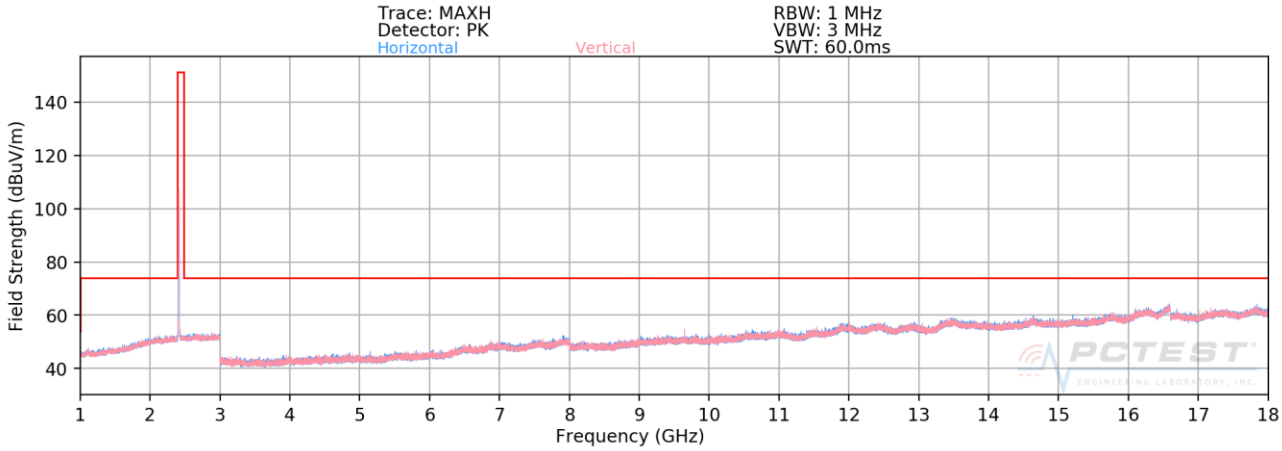
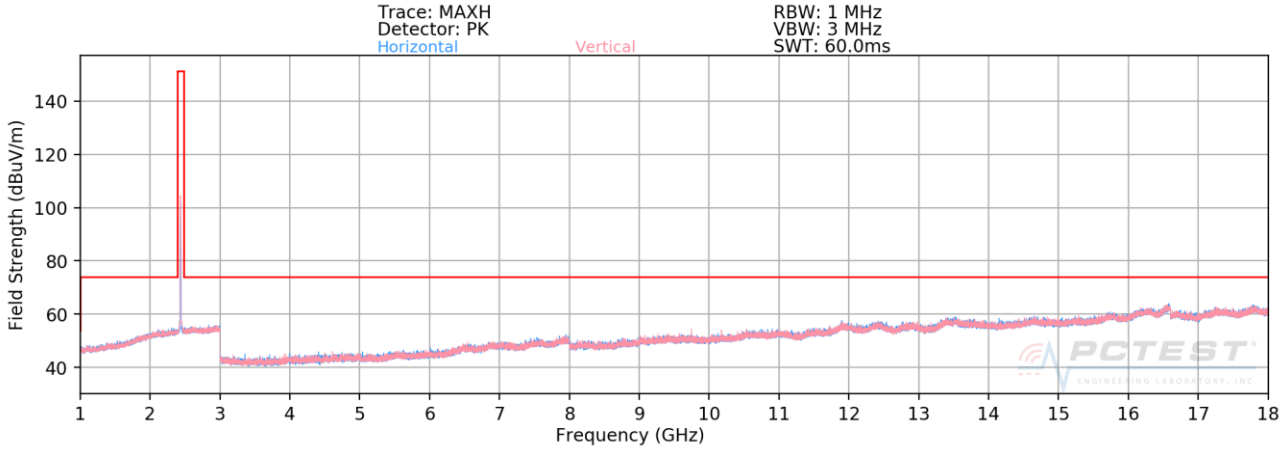
## 7.7.1 SISO Core-0 Radiated Spurious Emission Measurements

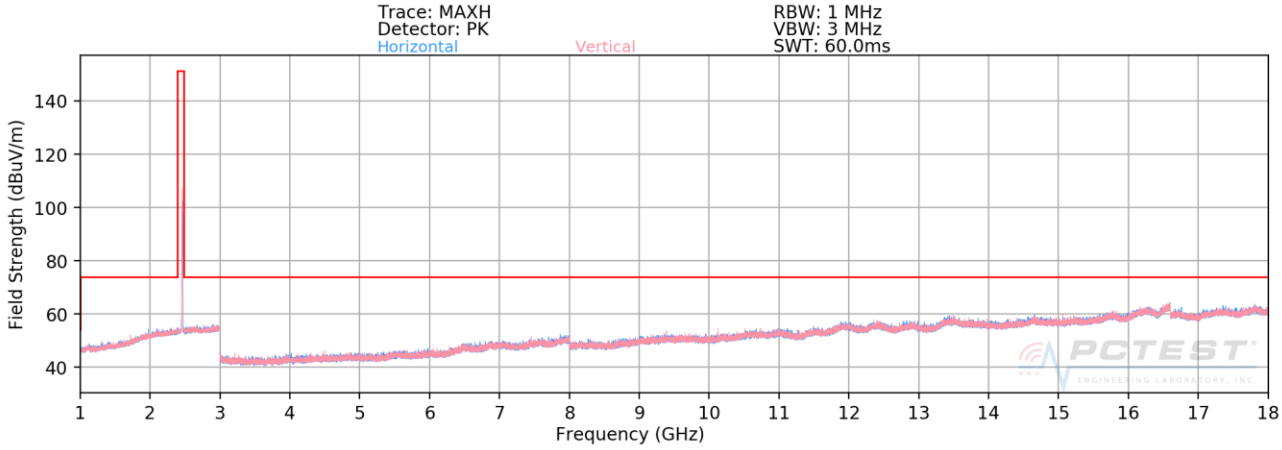
**§15.247(d) §15.205 & §15.209; RSS-Gen [8.9]**




**Plot 7-85. Radiated Spurious Plot above 1GHz SISO CORE 0 (802.11b – Ch. 1)**




**Plot 7-86. Radiated Spurious Plot above 1GHz SISO CORE 0 (802.11b – Ch. 6)**




**Plot 7-87. Radiated Spurious Plot above 1GHz SISO CORE 0 (802.11b – Ch. 11)**

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# SISO Core-0 Radiated Spurious Emission Measurements

**§15.247(d) §15.205 & §15.209; RSS-Gen [8.9]**

Worst Case Mode: 802.11b
Worst Case Transfer Rate: 1 Mbps
Distance of Measurements: 3 Meters
Operating Frequency: 2412MHz
Channel: 01

| 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] |
|---|---|---|---|---|---|---|---|---|---|
| 4824.00 | Avg | V | - | - | -82.26 | 9.10 | 33.84 | 53.98 | -20.14 |
| 4824.00 | Peak | V | - | - | -70.74 | 9.10 | 45.36 | 73.98 | -28.62 |
| 12060.00 | Avg | V | - | - | -84.96 | 21.15 | 43.19 | 53.98 | -10.79 |
| 12060.00 | Peak | V | - | - | -72.62 | 21.15 | 55.53 | 73.98 | -18.45 |

**Table 7-16. Radiated Measurements SISO CORE 0**

Worst Case Mode: 802.11b
Worst Case Transfer Rate: 1 Mbps
Distance of Measurements: 3 Meters
Operating Frequency: 2437MHz
Channel: 06

| 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] |
|---|---|---|---|---|---|---|---|---|---|
| 4874.00 | Avg | V | 362 | 14 | -81.28 | 9.35 | 35.07 | 53.98 | -18.91 |
| 4874.00 | Peak | V | 362 | 14 | -70.45 | 9.35 | 45.90 | 73.98 | -28.08 |
| 7311.00 | Avg | V | - | - | -83.25 | 13.61 | 37.36 | 53.98 | -16.62 |
| 7311.00 | Peak | V | - | - | -72.58 | 13.61 | 48.03 | 73.98 | -25.95 |
| 12185.00 | Avg | V | - | - | -84.50 | 21.18 | 43.68 | 53.98 | -10.30 |
| 12185.00 | Peak | V | - | - | -71.94 | 21.18 | 56.24 | 73.98 | -17.74 |

**Table 7-17. Radiated Measurements SISO CORE 0**



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| | |
|---|---|
| Worst Case Mode: | 802.11b |
| Worst Case Transfer Rate: | 1 Mbps |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 2462MHz |
| Channel: | 11 |

| 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] |
|---|---|---|---|---|---|---|---|---|---|
| 4924.00 | Avg | V | - | - | -82.27 | 8.97 | 33.70 | 53.98 | -20.28 |
| 4924.00 | Peak | V | - | - | -70.25 | 8.97 | 45.72 | 73.98 | -28.26 |
| 7386.00 | Avg | V | - | - | -83.71 | 14.08 | 37.37 | 53.98 | -16.61 |
| 7386.00 | Peak | V | - | - | -72.57 | 14.08 | 48.51 | 73.98 | -25.47 |
| 12310.00 | Avg | V | - | - | -84.74 | 21.77 | 44.03 | 53.98 | -9.95 |
| 12310.00 | Peak | V | - | - | -73.04 | 21.77 | 55.73 | 73.98 | -18.25 |

**Table 7-18. Radiated Measurements SISO CORE 0**




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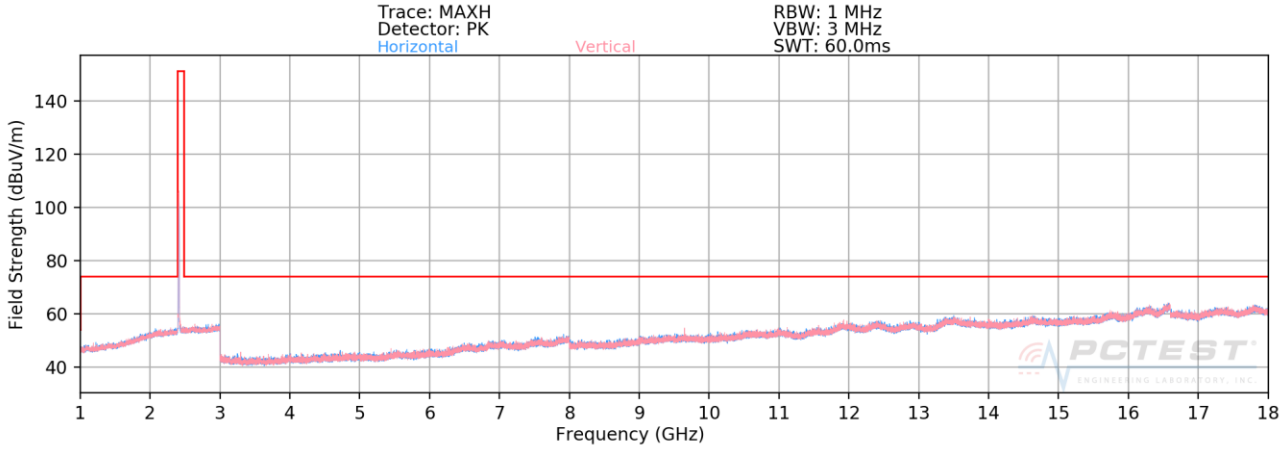
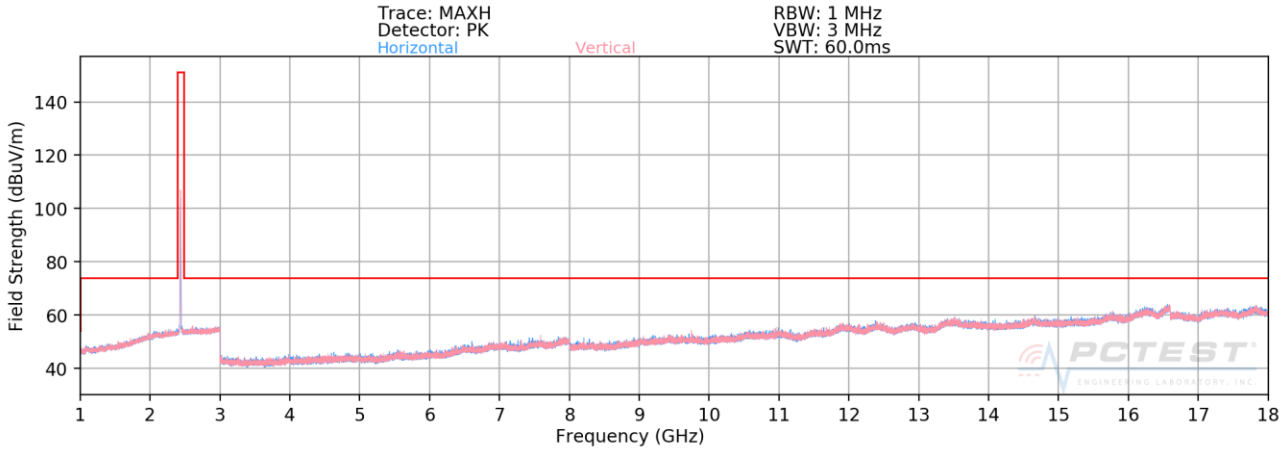
## 7.7.2 SISO Core-1 Radiated Spurious Emission Measurements

