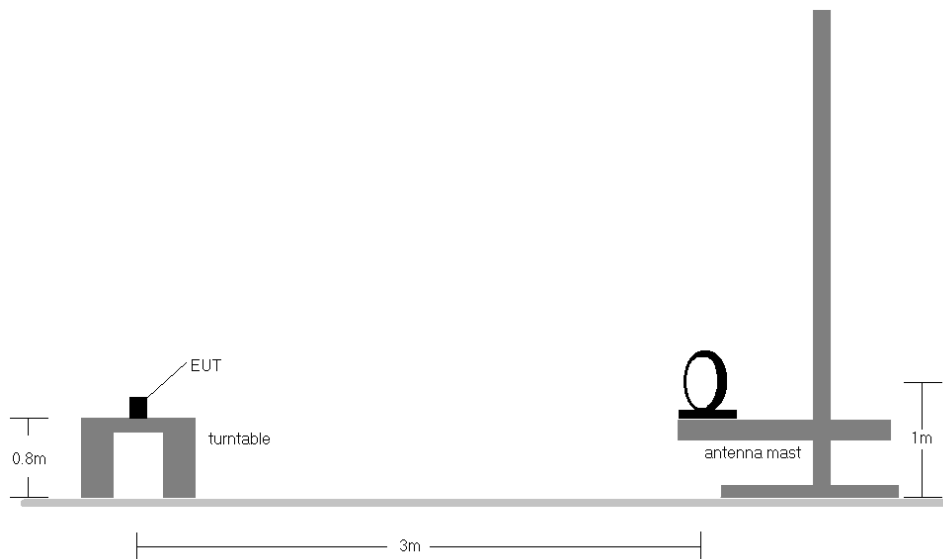
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 120kHz (for emissions from 30MHz – 1GHz)
3. VBW = 300kHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold

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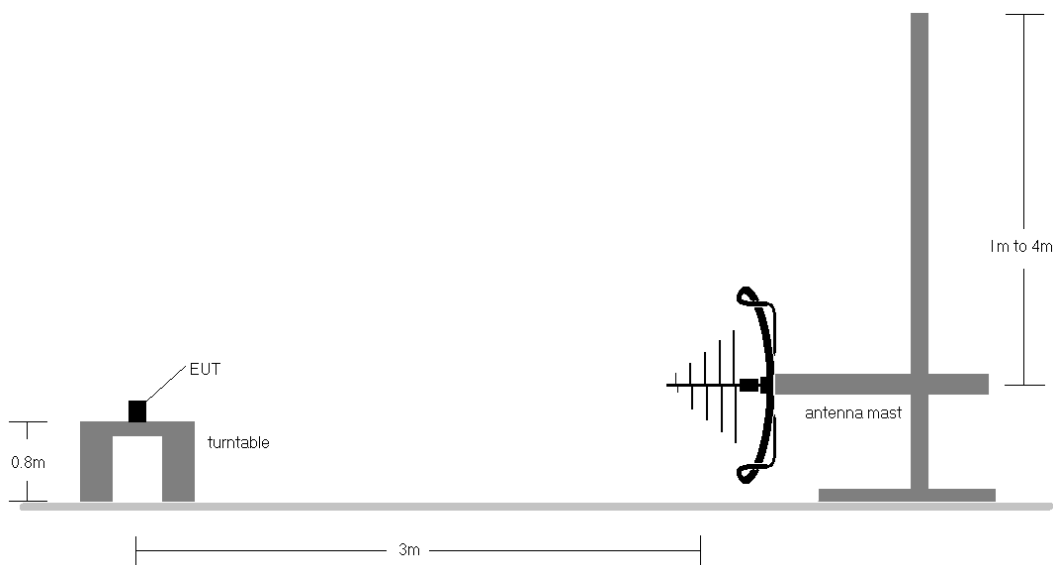
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## Test Setup

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**

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## **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**

