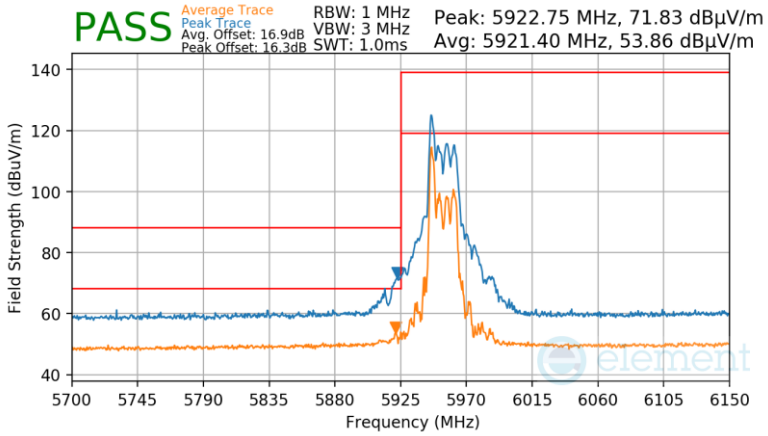
## 7.7.22 SDM Diversity Radiated Band Edge Measurements (20MHz BW)

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

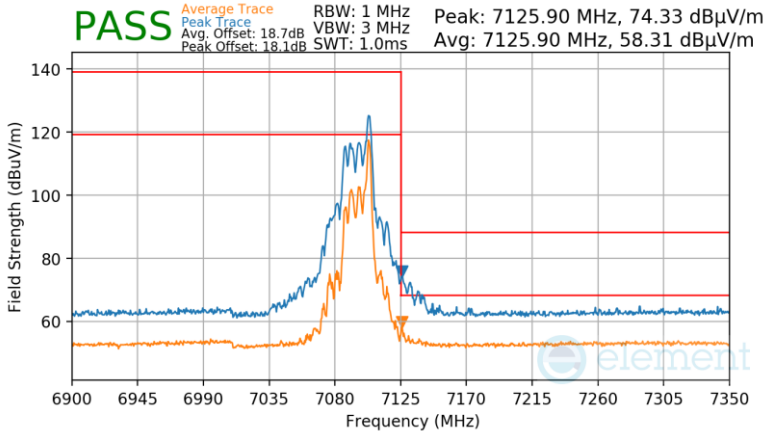
## RU26

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




**Plot 7-1781. SDM Diversity Radiated Lower Band Edge (Peak/Average – UNII Band 5 – RU26)**

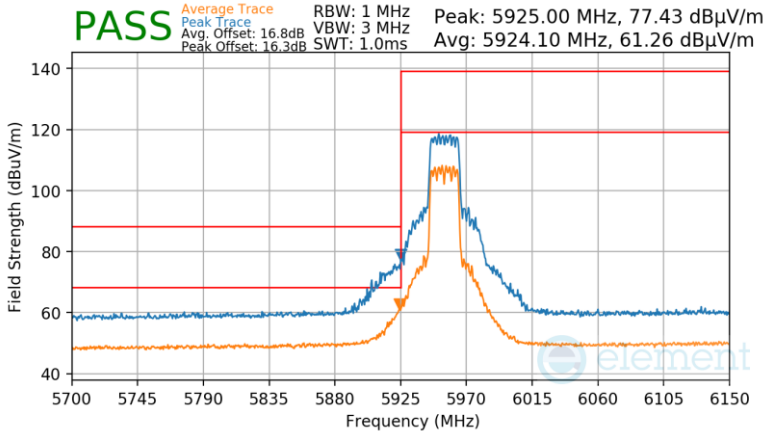
| | |
|---|---|
| Worst Case Mode: | 802.11ax |
| Worst Case Transfer Rate: | MCS11 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 7095MHz |
| Channel: | 229 |




**Plot 7-1782. SDM Diversity Radiated Upper Band Edge (Peak/Average – UNII Band 8 – RU26)**

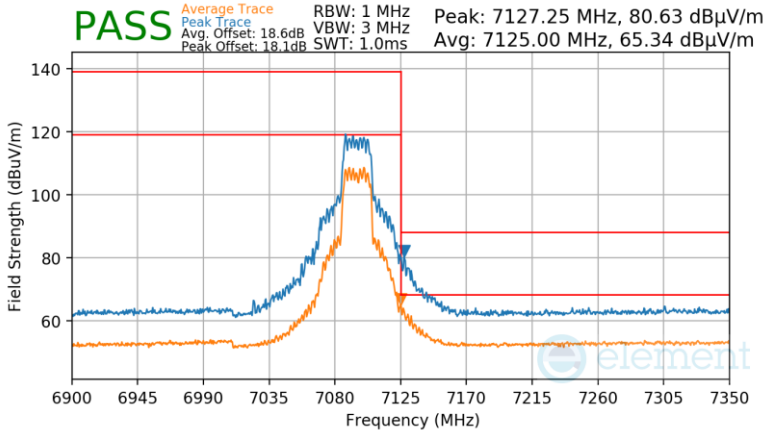
## RU242

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



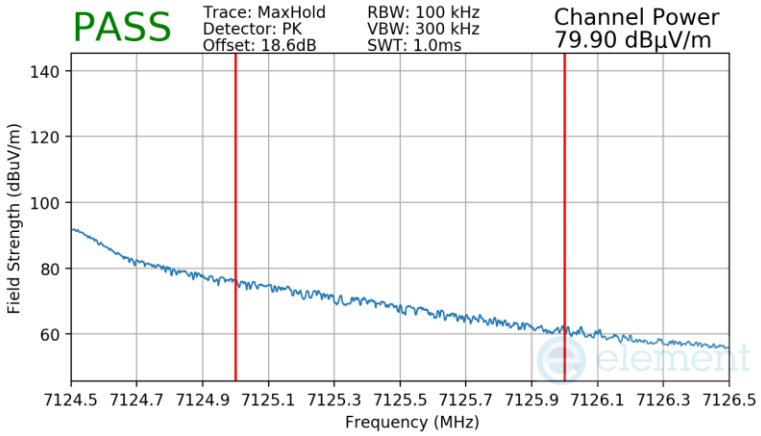

**Plot 7-1783. SDM Diversity Radiated Lower Band Edge (Peak/Average – UNII Band 5 – RU242)**

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



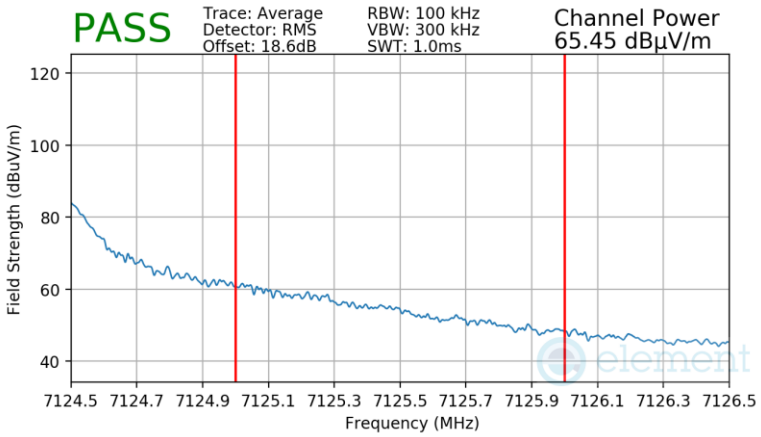

**Plot 7-1784. SDM Diversity Radiated Upper Band Edge (Peak/Average – UNII Band 8 – RU242)**

| | |
|---|---|
| Worst Case Mode: | 802.11ax |
| Worst Case Transfer Rate: | MCS11 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 7115MHz |
| Channel: | 233 |




**Plot 7-1785. SDM Diversity Radiated Upper Band Edge (Peak – UNII Band 8 – RU242)**

| | |
|---|---|
| Worst Case Mode: | 802.11ax |
| Worst Case Transfer Rate: | MCS11 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 7115MHz |
| Channel: | 233 |