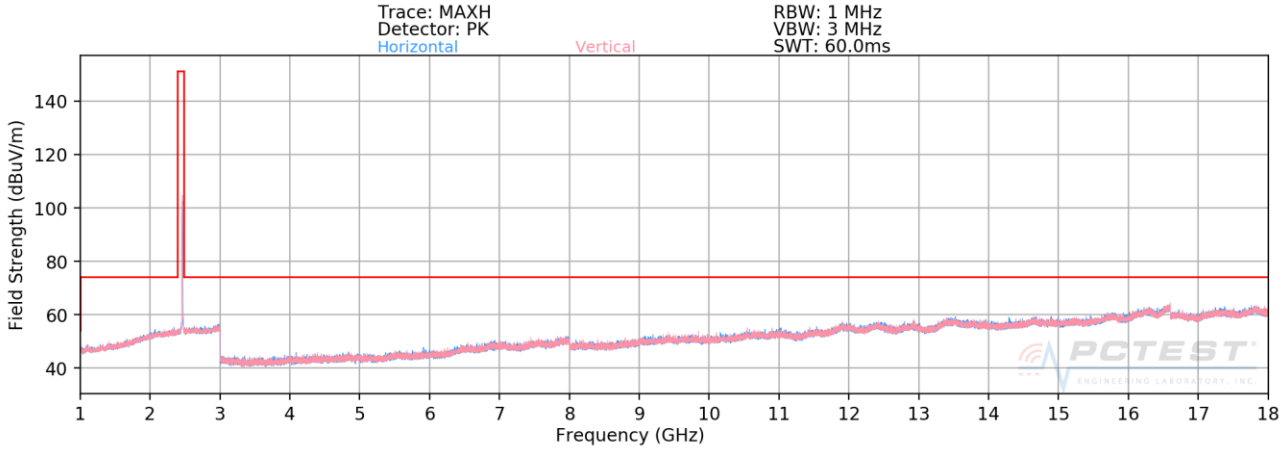
**§15.247(d) §15.205 & §15.209; RSS-Gen [8.9]**




**Plot 7-88. Radiated Spurious Plot above 1GHz SISO CORE 1 (802.11b – Ch. 1)**




**Plot 7-89. Radiated Spurious Plot above 1GHz SISO CORE 1 (802.11b – Ch. 6)**




**Plot 7-90. Radiated Spurious Plot above 1GHz SISO CORE 1 (802.11b – Ch. 11)**

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# SISO Core-1 Radiated Spurious Emission Measurements

**§15.247(d) §15.205 & §15.209; RSS-Gen [8.9]**

Worst Case Mode: 802.11b
Worst Case Transfer Rate: 1 Mbps
Distance of Measurements: 3 Meters
Operating Frequency: 2412MHz
Channel: 01

| 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] |
|---|---|---|---|---|---|---|---|---|---|
| 4824.00 | Avg | V | - | - | -82.23 | 9.10 | 33.87 | 53.98 | -20.11 |
| 4824.00 | Peak | V | - | - | -70.49 | 9.10 | 45.61 | 73.98 | -28.37 |
| 12060.00 | Avg | V | - | - | -84.39 | 21.15 | 43.76 | 53.98 | -10.22 |
| 12060.00 | Peak | V | - | - | -72.86 | 21.15 | 55.29 | 73.98 | -18.69 |

**Table 7-19. Radiated Measurements SISO CORE 1**

Worst Case Mode: 802.11b
Worst Case Transfer Rate: 1 Mbps
Distance of Measurements: 3 Meters
Operating Frequency: 2437MHz
Channel: 06

| 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] |
|---|---|---|---|---|---|---|---|---|---|
| 4874.00 | Avg | V | - | - | -82.14 | 9.35 | 34.21 | 53.98 | -19.77 |
| 4874.00 | Peak | V | - | - | -69.47 | 9.35 | 46.88 | 73.98 | -27.10 |
| 7311.00 | Avg | V | 281 | 72 | -80.78 | 13.61 | 39.83 | 53.98 | -14.15 |
| 7311.00 | Peak | V | 281 | 72 | -70.54 | 13.61 | 50.07 | 73.98 | -23.91 |
| 12185.00 | Avg | V | - | - | -84.05 | 21.18 | 44.13 | 53.98 | -9.85 |
| 12185.00 | Peak | V | - | - | -72.84 | 21.18 | 55.34 | 73.98 | -18.64 |

**Table 7-20. Radiated Measurements SISO CORE 1**



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| | |
|---|---|
| Worst Case Mode: | 802.11b |
| Worst Case Transfer Rate: | 1 Mbps |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 2462MHz |
| Channel: | 11 |

| 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] |
|---|---|---|---|---|---|---|---|---|---|
| 4924.00 | Avg | V | - | - | -82.07 | 8.97 | 33.90 | 53.98 | -20.08 |
| 4924.00 | Peak | V | - | - | -70.29 | 8.97 | 45.68 | 73.98 | -28.30 |
| 7386.00 | Avg | V | 276 | 69 | -78.03 | 14.08 | 43.05 | 53.98 | -10.93 |
| 7386.00 | Peak | V | 276 | 69 | -69.53 | 14.08 | 51.55 | 73.98 | -22.43 |
| 12310.00 | Avg | V | - | - | -84.29 | 21.77 | 44.48 | 53.98 | -9.50 |
| 12310.00 | Peak | V | - | - | -72.85 | 21.77 | 55.92 | 73.98 | -18.06 |

**Table 7-21. Radiated Measurements SISO CORE 1**




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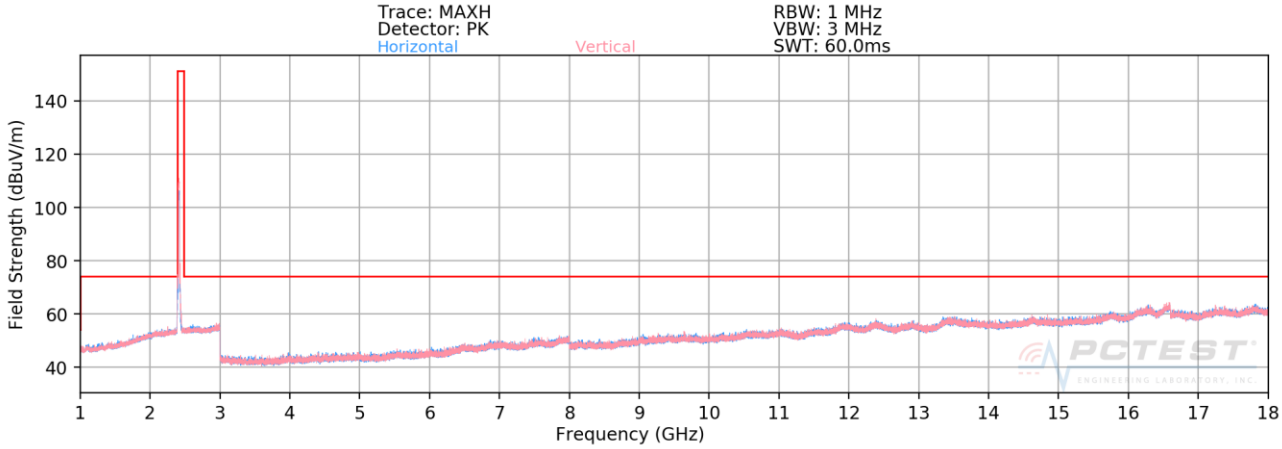
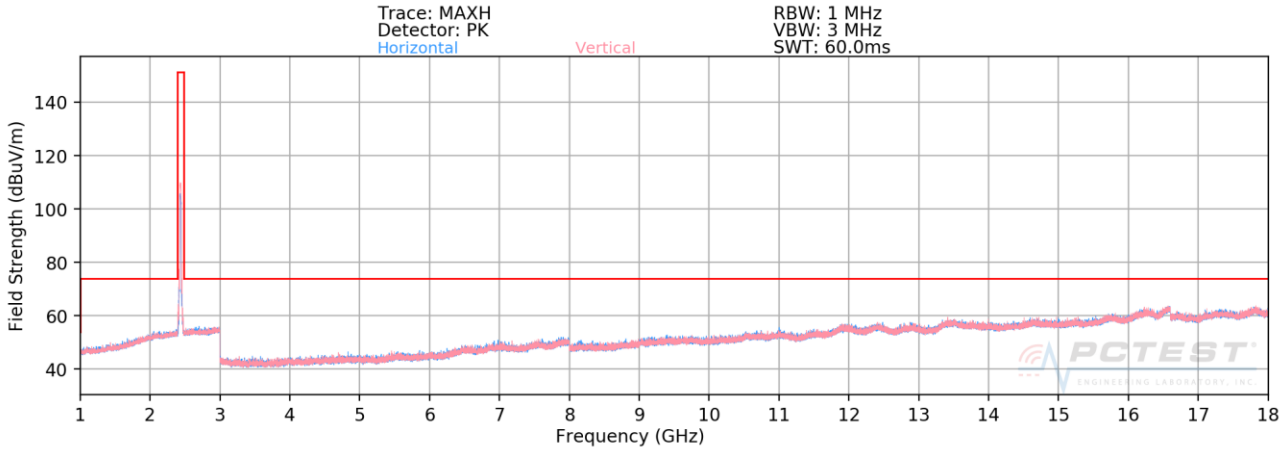
## 7.7.3 CDD Radiated Spurious Emission Measurements

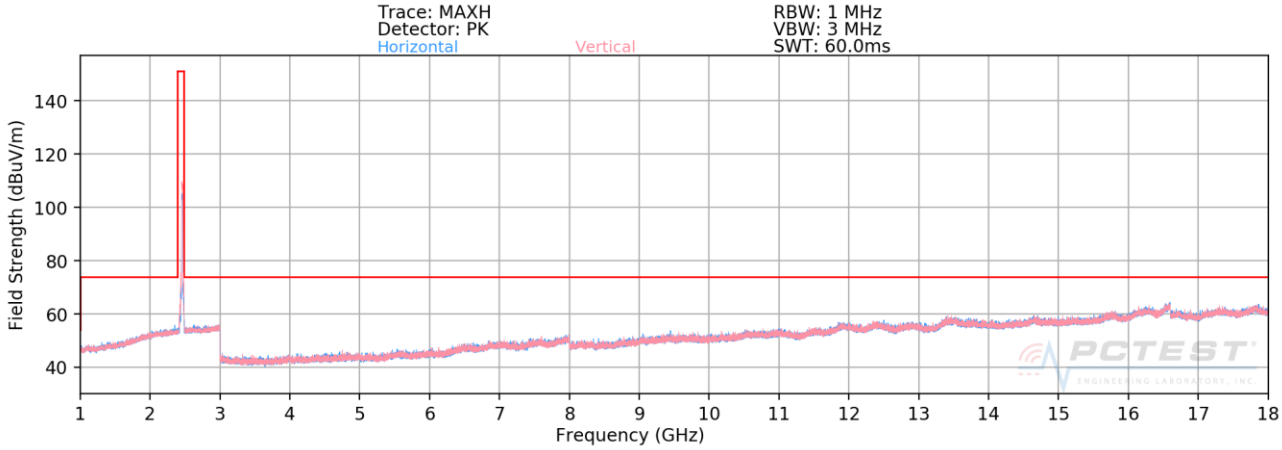
**§15.247(d) §15.205 & §15.209; RSS-Gen [8.9]**




