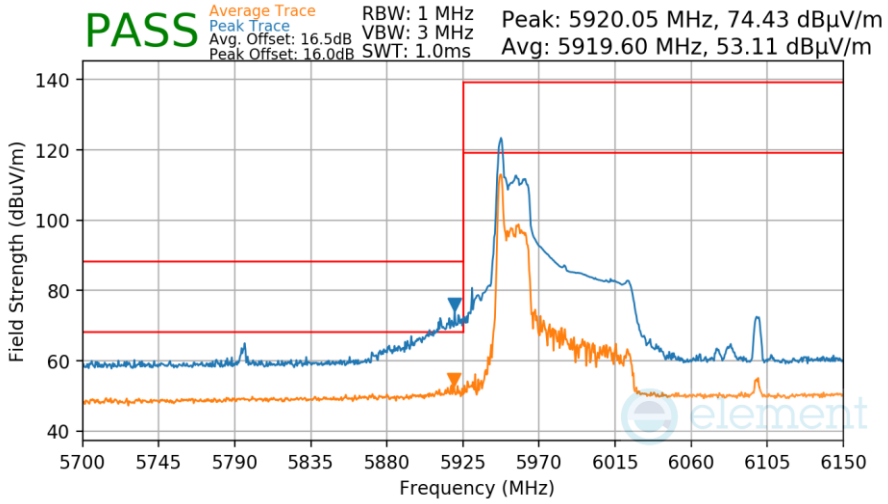
7.7.9 Antenna WF7a Radiated Band Edge Measurements (80MHz BW)

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

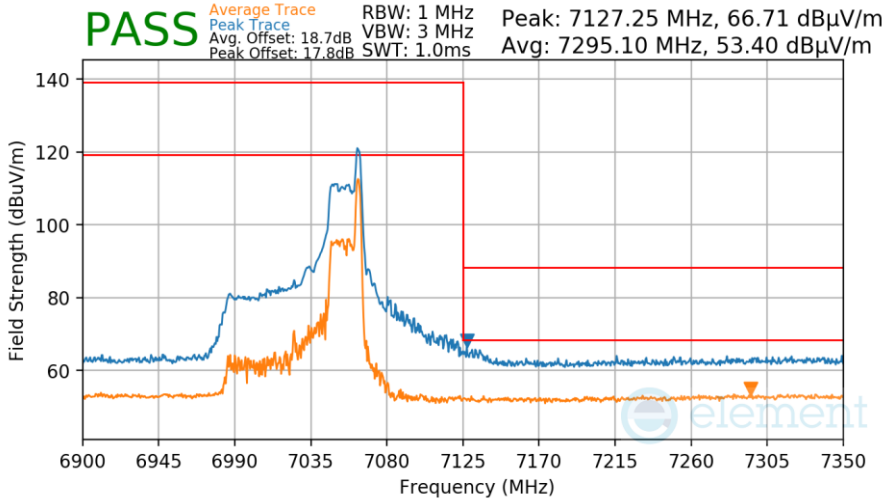
RU26

Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS11
Distance of Measurements:	3 Meters
Operating Frequency:	5985MHz
Channel:	7



Plot 7-1041. Antenna WF7a Radiated Lower Band Edge (Peak & Average – UNII Band 5 – RU26)

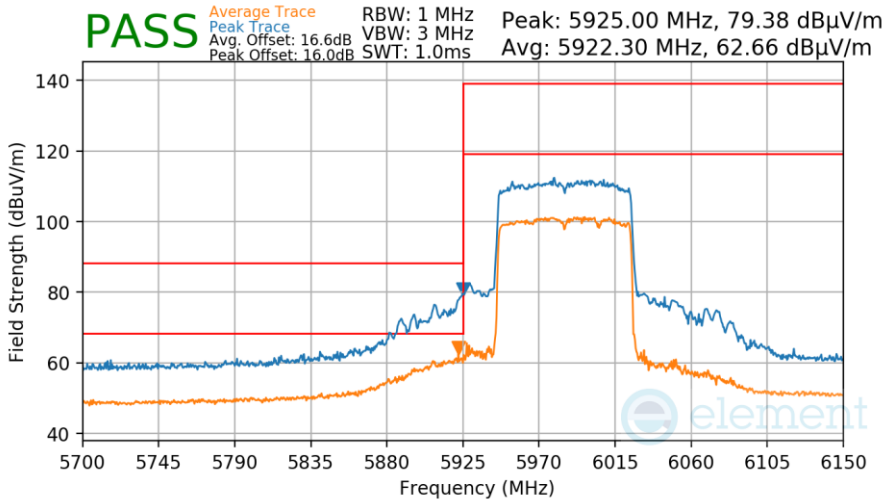
Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS11
Distance of Measurements:	3 Meters
Operating Frequency:	7025MHz
Channel:	215



Plot 7-1042. Antenna WF7a Radiated Lower Band Edge (Peak & Average – UNII Band 8 – RU26)

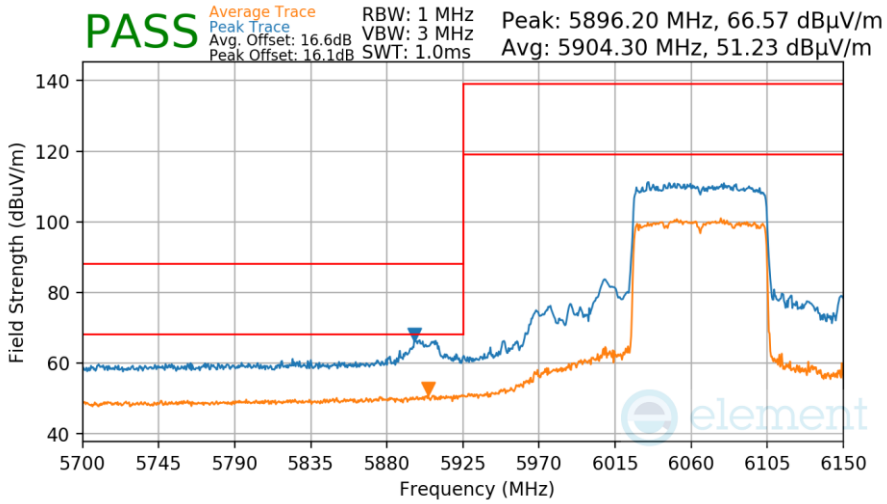
RU996

Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS11
Distance of Measurements:	3 Meters
Operating Frequency:	5985MHz
Channel:	7



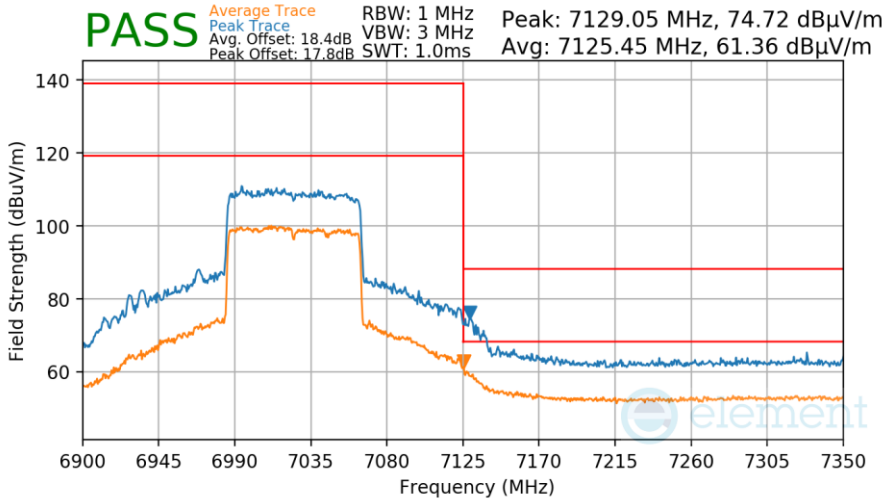
Plot 7-1043. Antenna WF7a Radiated Lower Band Edge (Peak & Average – UNII Band 5 – RU996)

Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS11
Distance of Measurements:	3 Meters
Operating Frequency:	6065MHz
Channel:	23



Plot 7-1044. Antenna WF7a Radiated Lower Band Edge (Peak & Average – UNII Band 5 – RU996)

Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS11
Distance of Measurements:	3 Meters
Operating Frequency:	7025MHz
Channel:	215



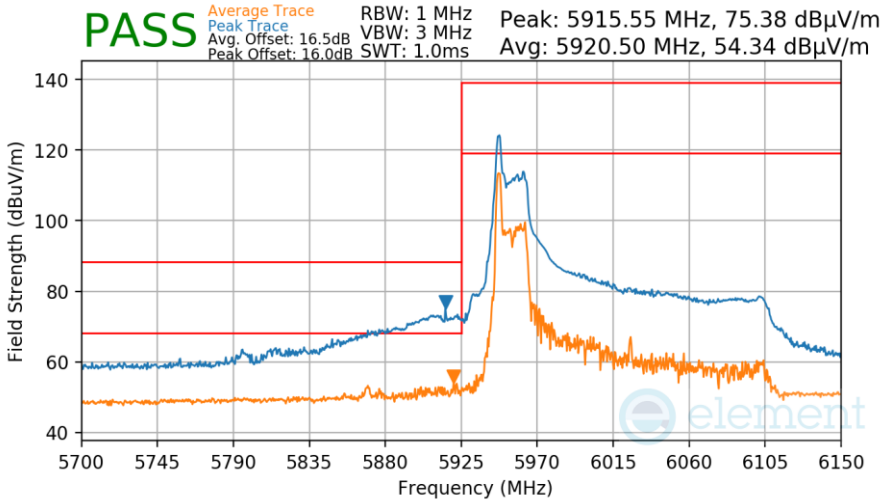
Plot 7-1045. Antenna WF7a Radiated Lower Band Edge (Peak & Average – UNII Band 8 – RU996)

7.7.10 Antenna WF7a Radiated Band Edge Measurements (160MHz BW)

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

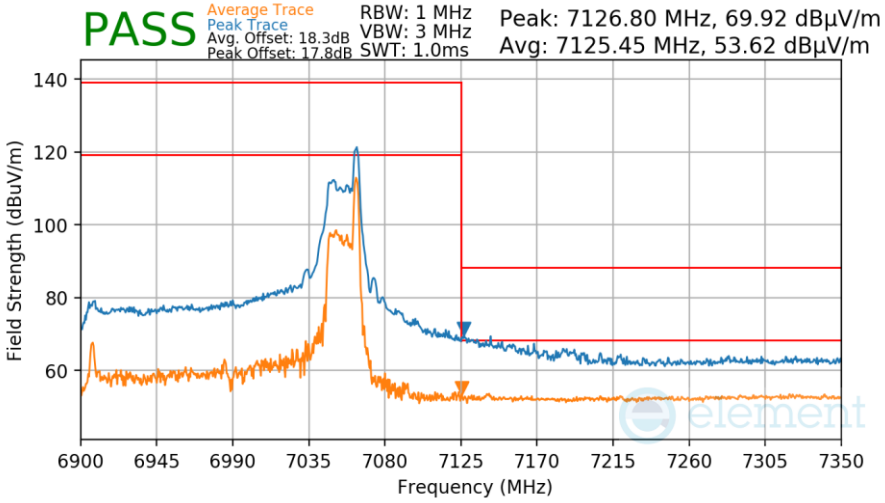
RU26

Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS11
Distance of Measurements:	3 Meters
Operating Frequency:	6025MHz
Channel:	15