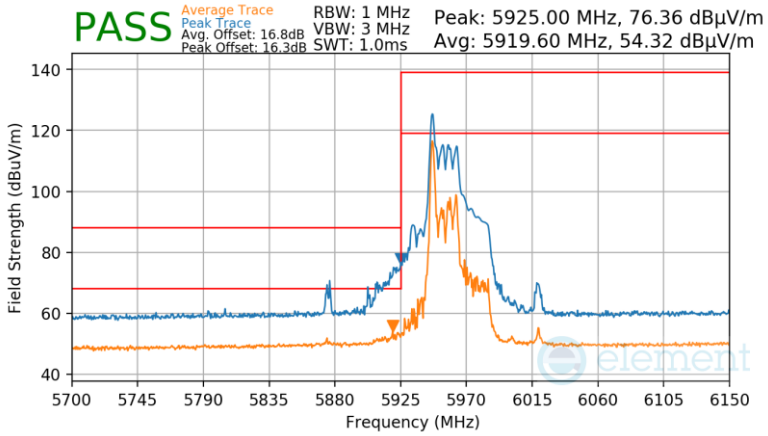

**Plot 7-1786. SDM Diversity Radiated Upper Band Edge (Average – UNII Band 8 – RU242)**

## 7.7.23 SDM Diversity Radiated Band Edge Measurements (40MHz BW)

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

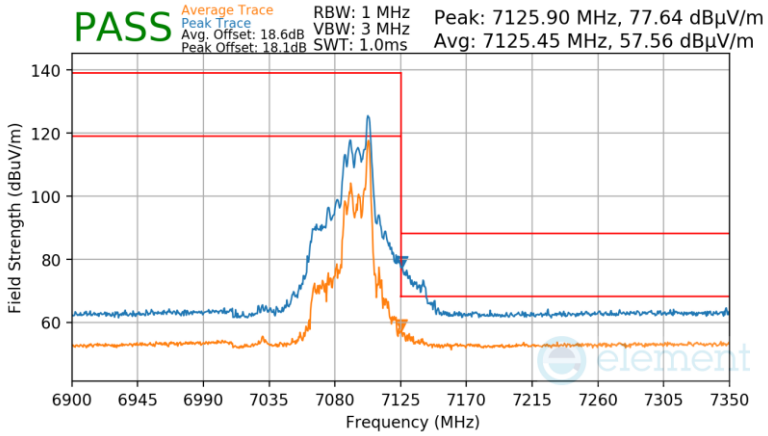
## RU26

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




**Plot 7-1787. SDM Diversity Radiated Lower Band Edge (Peak & Average – UNII Band 5 – RU26)**

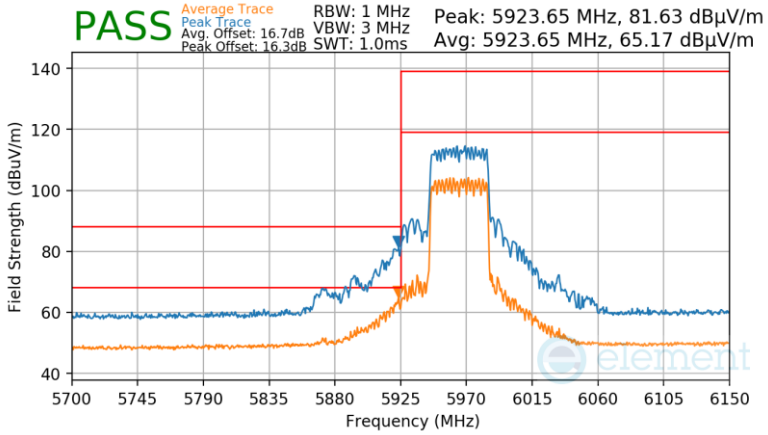
| | |
|---|---|
| Worst Case Mode: | 802.11ax |
| Worst Case Transfer Rate: | MCS11 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 7085MHz |
| Channel: | 227 |




**Plot 7-1788. SDM Diversity Radiated Upper Band Edge (Peak & Average – UNII Band 8 – RU26)**

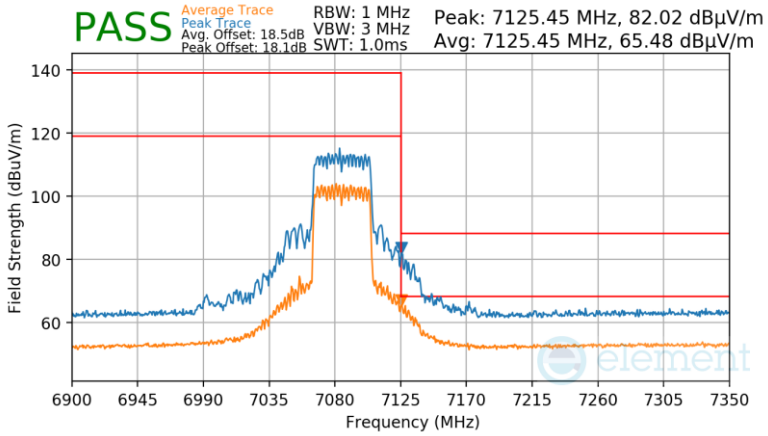
## RU484

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




**Plot 7-1789. SDM Diversity 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 |



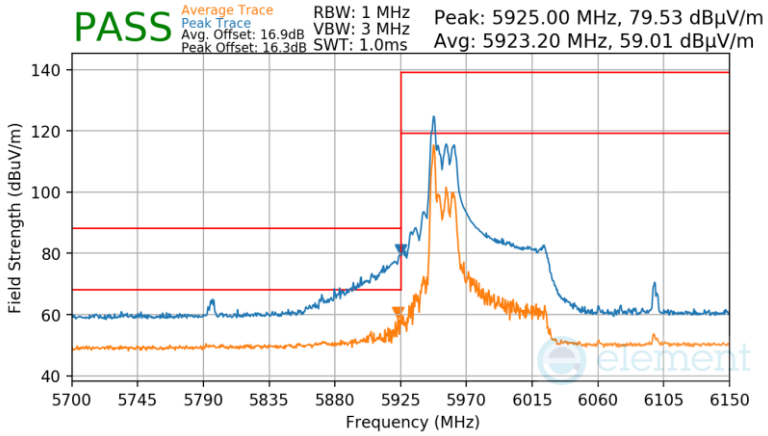

**Plot 7-1790. SDM Diversity Radiated Upper Band Edge (Peak & Average – UNII Band 8 – RU484)**

## 7.7.24 SDM Diversity Radiated Band Edge Measurements (80MHz BW)

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

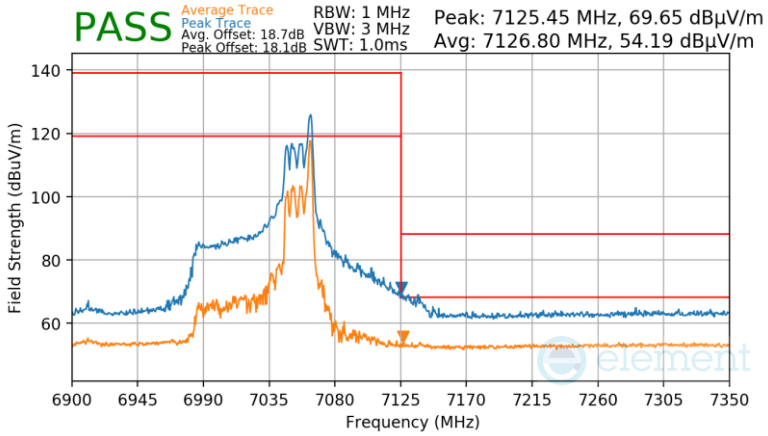
## RU26

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




**Plot 7-1791. SDM Diversity Radiated Lower Band Edge (Peak & Average – UNII Band 5 – RU26)**

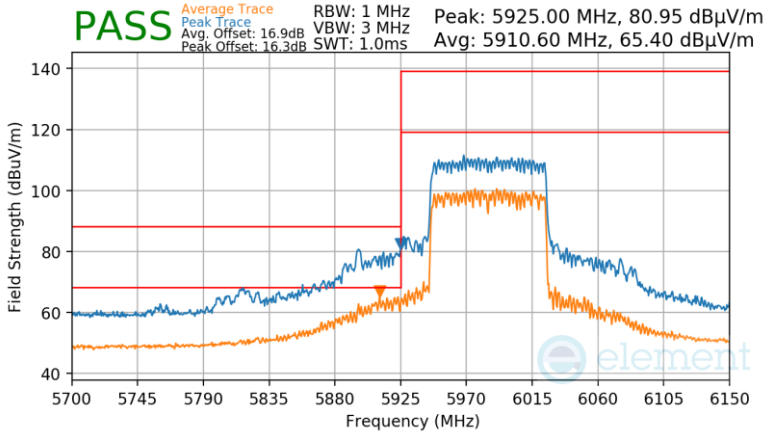
| | |
|---|---|
| Worst Case Mode: | 802.11ax |
| Worst Case Transfer Rate: | MCS11 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 7025MHz |
| Channel: | 215 |