**Plot 7-91. Radiated Spurious Plot above 1GHz CDD (802.11n – Ch. 1)**




**Plot 7-92. Radiated Spurious Plot above 1GHz CDD (802.11n – Ch. 6)**




**Plot 7-93. Radiated Spurious Plot above 1GHz CDD (802.11n – Ch. 11)**

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# CDD Radiated Spurious Emission Measurements

**§15.247(d) §15.205 & §15.209; RSS-Gen [8.9]**

Worst Case Mode: 802.11g
Worst Case Transfer Rate: 6 Mbps
Distance of Measurements: 3 Meters
Operating Frequency: 2412MHz
Channel: 01

| 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] |
|---|---|---|---|---|---|---|---|---|---|
| 4824.00 | Avg | V | - | - | -81.95 | 9.10 | 34.15 | 53.98 | -19.83 |
| 4824.00 | Peak | V | - | - | -70.27 | 9.10 | 45.83 | 73.98 | -28.15 |
| 12060.00 | Avg | V | - | - | -84.35 | 21.15 | 43.80 | 53.98 | -10.18 |
| 12060.00 | Peak | V | - | - | -72.82 | 21.15 | 55.33 | 73.98 | -18.65 |

**Table 7-22. Radiated Measurements CDD**

Worst Case Mode: 802.11g
Worst Case Transfer Rate: 6 Mbps
Distance of Measurements: 3 Meters
Operating Frequency: 2437MHz
Channel: 06

| 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] |
|---|---|---|---|---|---|---|---|---|---|
| 4874.00 | Avg | V | - | - | -82.08 | 9.35 | 34.27 | 53.98 | -19.71 |
| 4874.00 | Peak | V | - | - | -69.68 | 9.35 | 46.67 | 73.98 | -27.31 |
| 7311.00 | Avg | V | - | - | -83.13 | 13.61 | 37.48 | 53.98 | -16.50 |
| 7311.00 | Peak | V | - | - | -71.73 | 13.61 | 48.88 | 73.98 | -25.10 |
| 12185.00 | Avg | V | - | - | -84.05 | 21.18 | 44.13 | 53.98 | -9.85 |
| 12185.00 | Peak | V | - | - | -72.63 | 21.18 | 55.55 | 73.98 | -18.43 |

**Table 7-23. Radiated Measurements CDD**



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Worst Case Mode: 802.11g
Worst Case Transfer Rate: 6 Mbps
Distance of Measurements: 3 Meters
Operating Frequency: 2462MHz
Channel: 11

| 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] |
|---|---|---|---|---|---|---|---|---|---|
| 4924.00 | Avg | V | - | - | -81.92 | 8.97 | 34.05 | 53.98 | -19.93 |
| 4924.00 | Peak | V | - | - | -70.38 | 8.97 | 45.59 | 73.98 | -28.39 |
| 7386.00 | Avg | V | - | - | -83.57 | 14.08 | 37.51 | 53.98 | -16.47 |
| 7386.00 | Peak | V | - | - | -72.01 | 14.08 | 49.07 | 73.98 | -24.91 |
| 12310.00 | Avg | V | - | - | -84.33 | 21.77 | 44.44 | 53.98 | -9.54 |
| 12310.00 | Peak | V | - | - | -72.56 | 21.77 | 56.21 | 73.98 | -17.77 |

**Table 7-24. Radiated Measurements CDD**



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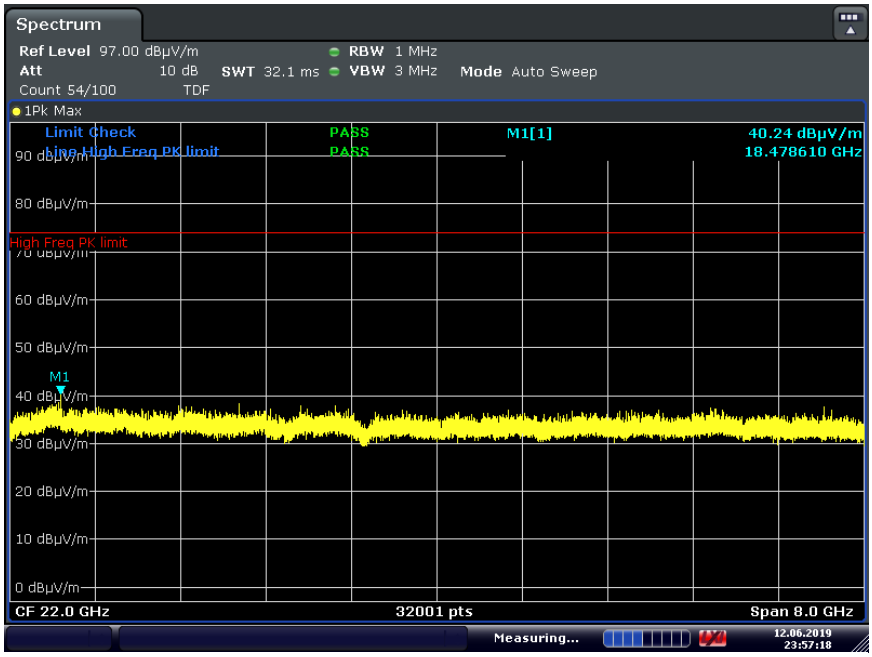
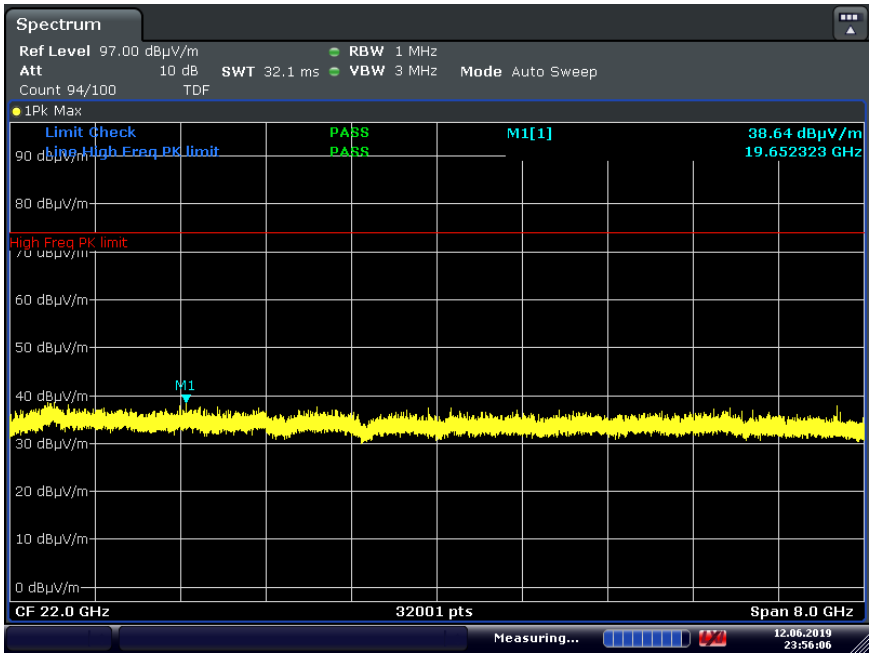
# CDD Radiated Spurious Emissions Measurements (Above 18GHz)

**§15.209; RSS-Gen [8.9]**




**Plot 7-94. Radiated Spurious Plot above 18GHz CDD (802.11n – Ch.6, Pol H)**




**Plot 7-95. Radiated Spurious Plot above 18GHz CDD (802.11n – Ch.6, Pol V)**



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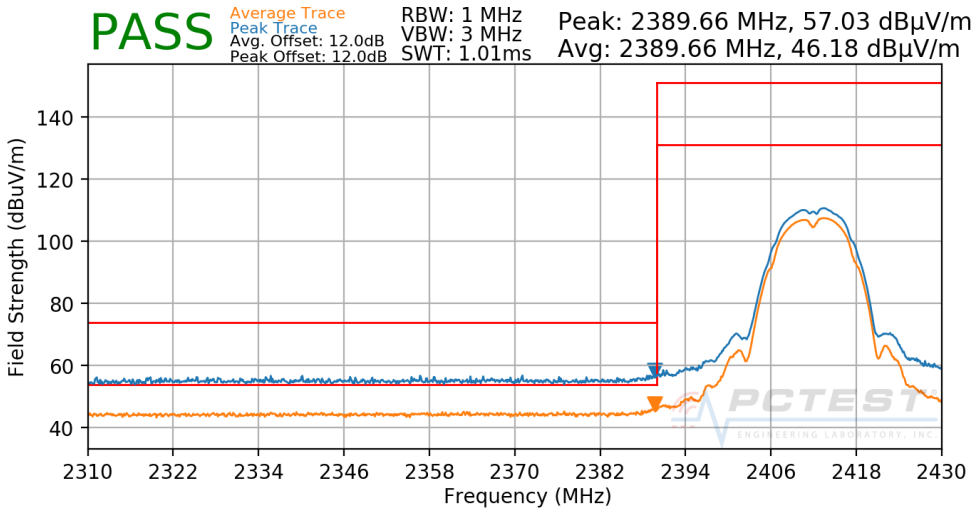
## 7.7.4 SISO Core-0 Radiated Restricted Band Edge Measurements

**§15.205 §15.209; RSS-Gen [8.9]**

The radiated restricted band edge measurements are measured with an EMI test receiver connected to the receive antenna while the EUT is transmitting.

| | |
|---|---|
| Worst Case Mode: | 802.11b |
| Worst Case Transfer Rate: | 1 Mbps |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 2412MHz |
| Channel: | 1 |




**Plot 7-96. Radiated Restricted Lower Band Edge Measurement SISO CORE 0**

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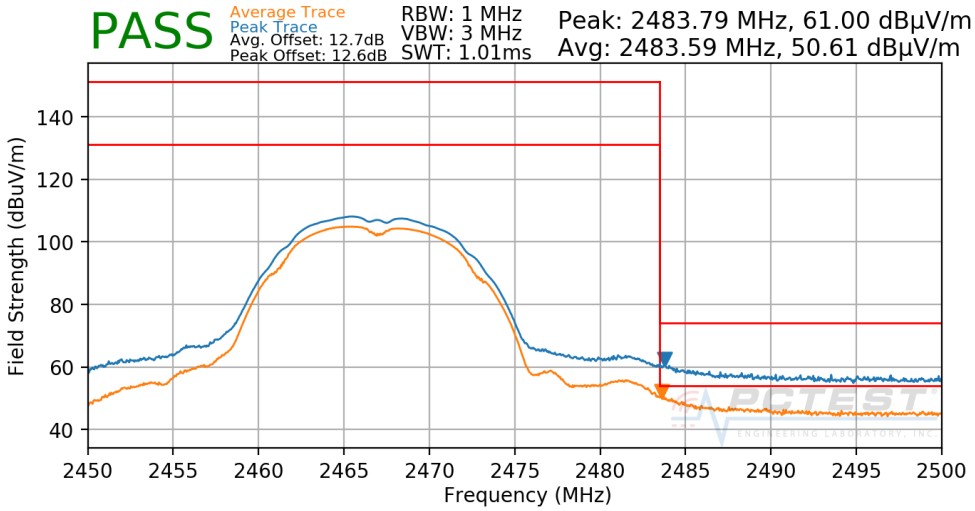
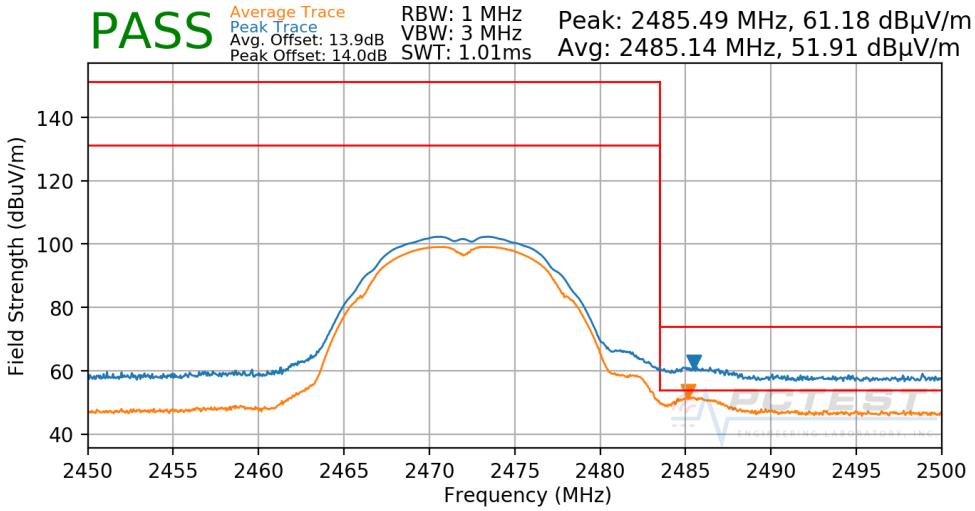
| | |
|---|---|
| Worst Case Mode: | 802.11b |
| Worst Case Transfer Rate: | 1 Mbps |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 2467MHz |
| Channel: | 12 |




