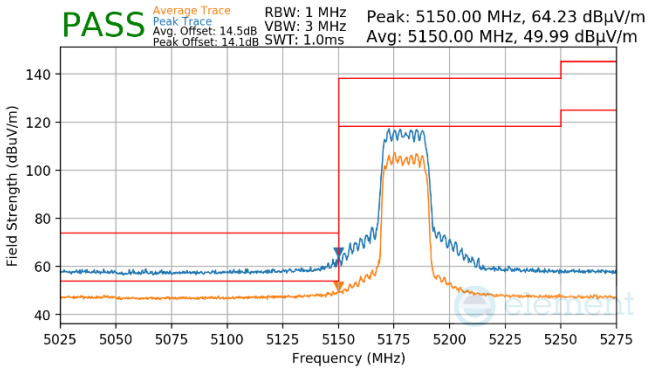
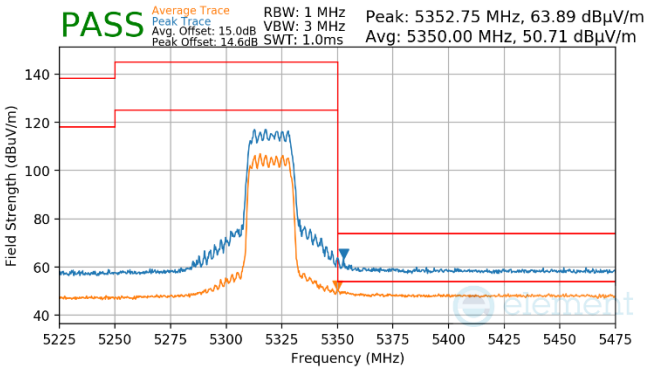
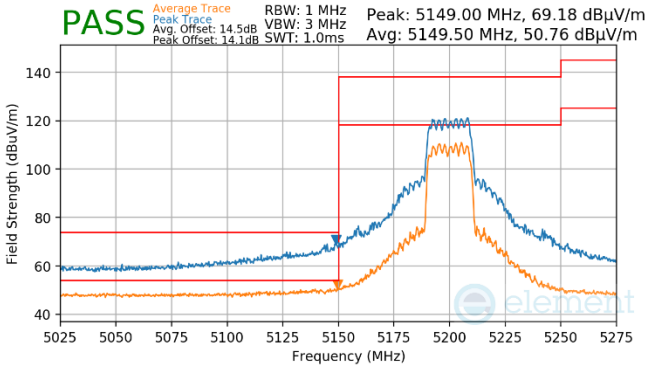
RU242



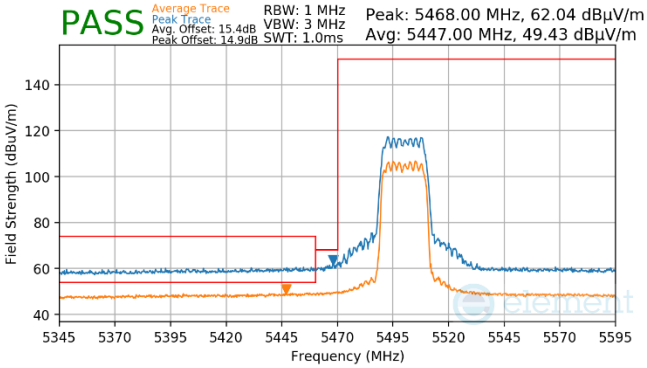
Plot 7-601. CDD (Pk & Avg, RU242, Index 61, Ch.36, MCS11)



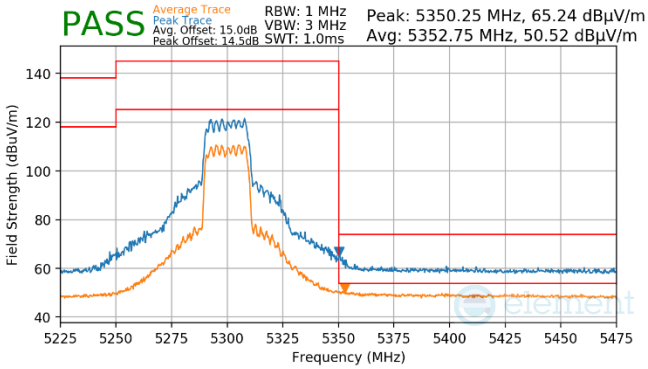
Plot 7-604. CDD (Pk & Avg, RU242, Index 61, Ch.64, MCS11)



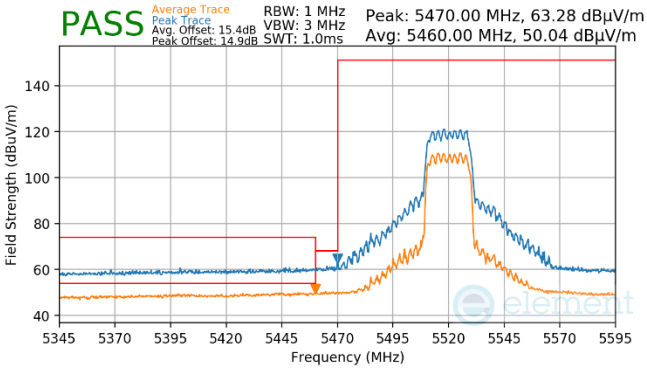
Plot 7-602. CDD (Pk & Avg, RU242, Index 61, Ch.40, MCS11)



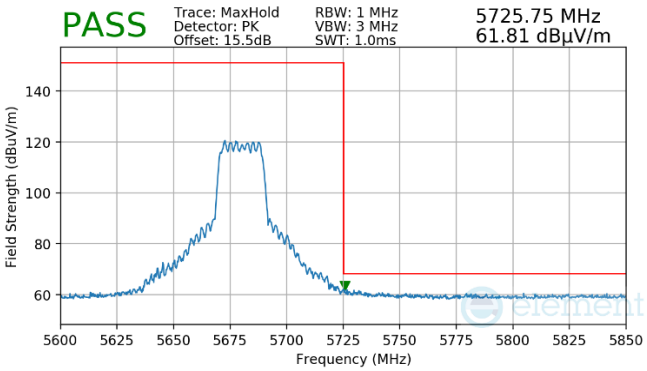
Plot 7-605. CDD (Pk & Avg, RU242, Index 61, Ch.100, MCS11)



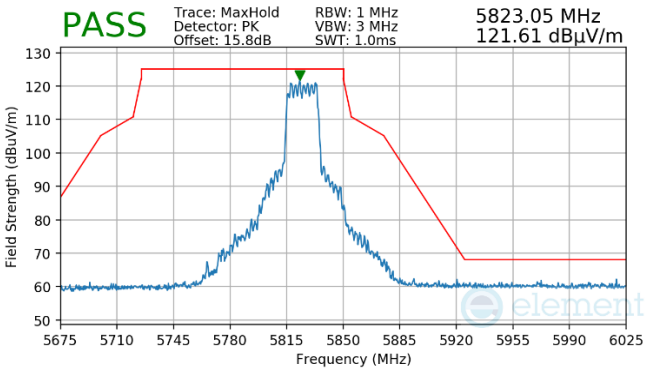
Plot 7-603. CDD (Pk & Avg, RU242, Index 61, Ch.60, MCS11)



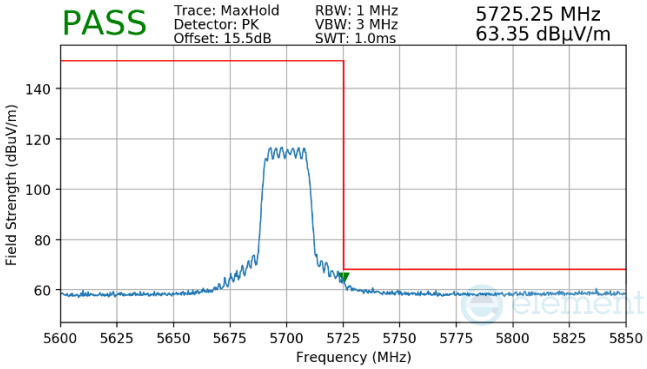
Plot 7-606. SDM (Pk & Avg, RU242, Index 61, Ch.104, MCS11)



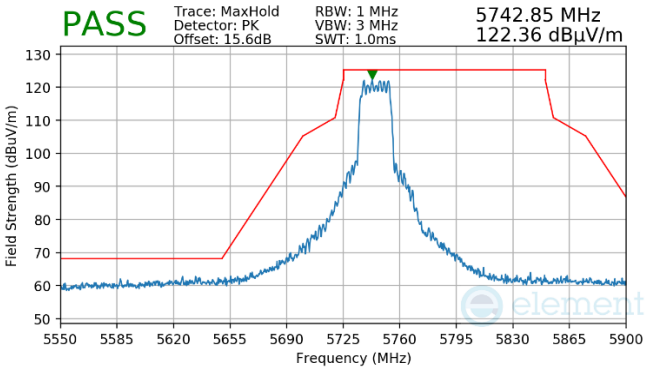
Plot 7-607. SDM (Pk, RU242, Index 61, Ch.136, MCS11)