**Plot 7-1792. SDM Diversity Radiated Upper Band Edge (Peak & Average – UNII Band 8 – RU26)**

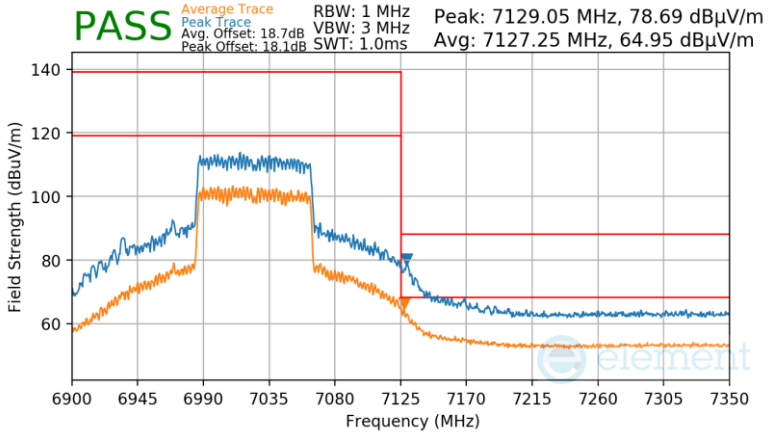
## RU996

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




**Plot 7-1793. SDM Diversity 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 |



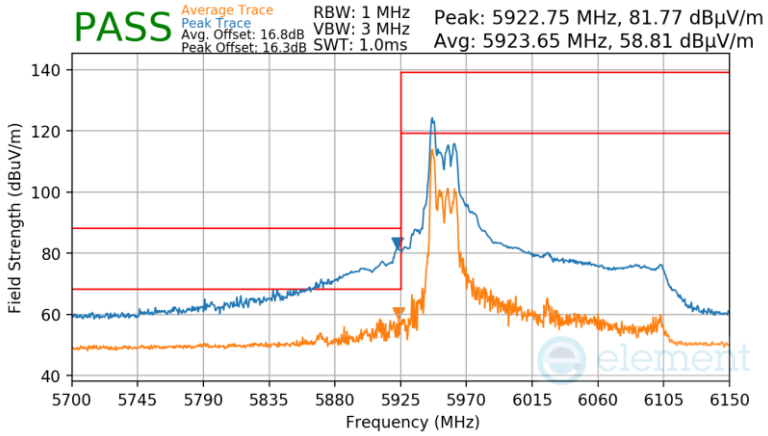

**Plot 7-1794. SDM Diversity Radiated Upper Band Edge (Peak & Average – UNII Band 8 – RU996)**

## 7.7.25 SDM Diversity Radiated Band Edge Measurements (160MHz BW)

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

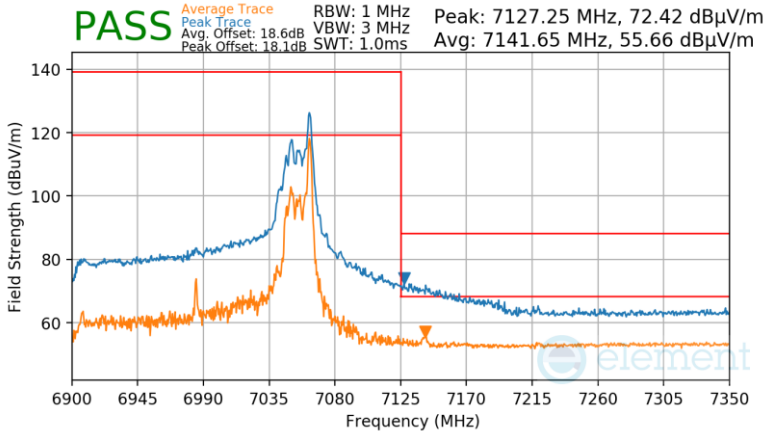
## RU26

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




**Plot 7-1795. SDM Diversity Radiated Lower Band Edge (Peak & Average – UNII Band 5 – RU26)**

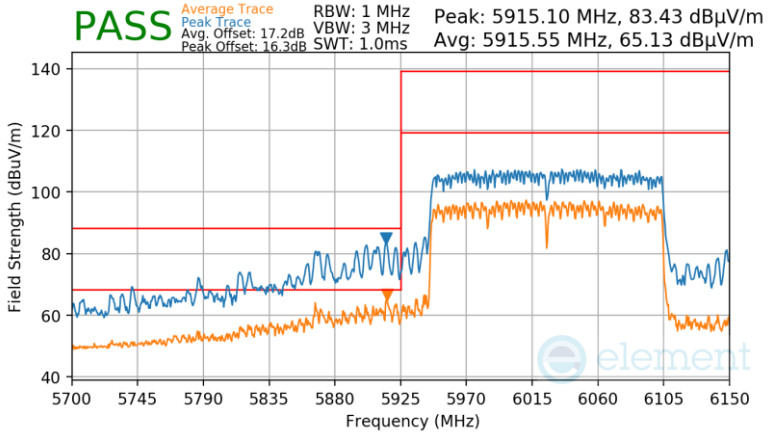
| | |
|---|---|
| Worst Case Mode: | 802.11ax |
| Worst Case Transfer Rate: | MCS11 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 6985MHz |
| Channel: | 207 |




**Plot 7-1796. SDM Diversity Radiated Upper Band Edge (Peak & Average – UNII Band 8 – RU26)**

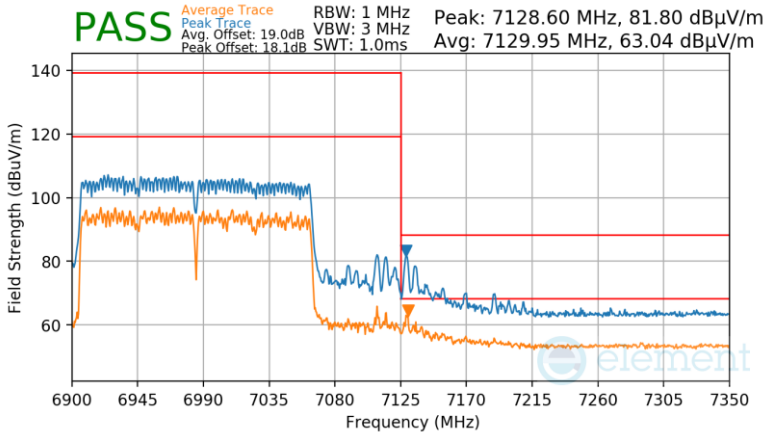
## RU996x2

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




**Plot 7-1797. SDM Diversity 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 7-1798. SDM Diversity Radiated Upper 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 7-280 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 7-280. 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.

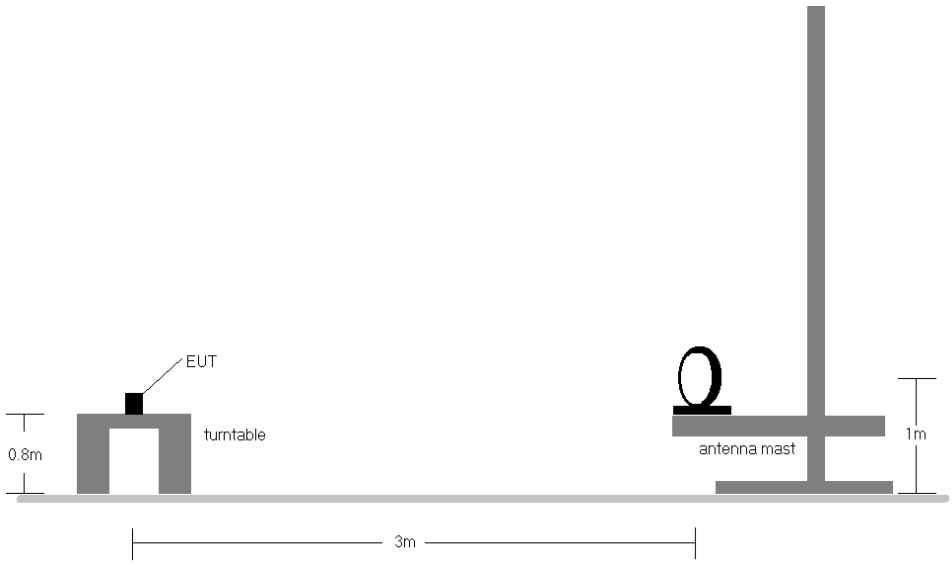



**Figure 7-6. Radiated Test Setup < 30MHz**

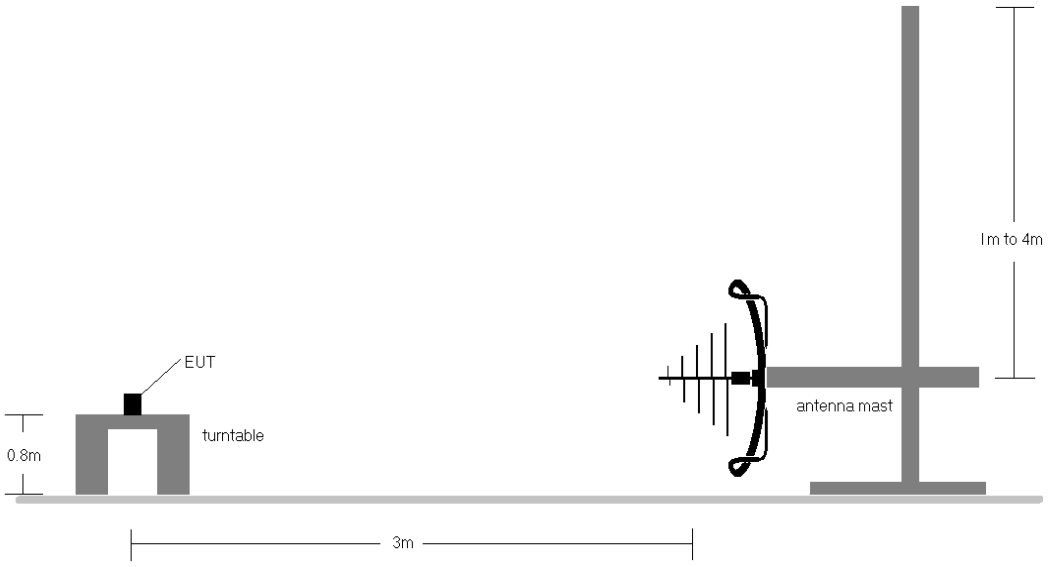



**Figure 7-7. Radiated Test Setup < 1GHz**

## 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 7-280.
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 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.