**Plot 7-97. Radiated Restricted Upper Band Edge Measurement SISO CORE 0**

| | |
|---|---|
| Worst Case Mode: | 802.11b |
| Worst Case Transfer Rate: | 1 Mbps |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 2472MHz |
| Channel: | 13 |




**Plot 7-98. Radiated Restricted Upper Band Edge Measurement SISO CORE 0**

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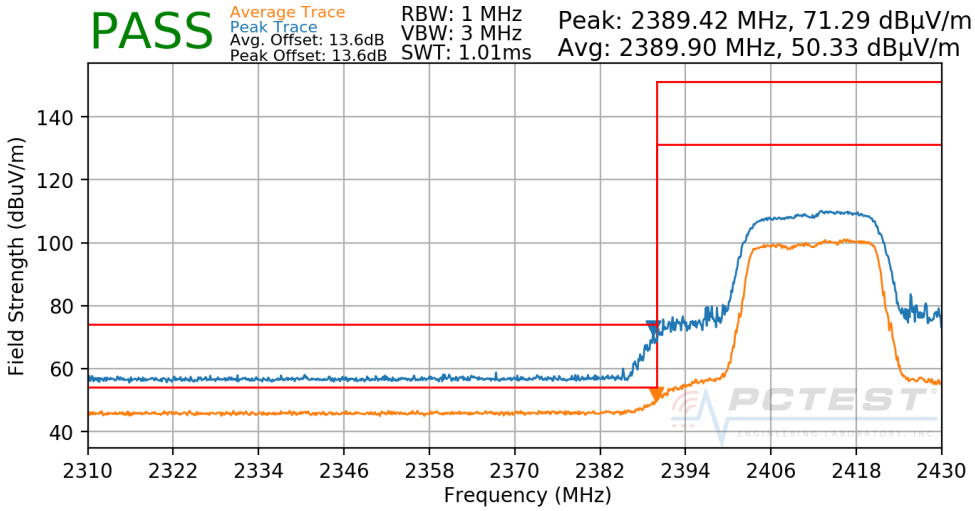
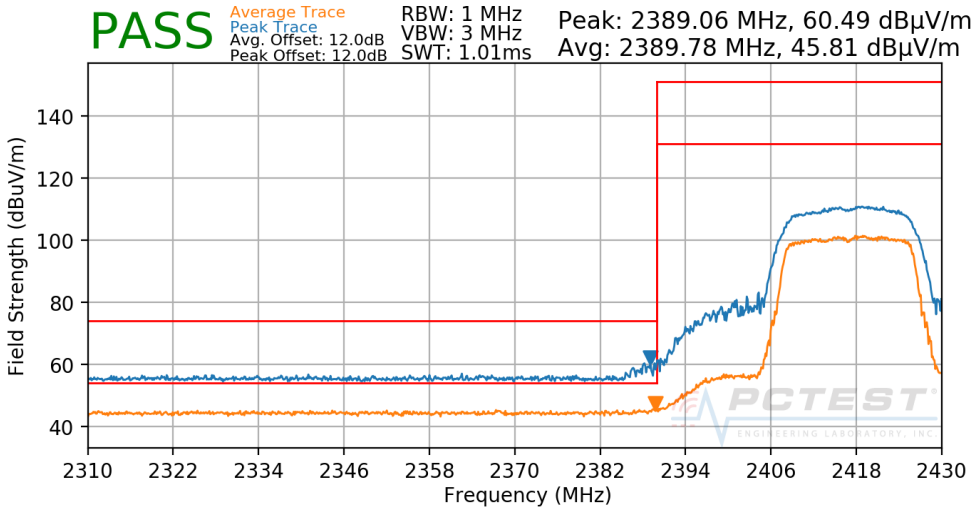
| | |
|---|---|
| Worst Case Mode: | 802.11n |
| Worst Case Transfer Rate: | MCS0 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 2412MHz |
| Channel: | 1 |




**Plot 7-99. Radiated Restricted Lower Band Edge Measurement SISO CORE 0**

| | |
|---|---|
| Worst Case Mode: | 802.11n |
| Worst Case Transfer Rate: | MCS0 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 2417MHz |
| Channel: | 2 |




**Plot 7-100. Radiated Restricted Lower Band Edge Measurement SISO CORE 0**

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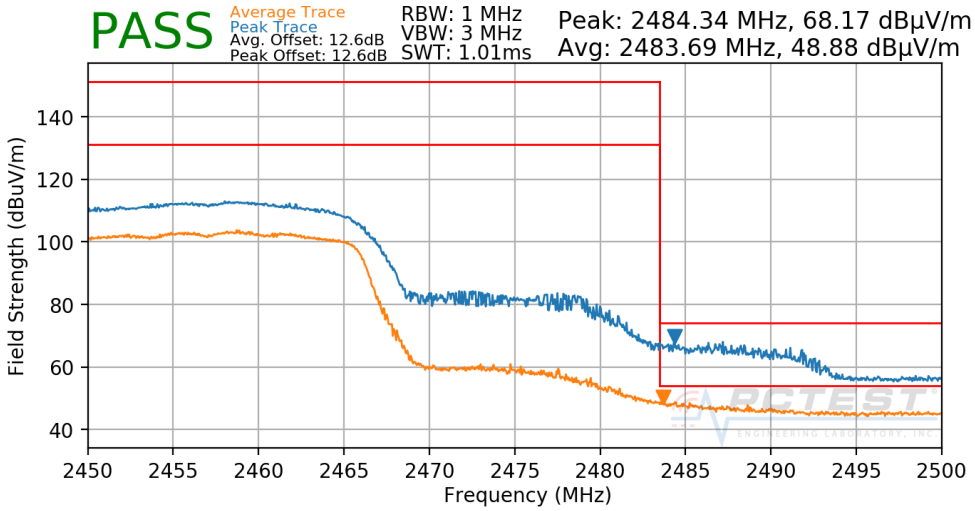
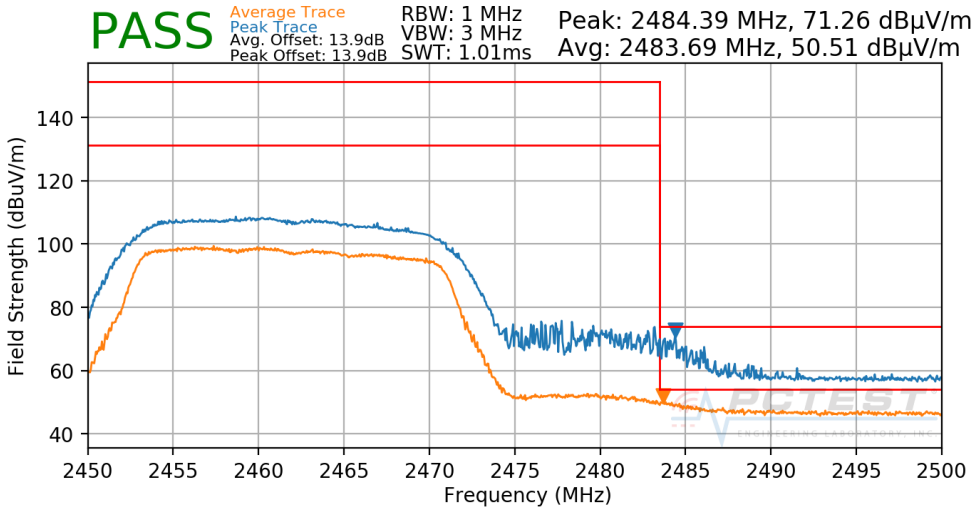
| | |
|---|---|
| Worst Case Mode: | 802.11n |
| Worst Case Transfer Rate: | MCS0 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 2457MHz |
| Channel: | 10 |




**Plot 7-101. Radiated Restricted Upper Band Edge Measurement SISO CORE 0**

| | |
|---|---|
| Worst Case Mode: | 802.11n |
| Worst Case Transfer Rate: | MCS0 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 2462MHz |
| Channel: | 11 |




**Plot 7-102. Radiated Restricted Upper Band Edge Measurement SISO CORE 0**

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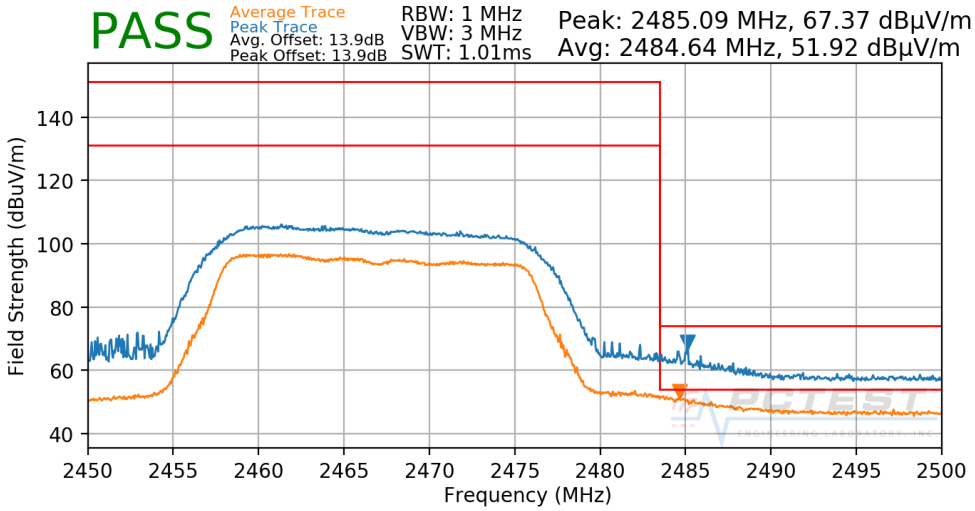
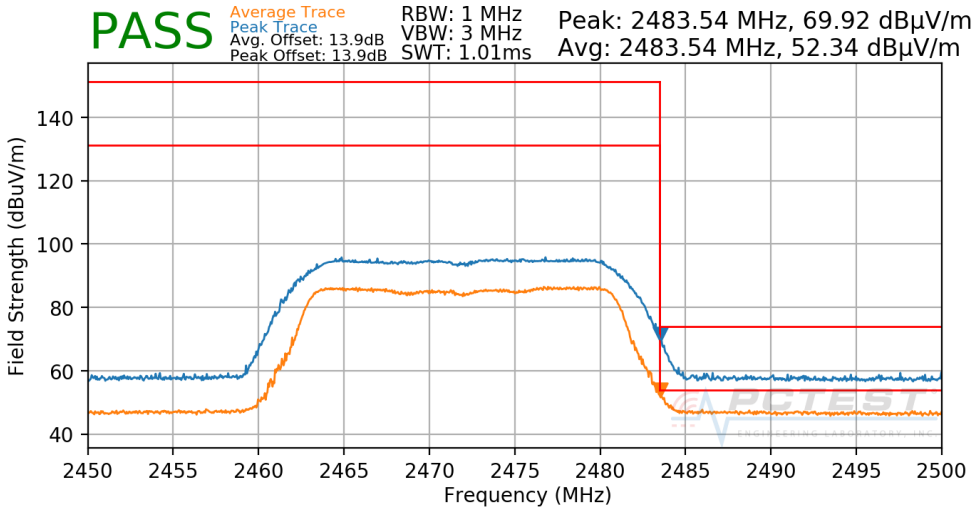
| | |
|---|---|
| Worst Case Mode: | 802.11n |
| Worst Case Transfer Rate: | MCS0 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 2467MHz |
| Channel: | 12 |