Plot 7-1046. Antenna WF7a Radiated Lower Band Edge (Peak & Average – UNII Band 5 – RU26)

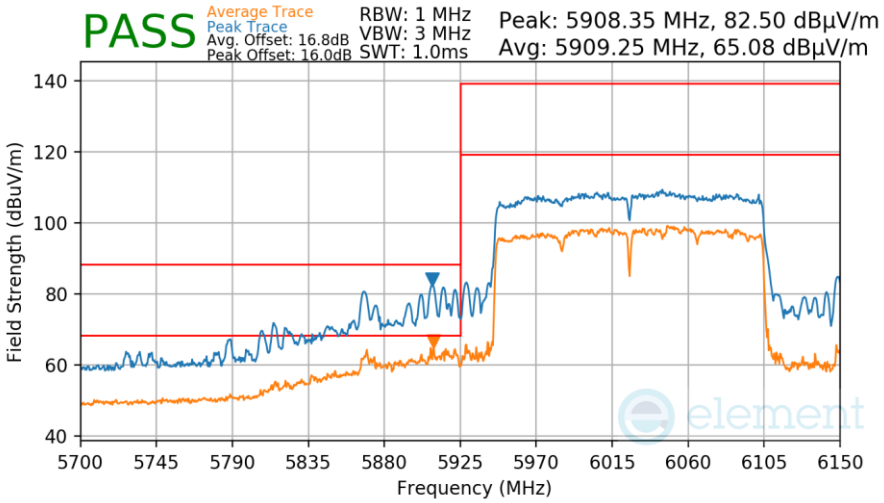
Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS11
Distance of Measurements:	3 Meters
Operating Frequency:	6985MHz
Channel:	207



Plot 7-1047. Antenna WF7a Radiated Lower Band Edge (Peak & Average – UNII Band 8 – RU26)

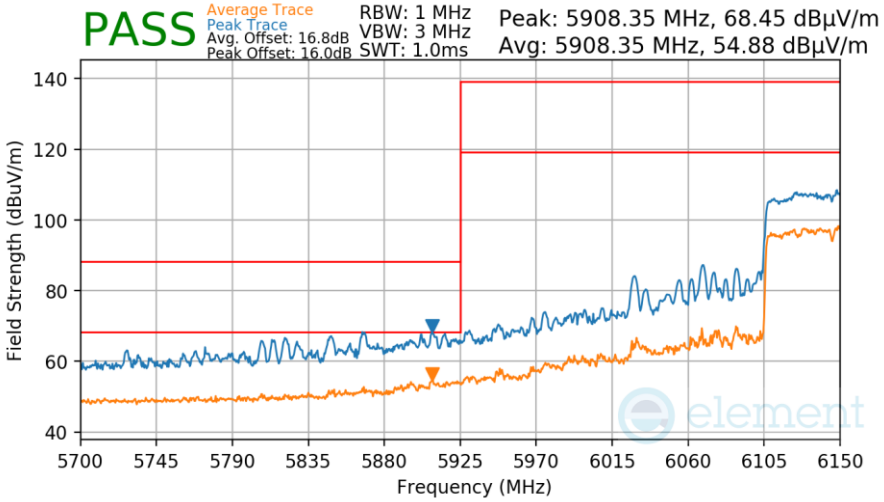
RU996x2

Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS11
Distance of Measurements:	3 Meters
Operating Frequency:	6025MHz
Channel:	15



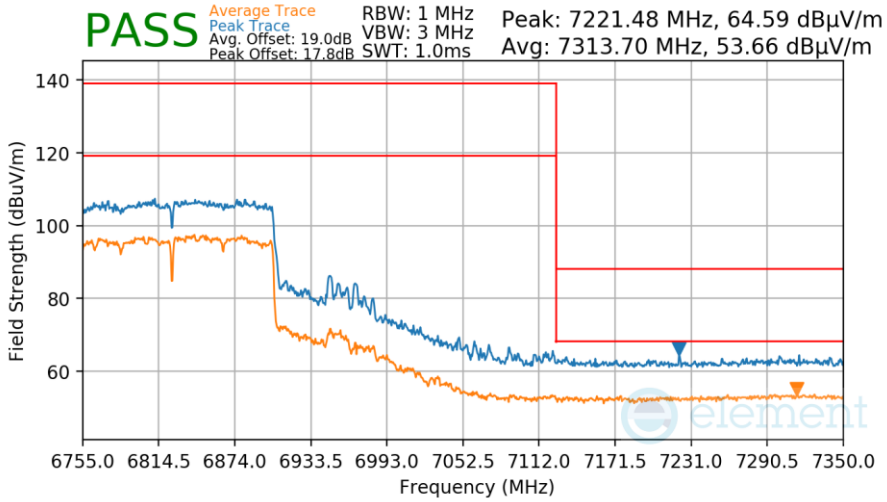
Plot 7-1048. Antenna WF7a Radiated Lower Band Edge (Peak & Average – UNII Band 5 – RU996x2)

Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS11
Distance of Measurements:	3 Meters
Operating Frequency:	6185MHz
Channel:	47



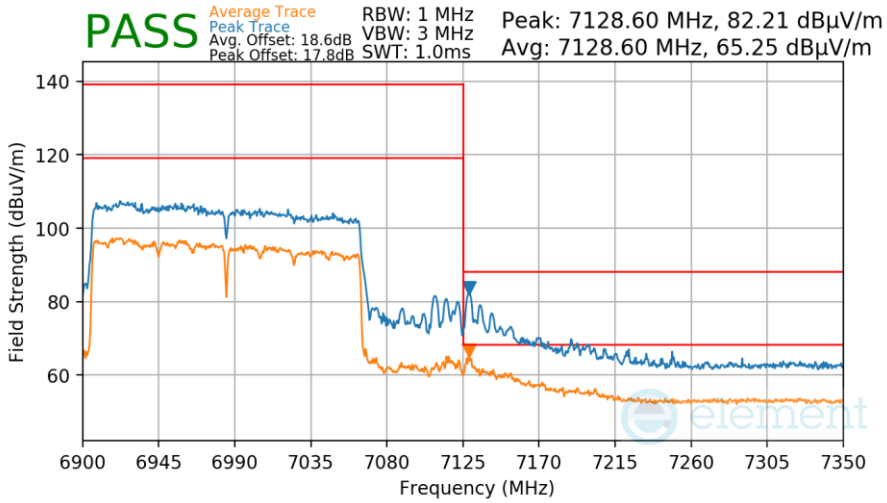
Plot 7-1049. Antenna WF7a Radiated Lower Band Edge (Peak & Average – UNII Band 5 – RU996x2)

Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS11
Distance of Measurements:	3 Meters
Operating Frequency:	6825MHz
Channel:	175



Plot 7-1050. Antenna WF7a Radiated Lower Band Edge (Peak & Average – UNII Band 5 – RU996x2)

Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS11
Distance of Measurements:	3 Meters
Operating Frequency:	6985MHz
Channel:	207



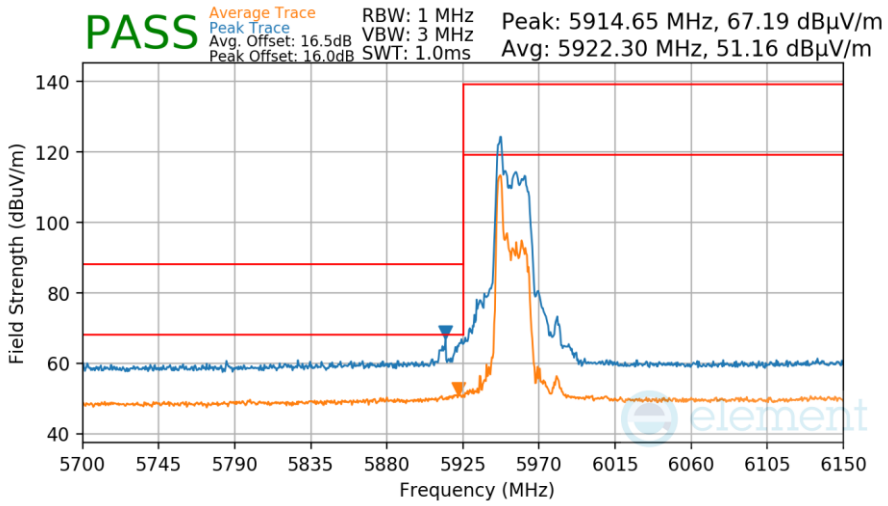
Plot 7-1051. Antenna WF7a Radiated Lower Band Edge (Peak & Average – UNII Band 8 – RU996x2)

7.7.11 SDM Radiated Band Edge Measurements (20MHz BW)

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

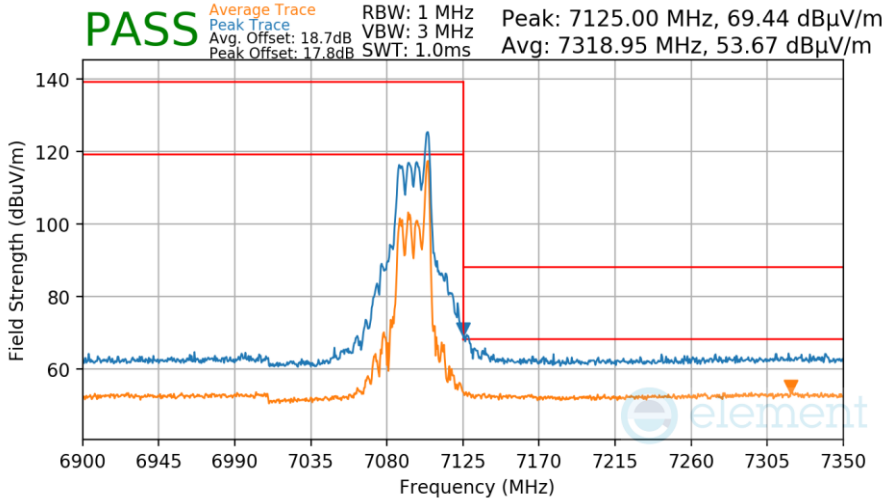
RU26

Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS11
Distance of Measurements:	3 Meters
Operating Frequency:	5955MHz
Channel:	1



Plot 7-1052. SDM Radiated Lower Band Edge (Peak/Average – UNII Band 5 – RU26)

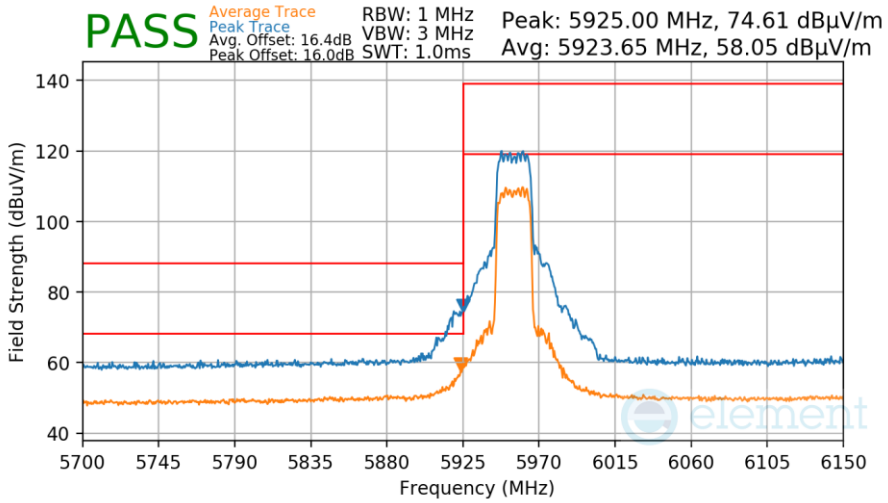
Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS11
Distance of Measurements:	3 Meters
Operating Frequency:	7095MHz
Channel:	229