Plot 7-610. CDD (Pk, RU242, Index 61, Ch.165, MCS11)



Plot 7-608. CDD (Pk, RU242, Index 61, Ch.140, MCS11)

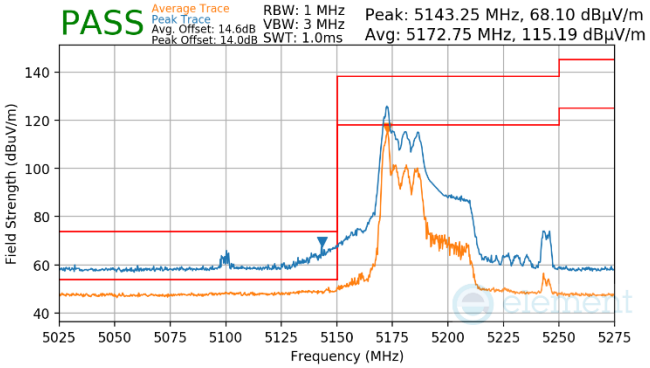


Plot 7-609. CDD (Pk, RU242, Index 61, Ch.149, MCS11)

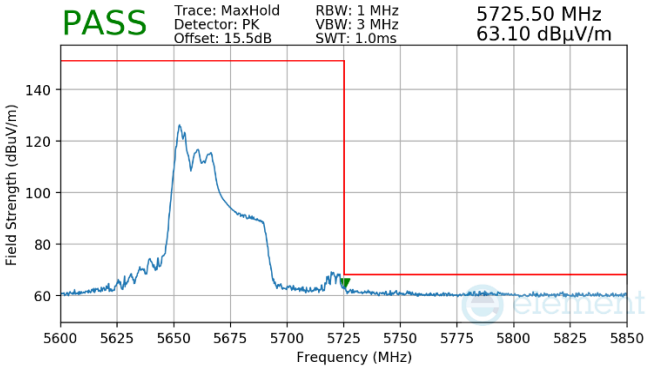
7.6.14 CDD/SDM Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209; RSS-Gen [8.9]

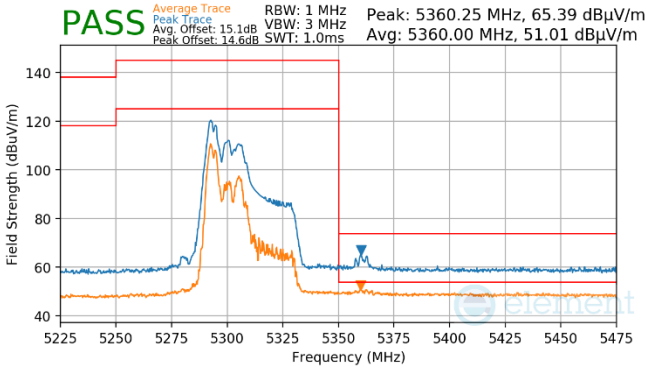
RU26/RU52



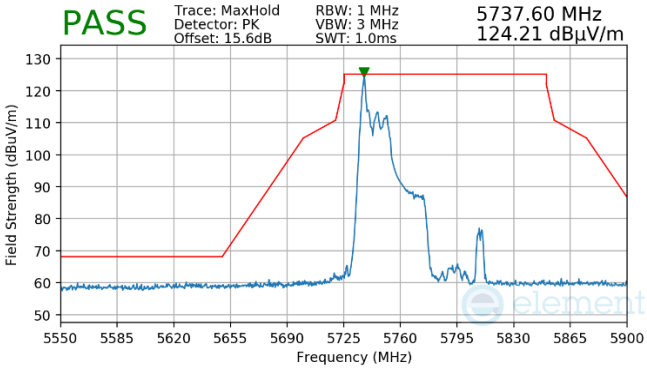
Plot 7-611. CDD (Pk & Avg, RU26, Index 0, Ch.38, MCS11)



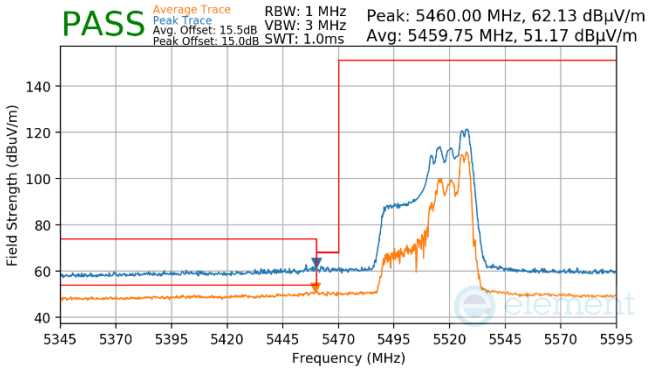
Plot 7-614. SDM (Pk, RU52, Index 37, Ch.134, MCS11)



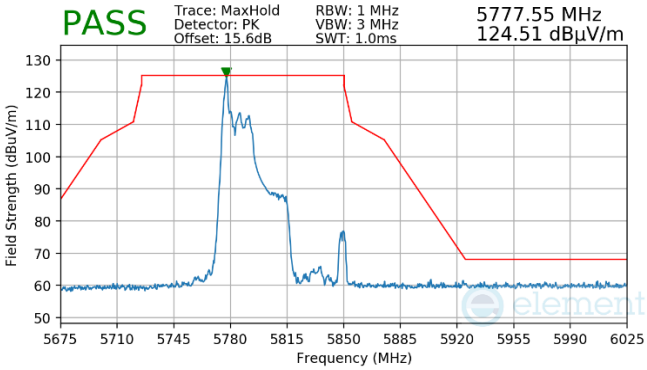
Plot 7-612. CDD (Pk & Avg, RU52, Index 37, Ch.62, MCS11)



Plot 7-615. CDD (Pk, RU26, Index 0, Ch.151, MCS11)

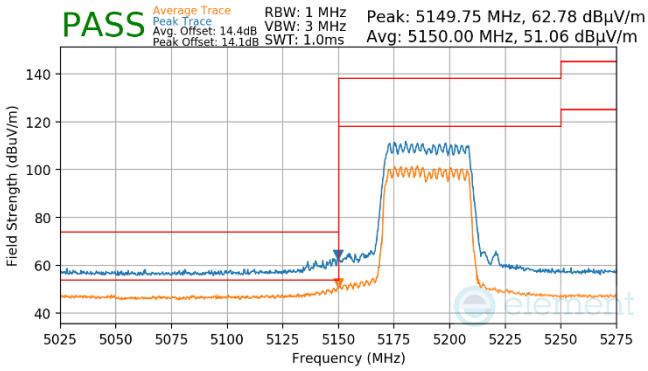


Plot 7-613. SDM (Pk & Avg, RU52, Index 44, Ch.102, MCS11)

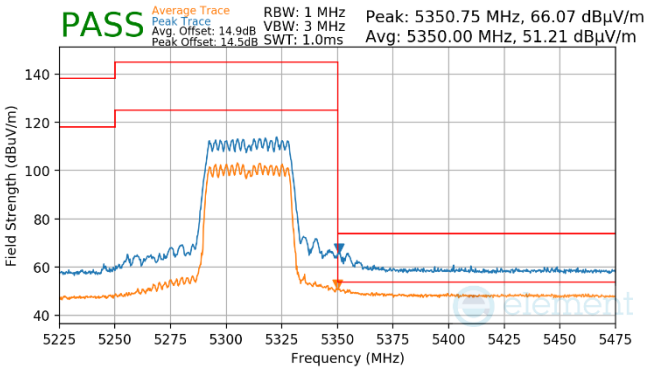


Plot 7-616. CDD (Pk, RU26, Index 0, Ch.159, MCS11)

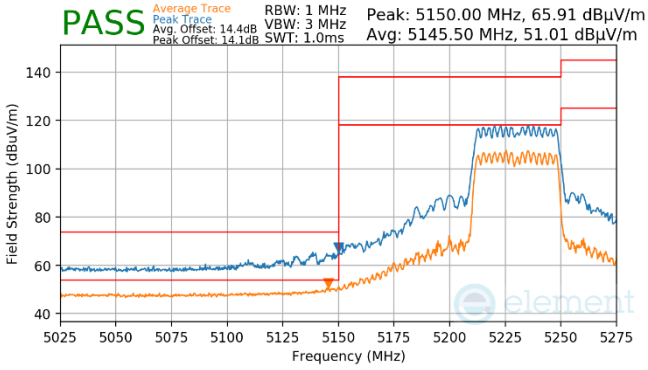
RU484



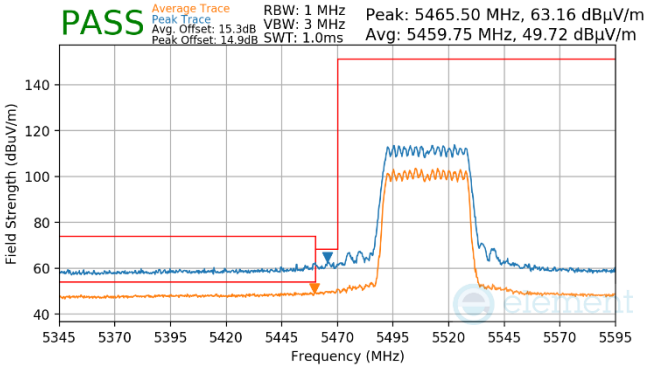
Plot 7-617. CDD (Pk & Avg, RU484, Index 65, Ch.38, MCS11)