**Plot 7-103. Radiated Restricted Upper Band Edge Measurement SISO CORE 0**

| | |
|---|---|
| Worst Case Mode: | 802.11n |
| Worst Case Transfer Rate: | MCS0 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 2472MHz |
| Channel: | 13 |




**Plot 7-104. Radiated Restricted Upper Band Edge Measurement SISO CORE 0**

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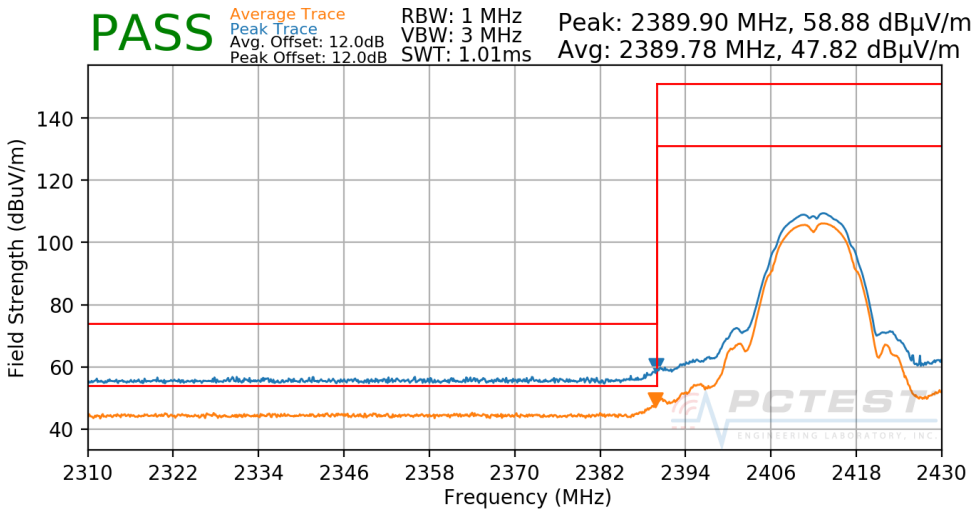
## 7.7.5 SISO Core-1 Radiated Restricted Band Edge Measurements

**§15.205 §15.209; RSS-Gen [8.9]**

The radiated restricted band edge measurements are measured with an EMI test receiver connected to the receive antenna while the EUT is transmitting.

| | |
|---|---|
| Worst Case Mode: | 802.11b |
| Worst Case Transfer Rate: | 1 Mbps |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 2412MHz |
| Channel: | 1 |




**Plot 7-105. Radiated Restricted Lower Band Edge Measurement SISO CORE 1**

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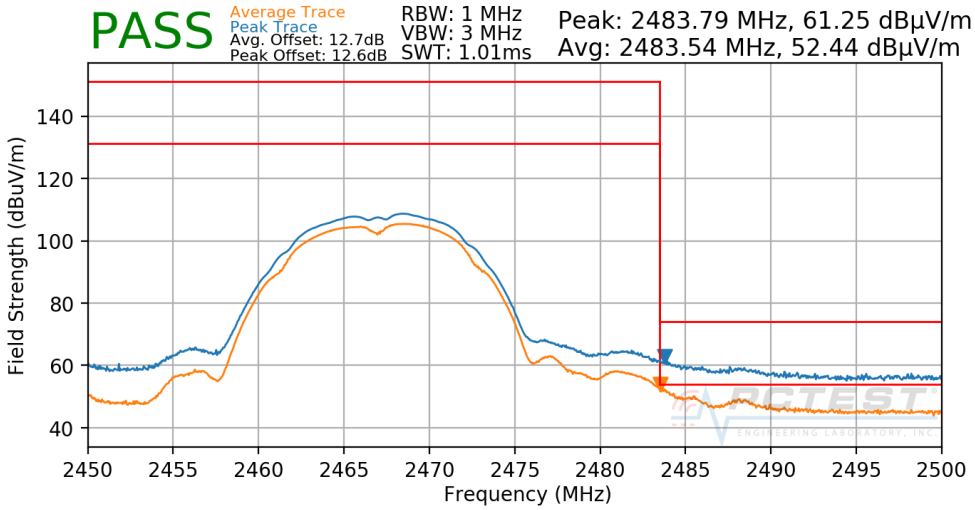
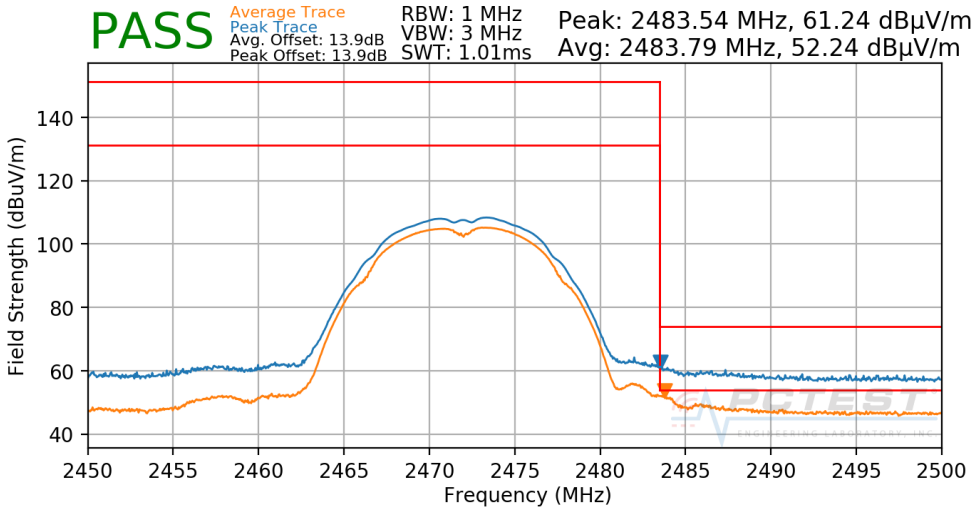
| | |
|---|---|
| Worst Case Mode: | 802.11b |
| Worst Case Transfer Rate: | 1 Mbps |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 2467MHz |
| Channel: | 12 |




**Plot 7-106. Radiated Restricted Upper Band Edge Measurement SISO CORE 1**

| | |
|---|---|
| Worst Case Mode: | 802.11b |
| Worst Case Transfer Rate: | 1 Mbps |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 2472MHz |
| Channel: | 13 |




**Plot 7-107. Radiated Restricted Upper Band Edge Measurement SISO CORE 1**

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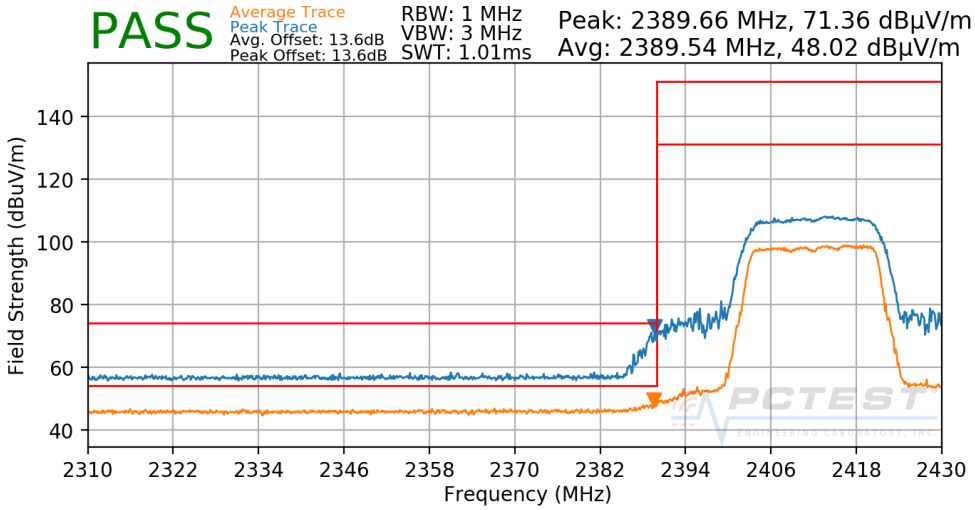
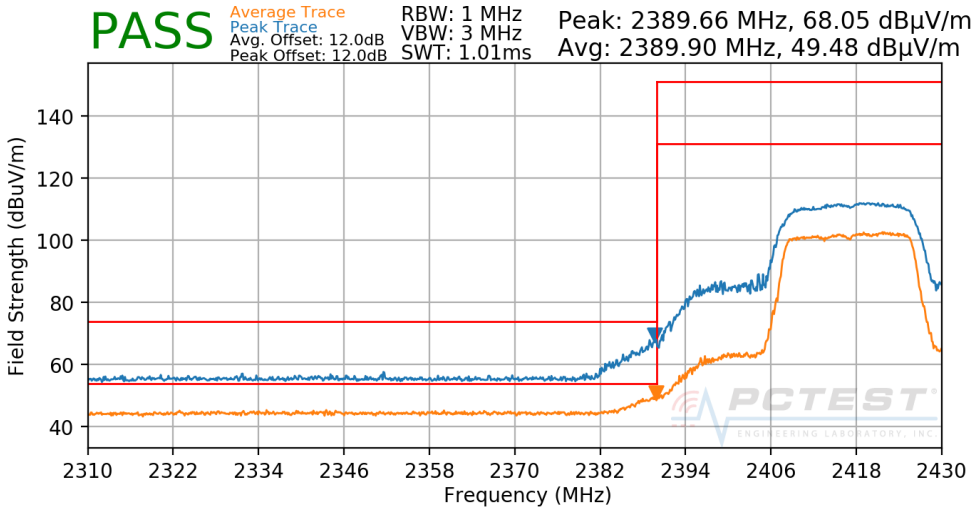
| | |
|---|---|
| Worst Case Mode: | 802.11n |
| Worst Case Transfer Rate: | MCS0 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 2412MHz |
| Channel: | 1 |




**Plot 7-108. Radiated Restricted Lower Band Edge Measurement SISO CORE 1**

| | |
|---|---|
| Worst Case Mode: | 802.11n |
| Worst Case Transfer Rate: | MCS0 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 2417MHz |
| Channel: | 2 |