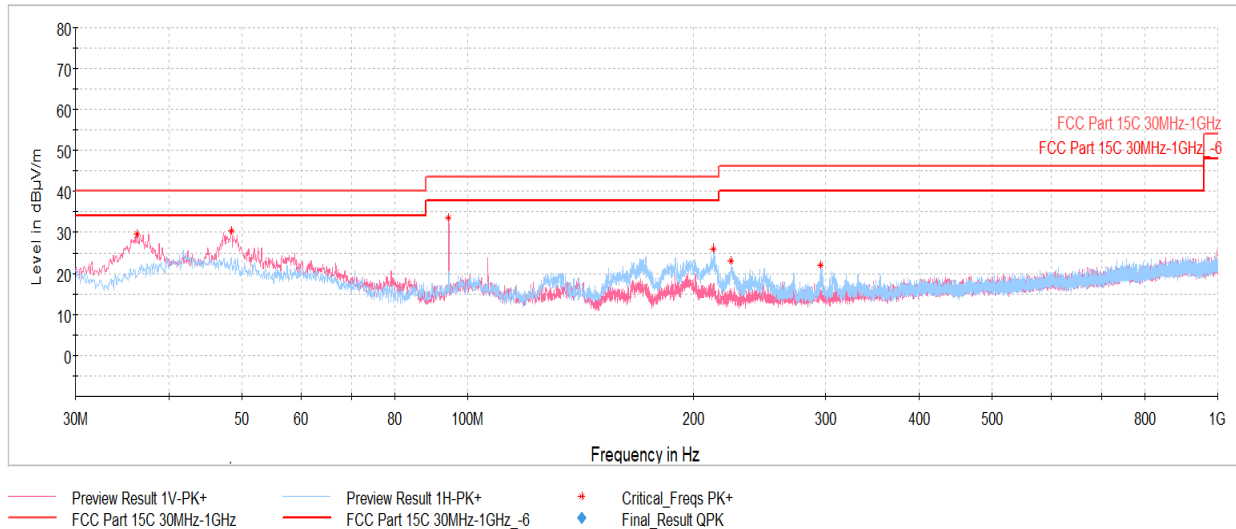
- Field Strength Level  $_{[dB\mu V/m]} = \text{Analyzer Level}_{[dBm]} + 107 + \text{AFCL}_{[dB/m]}$
- $\text{AFCL}_{[dB/m]} = \text{Antenna Factor}_{[dB/m]} + \text{Cable Loss}_{[dB]} - \text{Preamplifier Gain}_{[dB]}$
- $\text{Margin}_{[dB]} = \text{Field Strength Level}_{[dB\mu V/m]} - \text{Limit}_{[dB\mu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

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## CDD Radiated Spurious Emissions Measurements (Below 1GHz)

§15.209; RSS-Gen [8.9]



Plot 7-712. Radiated Spurious Emissions below 1GHz CDD 11n Ch.6, with AC/DC Adapter