Plot 7-1053. SDM Radiated Lower Band Edge (Peak/Average – UNII Band 8 – RU26)

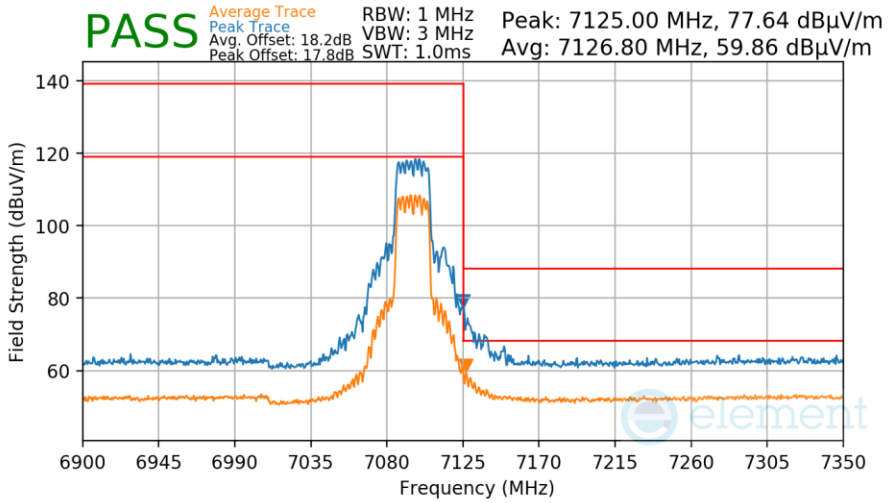
RU242

Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS11
Distance of Measurements:	3 Meters
Operating Frequency:	5955MHz
Channel:	1



Plot 7-1054. SDM Radiated Lower Band Edge (Peak/Average – UNII Band 5 – RU242)

Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS11
Distance of Measurements:	3 Meters
Operating Frequency:	7095MHz
Channel:	229



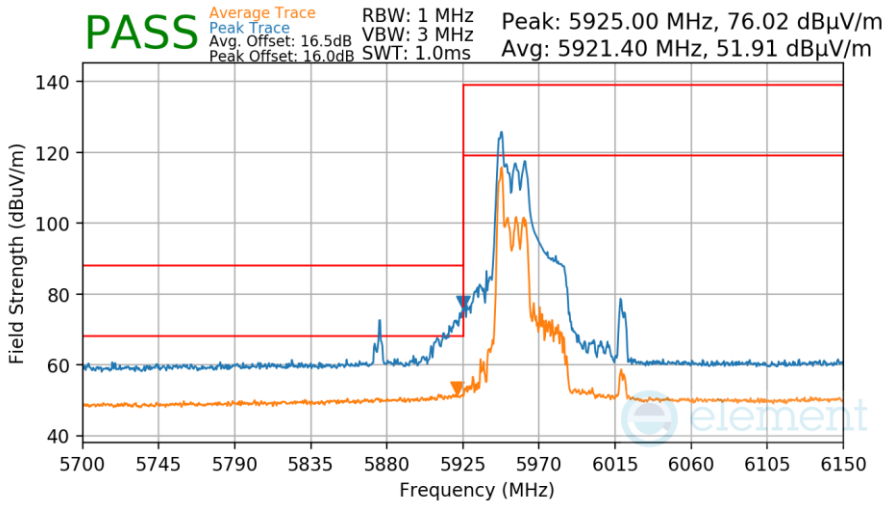
Plot 7-1055. SDM Radiated Lower Band Edge (Peak/Average – UNII Band 8 – RU242)

7.7.12 SDM Radiated Band Edge Measurements (40MHz BW)

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

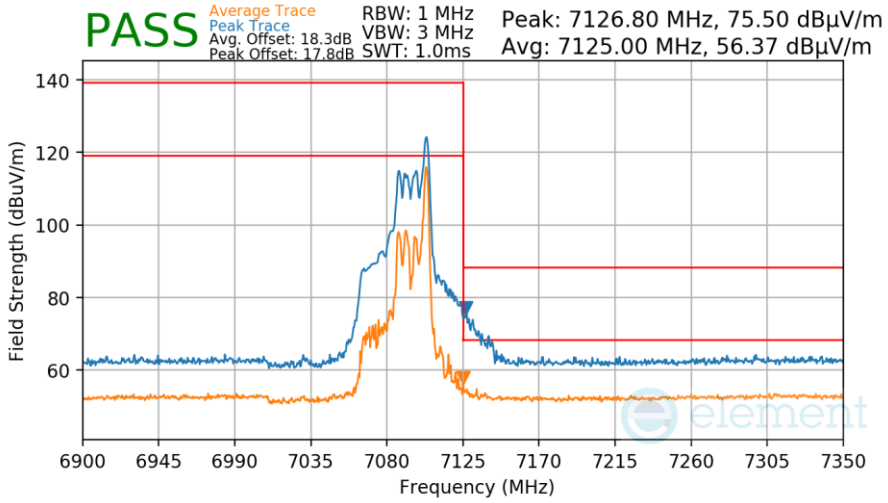
RU26

Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS11
Distance of Measurements:	3 Meters
Operating Frequency:	5965MHz
Channel:	3



Plot 7-1056. SDM Radiated Lower Band Edge (Peak & Average – UNII Band 5 – RU26)

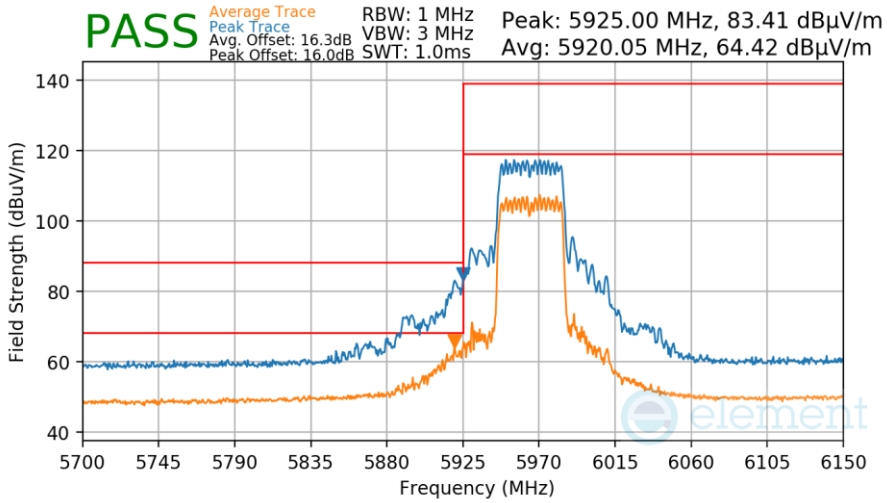
Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS11
Distance of Measurements:	3 Meters
Operating Frequency:	7085MHz
Channel:	227



Plot 7-1057. SDM Radiated Lower Band Edge (Peak & Average – UNII Band 8 – RU26)

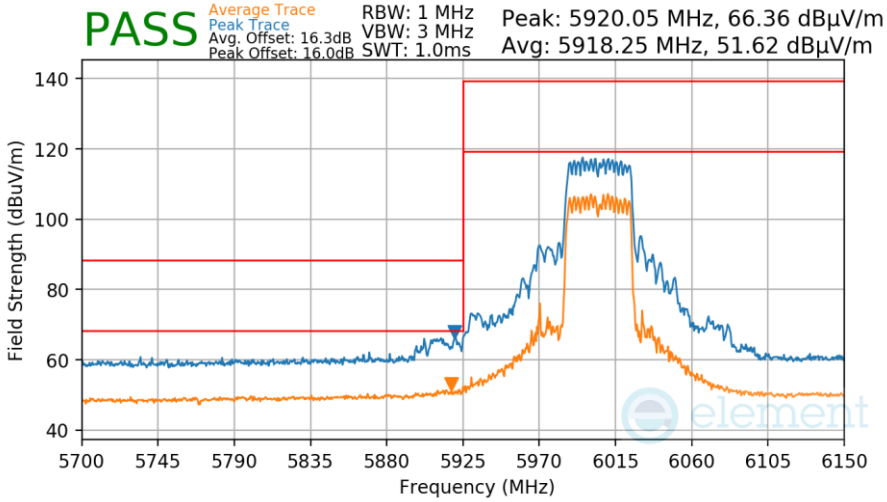
RU484

Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS11
Distance of Measurements:	3 Meters
Operating Frequency:	5965MHz
Channel:	3



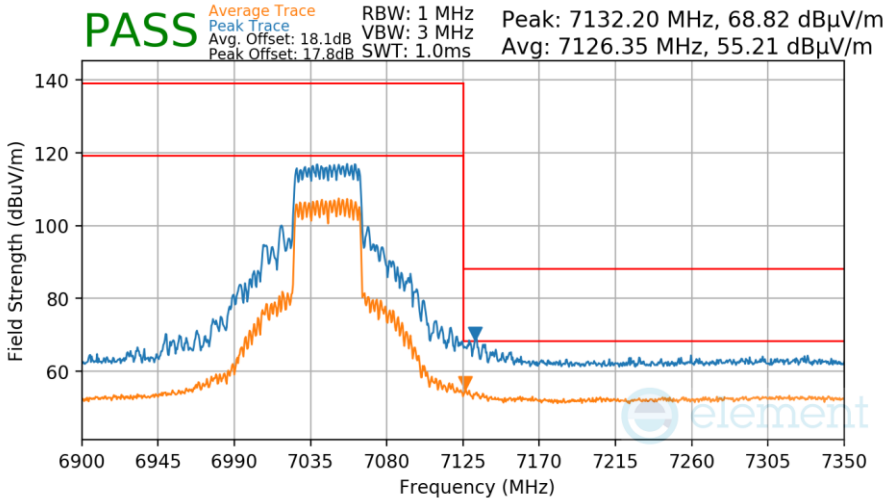
Plot 7-1058. SDM Radiated Lower Band Edge (Peak & Average – UNII Band 5 – RU484)

Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS11
Distance of Measurements:	3 Meters
Operating Frequency:	6005MHz
Channel:	11