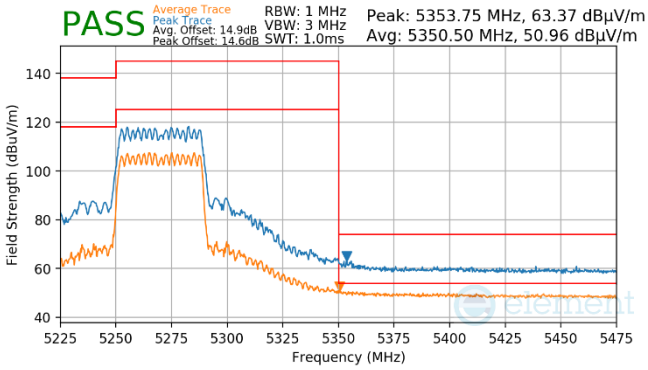
Plot 7-620. CDD (Pk & Avg, RU484, Index 65, Ch.62, MCS11)



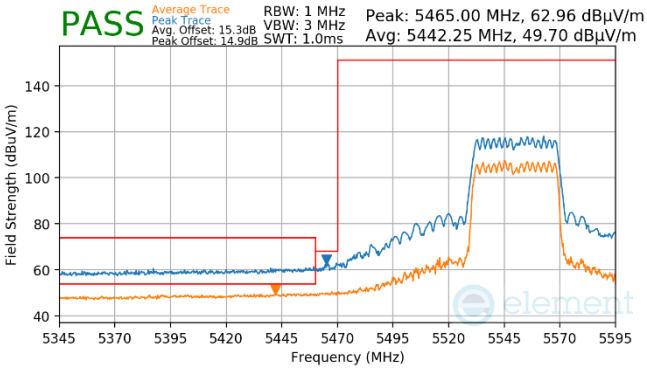
Plot 7-618. CDD (Pk & Avg, RU484, Index 65, Ch.46, MCS11)



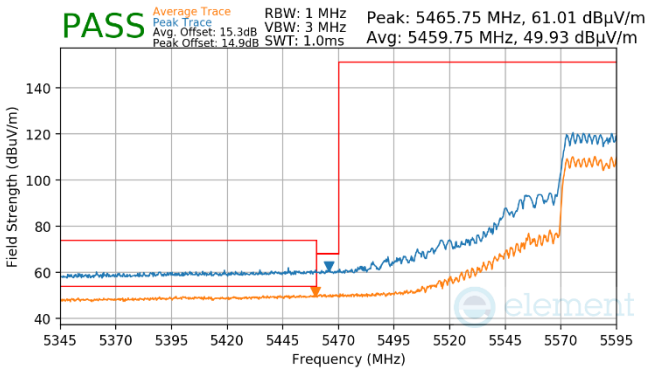
Plot 7-621. CDD (Pk & Avg, RU484, Index 65, Ch.102, MCS11)



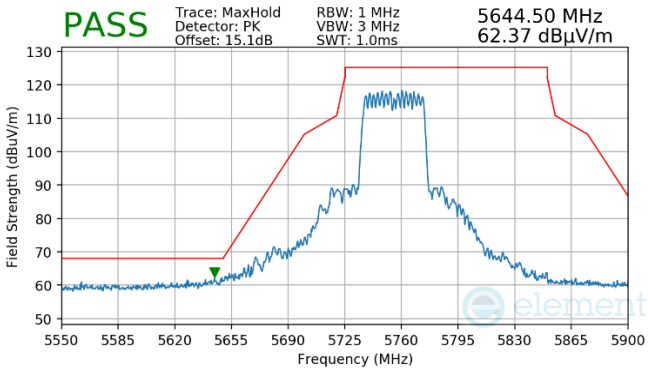
Plot 7-619. CDD (Pk & Avg, RU484, Index 65, Ch.54, MCS11)



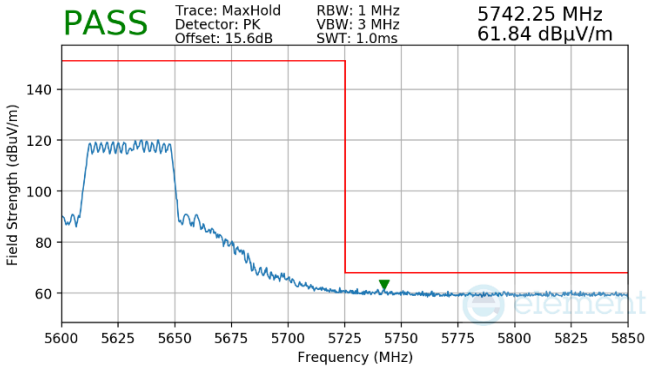
Plot 7-622. CDD (Pk & Avg, RU484, Index 65, Ch.110, MCS11)



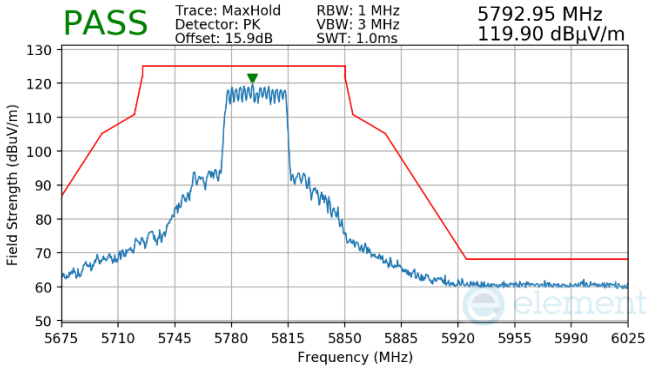
Plot 7-623. (FCC Only) SDM (Pk & Avg, RU484, Index 65, Ch.118, MCS11)



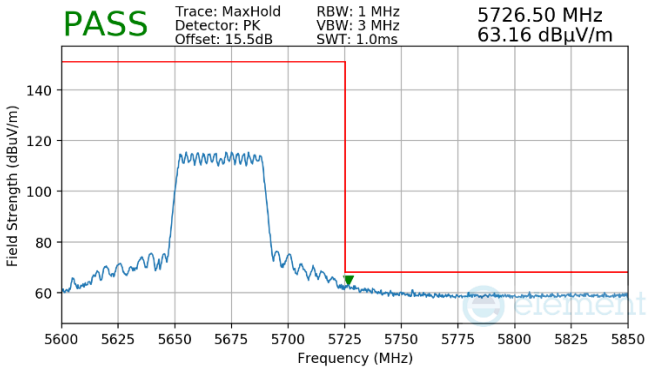
Plot 7-626. CDD (Pk, RU484, Index 65, Ch.151, MCS11)



Plot 7-624. (FCC Only) SDM (Pk, RU484, Index 65, Ch.126, MCS11)



Plot 7-627. CDD (Pk, RU484, Index 65, Ch.159, MCS11)

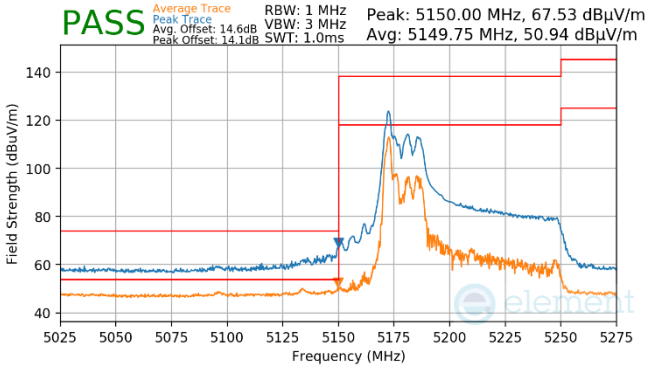


Plot 7-625. CDD (Pk, RU484, Index 65, Ch.134, MCS11)

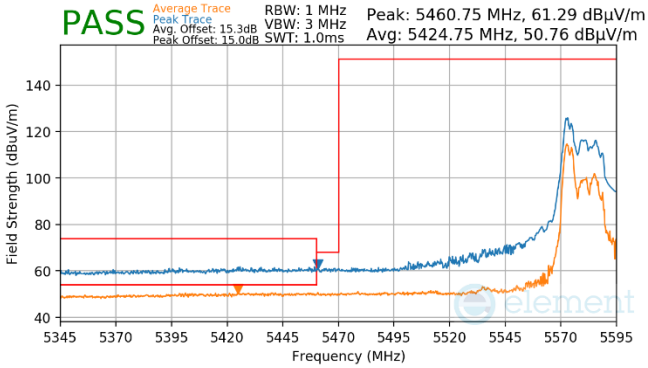
7.6.15 CDD/SDM Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209; RSS-Gen [8.9]