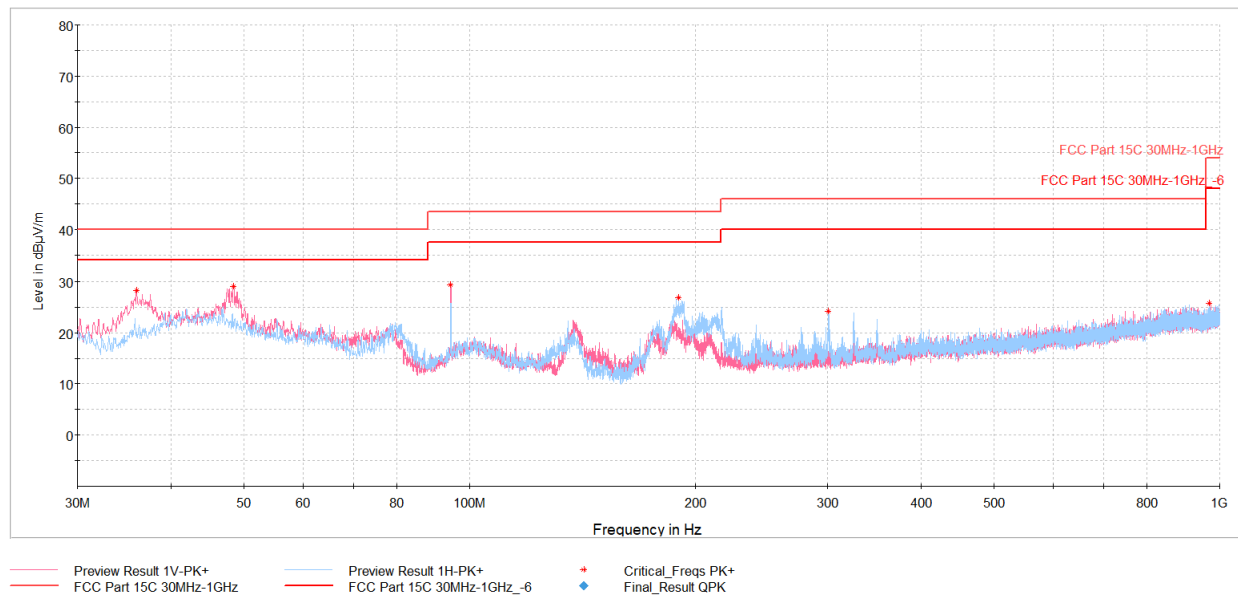
Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
36.26	Max Peak	V	100	64	-59.17	-18.39	29.44	40.00	-10.56
48.48	Max Peak	V	100	11	-61.35	-15.46	30.19	40.00	-9.81
94.46	Max Peak	V	100	233	-54.39	-19.06	33.55	43.52	-9.97
212.60	Max Peak	H	100	15	-63.04	-17.98	25.98	43.52	-17.54
224.44	Max Peak	H	100	7	-66.68	-17.22	23.10	46.02	-22.92
295.63	Max Peak	H	100	15	-69.55	-15.28	22.17	46.02	-23.85

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

FCC ID: BCGA2435 IC: 579C-A2435		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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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]
35.97	Max Peak	V	100	358	-60.22	-18.46	28.32	40.00	-11.68
48.43	Max Peak	V	100	347	-62.54	-15.46	29.00	40.00	-11.00
94.46	Max Peak	V	100	216	-58.61	-19.06	29.33	43.52	-14.19
189.61	Max Peak	H	100	245	-61.56	-18.54	26.90	43.52	-16.62
300.58	Max Peak	H	100	285	-67.39	-15.36	24.25	46.02	-21.77
967.65	Max Peak	H	100	183	-77.49	-3.84	25.67	53.98	-28.31

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

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## 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

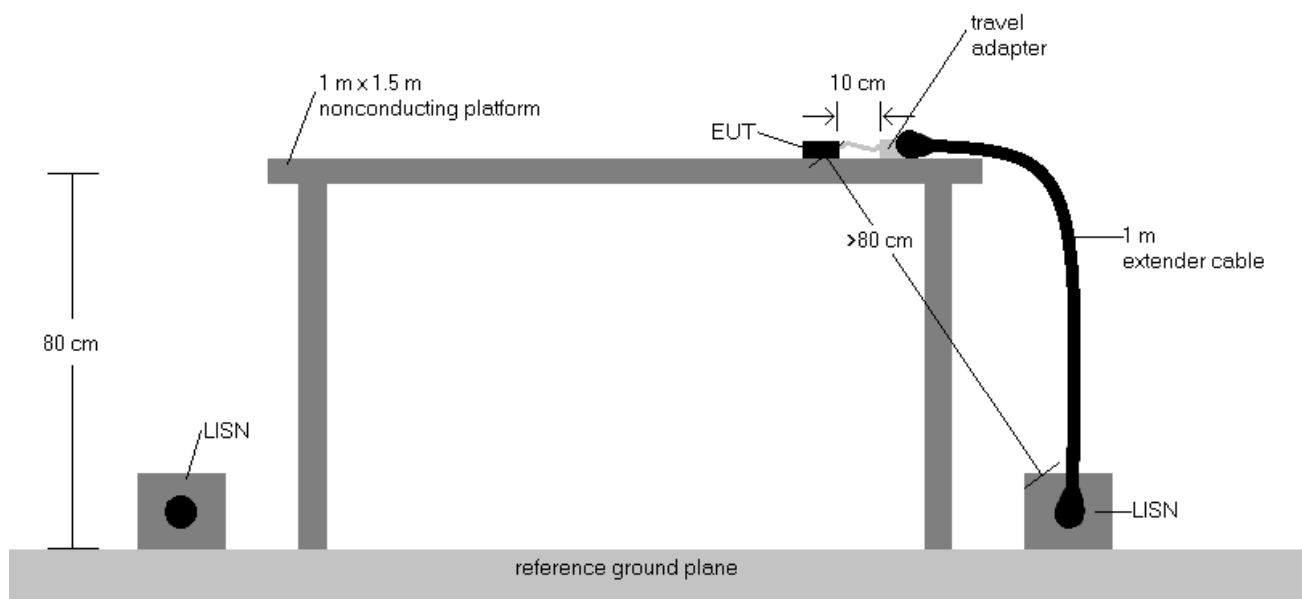
1. Analyzer center frequency was set to the frequency of the spurious emission of interest
2. RBW = 9kHz (for emissions from 150kHz – 30MHz)
3. Detector = RMS
4. Sweep time = auto couple
5. Trace mode = max hold
6. Trace was allowed to stabilize