**Plot 7-109. Radiated Restricted Lower Band Edge Measurement SISO CORE 1**

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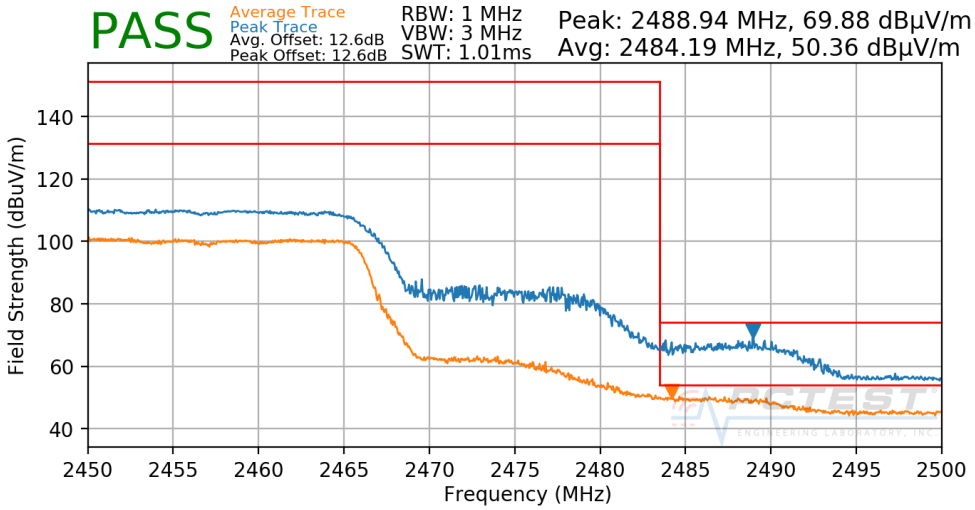
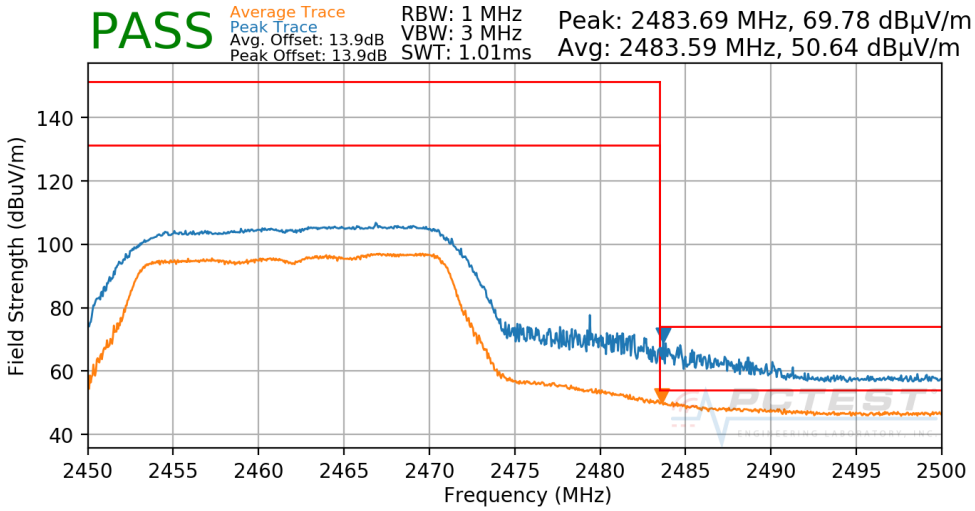
| | |
|---|---|
| Worst Case Mode: | 802.11n |
| Worst Case Transfer Rate: | MCS0 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 2457MHz |
| Channel: | 10 |




**Plot 7-110. Radiated Restricted Upper Band Edge Measurement SISO CORE 1**

| | |
|---|---|
| Worst Case Mode: | 802.11n |
| Worst Case Transfer Rate: | MCS0 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 2462MHz |
| Channel: | 11 |




**Plot 7-111. Radiated Restricted Upper Band Edge Measurement SISO CORE 1**



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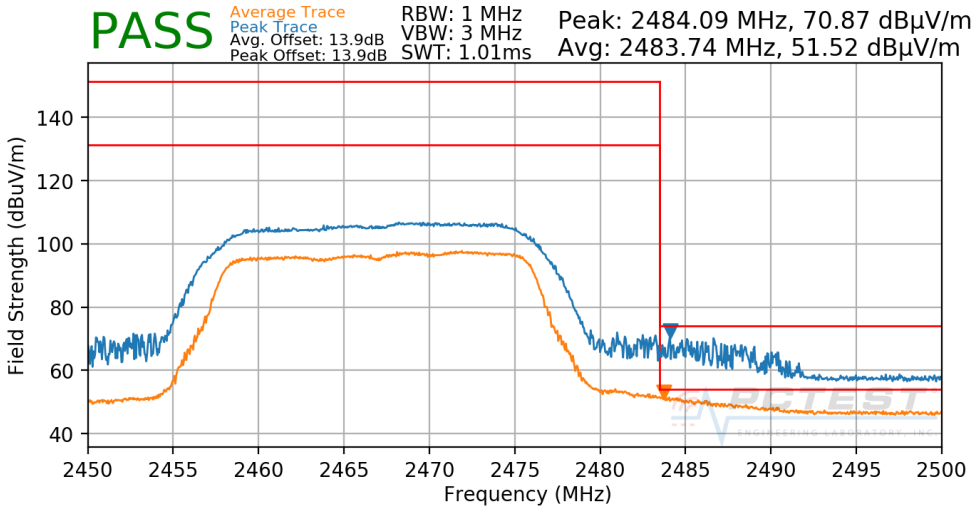
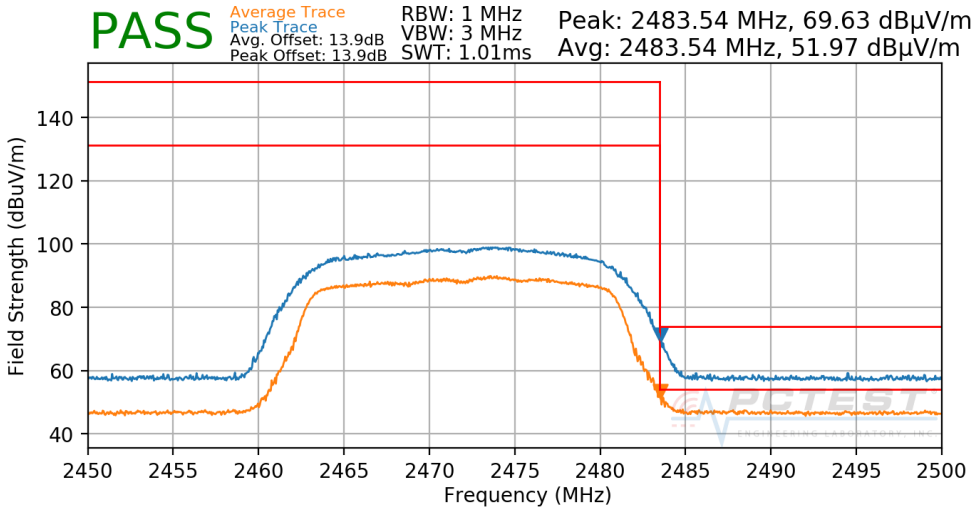
| | |
|---|---|
| Worst Case Mode: | 802.11n |
| Worst Case Transfer Rate: | MCS0 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 2467MHz |
| Channel: | 12 |




**Plot 7-112. Radiated Restricted Upper Band Edge Measurement SISO CORE 1**

| | |
|---|---|
| Worst Case Mode: | 802.11n |
| Worst Case Transfer Rate: | MCS0 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 2472MHz |
| Channel: | 13 |




**Plot 7-113. Radiated Restricted Upper Band Edge Measurement SISO CORE 1**

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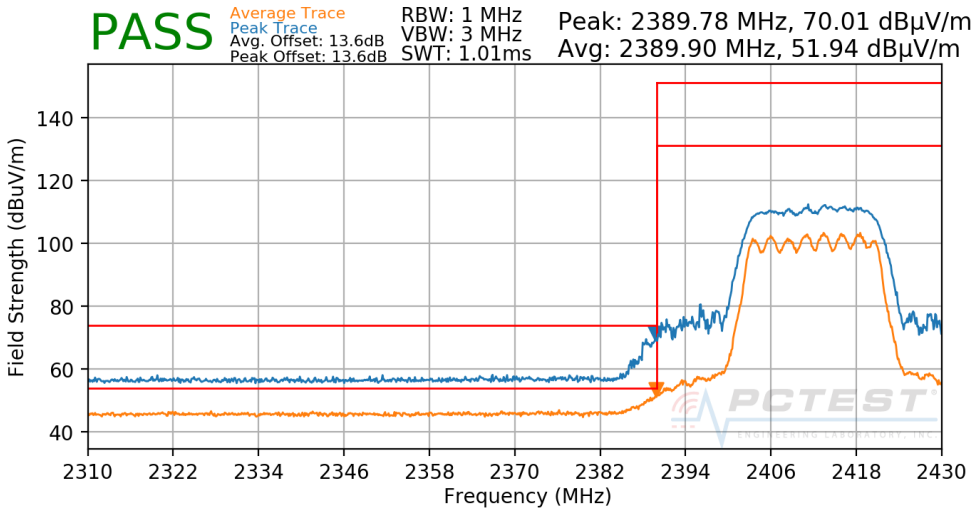
## 7.7.6 CDD Radiated Restricted Band Edge Measurements

**§15.205 §15.209; RSS-Gen [8.9]**

The radiated restricted band edge measurements are measured with an EMI test receiver connected to the receive antenna while the EUT is transmitting.

| | |
|---|---|
| Worst Case Mode: | 802.11n |
| Worst Case Transfer Rate: | MCS0 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 2412MHz |
| Channel: | 1 |




**Plot 7-114. Radiated Restricted Lower Band Edge Measurement CDD**

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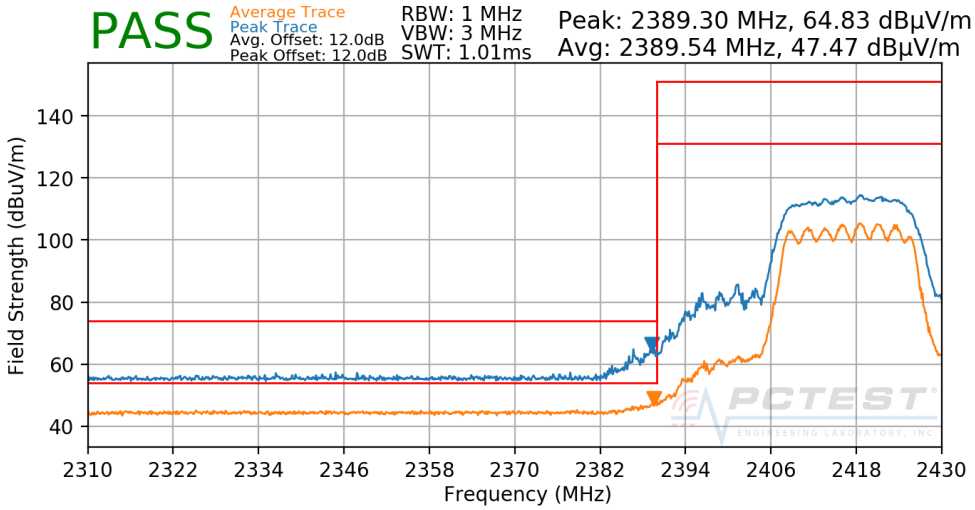
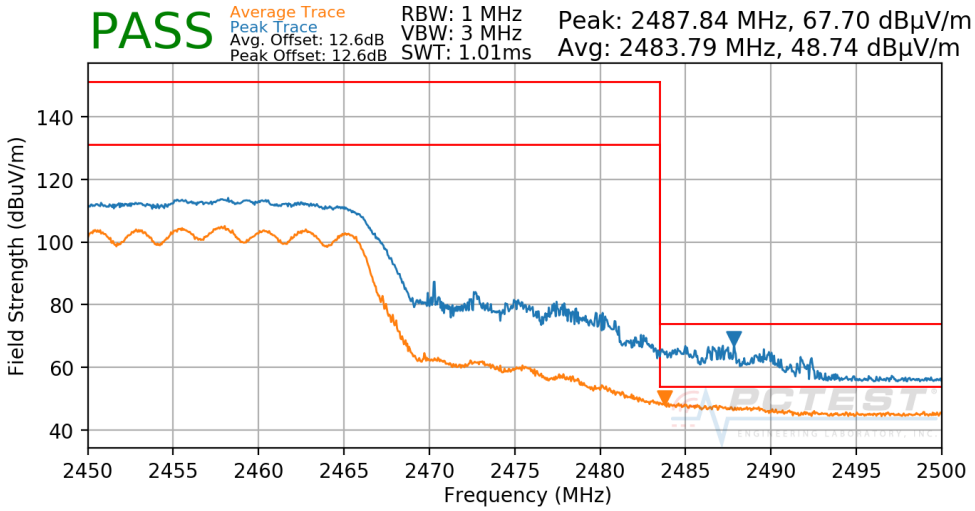
| | |
|---|---|
| Worst Case Mode: | 802.11n |
| Worst Case Transfer Rate: | MCS0 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 2417MHz |
| Channel: | 2 |




**Plot 7-115. Radiated Restricted Lower Band Edge Measurement CDD**

| | |
|---|---|
| Worst Case Mode: | 802.11n |
| Worst Case Transfer Rate: | MCS0 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 2457MHz |
| Channel: | 10 |