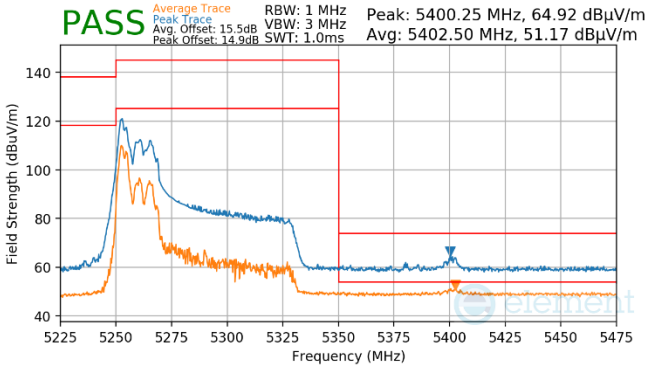
RU26/RU52



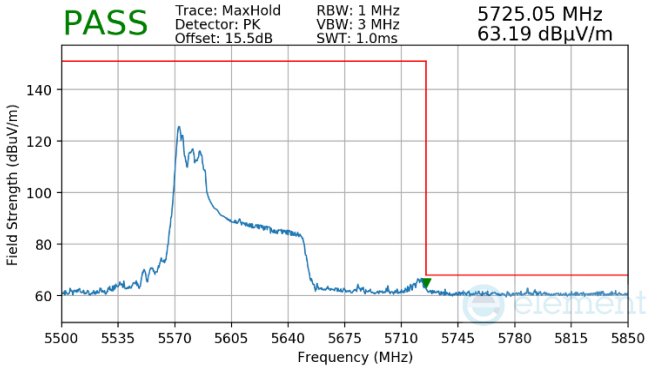
Plot 7-628. CDD (Pk & Avg, RU26, Index 0, Ch.42, MCS11)



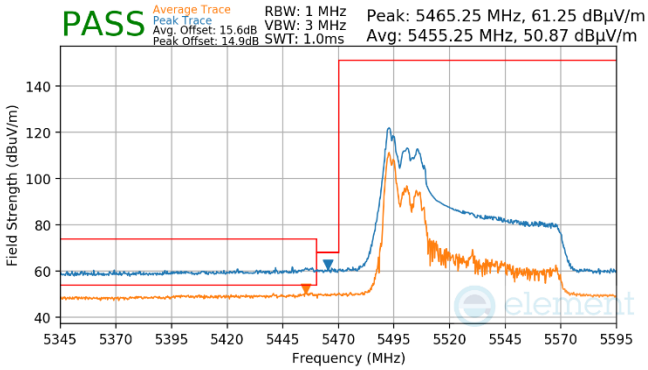
Plot 7-631. (FCC Only) SDM (Pk & Avg, RU52, Index 37, Ch.122, MCS11)



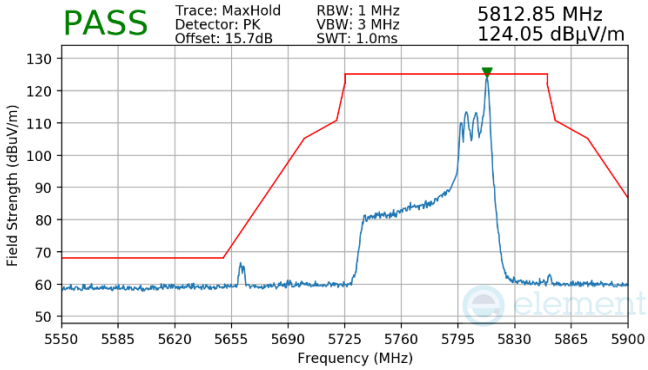
Plot 7-629. CDD (Pk & Avg, RU52, Index 37, Ch.58, MCS11)



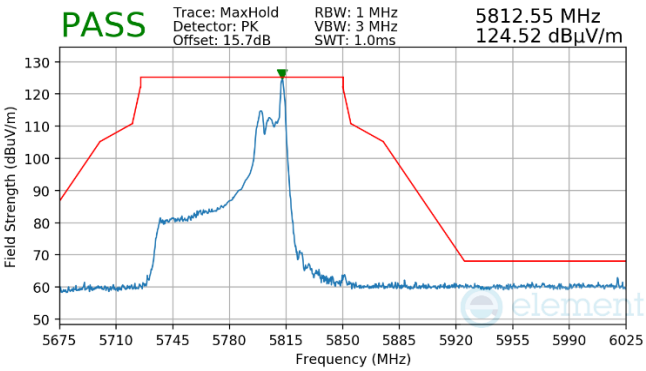
Plot 7-632. (FCC Only) SDM (Pk, RU52, Index 37, Ch.122, MCS11)



Plot 7-630. SDM (Pk & Avg, RU52, Index 37, Ch.106, MCS11)

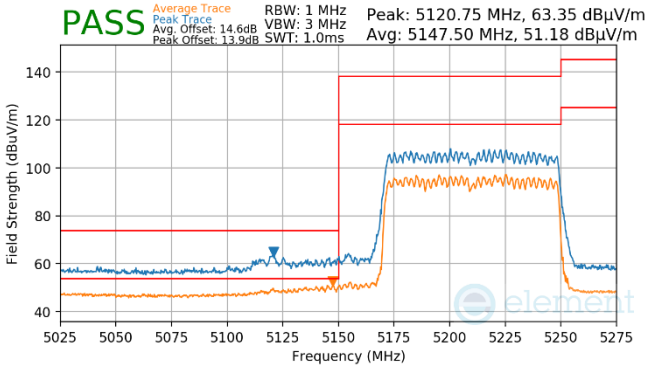


Plot 7-633. CDD (Pk, RU26, Index 36, Ch.155, MCS11)

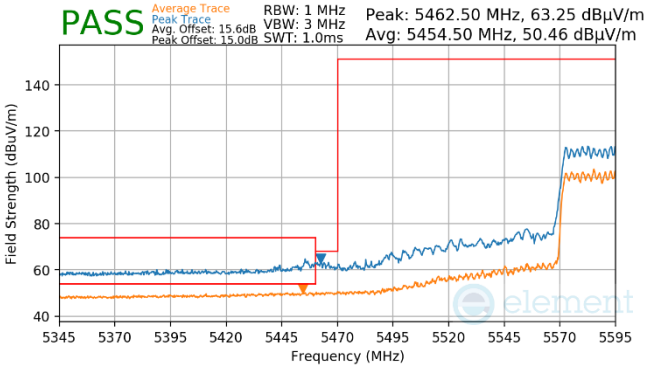


Plot 7-634. CDD (Pk, RU26, Index 36, Ch.155, MCS11)

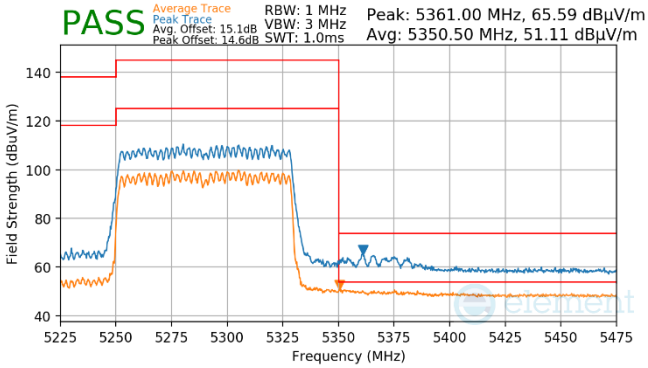
RU996



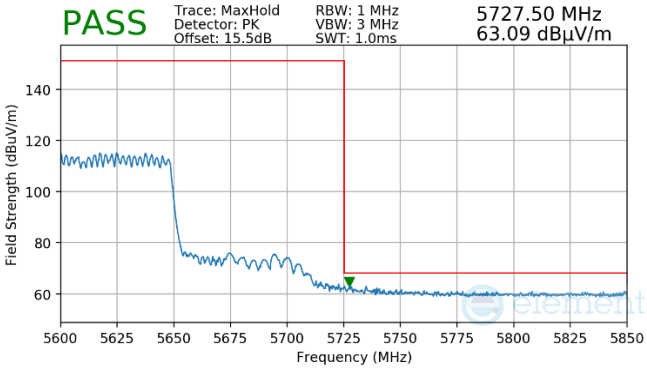
Plot 7-635. CDD (Pk & Avg, RU996, Index 67, Ch.42, MCS11)