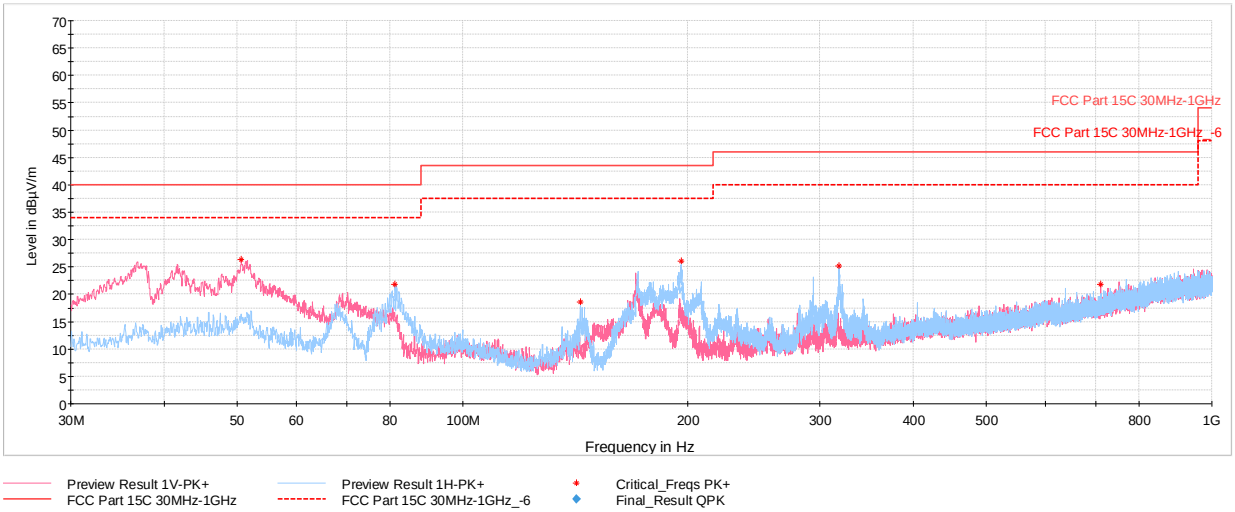
## Sample Calculations

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

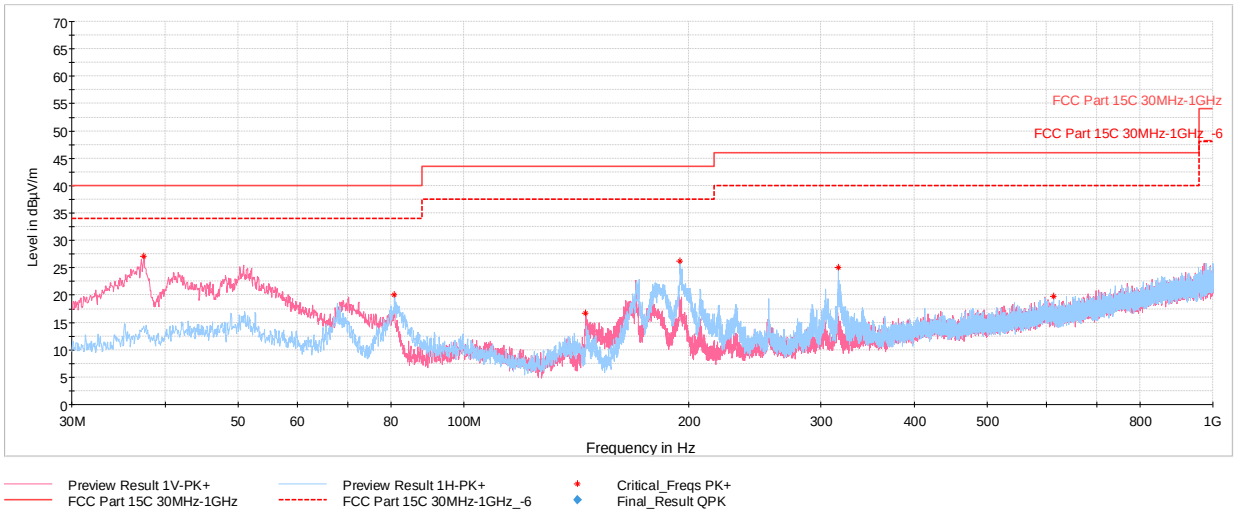
**§15.209; RSS-Gen [8.9]**




**Plot 7-1799. Radiated Spurious Emissions below 1GHz SDM Primary (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] |
|---|---|---|---|---|---|---|---|---|---|
| 50.66 | Max-Peak | V | 100 | 326 | -67.59 | -13.11 | 26.30 | 40.00 | -13.70 |
| 81.26 | Max-Peak | H | 200 | 118 | -64.27 | -20.97 | 21.76 | 40.00 | -18.24 |
| 143.59 | Max-Peak | H | 200 | 194 | -67.80 | -20.59 | 18.61 | 43.52 | -24.91 |
| 195.92 | Max-Peak | H | 100 | 198 | -64.38 | -16.55 | 26.07 | 43.52 | -17.45 |
| 318.09 | Max-Peak | H | 100 | 261 | -67.95 | -13.89 | 25.16 | 46.02 | -20.86 |
| 710.89 | Max-Peak | V | 200 | 292 | -78.90 | -6.25 | 21.85 | 46.02 | -24.17 |

**Table 7-281. Radiated Spurious Emissions below 1GHz SDM Primary (802.11ax – Ch.1 – RU26) with AC/DC Adapter**



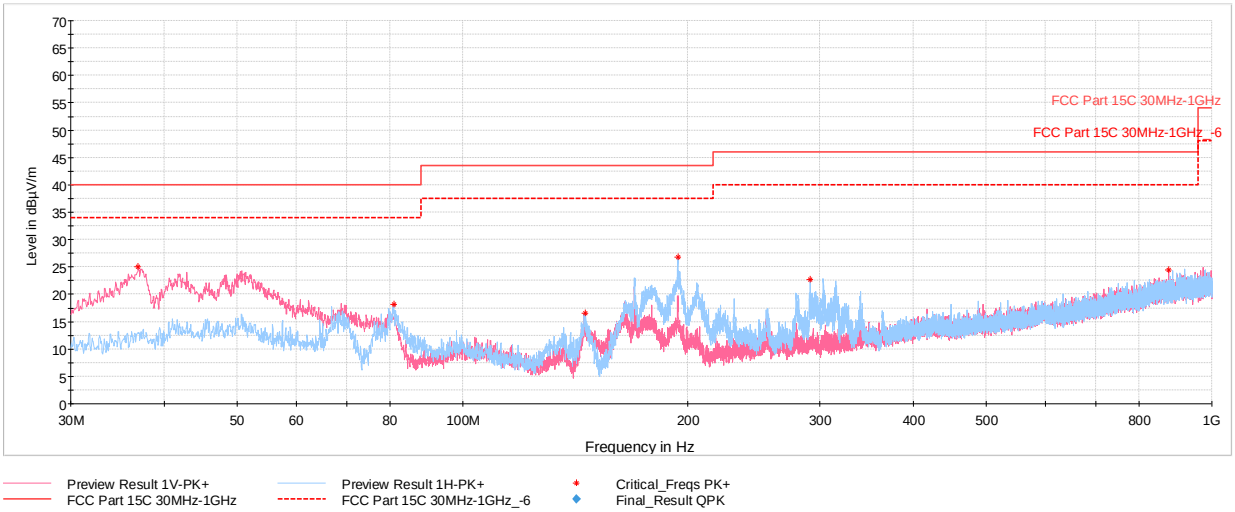

**Plot 7-1800. Radiated Spurious Emissions below 1GHz SDM Primary (802.11ax – Ch.1 – RU242) with AC/DC Adapter**

| 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] |
|---|---|---|---|---|---|---|---|---|---|
| 37.47 | Max-Peak | V | 100 | 35 | -64.74 | -15.12 | 27.14 | 40.00 | -12.86 |
| 80.88 | Max-Peak | H | 200 | 125 | -65.80 | -21.07 | 20.13 | 40.00 | -19.87 |
| 145.58 | Max-Peak | V | 100 | 0 | -69.71 | -20.56 | 16.73 | 43.52 | -26.79 |
| 194.46 | Max-Peak | H | 200 | 203 | -63.92 | -16.82 | 26.26 | 43.52 | -17.26 |
| 316.39 | Max-Peak | H | 100 | 138 | -68.06 | -13.93 | 25.01 | 46.02 | -21.01 |
| 613.02 | Max-Peak | H | 300 | 213 | -79.73 | -7.56 | 19.71 | 46.02 | -26.31 |

**Table 7-282. Radiated Spurious Emissions below 1GHz SDM Primary (802.11ax – Ch.1 – RU242) with AC/DC Adapter**

## 7.8.2 SDM Diversity Radiated Spurious Emissions Measurements (Below 1GHz)

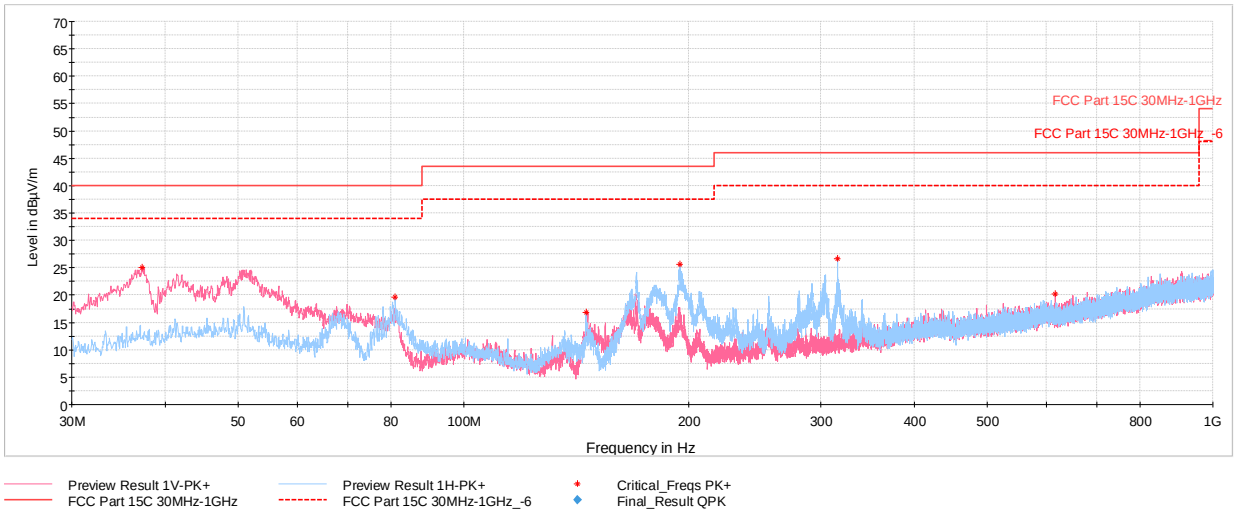
**§15.209; RSS-Gen [8.9]**




**Plot 7-1801. Radiated Spurious Emissions below 1GHz SDM Diversity (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] |
|---|---|---|---|---|---|---|---|---|---|
| 36.89 | Max-Peak | V | 100 | 270 | -66.64 | -15.26 | 25.10 | 40.00 | -14.90 |
| 80.93 | Max-Peak | H | 200 | 130 | -67.78 | -21.06 | 18.16 | 40.00 | -21.84 |
| 145.92 | Max-Peak | H | 200 | 194 | -69.91 | -20.54 | 16.55 | 43.52 | -26.97 |
| 193.78 | Max-Peak | H | 100 | 210 | -63.18 | -16.99 | 26.83 | 43.52 | -16.69 |
| 290.88 | Max-Peak | H | 100 | 285 | -69.44 | -14.79 | 22.77 | 46.02 | -23.25 |
| 875.65 | Max-Peak | V | 100 | 0 | -79.23 | -3.27 | 24.50 | 46.02 | -21.52 |