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## Test Setup

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



**Figure 7-9. Test Instrument & Measurement Setup**

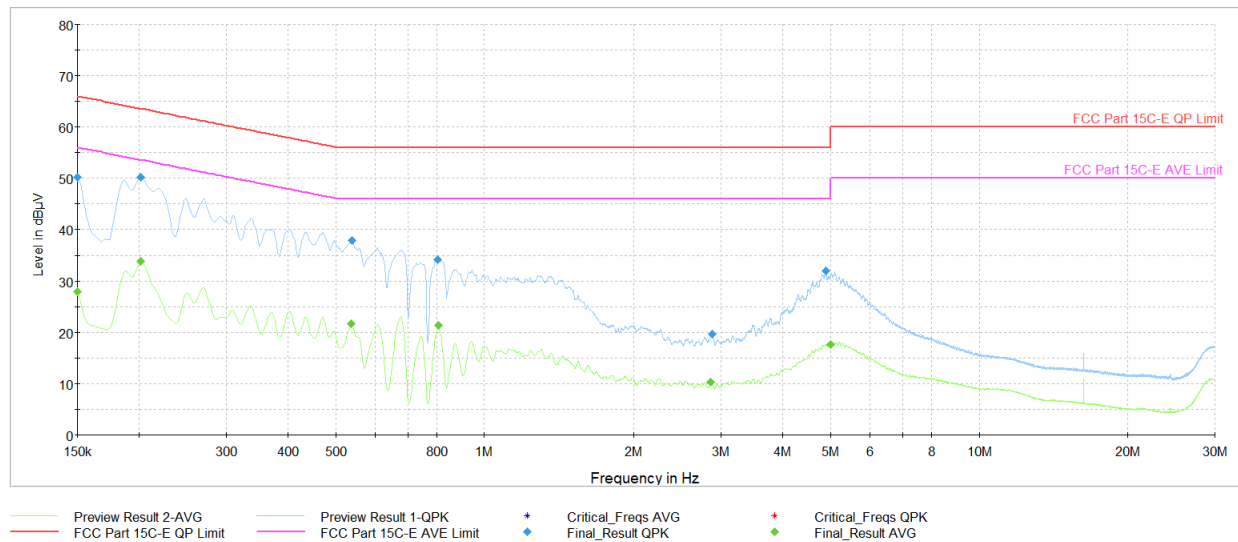
## Test Notes

- 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.
- Both configurations below were investigated, and the worst case has been reported.
  - EUT powered by AC/DC adaptor via USB-C cable with wire charger
  - EUT powered by host PC via USB-C cable with wire charger
- The limit for an intentional radiator from 150kHz to 30MHz are specified in Part 15.207 and RSS-Gen(8.8).
- $\text{Corr. (dB)} = \text{Cable loss (dB)} + \text{LISN insertion factor (dB)}$
- $\text{QP/AV Level (dB}\mu\text{V)} = \text{QP/AV Analyzer/Receiver Level (dB}\mu\text{V)} + \text{Corr. (dB)}$
- $\text{Margin (dB)} = \text{QP/AV Level (dB}\mu\text{V)} - \text{QP/AV Limit (dB}\mu\text{V)}$
- Traces shown in plot are made using quasi peak and average detectors.
- Deviations to the Specifications: None.