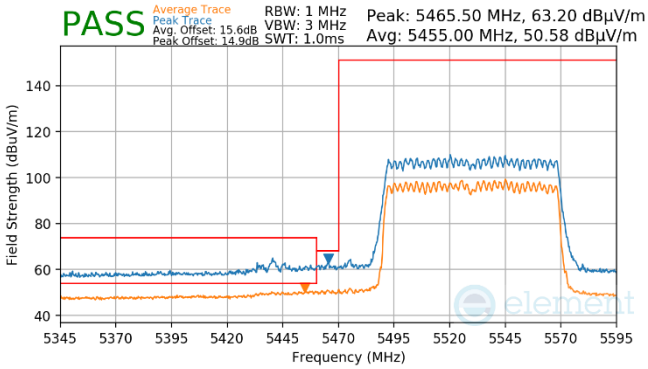
Plot 7-638. (FCC Only) CDD (Pk & Avg, RU996, Index 67, Ch.122, MCS11)



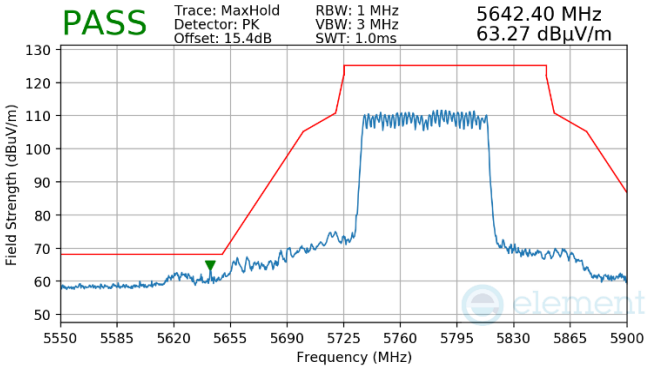
Plot 7-636. CDD (Pk & Avg, RU996, Index 67, Ch.58, MCS11)



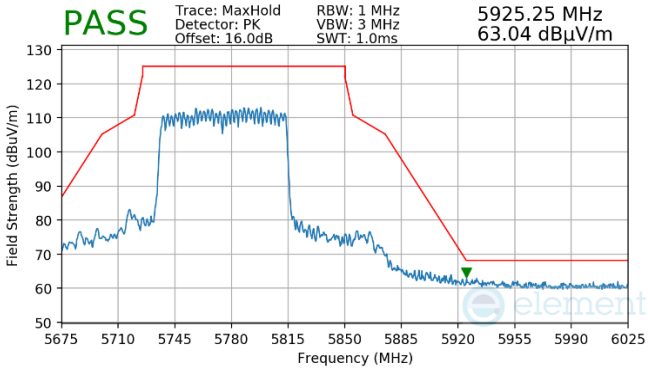
Plot 7-639. (FCC Only) CDD (Pk, RU996, Index 67, Ch.122, MCS11)



Plot 7-637. CDD (Pk & Avg, RU996, Index 67, Ch.106, MCS11)



Plot 7-640. CDD (Pk, RU996, Index 67, Ch.155, MCS11)

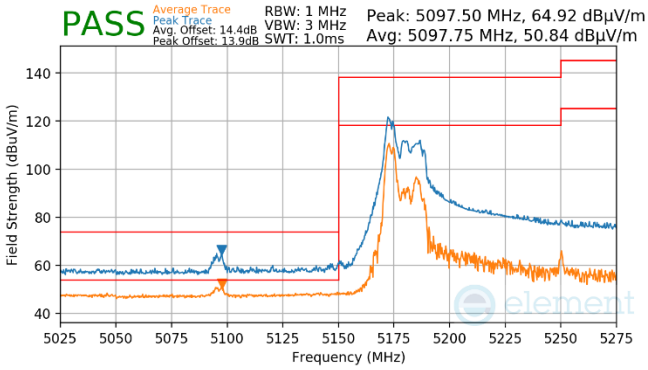


Plot 7-641. CDD (Pk, RU996, Index 67, Ch.155, MCS11)

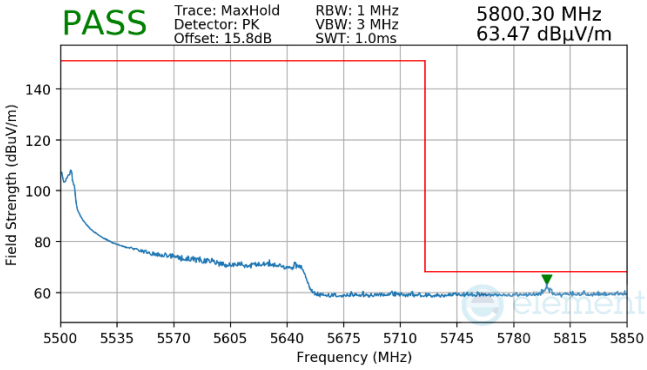
7.6.16 CDD Radiated Band Edge Measurements (160MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209; RSS-Gen [8.9]

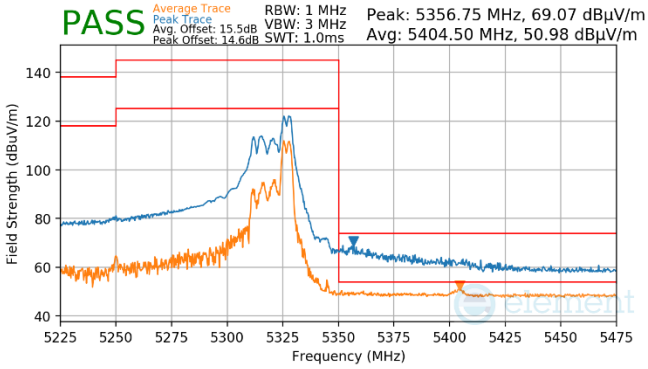
RU52



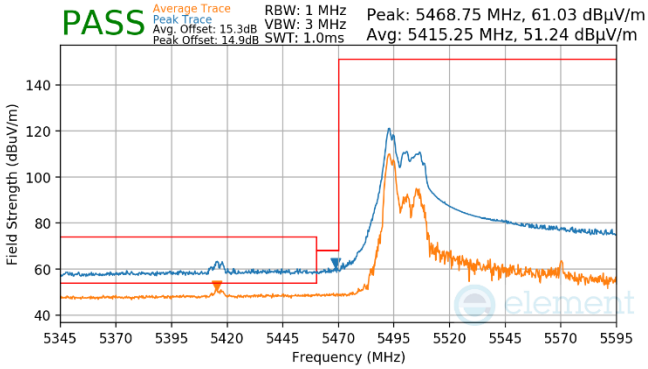
Plot 7-642. CDD (Pk & Avg, RU52, Index 37, Ch.50, MCS11)



Plot 7-645. (FCC Only) CDD (Pk, RU52, Index 52, Ch.114, MCS11)

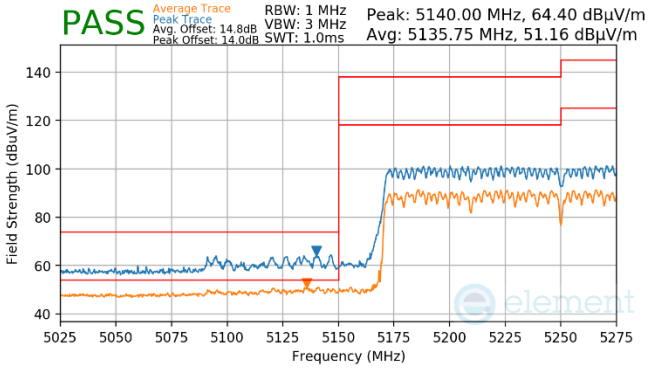


Plot 7-643. CDD (Pk & Avg, RU52, Index 52, Ch.50, MCS11)

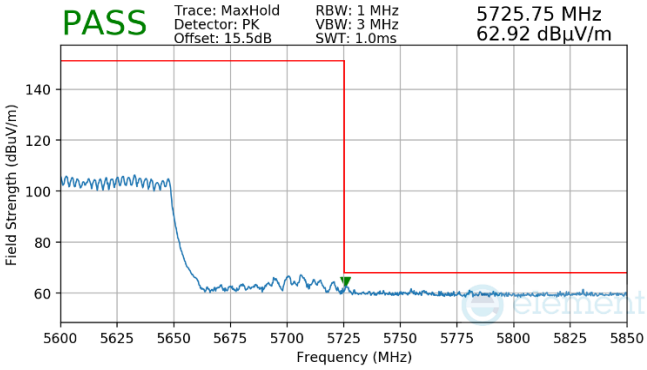


Plot 7-644. (FCC Only) CDD (Pk & Avg, RU52, Index 37, Ch.114, MCS11)