**Table 7-283. Radiated Spurious Emissions below 1GHz SDM Diversity (802.11ax – Ch.1 – RU26) with AC/DC Adapter**




**Plot 7-1802. Radiated Spurious Emissions below 1GHz SDM Diversity (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] |
|---|---|---|---|---|---|---|---|---|---|
| 37.23 | Max-Peak | V | 100 | 52 | -66.77 | -15.18 | 25.05 | 40.00 | -14.95 |
| 81.02 | Max-Peak | H | 200 | 141 | -66.36 | -21.04 | 19.60 | 40.00 | -20.40 |
| 145.67 | Max-Peak | H | 200 | 195 | -69.57 | -20.55 | 16.88 | 43.52 | -26.64 |
| 194.32 | Max-Peak | H | 100 | 224 | -64.55 | -16.86 | 25.59 | 43.52 | -17.93 |
| 315.86 | Max-Peak | H | 100 | 288 | -66.41 | -13.94 | 26.65 | 46.02 | -19.37 |
| 616.56 | Max-Peak | V | 100 | 71 | -79.05 | -7.72 | 20.23 | 46.02 | -25.79 |

**Table 7-284. Radiated Spurious Emissions below 1GHz SDM Diversity (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 7-285. 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.

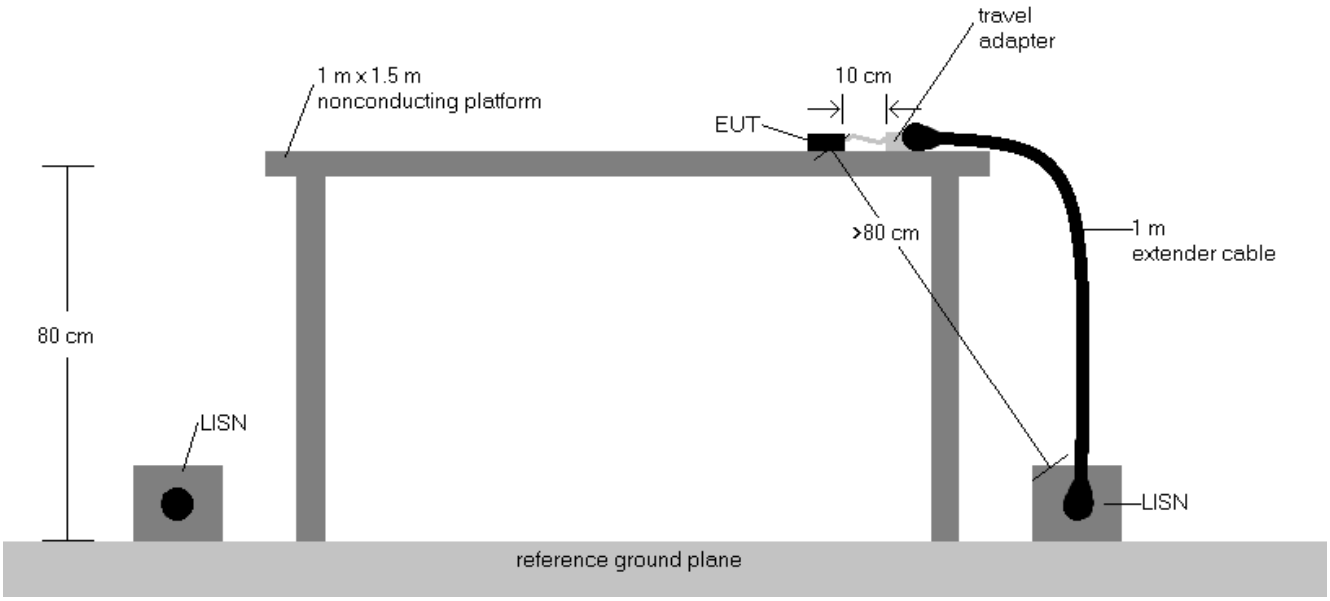
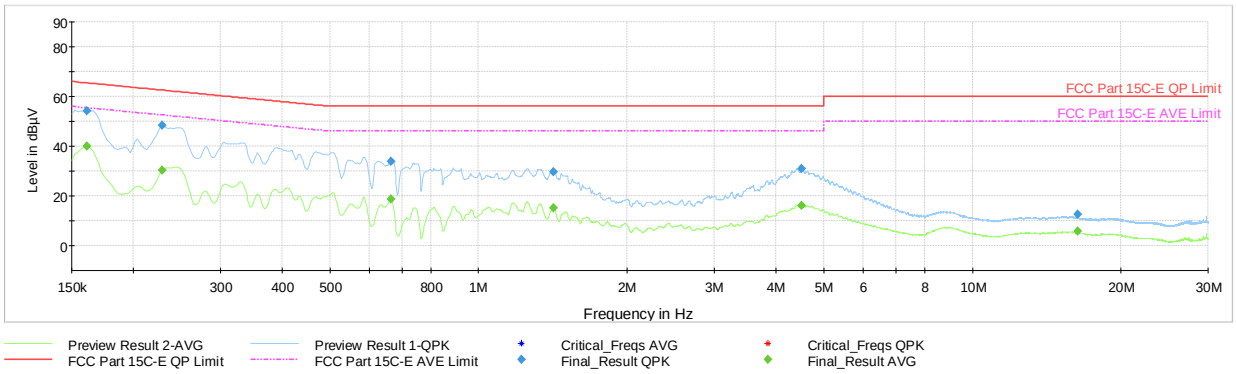



**Figure 7-8. Test Instrument & Measurement Setup**

## 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.
9. The unit was tested with all possible modes and only the highest emission is reported.

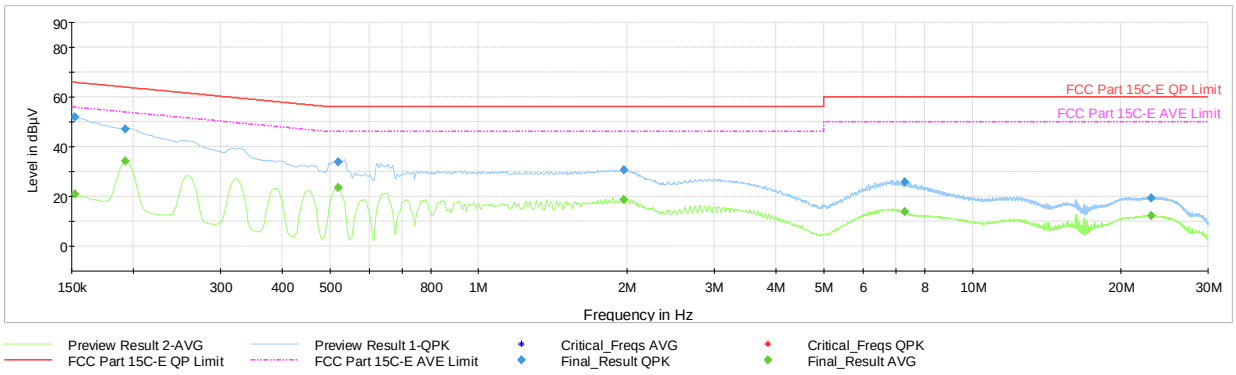
## 7.9.1 SDM Primary Line-Conducted Emissions Measurements




**Plot 7-1803. AC Line Conducted Plot with SDM Primary 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 | --- | 39.88 | 55.40 | -15.52 | L1 | GND |
| 0.161 | FINAL | 54.29 | --- | 65.40 | -11.11 | L1 | GND |
| 0.229 | FINAL | --- | 30.36 | 52.50 | -22.13 | L1 | GND |
| 0.229 | FINAL | 48.24 | --- | 62.50 | -14.26 | L1 | GND |
| 0.665 | FINAL | --- | 18.62 | 46.00 | -27.38 | L1 | GND |
| 0.665 | FINAL | 33.84 | --- | 56.00 | -22.16 | L1 | GND |
| 1.417 | FINAL | 29.59 | --- | 56.00 | -26.41 | L1 | GND |
| 1.417 | FINAL | --- | 15.07 | 46.00 | -30.93 | L1 | GND |
| 4.513 | FINAL | 30.82 | --- | 56.00 | -25.18 | L1 | GND |
| 4.513 | FINAL | --- | 16.20 | 46.00 | -29.80 | L1 | GND |
| 16.346 | FINAL | --- | 5.81 | 50.00 | -44.19 | L1 | GND |
| 16.346 | FINAL | 12.61 | --- | 60.00 | -47.39 | L1 | GND |

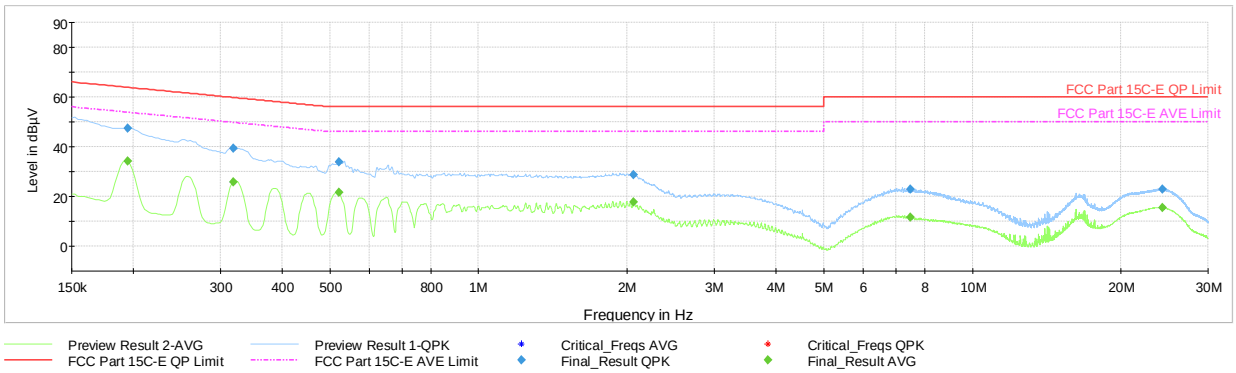
**Table 7-286. AC Line Conducted Data with SDM Primary 11ax UNII Band 5 – RU26 – Ch.1 (L1) with AC/DC Adapter**