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**Plot 7-714. AC Line Conducted Plot with CDD 11n Ch.6 (L1, with AC/DC Adapter)**

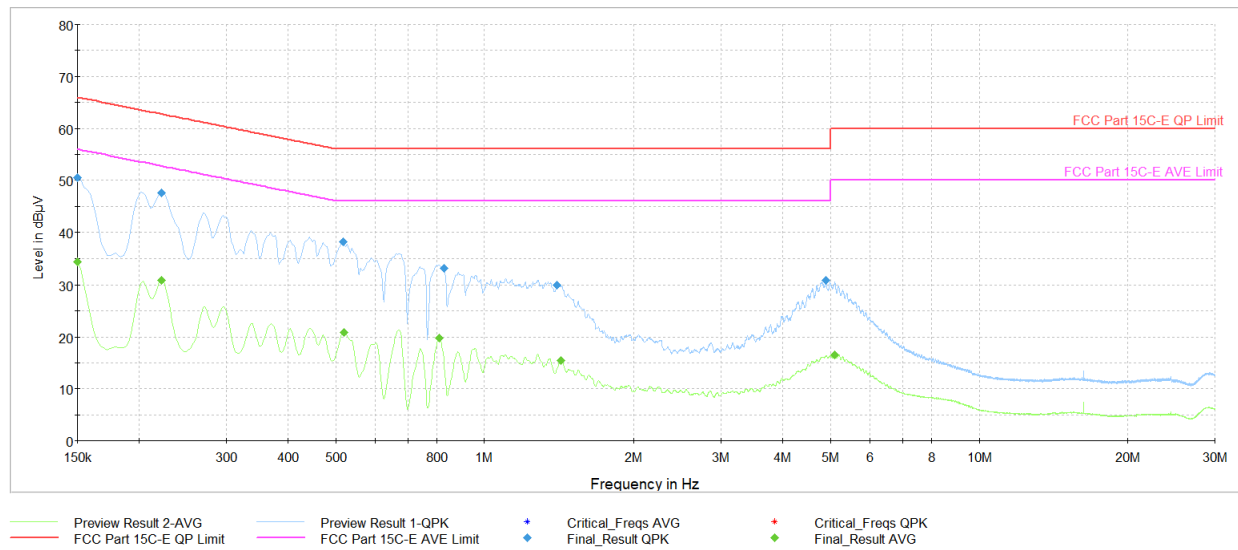
Frequency [MHz]	Process State	QuasiPeak [dBμV]	Average [dBμV]	Limit [dBμV]	Margin [dB]	Line	PE
0.150	FINAL	—	27.96	56.00	-28.04	L1	GND
0.150	FINAL	50.2	—	66.00	-15.79	L1	GND
0.202	FINAL	—	33.85	53.54	-19.68	L1	GND
0.202	FINAL	50.2	—	63.54	-13.33	L1	GND
0.537	FINAL	—	21.74	46.00	-24.26	L1	GND
0.539	FINAL	37.8	—	56.00	-18.20	L1	GND
0.805	FINAL	34.3	—	56.00	-21.73	L1	GND
0.807	FINAL	—	21.37	46.00	-24.63	L1	GND
2.864	FINAL	—	10.31	46.00	-35.69	L1	GND
2.877	FINAL	19.7	—	56.00	-36.32	L1	GND
4.895	FINAL	32.0	—	56.00	-24.02	L1	GND
5.012	FINAL	—	17.73	50.00	-32.27	L1	GND