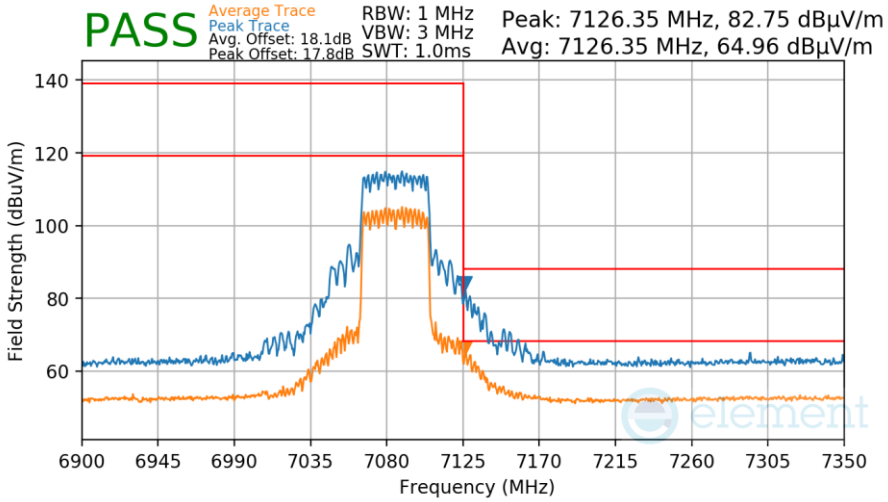
Plot 7-1059. SDM Radiated Lower Band Edge (Peak & Average – UNII Band 5 – RU484)

Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS11
Distance of Measurements:	3 Meters
Operating Frequency:	7045MHz
Channel:	219



Plot 7-1060. SDM Radiated Lower Band Edge (Peak & Average – UNII Band 5 – RU484)

Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS11
Distance of Measurements:	3 Meters
Operating Frequency:	7085MHz
Channel:	227



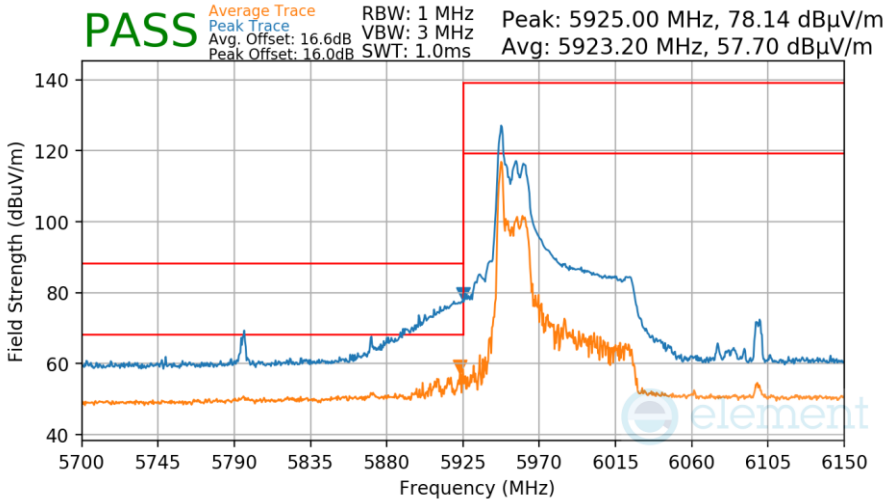
Plot 7-1061. SDM Radiated Lower Band Edge (Peak & Average – UNII Band 8 – RU484)

7.7.13 SDM Radiated Band Edge Measurements (80MHz BW)

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

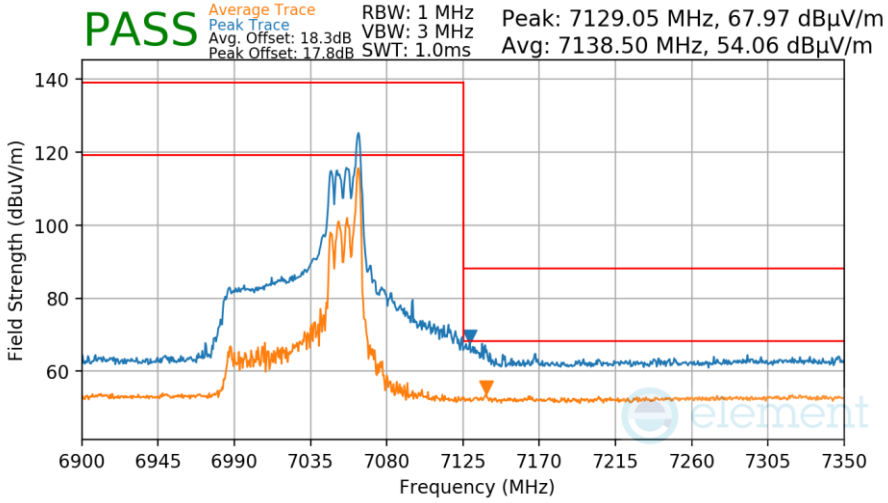
RU26

Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS11
Distance of Measurements:	3 Meters
Operating Frequency:	5985MHz
Channel:	7



Plot 7-1062. SDM Radiated Lower Band Edge (Peak & Average – UNII Band 5 – RU26)

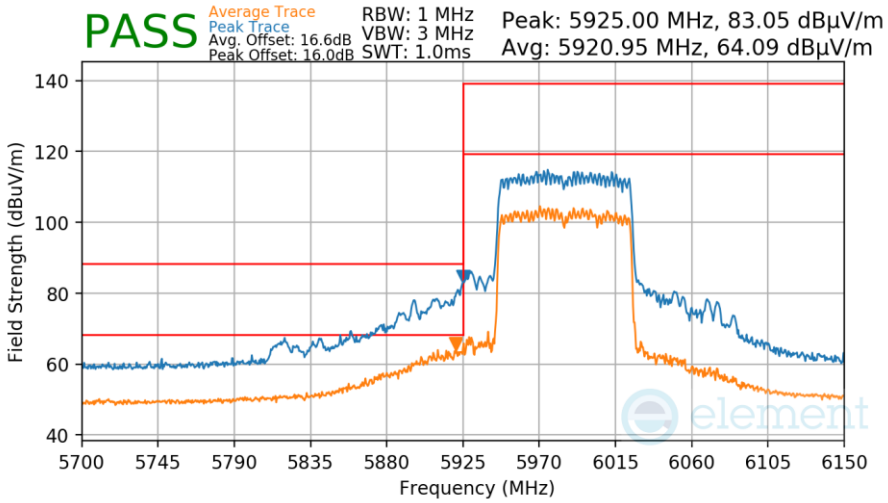
Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS11
Distance of Measurements:	3 Meters
Operating Frequency:	7025MHz
Channel:	215



Plot 7-1063. SDM Radiated Lower Band Edge (Peak & Average – UNII Band 8 – RU26)

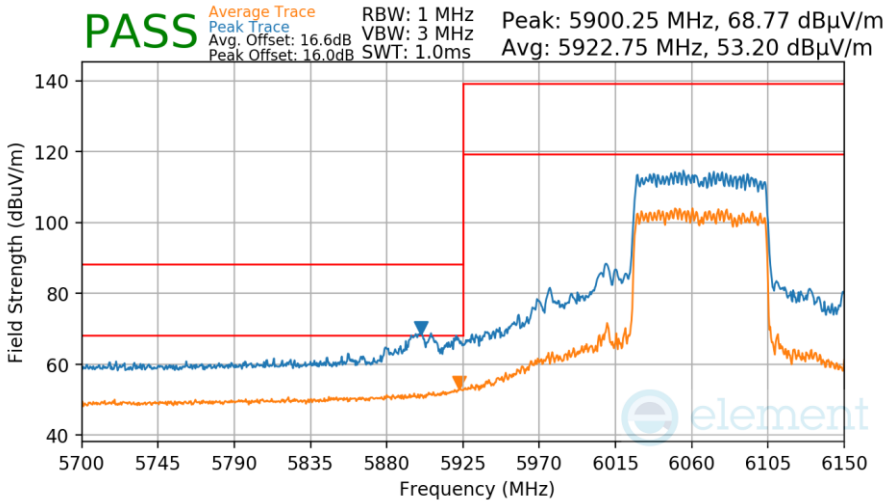
RU996

Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS11
Distance of Measurements:	3 Meters
Operating Frequency:	5985MHz
Channel:	7



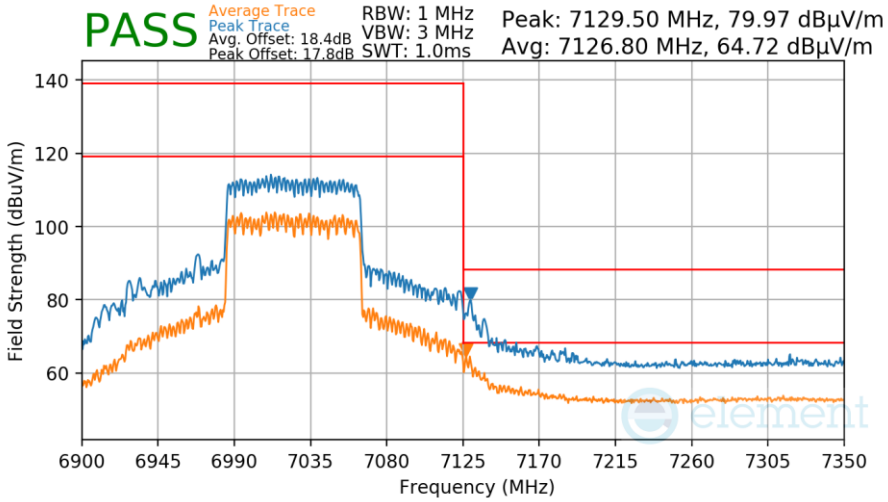
Plot 7-1064. SDM Radiated Lower Band Edge (Peak & Average – UNII Band 5 – RU996)

Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS11
Distance of Measurements:	3 Meters
Operating Frequency:	6025MHz
Channel:	23



Plot 7-1065. SDM Radiated Lower Band Edge (Peak & Average – UNII Band 5 – RU996)

Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS11
Distance of Measurements:	3 Meters
Operating Frequency:	7025MHz
Channel:	215



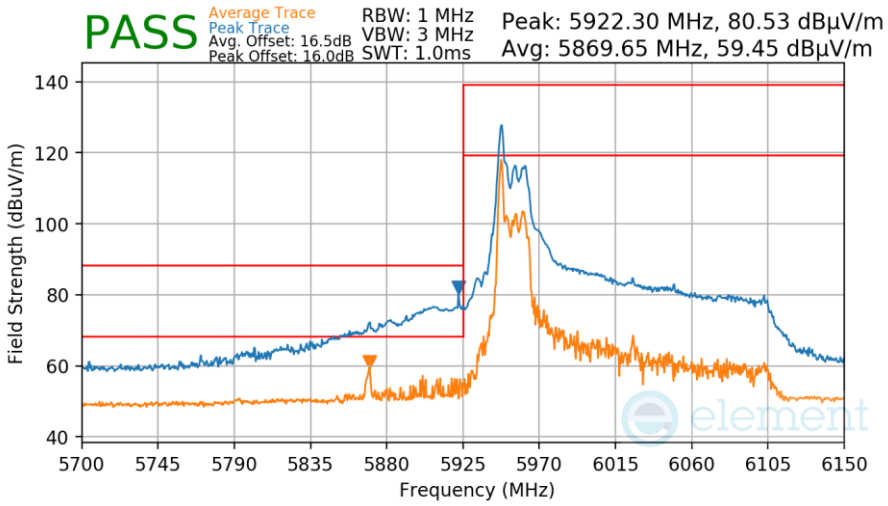
Plot 7-1066. SDM Radiated Lower Band Edge (Peak & Average – UNII Band 8 – RU996)