**Plot 7-1804. AC Line Conducted Plot with SDM Primary 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 |
|---|---|---|---|---|---|---|---|
| 0.152 | FINAL | --- | 20.95 | 55.88 | -34.93 | N | GND |
| 0.152 | FINAL | 52.08 | --- | 65.88 | -13.80 | N | GND |
| 0.193 | FINAL | --- | 34.07 | 53.92 | -19.85 | N | GND |
| 0.193 | FINAL | 47.20 | --- | 63.92 | -16.72 | N | GND |
| 0.519 | FINAL | --- | 23.41 | 46.00 | -22.59 | N | GND |
| 0.519 | FINAL | 33.76 | --- | 56.00 | -22.24 | N | GND |
| 1.968 | FINAL | 30.71 | --- | 56.00 | -25.29 | N | GND |
| 1.968 | FINAL | --- | 18.83 | 46.00 | -27.17 | N | GND |
| 7.301 | FINAL | 25.69 | --- | 60.00 | -34.31 | N | GND |
| 7.301 | FINAL | --- | 13.96 | 50.00 | -36.04 | N | GND |
| 22.999 | FINAL | --- | 12.17 | 50.00 | -37.83 | N | GND |
| 22.999 | FINAL | 19.46 | --- | 60.00 | -40.54 | N | GND |

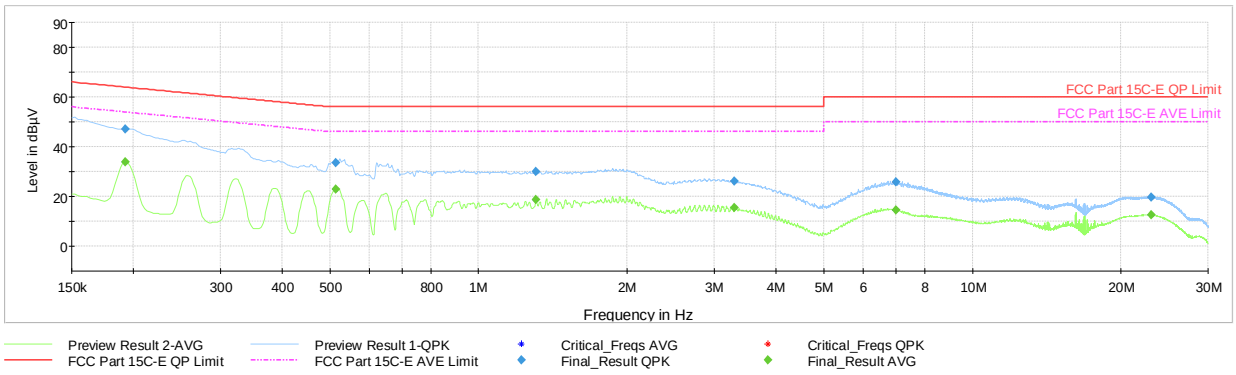
**Table 7-287. AC Line Conducted Data with SDM Primary 11ax UNII Band 5 – RU26 – Ch.1 (N) with AC/DC Adapter**




**Plot 7-1805. AC Line Conducted Plot with SDM Primary 11ax UNII Band 5 – RU242 – Ch.1 (L1) with AC/DC Adapter**

| Frequency [MHz] | Process State | QuasiPeak [dBµV] | Average [dBµV] | Limit [dBµV] | Margin [dB] | Line | PE |
|---|---|---|---|---|---|---|---|
| 0.195 | FINAL | --- | 34.12 | 53.82 | -19.70 | L1 | GND |
| 0.195 | FINAL | 47.55 | --- | 63.82 | -16.27 | L1 | GND |
| 0.319 | FINAL | --- | 25.92 | 49.74 | -23.82 | L1 | GND |
| 0.319 | FINAL | 39.27 | --- | 59.74 | -20.47 | L1 | GND |
| 0.521 | FINAL | --- | 21.72 | 46.00 | -24.28 | L1 | GND |
| 0.521 | FINAL | 33.74 | --- | 56.00 | -22.26 | L1 | GND |
| 2.058 | FINAL | 28.60 | --- | 56.00 | -27.40 | L1 | GND |
| 2.058 | FINAL | --- | 17.69 | 46.00 | -28.31 | L1 | GND |
| 7.483 | FINAL | 22.83 | --- | 60.00 | -37.17 | L1 | GND |
| 7.483 | FINAL | --- | 11.71 | 50.00 | -38.29 | L1 | GND |
| 24.212 | FINAL | --- | 15.48 | 50.00 | -34.52 | L1 | GND |
| 24.212 | FINAL | 22.77 | --- | 60.00 | -37.23 | L1 | GND |

**Table 7-288. AC Line Conducted Data with SDM Primary 11ax UNII Band 5 – RU242 – Ch.1 (L1) with AC/DC Adapter**

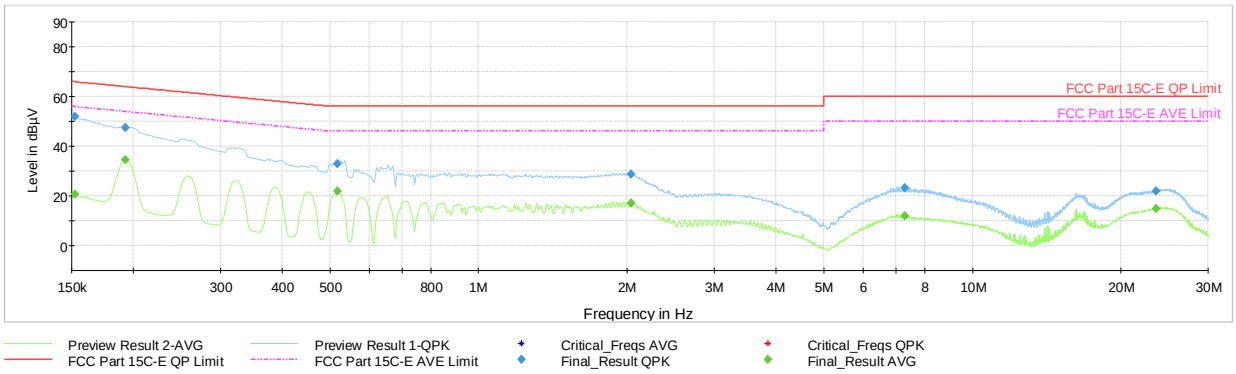



**Plot 7-1806. AC Line Conducted Plot with SDM Primary 11ax UNII Band 5 – RU242 – Ch.1 (N) with AC/DC Adapter**

| Frequency [MHz] | Process State | QuasiPeak [dBµV] | Average [dBµV] | Limit [dBµV] | Margin [dB] | Line | PE |
|---|---|---|---|---|---|---|---|
| 0.193 | FINAL | --- | 33.99 | 53.92 | -19.92 | N | GND |
| 0.193 | FINAL | 46.97 | --- | 63.92 | -16.95 | N | GND |
| 0.515 | FINAL | --- | 23.06 | 46.00 | -22.94 | N | GND |
| 0.515 | FINAL | 33.64 | --- | 56.00 | -22.36 | N | GND |
| 1.307 | FINAL | --- | 18.58 | 46.00 | -27.42 | N | GND |
| 1.307 | FINAL | 30.01 | --- | 56.00 | -25.99 | N | GND |
| 3.300 | FINAL | 26.07 | --- | 56.00 | -29.93 | N | GND |
| 3.300 | FINAL | --- | 15.44 | 46.00 | -30.56 | N | GND |
| 7.008 | FINAL | 25.85 | --- | 60.00 | -34.15 | N | GND |
| 7.008 | FINAL | --- | 14.67 | 50.00 | -35.33 | N | GND |
| 23.015 | FINAL | --- | 12.47 | 50.00 | -37.53 | N | GND |
| 23.015 | FINAL | 19.54 | --- | 60.00 | -40.46 | N | GND |

**Table 7-289. AC Line Conducted Data with SDM Primary 11ax UNII Band 5 – RU242 – Ch.1 (N) with AC/DC Adapter**

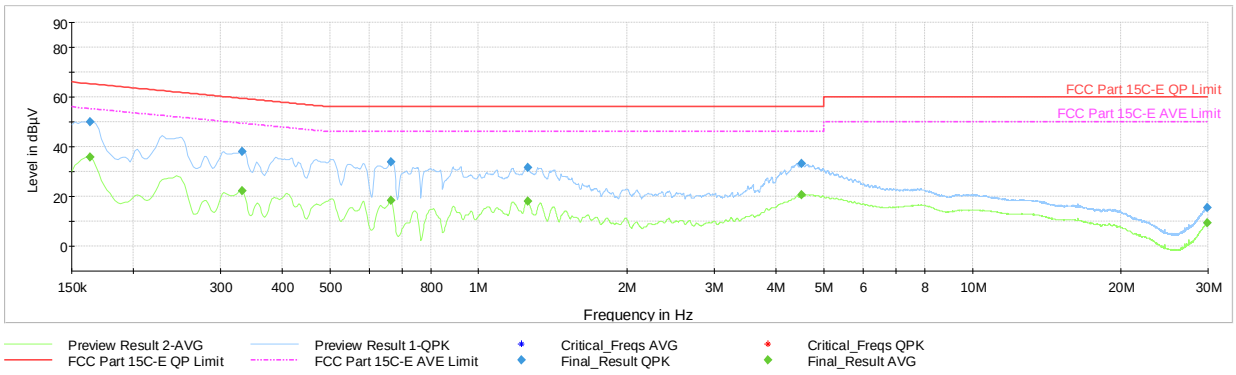
## 7.9.2 SDM Diversity Line-Conducted Emissions Measurements