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

FCC ID: BCGA2435 IC: 579C-A2435		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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**Plot 7-715. AC Line Conducted Plot with CDD 11n Ch.6 (N, with AC/DC Adapter)**

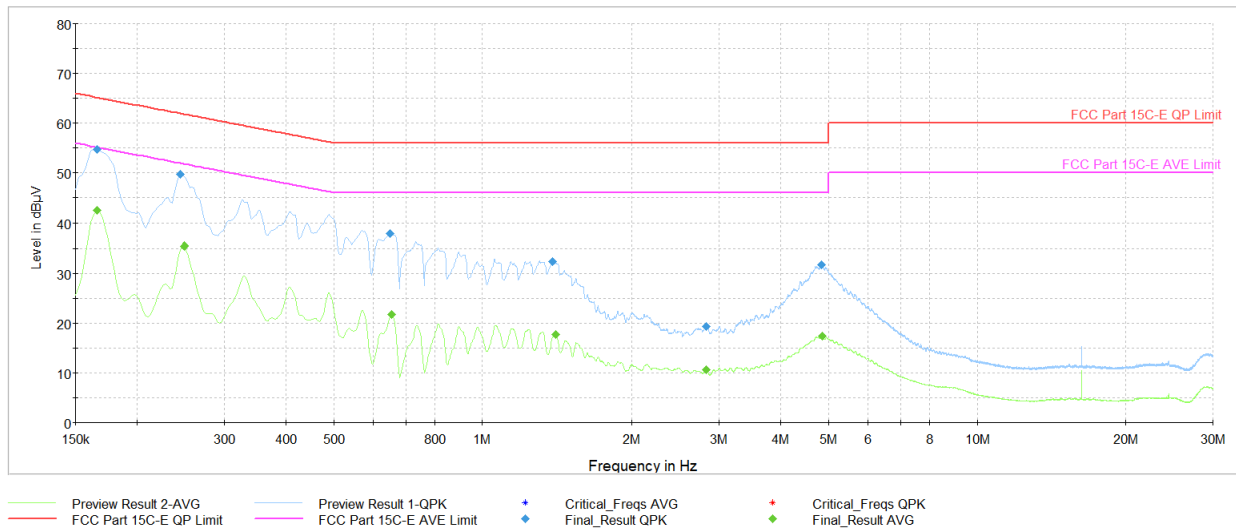
Frequency [MHz]	Process State	QuasiPeak [dBμV]	Average [dBμV]	Limit [dBμV]	Margin [dB]	Line	PE
0.150	FINAL	—	34.47	56.00	-21.53	N	GND
0.150	FINAL	50.5	—	66.00	-15.52	N	GND
0.222	FINAL	—	30.93	52.74	-21.82	N	GND
0.222	FINAL	47.6	—	62.74	-15.15	N	GND
0.517	FINAL	38.1	—	56.00	-17.91	N	GND
0.519	FINAL	—	20.86	46.00	-25.14	N	GND
0.809	FINAL	—	19.83	46.00	-26.17	N	GND
0.827	FINAL	33.3	—	56.00	-22.73	N	GND
1.401	FINAL	29.9	—	56.00	-26.11	N	GND
1.428	FINAL	—	15.41	46.00	-30.59	N	GND
4.900	FINAL	30.9	—	56.00	-25.14	N	GND
5.091	FINAL	—	16.52	50.00	-33.48	N	GND

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

FCC ID: BCGA2435 IC: 579C-A2435		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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**Plot 7-716. AC Line Conducted Plot with CDD 11ax - SU Ch.6 (L1, with AC/DC Adapter)**