7.7.14 SDM Radiated Band Edge Measurements (160MHz BW)

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

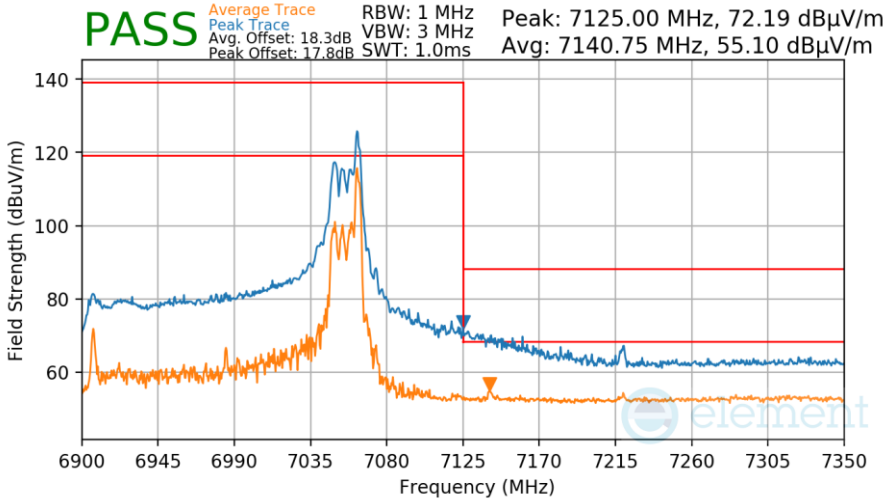
RU26

Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS11
Distance of Measurements:	3 Meters
Operating Frequency:	6025MHz
Channel:	15



Plot 7-1067. SDM Radiated Lower Band Edge (Peak & Average – UNII Band 5 – RU26)

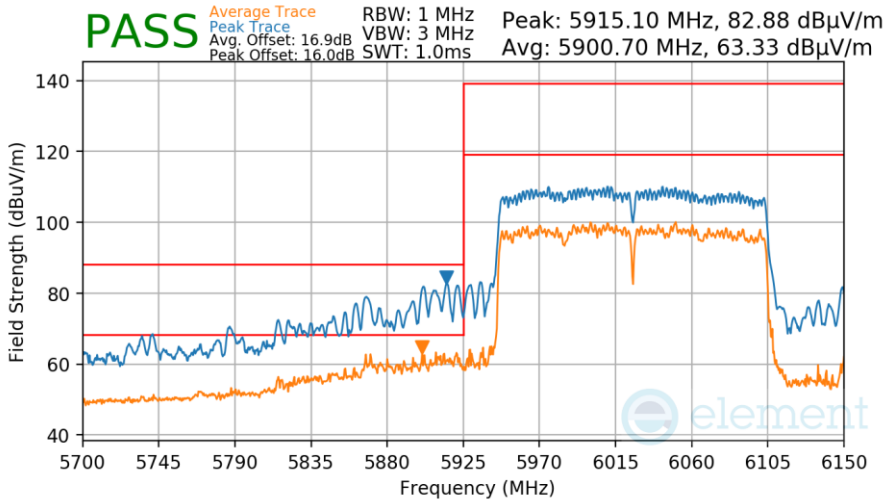
Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS11
Distance of Measurements:	3 Meters
Operating Frequency:	6985MHz
Channel:	207



Plot 7-1068. SDM Radiated Lower Band Edge (Peak & Average – UNII Band 8 – RU26)

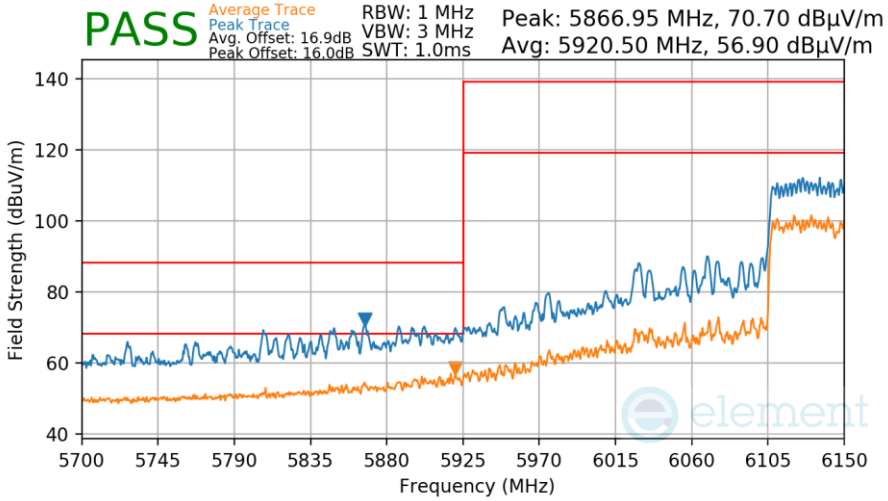
RU996x2

Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS11
Distance of Measurements:	3 Meters
Operating Frequency:	6025MHz
Channel:	15



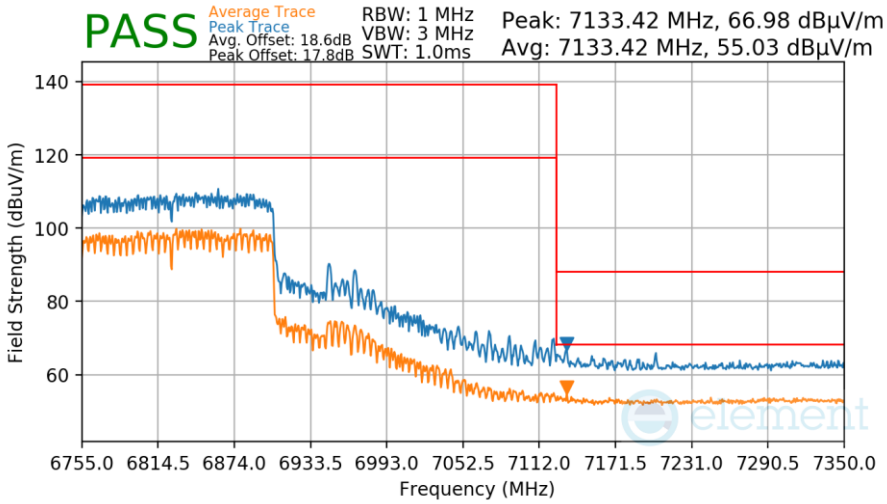
Plot 7-1069. SDM Radiated Lower Band Edge (Peak & Average – UNII Band 5 – RU996x2)

Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS11
Distance of Measurements:	3 Meters
Operating Frequency:	6185MHz
Channel:	47



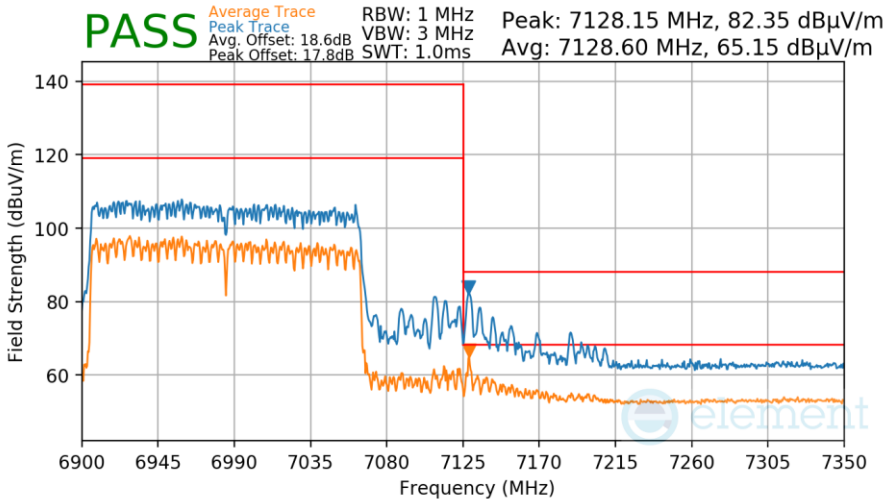
Plot 7-1070. SDM Radiated Lower Band Edge (Peak & Average – UNII Band 5 – RU996x2)

Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS11
Distance of Measurements:	3 Meters
Operating Frequency:	6825MHz
Channel:	175



Plot 7-1071. SDM Radiated Lower Band Edge (Peak & Average – UNII Band 8 – RU996x2)

Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS11
Distance of Measurements:	3 Meters
Operating Frequency:	6985MHz
Channel:	207



Plot 7-1072. SDM Radiated Lower Band Edge (Peak & Average – UNII Band 8 – RU996x2)

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 7-171 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 7-171. 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 = quasi-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.

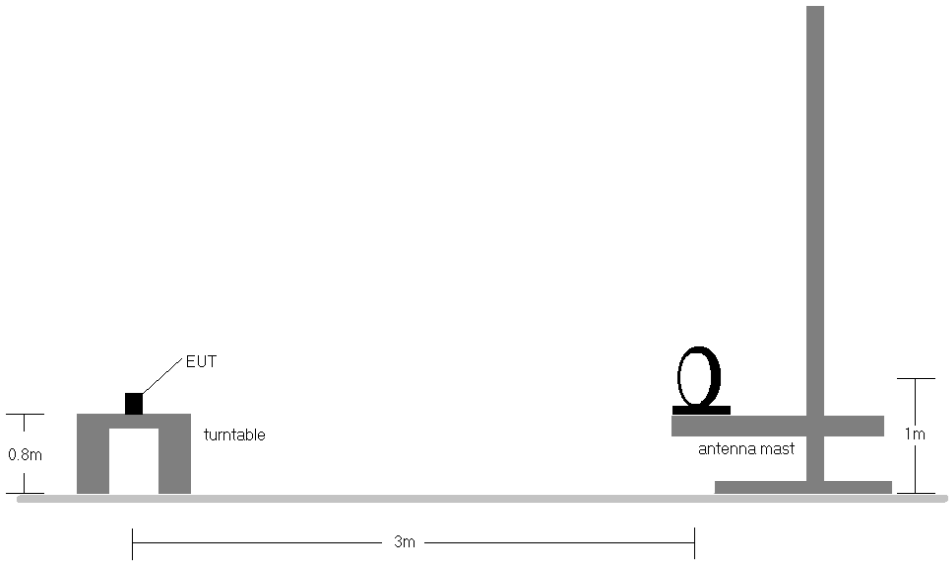


Figure 7-7. Radiated Test Setup < 30MHz

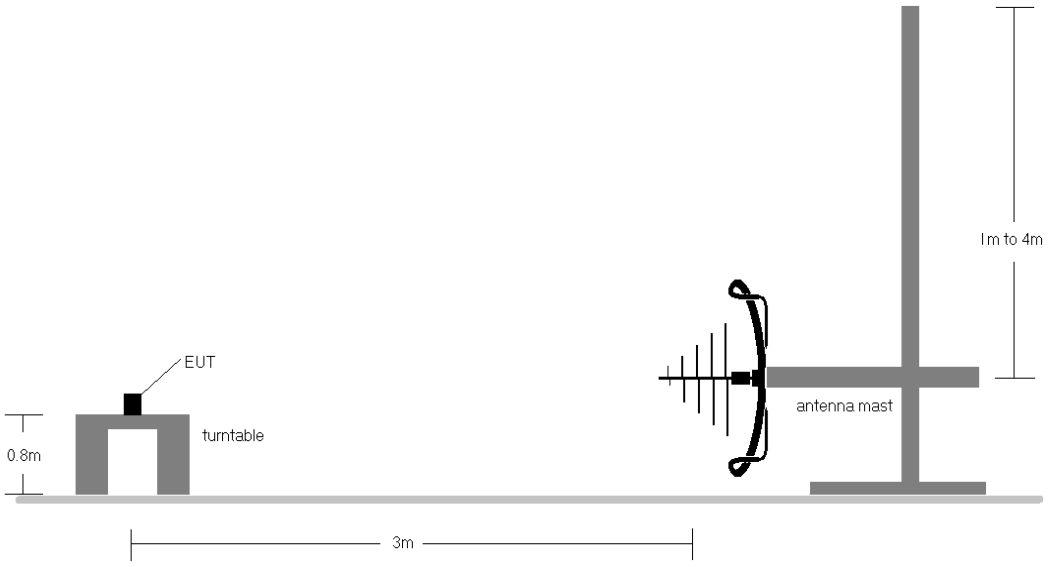


Figure 7-8. Radiated Test Setup < 1GHz

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 7-171.
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. N/A
4. The spectrum is investigated using a peak detector and final measurements are recorded using CISPR quasi peak detector on emissions that were 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. 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
10. All antenna configurations were investigated and only the worst case is reported.
11. The unit was tested with all possible modes and only the highest emission is reported.