**Plot 7-1807. AC Line Conducted Plot with SDM Diversity 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 |
|---|---|---|---|---|---|---|---|
| 0.152 | FINAL | --- | 20.73 | 55.88 | -35.14 | L1 | GND |
| 0.152 | FINAL | 51.9 | --- | 65.88 | -14.03 | L1 | GND |
| 0.193 | FINAL | --- | 34.59 | 53.92 | -19.32 | L1 | GND |
| 0.193 | FINAL | 47.5 | --- | 63.92 | -16.45 | L1 | GND |
| 0.517 | FINAL | --- | 21.86 | 46.00 | -24.14 | L1 | GND |
| 0.517 | FINAL | 32.8 | --- | 56.00 | -23.17 | L1 | GND |
| 2.033 | FINAL | 28.6 | --- | 56.00 | -27.37 | L1 | GND |
| 2.033 | FINAL | --- | 17.06 | 46.00 | -28.94 | L1 | GND |
| 7.303 | FINAL | 23.2 | --- | 60.00 | -36.84 | L1 | GND |
| 7.303 | FINAL | --- | 11.95 | 50.00 | -38.06 | L1 | GND |
| 23.501 | FINAL | --- | 14.77 | 50.00 | -35.23 | L1 | GND |
| 23.501 | FINAL | 22.0 | --- | 60.00 | -38.03 | L1 | GND |

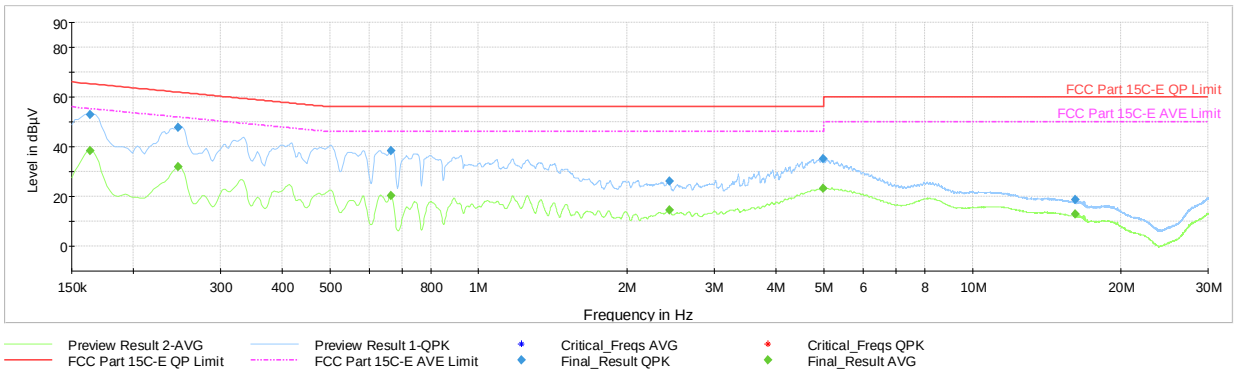
**Table 7-290. AC Line Conducted Data with SDM Diversity 11ax UNII Band 5 – RU26 – Ch.1 (L1) with AC/DC Adapter**




**Plot 7-1808. AC Line Conducted Plot with SDM Diversity 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 | --- | 35.66 | 55.28 | -19.62 | N | GND |
| 0.164 | FINAL | 50.0 | --- | 65.28 | -15.33 | N | GND |
| 0.332 | FINAL | --- | 22.32 | 49.40 | -27.08 | N | GND |
| 0.332 | FINAL | 38.1 | --- | 59.40 | -21.25 | N | GND |
| 0.665 | FINAL | --- | 18.31 | 46.00 | -27.69 | N | GND |
| 0.665 | FINAL | 33.9 | --- | 56.00 | -22.10 | N | GND |
| 1.257 | FINAL | 31.7 | --- | 56.00 | -24.34 | N | GND |
| 1.257 | FINAL | --- | 17.96 | 46.00 | -28.04 | N | GND |
| 4.515 | FINAL | 33.4 | --- | 56.00 | -22.65 | N | GND |
| 4.515 | FINAL | --- | 20.60 | 46.00 | -25.40 | N | GND |
| 29.843 | FINAL | --- | 9.35 | 50.00 | -40.65 | N | GND |
| 29.843 | FINAL | 15.4 | --- | 60.00 | -44.60 | N | GND |

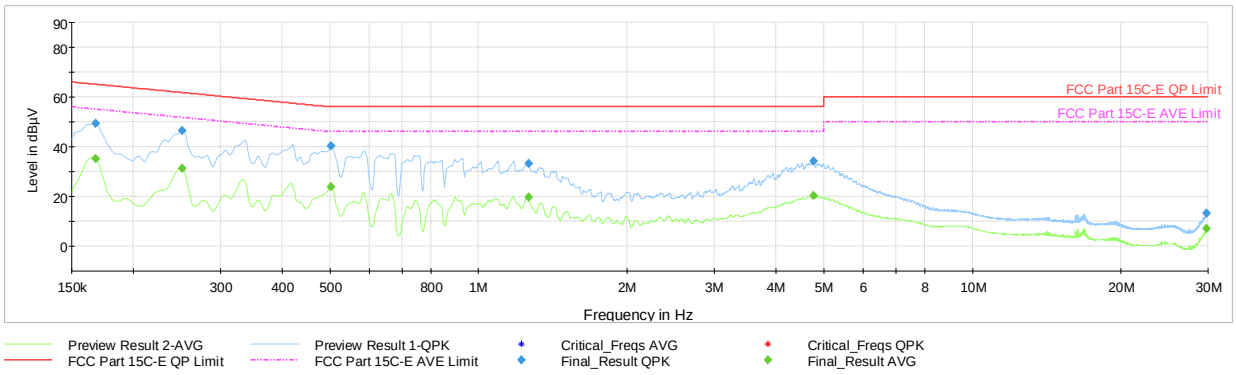
**Table 7-291. AC Line Conducted Data with SDM Diversity 11ax UNII Band 5 – RU26 – Ch.1 (N) with AC/DC Adapter**




**Plot 7-1809. AC Line Conducted Plot with SDM Diversity 11ax UNII Band 5 – RU242 – Ch.1 (L1) with AC/DC Adapter**

| Frequency [MHz] | Process State | QuasiPeak [dBµV] | Average [dBµV] | Limit [dBµV] | Margin [dB] | Line | PE |
|---|---|---|---|---|---|---|---|
| 0.164 | FINAL | --- | 38.37 | 55.28 | -16.91 | L1 | GND |
| 0.164 | FINAL | 52.9 | --- | 65.28 | -12.39 | L1 | GND |
| 0.247 | FINAL | --- | 31.93 | 51.87 | -19.94 | L1 | GND |
| 0.247 | FINAL | 47.7 | --- | 61.87 | -14.18 | L1 | GND |
| 0.665 | FINAL | --- | 20.45 | 46.00 | -25.55 | L1 | GND |
| 0.665 | FINAL | 38.6 | --- | 56.00 | -17.45 | L1 | GND |
| 2.434 | FINAL | 26.0 | --- | 56.00 | -29.97 | L1 | GND |
| 2.434 | FINAL | --- | 14.36 | 46.00 | -31.64 | L1 | GND |
| 4.981 | FINAL | 35.0 | --- | 56.00 | -20.97 | L1 | GND |
| 4.981 | FINAL | --- | 23.13 | 46.00 | -22.87 | L1 | GND |
| 16.168 | FINAL | --- | 12.84 | 50.00 | -37.16 | L1 | GND |
| 16.168 | FINAL | 18.6 | --- | 60.00 | -41.41 | L1 | GND |

**Table 7-292. AC Line Conducted Data with SDM Diversity 11ax UNII Band 5 – RU242 – Ch.1 (L1) with AC/DC Adapter**




**Plot 7-1810. AC Line Conducted Plot with SDM Diversity 11ax UNII Band 5 – RU242 – Ch.1 (N) with AC/DC Adapter**

| Frequency [MHz] | Process State | QuasiPeak [dBµV] | Average [dBµV] | Limit [dBµV] | Margin [dB] | Line | PE |
|---|---|---|---|---|---|---|---|
| 0.168 | FINAL | --- | 35.26 | 55.06 | -19.80 | N | GND |
| 0.168 | FINAL | 49.2 | --- | 65.06 | -15.85 | N | GND |
| 0.251 | FINAL | --- | 31.31 | 51.72 | -20.41 | N | GND |
| 0.251 | FINAL | 46.5 | --- | 61.72 | -15.27 | N | GND |
| 0.503 | FINAL | --- | 23.96 | 46.00 | -22.04 | N | GND |
| 0.503 | FINAL | 40.2 | --- | 56.00 | -15.80 | N | GND |
| 1.262 | FINAL | 33.3 | --- | 56.00 | -22.66 | N | GND |
| 1.262 | FINAL | --- | 19.54 | 46.00 | -26.46 | N | GND |
| 4.760 | FINAL | 34.1 | --- | 56.00 | -21.91 | N | GND |
| 4.760 | FINAL | --- | 20.25 | 46.00 | -25.75 | N | GND |
| 29.794 | FINAL | --- | 7.05 | 50.00 | -42.96 | N | GND |
| 29.794 | FINAL | 13.2 | --- | 60.00 | -46.76 | N | GND |