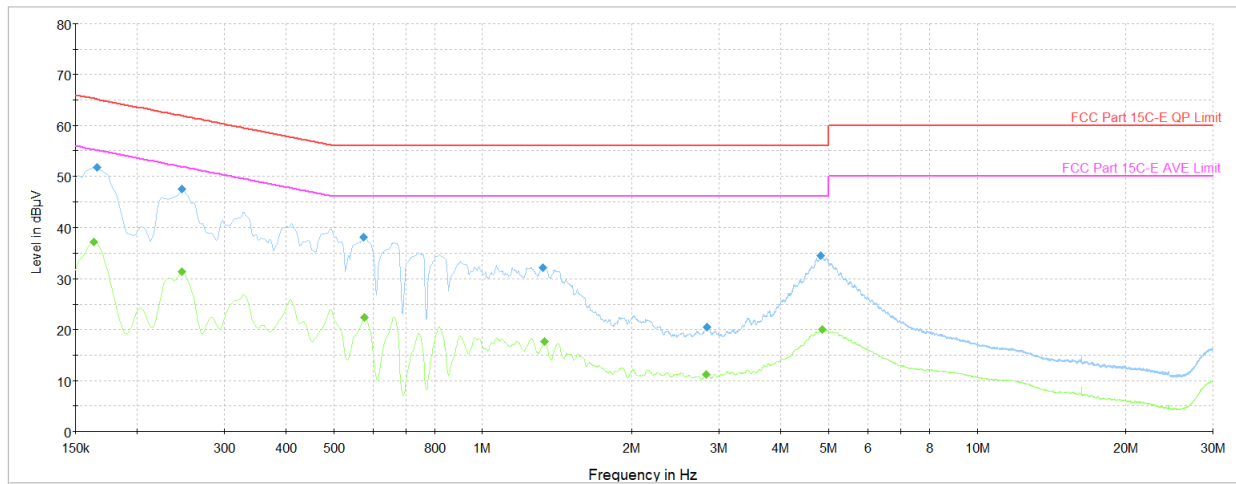
Frequency [MHz]	Process State	QuasiPeak [dBµV]	Average [dBµV]	Limit [dBµV]	Margin [dB]	Line	PE
0.166	FINAL	—	42.49	55.17	-12.68	L1	GND
0.166	FINAL	54.7	—	65.17	-10.51	L1	GND
0.245	FINAL	49.7	—	61.94	-12.23	L1	GND
0.249	FINAL	—	35.34	51.79	-16.45	L1	GND
0.650	FINAL	37.8	—	56.00	-18.25	L1	GND
0.654	FINAL	—	21.76	46.00	-24.24	L1	GND
1.385	FINAL	32.3	—	56.00	-23.72	L1	GND
1.406	FINAL	—	17.70	46.00	-28.30	L1	GND
2.828	FINAL	19.4	—	56.00	-36.61	L1	GND
2.828	FINAL	—	10.70	46.00	-35.30	L1	GND
4.841	FINAL	31.8	—	56.00	-24.23	L1	GND
4.855	FINAL	—	17.41	46.00	-28.59	L1	GND

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

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— Preview Result 2-AVG    — Preview Result 1-QPK    ♦ Critical\_Freqs AVG    ♦ Critical\_Freqs QPK  
— FCC Part 15C-E QP Limit    — FCC Part 15C-E AVE Limit    ♦ Final\_Result QPK    ♦ Final\_Result AVG

**Plot 7-717. 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
0.164	FINAL	—	37.11	55.28	-18.17	N	GND
0.166	FINAL	51.8	—	65.17	-13.41	N	GND
0.247	FINAL	—	31.46	51.87	-20.41	N	GND
0.247	FINAL	47.5	—	61.87	-14.36	N	GND
0.575	FINAL	38.1	—	56.00	-17.92	N	GND
0.578	FINAL	—	22.46	46.00	-23.54	N	GND
1.327	FINAL	32.2	—	56.00	-23.78	N	GND
1.336	FINAL	—	17.65	46.00	-28.35	N	GND
2.823	FINAL	—	11.19	46.00	-34.81	N	GND
2.839	FINAL	20.5	—	56.00	-35.54	N	GND
4.814	FINAL	34.6	—	56.00	-21.37	N	GND
4.862	FINAL	—	20.09	46.00	-25.91	N	GND

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

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## 8.0 CONCLUSION

The data collected relate only the item(s) tested and show that the **Apple Tablet Device FCC ID: BCGA2435, IC: 579C-A2435** 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.

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