**Plot 7-116. Radiated Restricted Upper Band Edge Measurement CDD**



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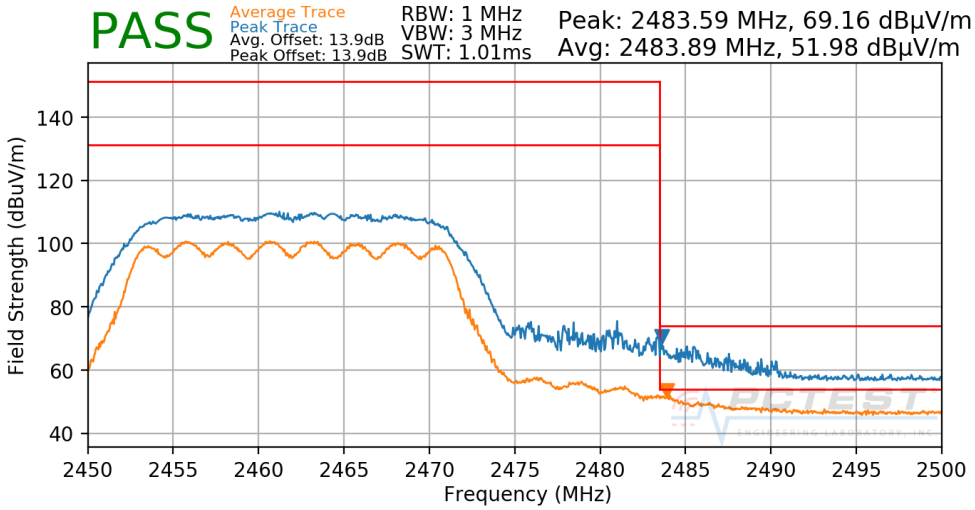
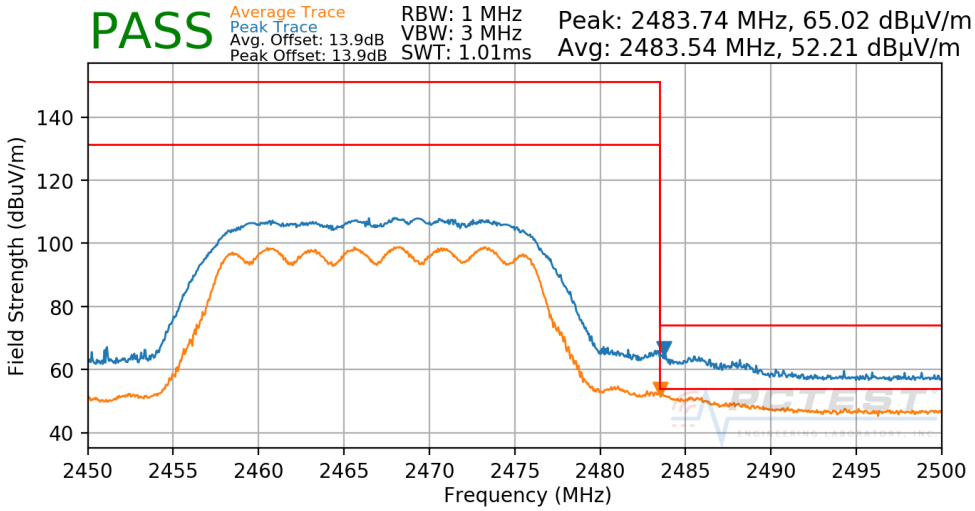
| | |
|---|---|
| Worst Case Mode: | 802.11n |
| Worst Case Transfer Rate: | MCS0 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 2462MHz |
| Channel: | 11 |




**Plot 7-117. Radiated Restricted Upper Band Edge Measurement CDD**

| | |
|---|---|
| Worst Case Mode: | 802.11n |
| Worst Case Transfer Rate: | MCS0 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 2467MHz |
| Channel: | 12 |




**Plot 7-118. Radiated Restricted Upper Band Edge Measurement CDD**

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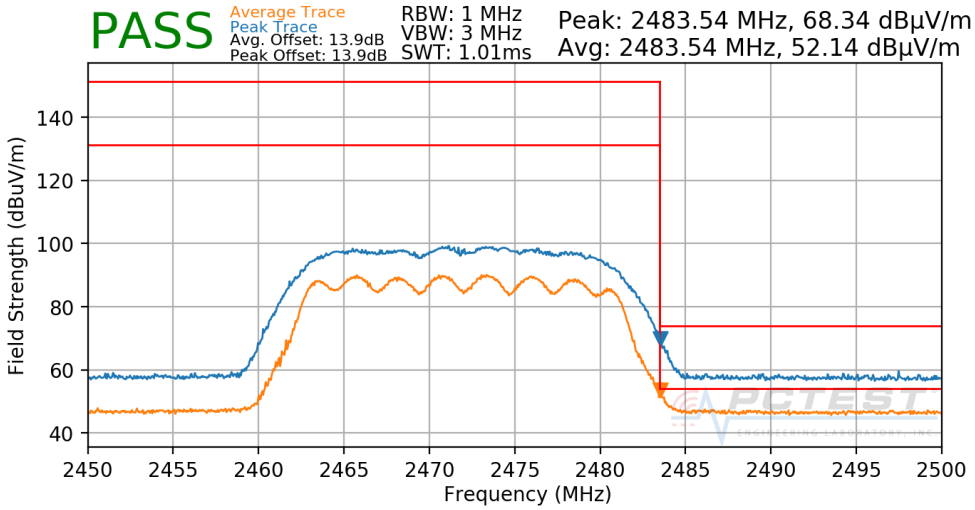
| | |
|---|---|
| Worst Case Mode: | 802.11n |
| Worst Case Transfer Rate: | MCS0 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 2472MHz |
| Channel: | 13 |




**Plot 7-119. Radiated Restricted Upper Band Edge Measurement CDD**

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## 7.8 Radiated Spurious Emissions Measurements – 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 7-25 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 7-25. 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




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## Test Setup

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

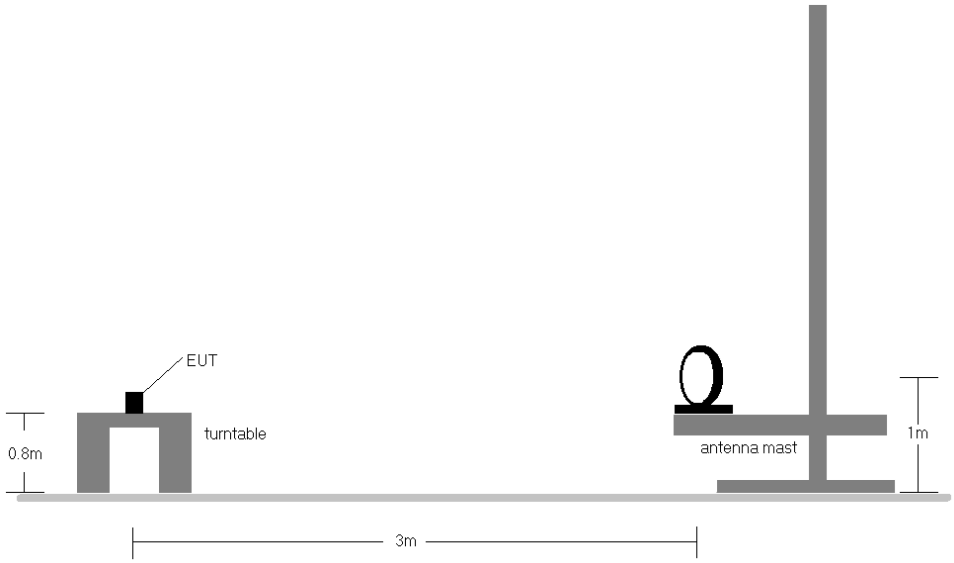


**Figure 7-7. Radiated Test Setup < 30Mhz**

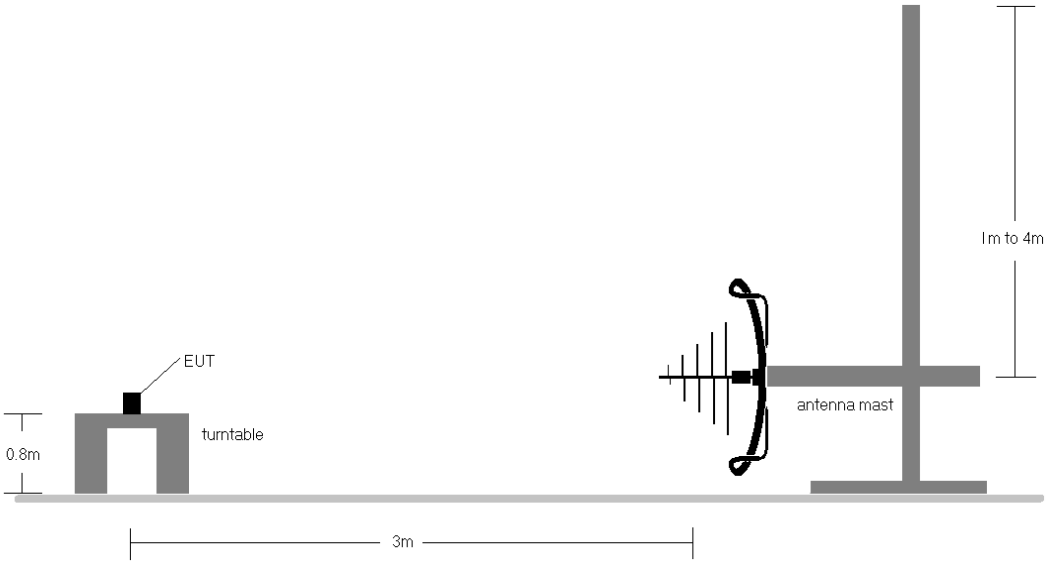


**Figure 7-8. Radiated Test Setup < 1GHz**




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## Test Notes

1. All emissions lying in restricted bands specified in §15.205 and RSS-Gen(8.10) are below the limit shown in Table 7-25.
2. The broadband receive antenna is manipulated through vertical and horizontal polarizations during the tests. The EUT is manipulated through three orthogonal planes.
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. The worst-case emissions are reported however emissions whose levels were not within 20dB of the respective limits were not reported.
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 configs were investigated and only the worst case is reported.



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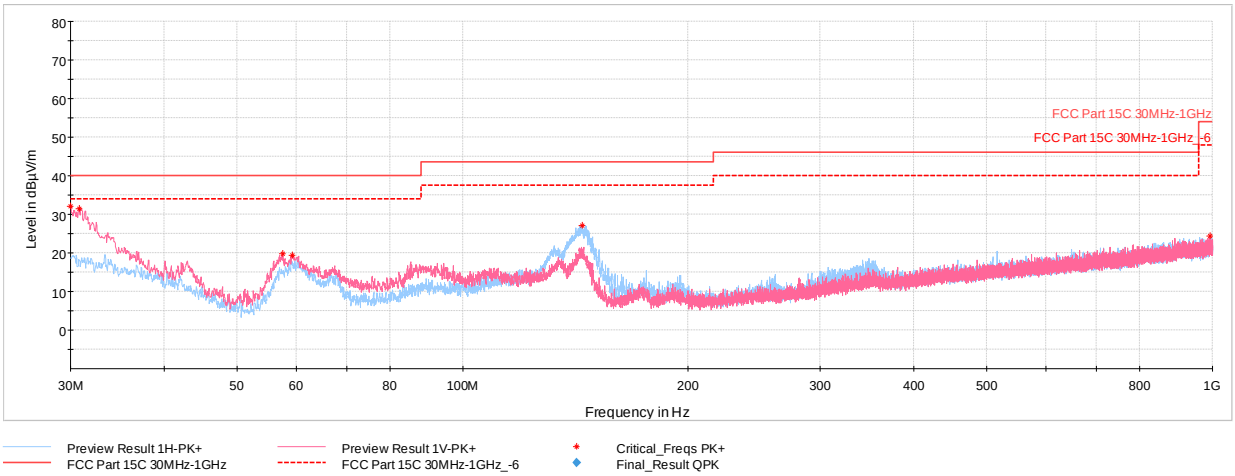
# CDD Radiated Spurious Emissions Measurements (Below 1GHz)

**§15.209; RSS-Gen [8.9]**




**Plot 7-120. Radiated Spurious Plot below 1GHz CDD Ch.6, with AC/DC Adapter**

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Field Strength [dBµV/m] | Limit [dBµV/m] | Margin [dB] |
|---|---|---|---|---|---|---|---|---|---|
| 30.00 | Max-Peak | V | 100 | 15 | -66.08 | -8.89 | 32.03 | 40.00 | -7.97 |
| 30.83 | Max-Peak | V | 100 | 15 | -66.30 | -9.26 | 31.44 | 40.00 | -8.56 |
| 57.55 | Max-Peak | V | 250 | 31 | -64.04 | -23.10 | 19.86 | 40.00 | -20.14 |
| 59.25 | Max-Peak | V | 250 | 218 | -65.13 | -22.52 | 19.35 | 40.00 | -20.65 |
| 144.46 | Max-Peak | H | 250 | 263 | -60.88 | -19.02 | 27.10 | 43.52 | -16.42 |
| 993.65 | Max-Peak | V | 250 | 249 | -79.19 | -3.50 | 24.31 | 53.98 | -29.66 |

**Table 7-26. Radiated Spurious Emissions below 1GHz CDD Ch.6, with AC/DC Adapter**



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## 7.9 AC Line-Conducted Test Data

**§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 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 7-27. Conducted Limits**

*Decreases with the logarithm of the frequency.