**Table 7-293. AC Line Conducted Data with SDM Diversity 11ax UNII Band 5 – RU242 – Ch.1 (N) with AC/DC Adapter**

## 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.

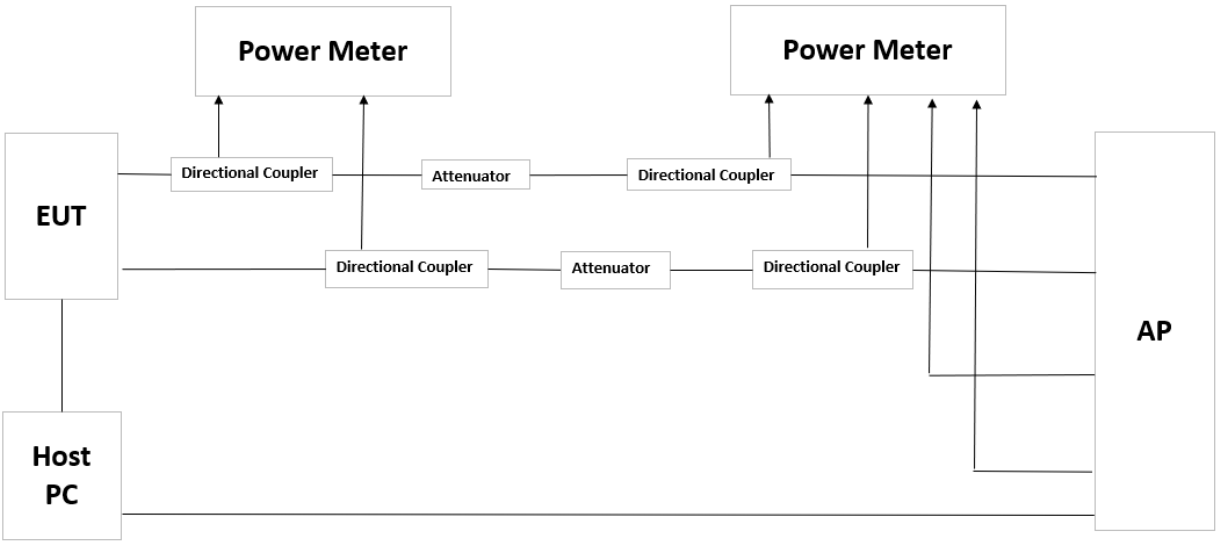



**Figure 9: Test Instrument & Measurement Setup**

**Test Notes**

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

## 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 | 20.32 | 19.78 | 19.86 | 19.71 | 25.94 | 6.02 | 31.72 |

**Table 294. AP measured e.i.r.p**

| Channel | Frequency (MHz) | Power Measured (dBm) | | | Correlated Gain (dBi) | Measured e.i.r.p (dBm) |
|---|---|---|---|---|---|---|
| | | Antenna WF5b | Antenna WF8 | Summed | | |
| 5 | 5975 | 13.88 | 6.07 | 14.55 | 1.7 | 16.25 |

**Table 295. 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 | 19.59 | 19.58 | 19.75 | 19.32 | 25.58 | 0 | 25.62 |

**Table 296. AP measured e.i.r.p**

| Channel | Frequency (MHz) | Power Measured (dBm) | | | Correlated Gain (dBi) | Measured e.i.r.p (dBm) |
|---|---|---|---|---|---|---|
| | | Antenna WF5b | Antenna WF8 | Summed | | |
| 5 | 5975 | 12.16 | 6.32 | 13.17 | 1.7 | 14.9 |

**Table 297. 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 | 13.1 | 12.74 | 13.16 | 12.39 | 18.88 | 0 | 18.81 |

**Table 298. AP measured e.i.r.p**

| Antenna | Channel | Frequency (MHz) | Power Measured (dBm) | Antenna Gain (dBi) | Measured e.i.r.p (dBm) |
|---|---|---|---|---|---|
| WF5b | 5 | 5975 | 10.80 | 1.7 | 12.50 |
| WF8 | 5 | 5975 | 6.05 | 1.3 | 7.35 |

**Table 299. EUT measured e.i.r.p (SISO)**

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

**§15.407; RSS-248**

**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.

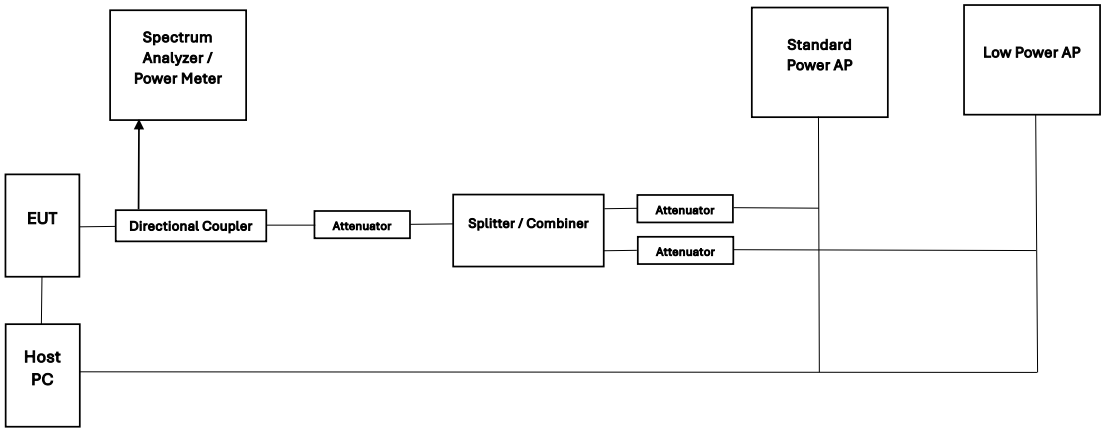
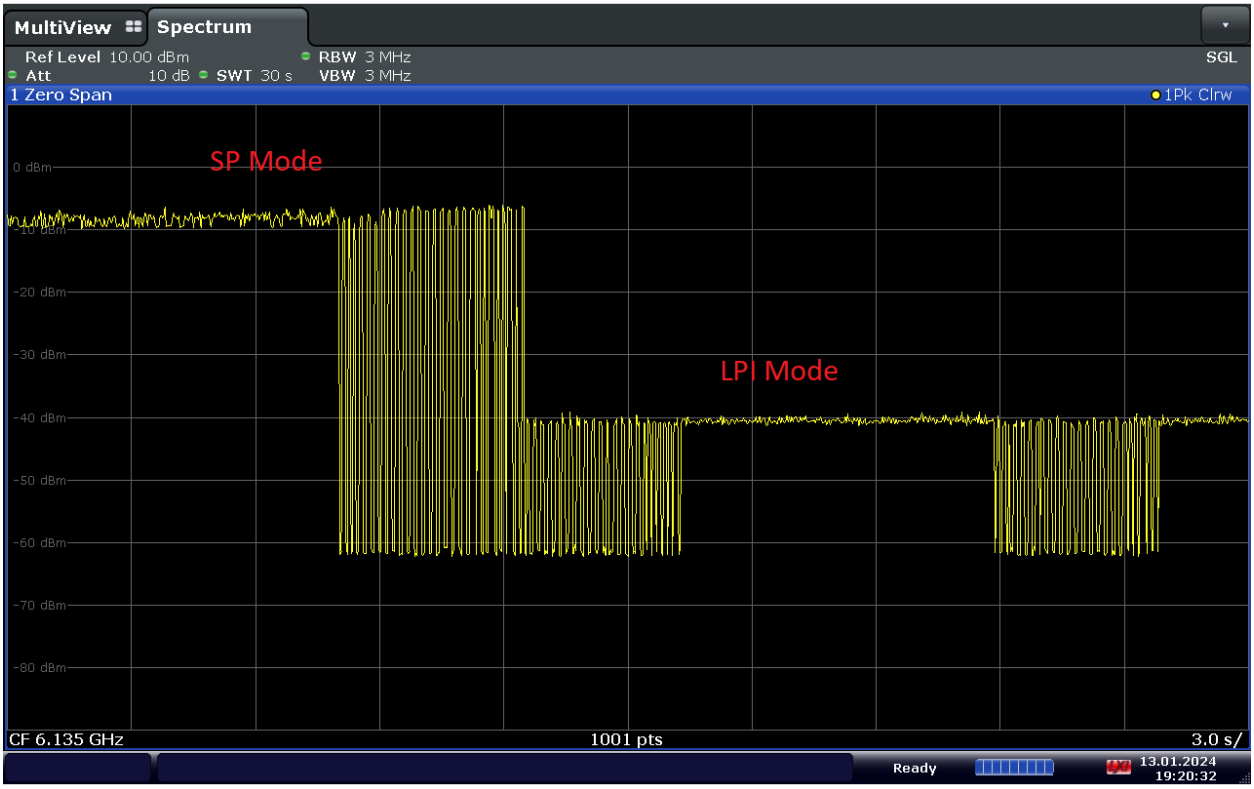



**Figure 10: Test Instrument & Measurement Setup**

**Test Notes**

1. Standard Power AP which was used in the test setup is not certified and it's a production version.
2. Standard Power AP specification is declared by Apple/manufacturer.
3. Standard Power AP was set on highest power setting (36dBm EIRP)
4. Standard Power AP and Low Power Indoor AP were configured to transmit on same channel.
5. DUT was configured for SISO transmission so Antenna WF5b was measured.

Element




19:20:32 13.01.2024

**Figure 11: 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 | 20.21 | 20.05 | 19.97 | 19.91 | 26.06 | 6.02 | 32.08 |

**Table 300: 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) |
|---|---|---|---|---|---|
| WF5b | 37 | 6135 | 13.27 | 1.7 | 14.97 |

**Table 301: 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) |
|---|---|---|---|---|---|
| WF5b | 37 | 6135 | 5.36 | 1.7 | 7.06 |

**Table 302: 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: BCGA2925** and **IC: 579C-A2925** 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.