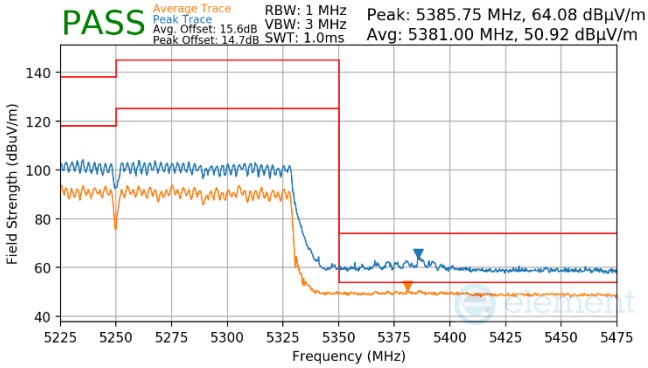
RU996x2



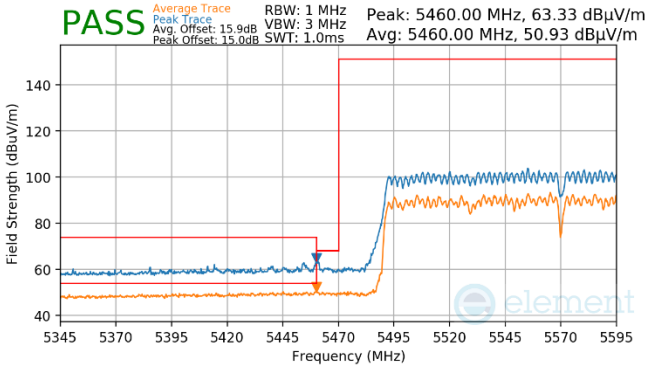
Plot 7-646. CDD (Pk & Avg, RU996x2, Index 68, Ch.50, MCS11)



Plot 7-649. CDD (Pk, RU996x2, Index 68, Ch.114, MCS11)



Plot 7-647. CDD (Pk & Avg, RU996x2, Index 68, Ch.50, MCS11)



Plot 7-648. CDD (Pk & Avg, RU996x2, Index 68, Ch.114, MCS11)

7.7 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 7-196 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 7-196. 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
7. Trace was allowed to stabilize

Test Setup

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

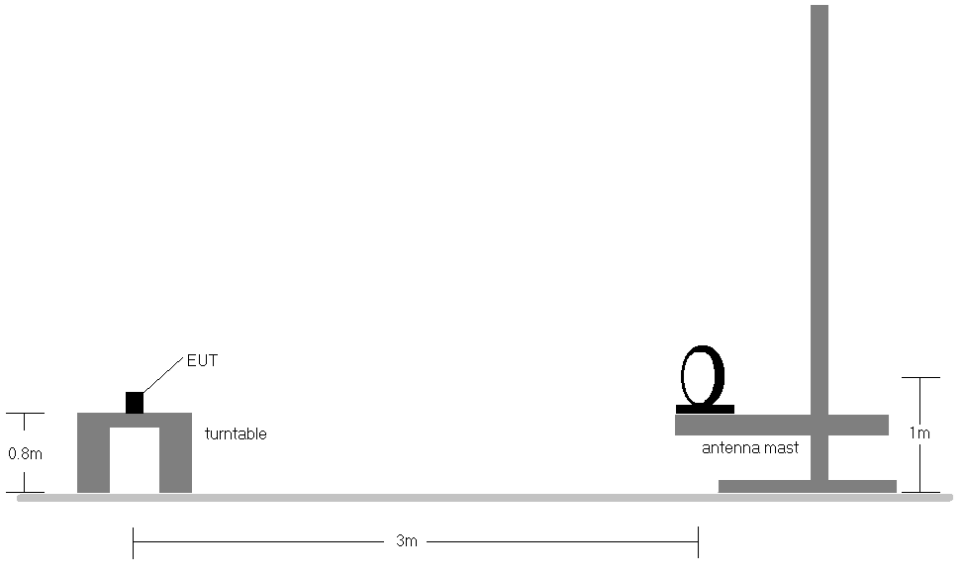


Figure 7-6. Radiated Test Setup < 30MHz

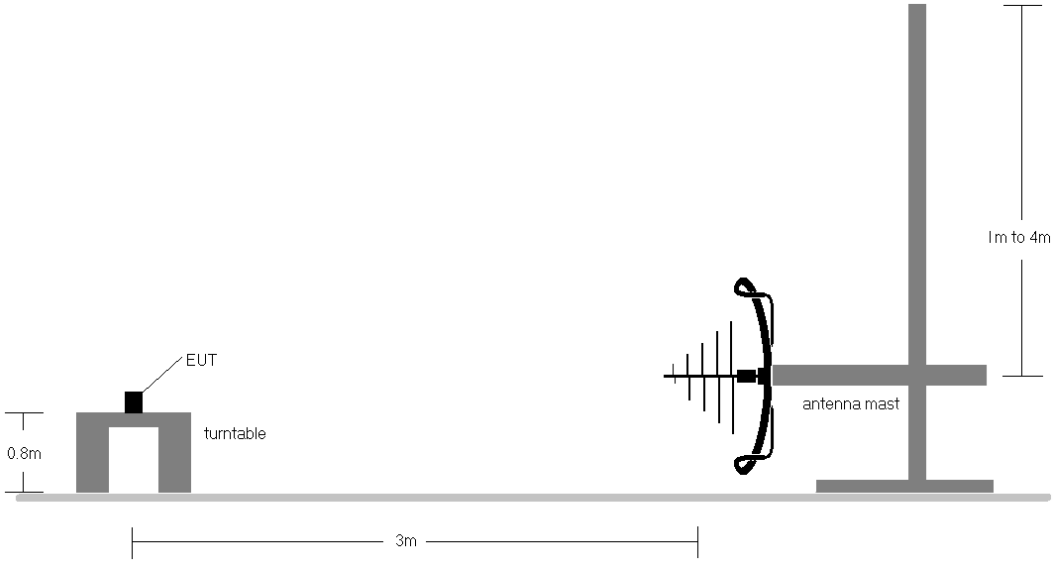


Figure 7-7. Radiated Test Setup < 1GHz

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 7-196.
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. 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.
9. The wide spectrum spurious emissions plots shown on the following pages are used only for the purpose of emission identification. There were no emissions detected in the 30MHz – 1GHz frequency range, as shown in the subsequent plots.
10. All antenna configurations and data rates were investigated and only the worst case are reported.
11. 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

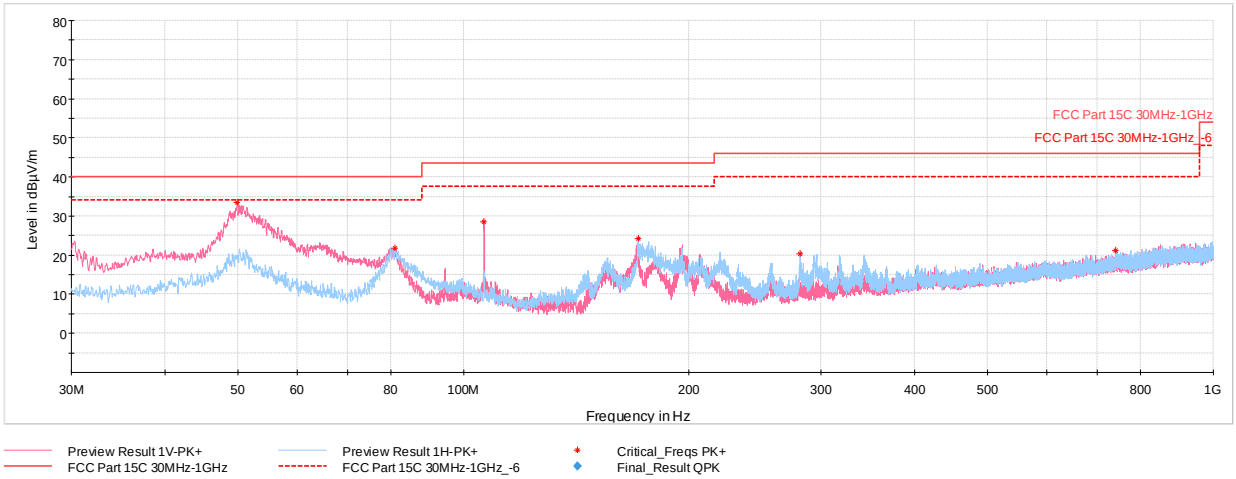
Sample Calculations

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 $_{[dB\mu V/m]}$

7.6.17 CDD Radiated Spurious Emissions (Below 1GHz)

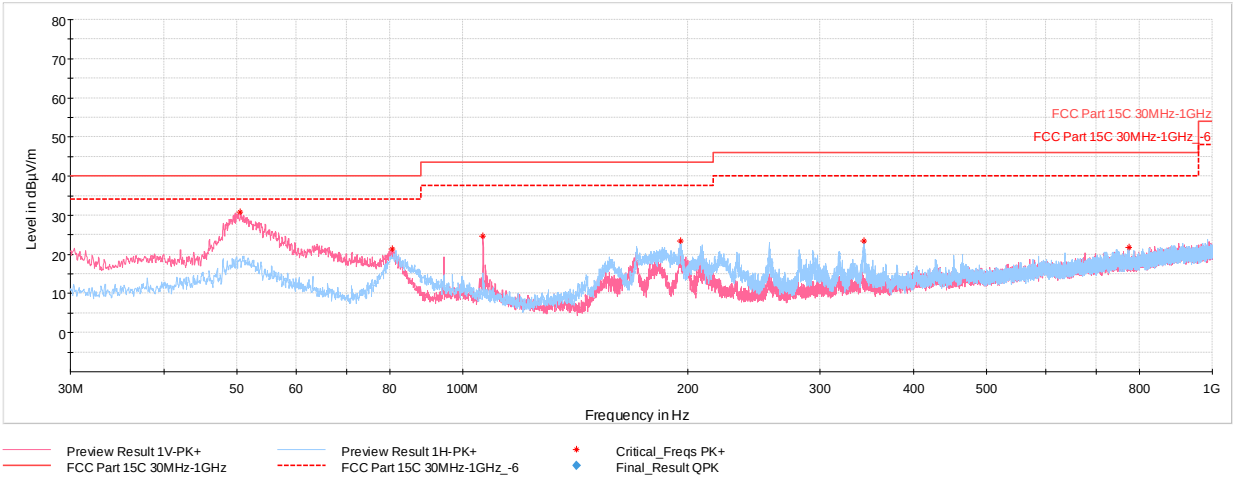
§15.209; RSS-Gen [8.9]