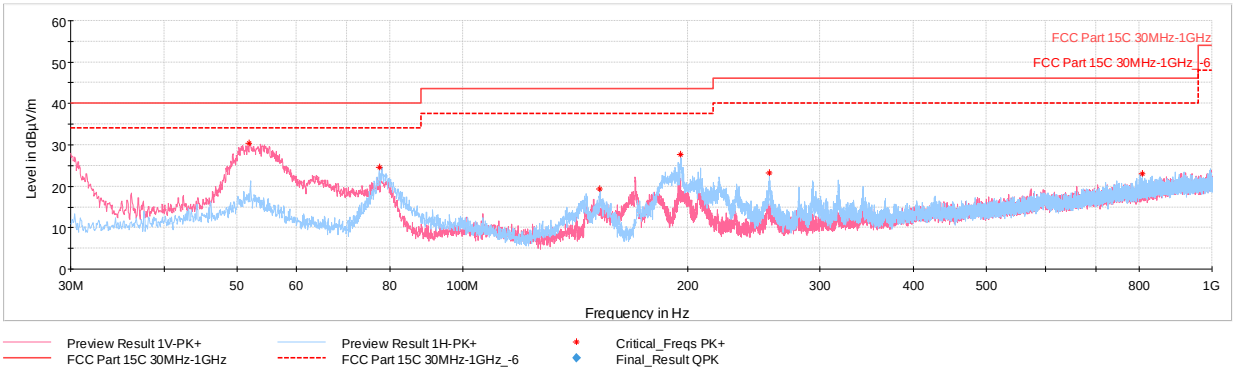
Sample Calculations

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 $_{[dB]}$ - Preamp Gain $_{[dB]}$
- Margin $_{[dB]}$ = Field Strength Level $_{[dB\mu V/m]}$ – Limit $_{[dB\mu V/m]}$

7.8.1 SDM Radiated Spurious Emissions Measurements (Below 1GHz)

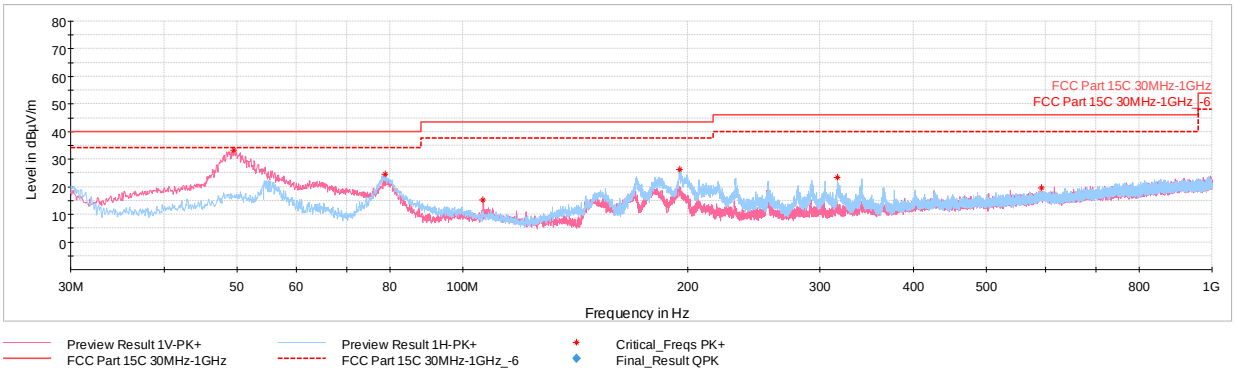
§15.209; RSS-Gen [8.9]



Plot 7-1073. Radiated Spurious Emissions below 1GHz SDM (802.11ax – Ch.1 – RU26) 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]
51.97	Max-Peak	V	100	119	-63.63	-12.89	30.48	40.00	-9.52
77.48	Max-Peak	H	300	247	-61.42	-21.07	24.51	40.00	-15.49
152.56	Max-Peak	H	200	179	-68.08	-19.60	19.32	43.52	-24.20
195.29	Max-Peak	H	100	185	-62.85	-16.38	27.77	43.52	-15.75
256.93	Max-Peak	H	100	356	-69.05	-14.79	23.16	46.02	-22.86
807.36	Max-Peak	H	100	38	-79.27	-4.79	22.94	46.02	-23.08

Table 7-172. Radiated Spurious Emissions below 1GHz SDM (802.11ax – Ch.1 – RU26) with AC/DC Adapter



Plot 7-1074. Radiated Spurious Emissions below 1GHz SDM (802.11ax – Ch.1 – RU242) 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]
49.55	Max-Peak	V	100	0	-61.21	-12.61	33.18	40.00	-6.82
78.79	Max-Peak	H	200	230	-61.15	-21.28	24.57	40.00	-15.43
106.44	Max-Peak	V	200	132	-75.09	-16.52	15.39	43.52	-28.13
194.71	Max-Peak	H	200	169	-64.11	-16.47	26.42	43.52	-17.10
316.39	Max-Peak	H	100	350	-69.77	-13.78	23.45	46.02	-22.57
592.70	Max-Peak	H	100	155	-79.88	-7.44	19.68	46.02	-26.34

Table 7-173. Radiated Spurious Emissions below 1GHz SDM (802.11ax – Ch.1 – RU242) with AC/DC Adapter

7.9 AC Line-Conducted Emissions Measurement

§15.407; 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 7-174. Conducted Limits

*Decreases with the logarithm of the frequency.

Test Procedures Used

ANSI C63.10-2013, Section 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.

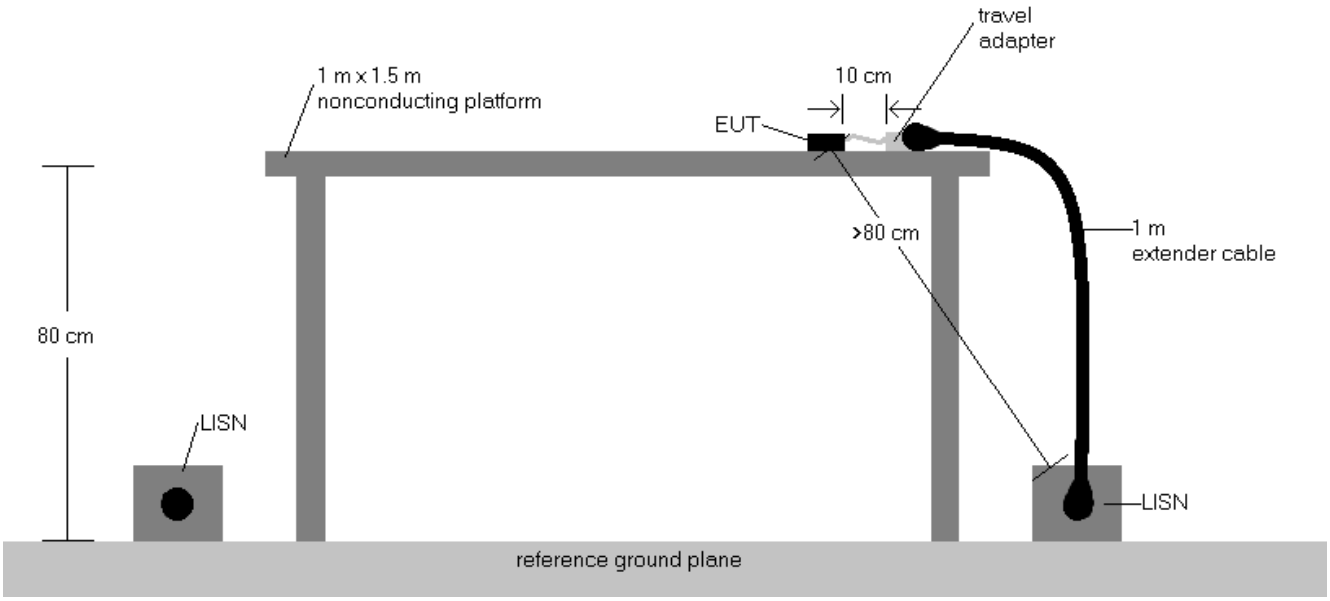
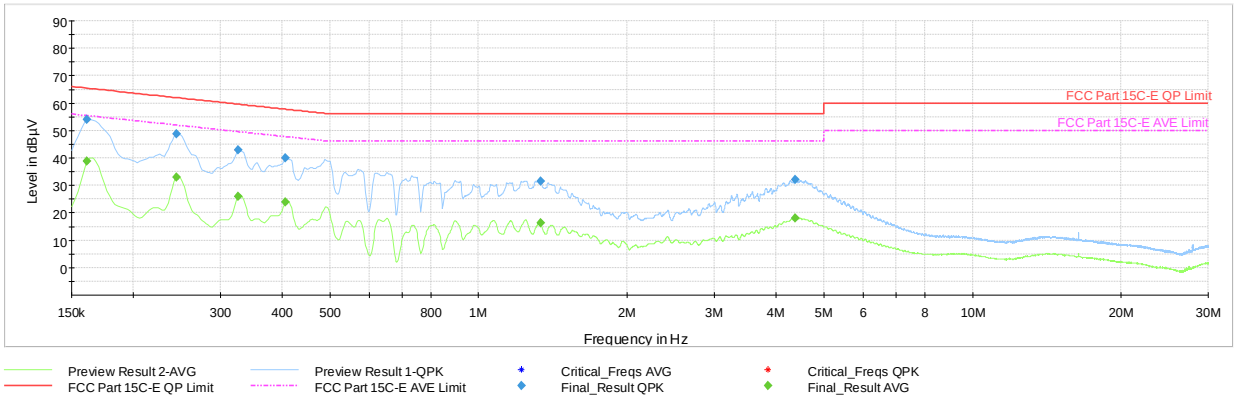