**Test Procedures Used**

ANSI C63.10-2013, Section 6.2

**Test Settings**

**Quasi-Peak Field Strength 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 Field Strength Measurements**

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




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## Test Setup

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

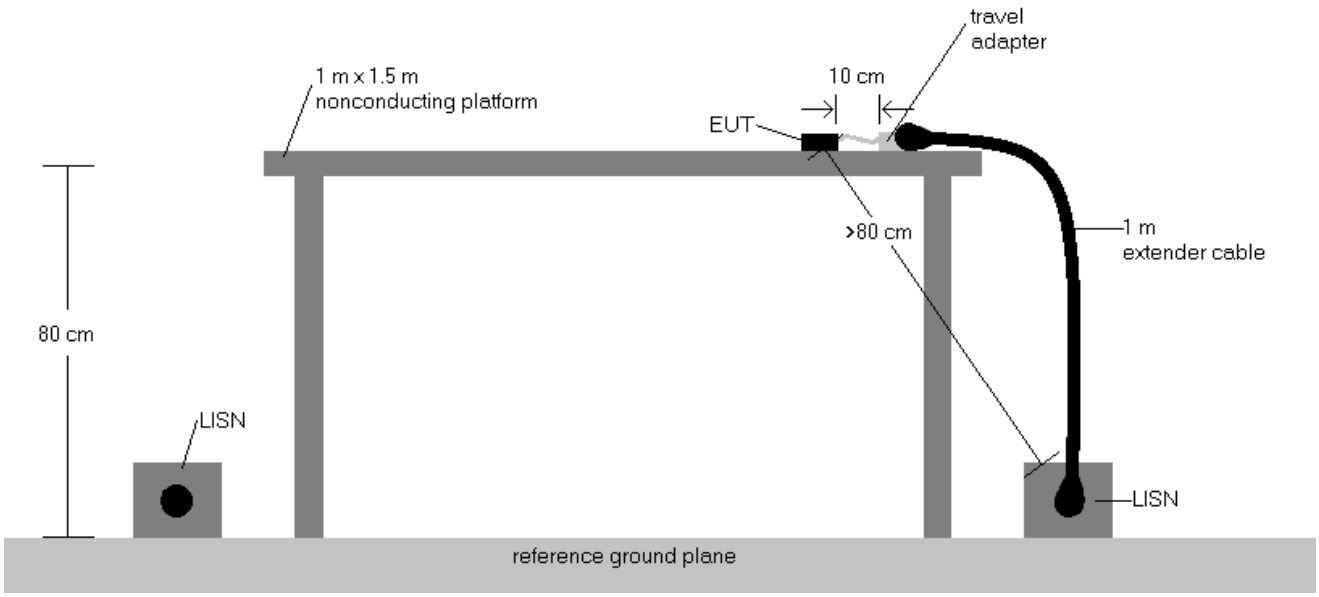


**Figure 7-9. Test Instrument & Measurement Setup**

## Test Notes

1. All modes of operation were investigated and the worst-case emissions are reported using mid channel. The emissions found were not affected by the choice of channel used during testing.
2. The limit for an intentional radiator from 150kHz to 30MHz are specified in Part 15.207 and RSS-Gen(8.8).
3. Corr. (dB) = Cable loss (dB) + LISN insertion factor (dB)
4. QP/AV Level (dBμV) = QP/AV Analyzer/Receiver Level (dBμV) + Corr. (dB)
5. Margin (dB) = QP/AV Limit (dBμV) - QP/AV Level (dBμV)
6. The traces on the plots were measured with a quasi-peak and average detectors.
7. Deviations to the Specifications: None.



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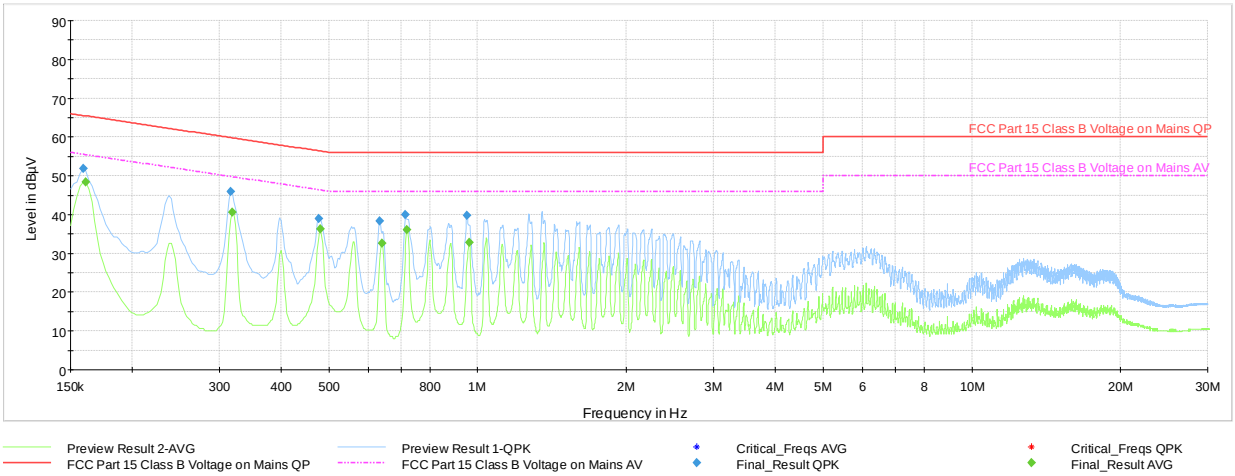


**Plot 7-121. AC Line Conducted Plot with 802.11n CDD Ch.6 (L1, with Laptop)**

| Frequency [MHz] | Process State | QuasiPeak [dBµV] | Average [dBµV] | Limit [dBµV] | Margin [dB] | Line | PE |
|---|---|---|---|---|---|---|---|
| 0.159 | FINAL | 51.8 | — | 65.52 | -13.70 | L1 | GND |
| 0.161 | FINAL | — | 48.31 | 55.40 | -7.09 | L1 | GND |
| 0.317 | FINAL | 45.9 | — | 59.80 | -13.87 | L1 | GND |
| 0.319 | FINAL | — | 40.65 | 49.74 | -9.09 | L1 | GND |
| 0.476 | FINAL | 38.9 | — | 56.40 | -17.52 | L1 | GND |
| 0.481 | FINAL | — | 36.22 | 46.33 | -10.11 | L1 | GND |
| 0.634 | FINAL | 38.3 | — | 56.00 | -17.71 | L1 | GND |
| 0.641 | FINAL | — | 32.64 | 46.00 | -13.36 | L1 | GND |
| 0.715 | FINAL | 40.1 | — | 56.00 | -15.94 | L1 | GND |
| 0.719 | FINAL | — | 36.00 | 46.00 | -10.00 | L1 | GND |
| 0.951 | FINAL | 39.7 | — | 56.00 | -16.28 | L1 | GND |
| 0.962 | FINAL | — | 32.82 | 46.00 | -13.18 | L1 | GND |

**Table 7-28. AC Line Conducted Measurements with 802.11n CDD Ch.6 (L1, with Laptop)**




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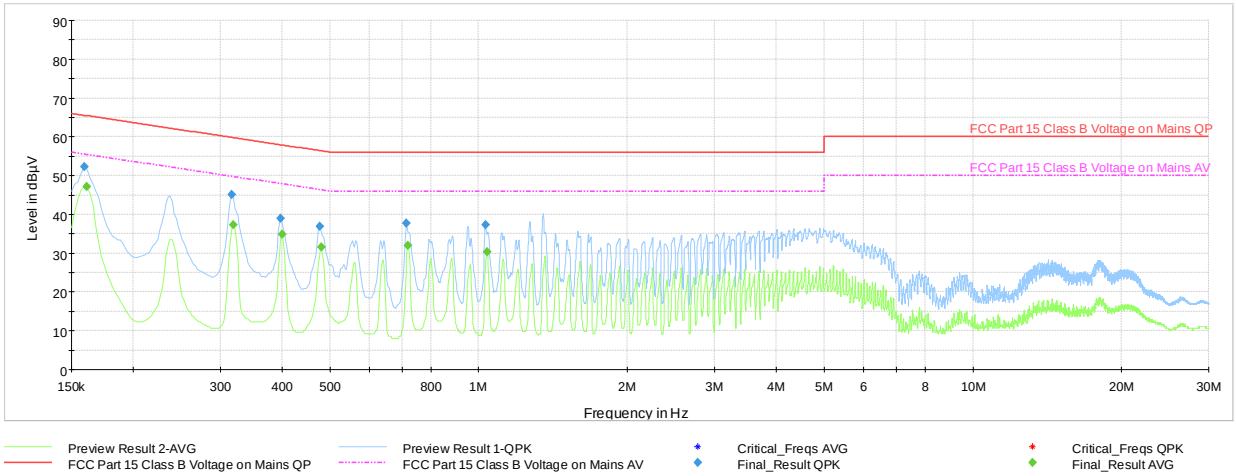


**Plot 7-122. AC Line Conducted Plot with 802.11n CDD Ch.6 (N, with Laptop)**

| Frequency [MHz] | Process State | QuasiPeak [dBµV] | Average [dBµV] | Limit [dBµV] | Margin [dB] | Line | PE |
|---|---|---|---|---|---|---|---|
| 0.159 | FINAL | 52.2 | — | 65.52 | -13.32 | N | GND |
| 0.161 | FINAL | — | 47.20 | 55.40 | -8.20 | N | GND |
| 0.317 | FINAL | 45.0 | — | 59.80 | -14.80 | N | GND |
| 0.319 | FINAL | — | 37.38 | 49.74 | -12.36 | N | GND |
| 0.398 | FINAL | 38.9 | — | 57.91 | -18.97 | N | GND |
| 0.400 | FINAL | — | 34.89 | 47.86 | -12.97 | N | GND |
| 0.476 | FINAL | 36.8 | — | 56.40 | -19.56 | N | GND |
| 0.481 | FINAL | — | 31.48 | 46.33 | -14.85 | N | GND |
| 0.715 | FINAL | 37.6 | — | 56.00 | -18.37 | N | GND |
| 0.719 | FINAL | — | 31.90 | 46.00 | -14.10 | N | GND |
| 1.032 | FINAL | 37.2 | — | 56.00 | -18.78 | N | GND |
| 1.041 | FINAL | — | 30.25 | 46.00 | -15.75 | N | GND |

**Table 7-29. AC Line Conducted Measurements with 802.11n CDD Ch.6 (N, with Laptop)**




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# 8.0 CONCLUSION

The data collected relate only the item(s) tested and show that the **Apple Tablet Device FCC ID: BCGA2200** is in compliance with Part 15 Subpart C (15.247) of the FCC Rules and RSS-247 of the Innovation, Science and Economic Development Canada Rules.




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