Plot 7-650. RSE below 1GHz CDD (RU26 – Ch.40), 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]
49.93	Max Peak	V	100	341	-60.93	-12.63	33.44	40.00	-6.56
80.97	Max Peak	H	300	70	-64.11	-21.06	21.83	40.00	-18.17
106.48	Max Peak	V	100	156	-61.85	-16.52	28.63	43.52	-14.89
171.04	Max Peak	H	200	359	-63.95	-18.89	24.16	43.52	-19.36
281.38	Max Peak	H	100	82	-71.96	-14.61	20.43	46.02	-25.59
740.04	Max Peak	H	100	213	-80.37	-5.56	21.07	46.02	-24.95

Table 7-197. RSE below 1GHz CDD (RU26 – Ch.40), with AC/DC Adapter



Plot 7-651. RSE below 1GHz CDD (RU242 – Ch.40), 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]
50.52	Max Peak	V	100	248	-63.53	-12.67	30.80	40.00	-9.20
80.59	Max Peak	V	300	49	-64.49	-21.14	21.37	40.00	-18.63
106.48	Max Peak	V	100	154	-65.77	-16.52	24.71	43.52	-18.81
195.19	Max Peak	H	100	188	-67.08	-16.40	23.52	43.52	-20.00
343.07	Max Peak	H	100	353	-71.07	-12.42	23.51	46.02	-22.51
774.14	Max Peak	H	100	175	-79.61	-5.52	21.87	46.02	-24.15

Table 7-198. RSE below 1GHz CDD (RU242– Ch.40), with AC/DC Adapter

7.8 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. All data rates and modes were investigated for AC Line conducted spurious emissions.

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 7-199. 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.

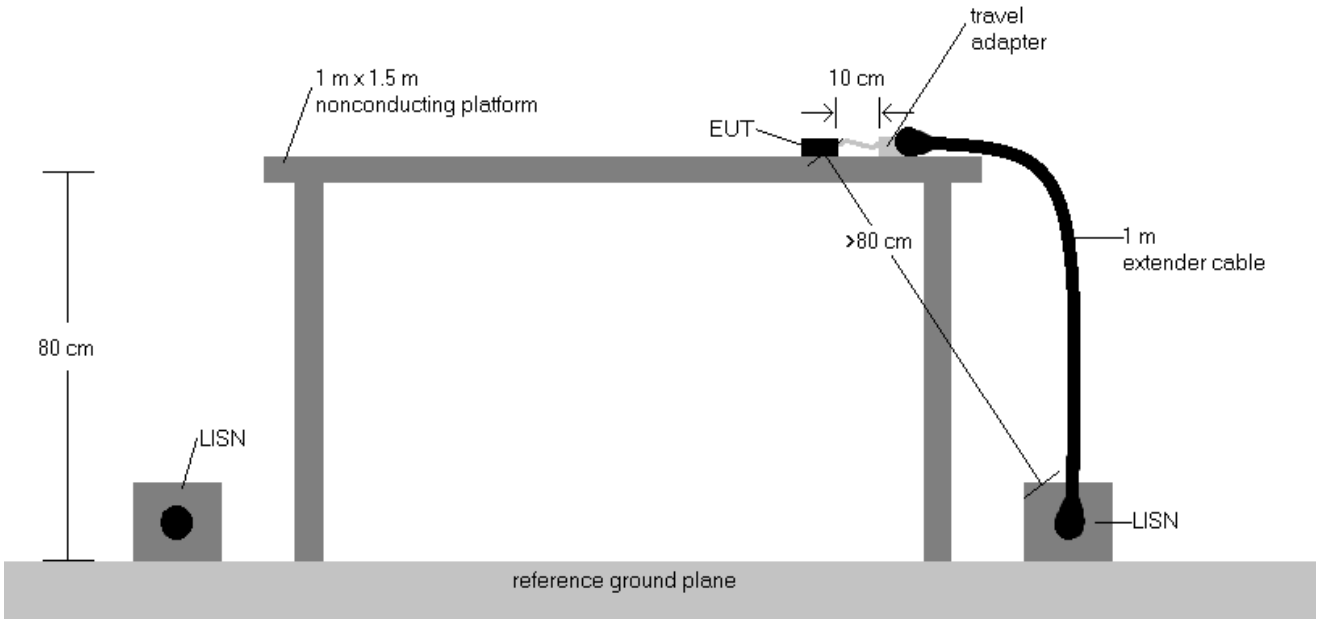
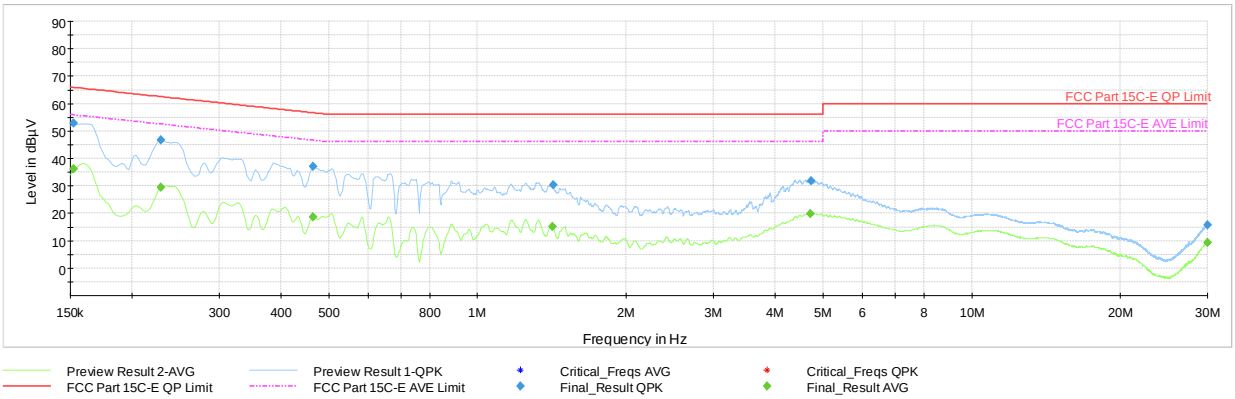


Figure 7-8. Test Instrument & Measurement Setup

Test Notes

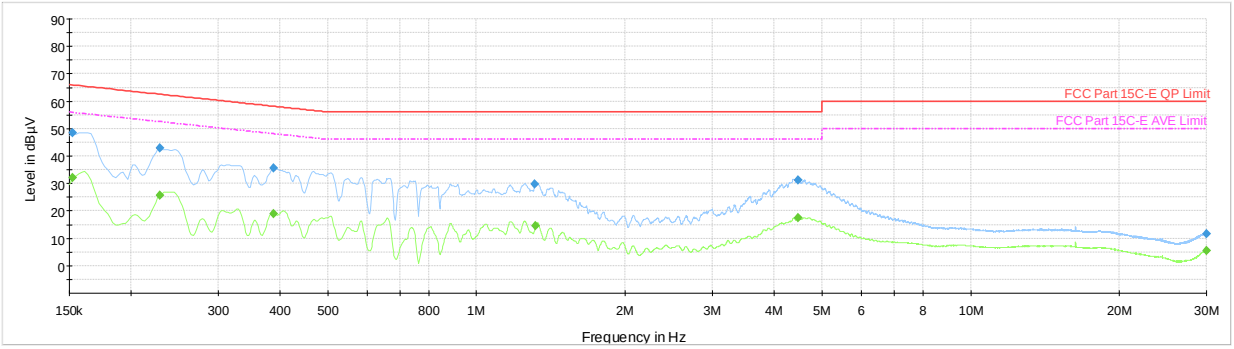
1. All modes of operation were investigated and the worst-case emissions are reported. The emissions found were not affected by the choice of channel used during testing.
2. Both configurations below were investigated, and the worst case has been reported.
    a. EUT powered by AC/DC adaptor via USB-C 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 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) + Correction Factor (dB)
6. Margin (dB) = QP/AV Level (dBμV) - QP/AV Limit (dBμV)
7. Traces shown in plots are made using quasi-peak and average detectors.
8. Deviations to the Specifications: None.