Figure 7-9. Test Instrument & Measurement Setup

Test Notes

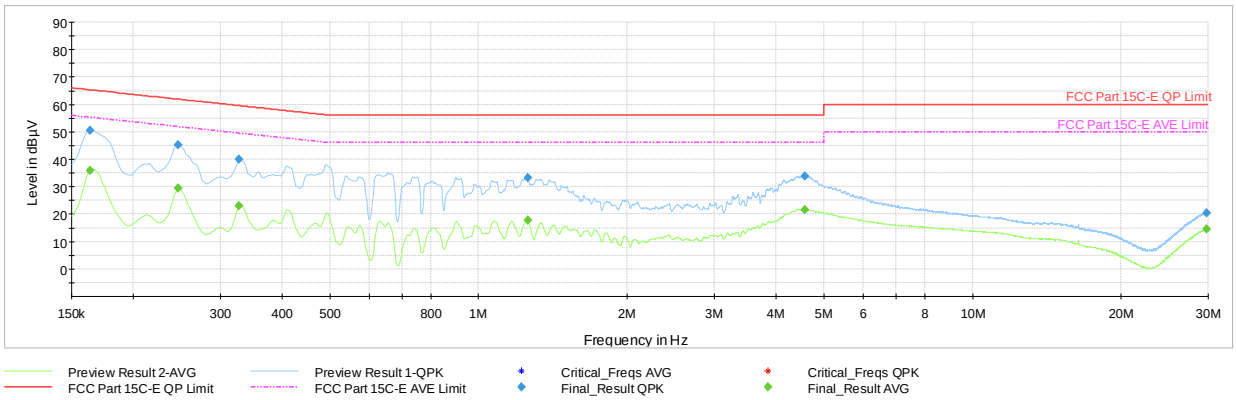
1. All modes of operation were investigated and the worst-case emissions are reported. The emissions found were not affected by the choice of channel used during testing.
2. Both configurations below were investigated, and the worst case has been reported.
    a. EUT powered by AC/DC adaptor via USB-C 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 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.
9. The unit was tested with all possible modes and only the highest emission is reported.



Plot 7-1075. AC Line Conducted Plot with SDM 11ax UNII Band 5 – RU26 – Ch.1 (L1) with AC/DC Adapter

Frequency [MHz]	Process State	QuasiPeak [dBµV]	Average [dBµV]	Limit [dBµV]	Margin [dB]	Line	PE
0.161	FINAL	—	38.76	55.40	-16.64	L1	ON
0.161	FINAL	54.1	—	65.40	-11.30	L1	ON
0.245	FINAL	—	32.89	51.94	-19.05	L1	ON
0.245	FINAL	48.8	—	61.94	-13.12	L1	ON
0.326	FINAL	—	26.03	49.57	-23.53	L1	ON
0.326	FINAL	42.9	—	59.57	-16.69	L1	ON
0.407	FINAL	40.0	—	57.72	-17.74	L1	ON
0.407	FINAL	—	23.83	47.72	-23.89	L1	ON
1.336	FINAL	31.6	—	56.00	-24.44	L1	ON
1.336	FINAL	—	16.24	46.00	-29.76	L1	ON
4.369	FINAL	—	18.06	46.00	-27.94	L1	ON
4.369	FINAL	32.0	—	56.00	-24.02	L1	ON

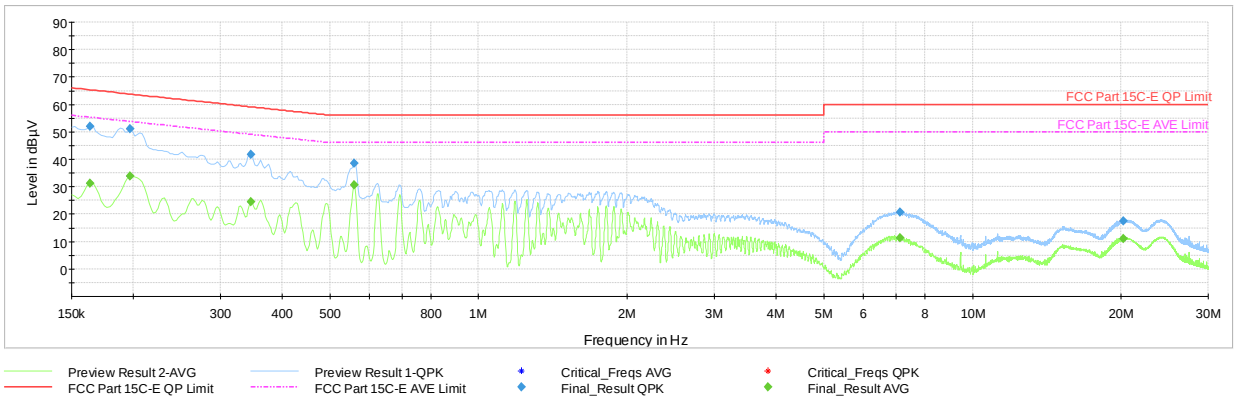
Table 7-175. AC Line Conducted Data with SDM 11ax UNII Band 5 – RU26 – Ch.1 (L1) with AC/DC Adapter



Plot 7-1076. AC Line Conducted Plot with SDM 11ax UNII Band 5 – RU26 – Ch.1 (N) with AC/DC Adapter

Frequency [MHz]	Process State	QuasiPeak [dBµV]	Average [dBµV]	Limit [dBµV]	Margin [dB]	Line	PE
0.164	FINAL	—	35.80	55.28	-19.49	N	ON
0.164	FINAL	50.7	—	65.28	-14.63	N	ON
0.247	FINAL	—	29.52	51.87	-22.35	N	ON
0.247	FINAL	45.4	—	61.87	-16.46	N	ON
0.328	FINAL	—	23.09	49.51	-26.42	N	ON
0.328	FINAL	40.0	—	59.51	-19.49	N	ON
1.257	FINAL	33.2	—	56.00	-22.80	N	ON
1.257	FINAL	—	17.67	46.00	-28.33	N	ON
4.576	FINAL	34.0	—	56.00	-22.03	N	ON
4.578	FINAL	—	21.49	46.00	-24.51	N	ON
29.828	FINAL	—	14.51	50.00	-35.49	N	ON
29.828	FINAL	20.5	—	60.00	-39.48	N	ON

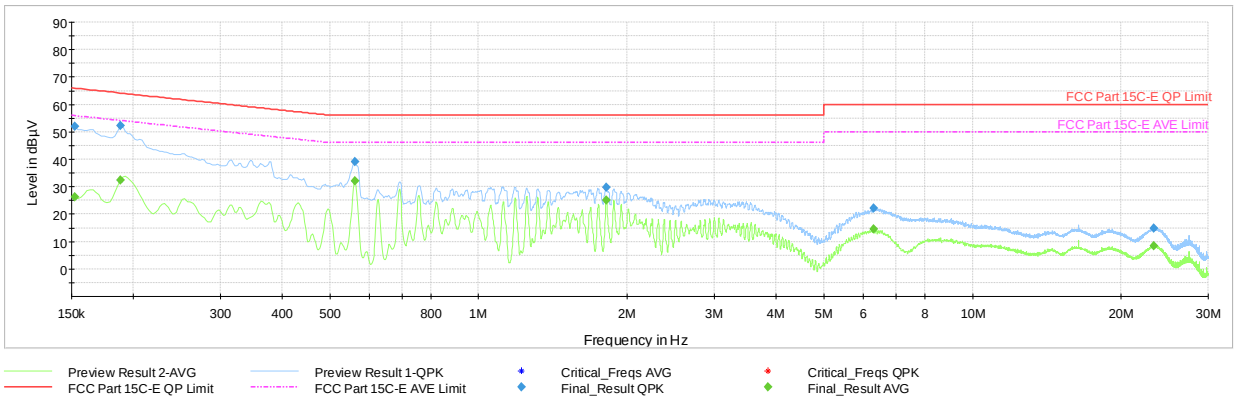
Table 7-176. AC Line Conducted Data with SDM 11ax UNII Band 5 – RU26 – Ch.1 (N) with AC/DC Adapter



Plot 7-1077. AC Line Conducted Plot with SDM 11ax UNII Band 5 – RU242 – Ch.1 (L1) with Laptop

Frequency [MHz]	Process State	QuasiPeak [dBµV]	Average [dBµV]	Limit [dBµV]	Margin [dB]	Line	PE
0.164	FINAL	—	31.28	55.28	-24.01	L1	GND
0.164	FINAL	52.0	—	65.28	-13.33	L1	GND
0.197	FINAL	—	33.75	53.73	-19.97	L1	GND
0.197	FINAL	51.0	—	63.73	-12.74	L1	GND
0.346	FINAL	—	24.42	49.06	-24.65	L1	GND
0.346	FINAL	41.8	—	59.06	-17.24	L1	GND
0.560	FINAL	38.4	—	56.00	-17.59	L1	GND
0.560	FINAL	—	30.54	46.00	-15.46	L1	GND
7.125	FINAL	20.7	—	60.00	-39.34	L1	GND
7.130	FINAL	—	11.34	50.00	-38.66	L1	GND
20.171	FINAL	17.6	—	60.00	-42.43	L1	GND
20.186	FINAL	—	10.97	50.00	-39.03	L1	GND

Table 7-177. AC Line Conducted Data with SDM 11ax UNII Band 5 – RU242 – Ch.1 (L1) with Laptop



Plot 7-1078. AC Line Conducted Plot with SDM 11ax UNII Band 5 – RU242 – Ch.1 (N) with Laptop

Frequency [MHz]	Process State	QuasiPeak [dBµV]	Average [dBµV]	Limit [dBµV]	Margin [dB]	Line	PE
0.152	FINAL	—	26.40	55.88	-29.48	N	GND
0.152	FINAL	51.9	—	65.88	-13.98	N	GND
0.188	FINAL	—	32.47	54.11	-21.64	N	GND
0.188	FINAL	52.3	—	64.11	-11.86	N	GND
0.562	FINAL	39.0	—	56.00	-16.99	N	GND
0.562	FINAL	—	31.96	46.00	-14.04	N	GND
1.813	FINAL	29.7	—	56.00	-26.33	N	GND
1.813	FINAL	—	25.09	46.00	-20.91	N	GND
6.304	FINAL	—	14.45	50.00	-35.55	N	GND
6.308	FINAL	22.2	—	60.00	-37.85	N	GND
23.305	FINAL	14.8	—	60.00	-45.23	N	GND
23.307	FINAL	—	8.56	50.00	-41.44	N	GND

Table 7-178. AC Line Conducted Data with SDM 11ax UNII Band 5 – RU242 – Ch.1 (N) with Laptop

7.10 Proper Power Adjustment, Client Devices Connected to a Standard Power Access Point §15.407; RSS-248

Test Overview and Limits

A client device that connects to a Standard Power AP must limit its power to a minimum of 6 dB lower than its associated Standard Power access point's authorized transmit power. The term "authorized" means the AFC-approved power level for the AP to use on a particular channel.

Test Procedure Used

KDB 987594 D02 v02r01 – Section L
ANSI C63.10-2013 – Section 12.3.3.2 Method PM-G
ANSI C63.10-2013 – Section 14.2 Measure-and-Sum Technique

Test Settings

Average power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter. The trace was averaged over 100 traces to obtain the final measured average power.