Plot 7-652. AC Line Conducted Plot with 11ax UNII Band 1 – RU26 – Ch.36 (L1) with AC/DC Adapter

Frequency [MHz]	Process State	QuasiPeak [dBµV]	Average [dBµV]	Limit [dBµV]	Margin [dB]	Line	PE
0.152	FINAL	—	36.17	55.88	-19.71	L1	GND
0.152	FINAL	52.8	—	65.88	-13.07	L1	GND
0.229	FINAL	—	29.55	52.50	-22.95	L1	GND
0.229	FINAL	46.8	—	62.50	-15.73	L1	GND
0.465	FINAL	37.0	—	56.60	-19.60	L1	GND
0.465	FINAL	—	18.74	46.60	-27.86	L1	GND
1.419	FINAL	—	15.18	46.00	-30.82	L1	GND
1.421	FINAL	30.2	—	56.00	-25.79	L1	GND
4.722	FINAL	—	19.97	46.00	-26.03	L1	GND
4.724	FINAL	31.8	—	56.00	-24.16	L1	GND
29.992	FINAL	—	9.41	50.00	-40.59	L1	GND
29.992	FINAL	15.7	—	60.00	-44.29	L1	GND

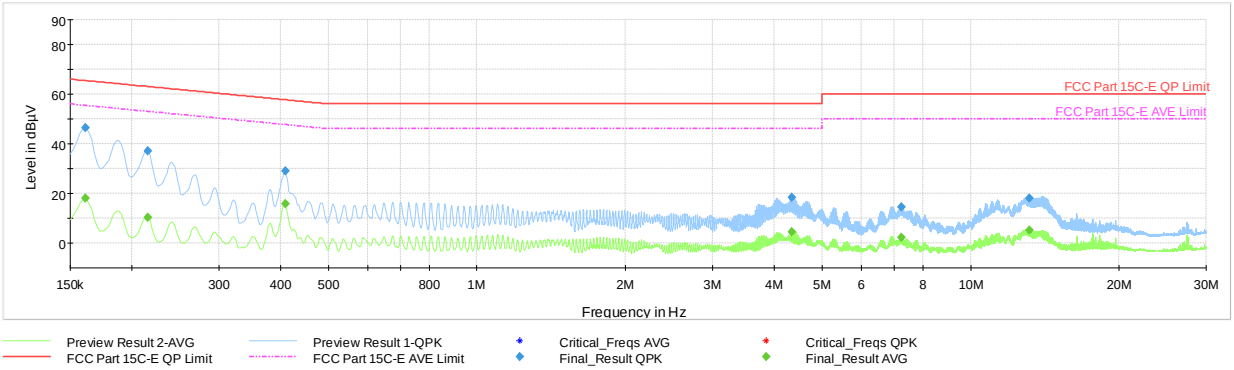
Table 7-200. AC Line Conducted with 11ax UNII Band 1 – RU26 – Ch.36 (L1) with AC/DC Adapter



Plot 7-653. AC Line Conducted Plot with 11ax UNII Band 1 – RU26 – Ch.36 (N) with AC/DC Adapter

Frequency [MHz]	Process State	QuasiPeak [dBµV]	Average [dBµV]	Limit [dBµV]	Margin [dB]	Line	PE
0.152	FINAL	—	31.99	55.88	-23.88	N	GND
0.152	FINAL	48.5	—	65.88	-17.41	N	GND
0.229	FINAL	—	25.77	52.50	-26.73	N	GND
0.229	FINAL	42.8	—	62.50	-19.70	N	GND
0.389	FINAL	—	19.06	48.10	-29.04	N	GND
0.389	FINAL	35.7	—	58.10	-22.41	N	GND
1.313	FINAL	29.7	—	56.00	-26.35	N	GND
1.316	FINAL	—	14.43	46.00	-31.57	N	GND
4.475	FINAL	31.3	—	56.00	-24.67	N	GND
4.477	FINAL	—	17.48	46.00	-28.52	N	GND
29.974	FINAL	11.7	—	60.00	-48.26	N	GND
29.978	FINAL	—	5.63	50.00	-44.37	N	GND

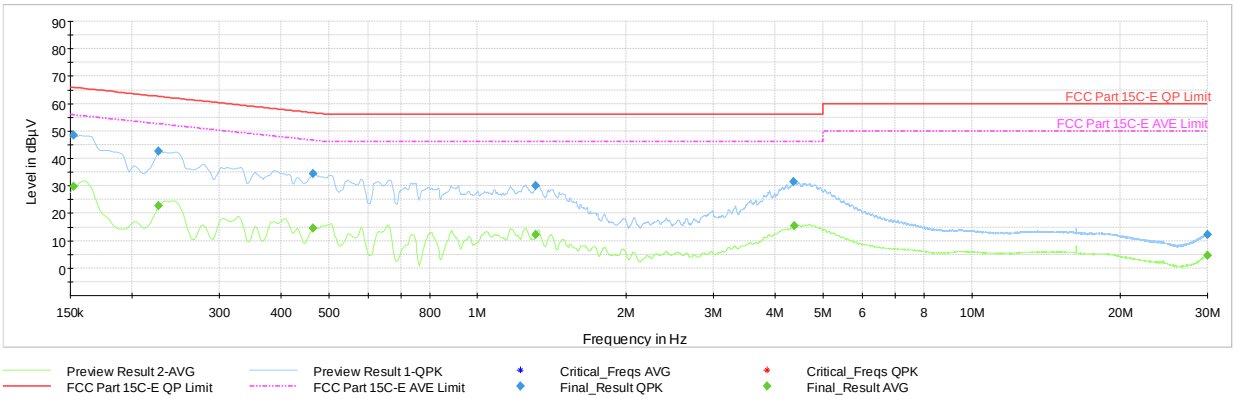
Table 7-201. AC Line Conducted with 11ax UNII Band 1 – RU26 – Ch.36 (N) with AC/DC Adapter



Plot 7-654. AC Line Conducted Plot with 11ax UNII Band 1 – RU242 – Ch.36 (L1) with AC/DC Adapter

Frequency [MHz]	Process State	QuasiPeak [dBµV]	Average [dBµV]	Limit [dBµV]	Margin [dB]	Line	PE
0.161	FINAL	—	17.93	55.40	-37.47	L1	GND
0.161	FINAL	46.6	—	65.40	-18.79	L1	GND
0.215	FINAL	—	10.36	53.00	-42.64	L1	GND
0.215	FINAL	37.1	—	63.00	-25.93	L1	GND
0.409	FINAL	—	15.71	47.67	-31.96	L1	GND
0.409	FINAL	29.0	—	57.67	-28.71	L1	GND
4.335	FINAL	18.4	—	56.00	-37.64	L1	GND
4.335	FINAL	—	4.67	46.00	-41.33	L1	GND
7.249	FINAL	14.6	—	60.00	-45.45	L1	GND
7.249	FINAL	—	2.29	50.00	-47.71	L1	GND
13.148	FINAL	—	5.27	50.00	-44.73	L1	GND
13.148	FINAL	18.2	—	60.00	-41.79	L1	GND

Table 7-202. AC Line Conducted with 11ax UNII Band 1 – RU242 – Ch.36 (L1) with AC/DC Adapter



Plot 7-655. AC Line Conducted Plot with 11ax UNII Band 1 – RU26 – Ch.36 (N) with AC/DC Adapter

Frequency [MHz]	Process State	QuasiPeak [dBµV]	Average [dBµV]	Limit [dBµV]	Margin [dB]	Line	PE
0.152	FINAL	—	29.81	55.88	-26.07	N	GND
0.152	FINAL	48.4	—	65.88	-17.47	N	GND
0.227	FINAL	—	22.82	52.58	-29.76	N	GND
0.227	FINAL	42.6	—	62.58	-20.02	N	GND
0.465	FINAL	—	14.64	46.60	-31.97	N	GND
0.465	FINAL	34.6	—	56.60	-22.03	N	GND
1.311	FINAL	29.9	—	56.00	-26.08	N	GND
1.311	FINAL	—	12.28	46.00	-33.72	N	GND
4.367	FINAL	31.6	—	56.00	-24.44	N	GND
4.371	FINAL	—	15.51	46.00	-30.49	N	GND
29.960	FINAL	—	4.63	50.00	-45.37	N	GND
29.960	FINAL	12.1	—	60.00	-47.89	N	GND

Table 7-203. AC Line Conducted with 11ax UNII Band 1 – RU26 – Ch.36 (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: BCGA2902** and **IC: 579C-A2902** is in compliance with is in compliance with Part 15 Subpart E (15.407) of the FCC Rules and RSS-247 of the Innovation, Science and Economic Development Canada Rules.