Test Setup

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

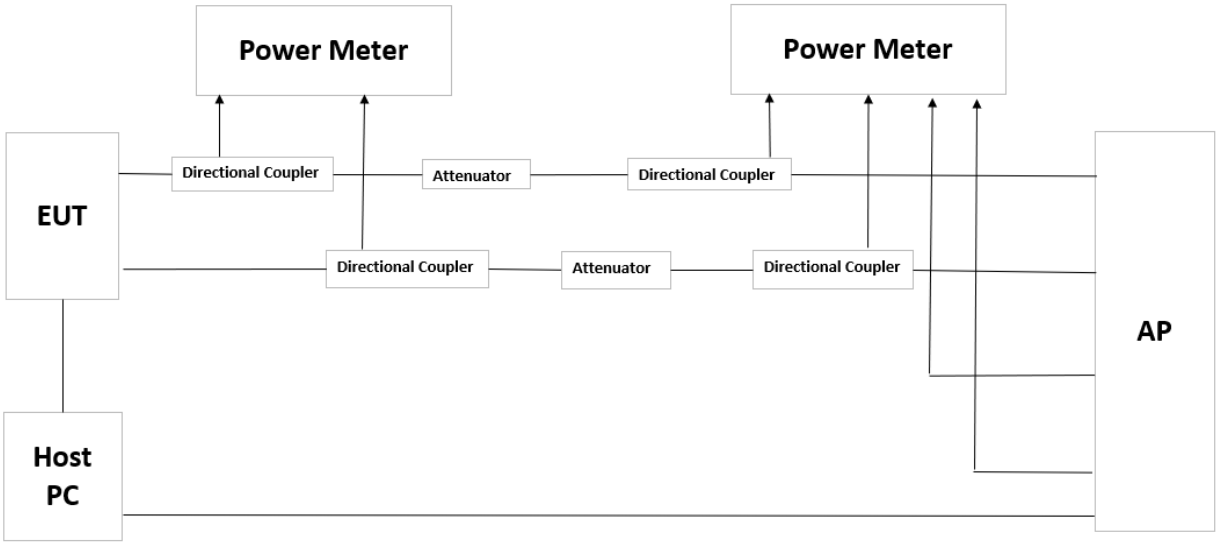


Figure 7-10. Test Instrument & Measurement Setup

Test Notes

1. AFC Limit was set to 36, 28 and 21 dBm EIRP.
2. Standard Power AP which was used in the test setup is not certified and it's a production version.
3. Standard Power AP specification is declared by Apple/manufacturer.

36 dBm EIRP

Channel	Frequency (MHz)	Mode	Power Measured (dBm)					Correlated Gain (dBi)	Measured e.i.r.p (dBm)
			Ant0	Ant1	Ant2	Ant3	Summed		
5	5975	TxBF	20.23	19.62	19.65	19.51	25.27	6.02	31.80

Table 7-179: AP measured e.i.r.p

Channel	Frequency (MHz)	Power Measured (dBm)			Correlated Gain (dBi)	Measured e.i.r.p (dBm)
		Antenna WF8	Antenna WF7a	Summed		
5	5975	12.35	10.93	14.67	5.0	19.67

Table 7-180: EUT measured e.i.r.p (MIMO)

28 dBm EIRP

Channel	Frequency (MHz)	Mode	Power Measured (dBm)					Correlated Gain (dBi)	Measured e.i.r.p (dBm)
			Ant0	Ant1	Ant2	Ant3	Summed		
5	5975	CDD	18.57	19.73	19.55	19.23	25.31	0	25.31

Table 7-181: AP measured e.i.r.p

Channel	Frequency (MHz)	Power Measured (dBm)			Correlated Gain (dBi)	Measured e.i.r.p (dBm)
		Antenna WF8	Antenna WF7a	Summed		
5	5975	10.02	10.06	13.05	5.0	18.05

Table 7-182: EUT measured e.i.r.p (MIMO)

21 dBm EIRP

Channel	Frequency (MHz)	Mode	Power Measured (dBm)					Correlated Gain (dBi)	Measured e.i.r.p (dBm)
			Ant0	Ant1	Ant2	Ant3	Summed		
5	5975	CDD	13.2	12.71	13.05	12.33	18.86	0	18.86

Table 7-183: AP measured e.i.r.p

Antenna	Channel	Frequency (MHz)	Power Measured (dBm)	Antenna Gain (dBi)	Measured e.i.r.p (dBm)
WF8	5	5975	8.75	5.0	13.75
WF7a	5	5975	6.47	3.6	10.07

Table 7-184: EUT measured e.i.r.p (SISO)

7.11 Dual Client Test, Demonstration of Proper Power Adjustment based on Associated AP §15.407

Test Overview and Limits

A client device may connect to a Standard Power AP with a maximum power level of 30 dBm EIRP. A client may also connect to a Low Power indoor AP, but the power level is limited to a maximum of 24 dBm EIRP. If a client has the flexibility to connect to both APs, verification is needed to show that it can distinguish between the two configurations, and then control the power levels accordingly.

Test Procedure Used

KDB 987594 D02 v02r01 – Section K
ANSI C63.10-2013 – Section 12.3.3.2 Method PM-G
ANSI C63.10-2013 – Section 14.2 Measure-and-Sum Technique

Test Settings

Average power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter. The trace was averaged over 100 traces to obtain the final measured average power.

Test Setup

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

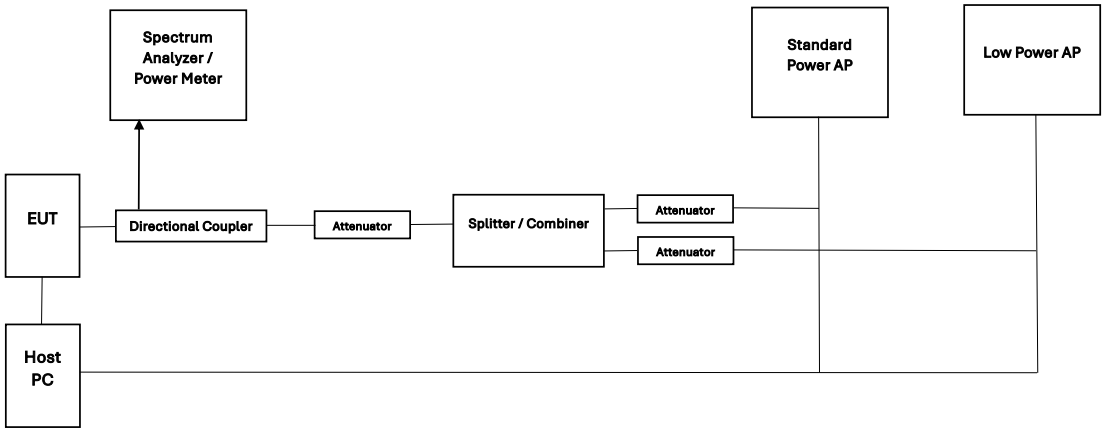
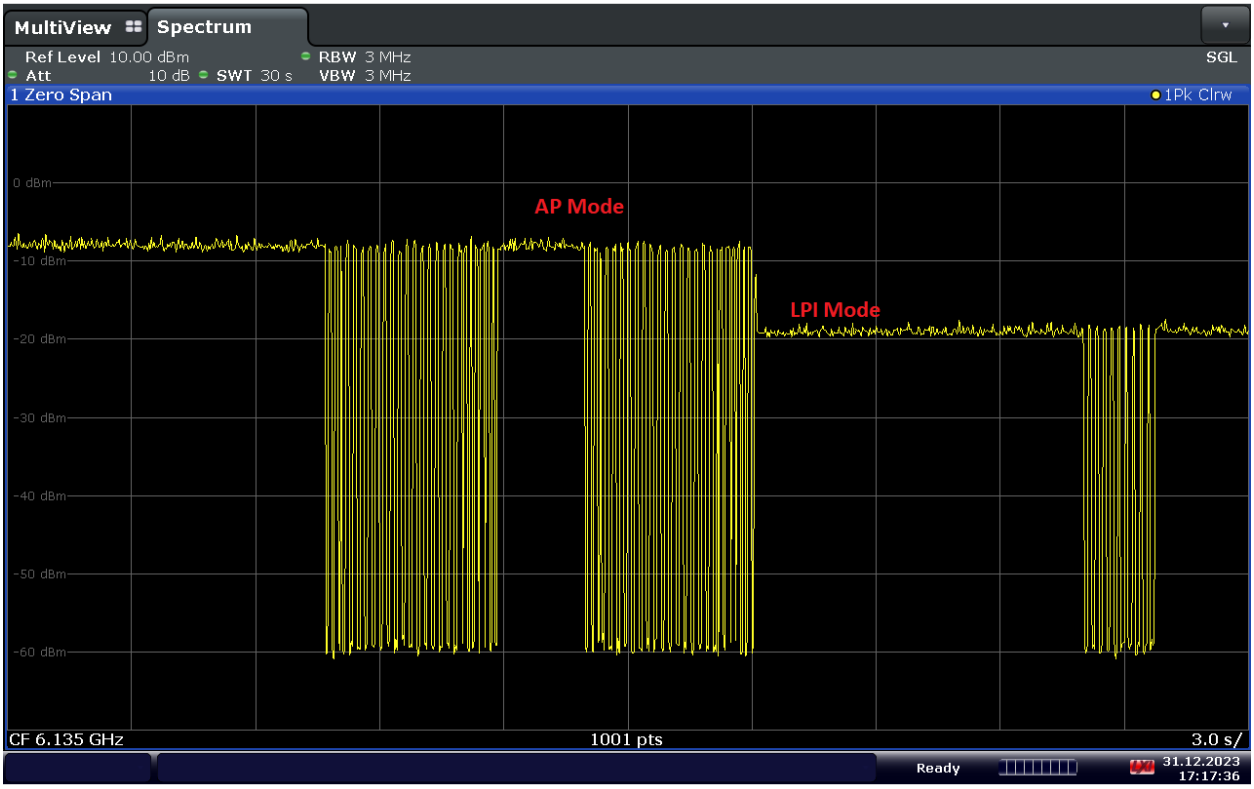


Figure 7-11. Test Instrument & Measurement Setup

Test Notes

1. Standard Power AP was set on highest power setting (36dBm EIRP)
2. Standard Power AP and Low Power Indoor AP were configured to transmit on same channel.
3. DUT was configured for SISO transmission so Antenna WF8 was measured.

Element



17:17:36 31.12.2023

Plot 7-1079. Client device observation from Standard Power AP to Low Power Indoor AP

Channel	Frequency (MHz)	Mode	Power Measured (dBm)					Correlated Gain (dBi)	Measured e.i.r.p (dBm)
			Ant0	Ant1	Ant2	Ant3	Summed		
37	6135	TxBF	20.37	19.41	19.72	19.59	25.81	6.02	31.83

Table 7-185: Measured e.i.r.p from Standard Power AP

Antenna	Channel	Frequency (MHz)	Power Measured (dBm)	Antenna Gain (dBi)	Measured e.i.r.p (dBm)
WF8	37	6135	11.06	5.0	16.06

Table 7-186: EUT measured e.i.r.p when established with Standard Power AP

Antenna	Channel	Frequency (MHz)	Power Measured (dBm)	Antenna Gain (dBi)	Measured e.i.r.p (dBm)
WF8	37	6135	1.7	5.0	6.70

Table 7-187: EUT measured e.i.r.p when established with Low Power Indoor AP

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 Part 15 Subpart E (15.407) of the FCC Rules and RSS-248 of the Innovation, Science and Economic Development Canada Rules.