PCTEST ENGINEERING LABORATORY, INC.
7185 Oakland Mills Road, Columbia, MD 21046 USA
Tel. 410.290.6652 / Fax 410.290.6654
http://www.pctestlab.com

# MEASUREMENT REPORT
## FCC Part 15.407 UNII 802.11 a/b/g/n/ac

**Applicant Name:**
LG Electronics MobileComm U.S.A
1000 Sylvan Avenue
Englewood Cliffs, NJ 07632
United States

**Date of Testing:**
8/8 - 8/25/2016
**Test Site/Location:**
PCTEST Lab, Columbia, MD, USA
**Test Report Serial No.:**
0Y1608121376-R1.ZNF

| | |
|---|---|
| **FCC ID:** | **ZNFVS995** |
| **APPLICANT:** | **LG Electronics MobileComm U.S.A** |

| | |
|---|---|
| **Application Type:** | Class II Permissive Change |
| **Model(s):** | LG-VS995, LGVS995, VS995, LG-US996, LGUS996, US996, LG-H990T, LGH990T, H990T, LG-VS995S, LGVS995S, VS995S |
| **EUT Type:** | Portable Handset |
| **FCC Classification:** | Unlicensed National Information Infrastructure (UNII) |
| **FCC Rule Part(s):** | Part 15.407 |
| **Test Procedure(s):** | KDB 789033 v01r03, KDB 662911 D01 v02r01 |
| **Class II Permissive Change:** | Please see FCC change document |

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in KDB 789033 v01r03. Test results reported herein relate only to the item(s) tested.

This revised Test Report (S/N: 0Y1608121376-R1.ZNF) supersedes and replaces the previously issued test report (S/N: 0Y1608121376.ZNF) on the same subject device for the same type of testing as indicated. Please discard or destroy the previously issued test report(s) and dispose of it accordingly.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Randy Ortanez
President

ACCREDITED
TESTING CERT#2041.01



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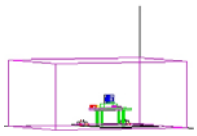
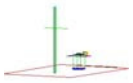


# MEASUREMENT REPORT
## FCC Part 15.407



## § 2.1033 General Information

| | |
|---|---|
| **APPLICANT:** | LG Electronics MobileComm U.S.A |
| **APPLICANT ADDRESS:** | 1000 Sylvan Avenue |
| | Englewood Cliffs, NJ 07632, United States |
| **TEST SITE:** | PCTEST ENGINEERING LABORATORY, INC. |
| **TEST SITE ADDRESS:** | 7185 Oakland Mills Road, Columbia, MD 21046 USA |
| **FCC RULE PART(S):** | Part 15.407 |
| **BASE MODEL:** | LG-VS995, LGVS995, VS995, LG-US996, LGUS996, US996, LG-H990T, LGH990T, H990T, LG-VS995S, LGVS995S, VS995S |
| **FCC ID:** | ZNFVS995 |
| **FCC CLASSIFICATION:** | Unlicensed National Information Infrastructure (UNII) |
| **Test Device Serial No.:** | 11403 ☐ Production ☒ Pre-Production ☐ Engineering |
| **DATE(S) OF TEST:** | 8/8 - 8/25/2016 |
| **TEST REPORT S/N:** | 0Y1608121376-R1.ZNF |

## Test Facility / Accreditations

**Measurements were performed at PCTEST Engineering Lab located in Columbia, MD 21046, U.S.A.**

- PCTEST facility is an FCC registered (PCTEST Reg. No. 159966) test facility with the site description report on file and has met all the requirements specified in Section 2.948 of the FCC Rules and Industry Canada (2451B-1).
- PCTEST Lab is accredited to ISO 17025 by U.S. National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP Lab code: 100431-0) in EMC, FCC and Telecommunications.
- PCTEST Lab is accredited to ISO 17025-2005 by the American Association for Laboratory Accreditation (A2LA) in Specific Absorption Rate (SAR) testing, Hearing Aid Compatibility (HAC) testing, CTIA Test Plans, and wireless testing for FCC and Industry Canada Rules.

- PCTEST Lab is a recognized U.S. Conformity Assessment Body (CAB) in EMC and R&TTE (n.b. 0982) under the U.S.-EU Mutual Recognition Agreement (MRA).
- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC Guide 65 by the American National Standards Institute (ANSI) in all scopes of FCC Rules and Industry Canada Standards (RSS).
- PCTEST facility is an IC registered (2451B-1) test laboratory with the site description on file at Industry Canada.
- PCTEST is a CTIA Authorized Test Laboratory (CATL) for AMPS, CDMA, and EvDO wireless devices and for Over-the-Air (OTA) Antenna Performance testing for AMPS, CDMA, GSM, GPRS, EGPRS, UMTS (W-CDMA), CDMA 1xEVDO, and CDMA 1xRTT.



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# 1.0 INTRODUCTION

## 1.1 Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Industry Canada Certification and Engineering Bureau.

## 1.2 PCTEST Test Location

The map below shows the location of the PCTEST LABORATORY, its proximity to the FCC Laboratory, the Columbia vicinity, the Baltimore-Washington Internt'l (BWI) airport, the city of Baltimore and the Washington, DC area. (*See Figure 1-1*).

These measurement tests were conducted at the PCTEST Engineering Laboratory, Inc. facility located at 7185 Oakland Mills Road, Columbia, MD 21046. The site coordinates are 39º 10'23" N latitude and 76º 49'50" W longitude. The facility is 0.4 miles North of the FCC laboratory, and the ambient signal and ambient signal strength are approximately equal to those of the FCC laboratory. The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4-2014 on January 22, 2015.

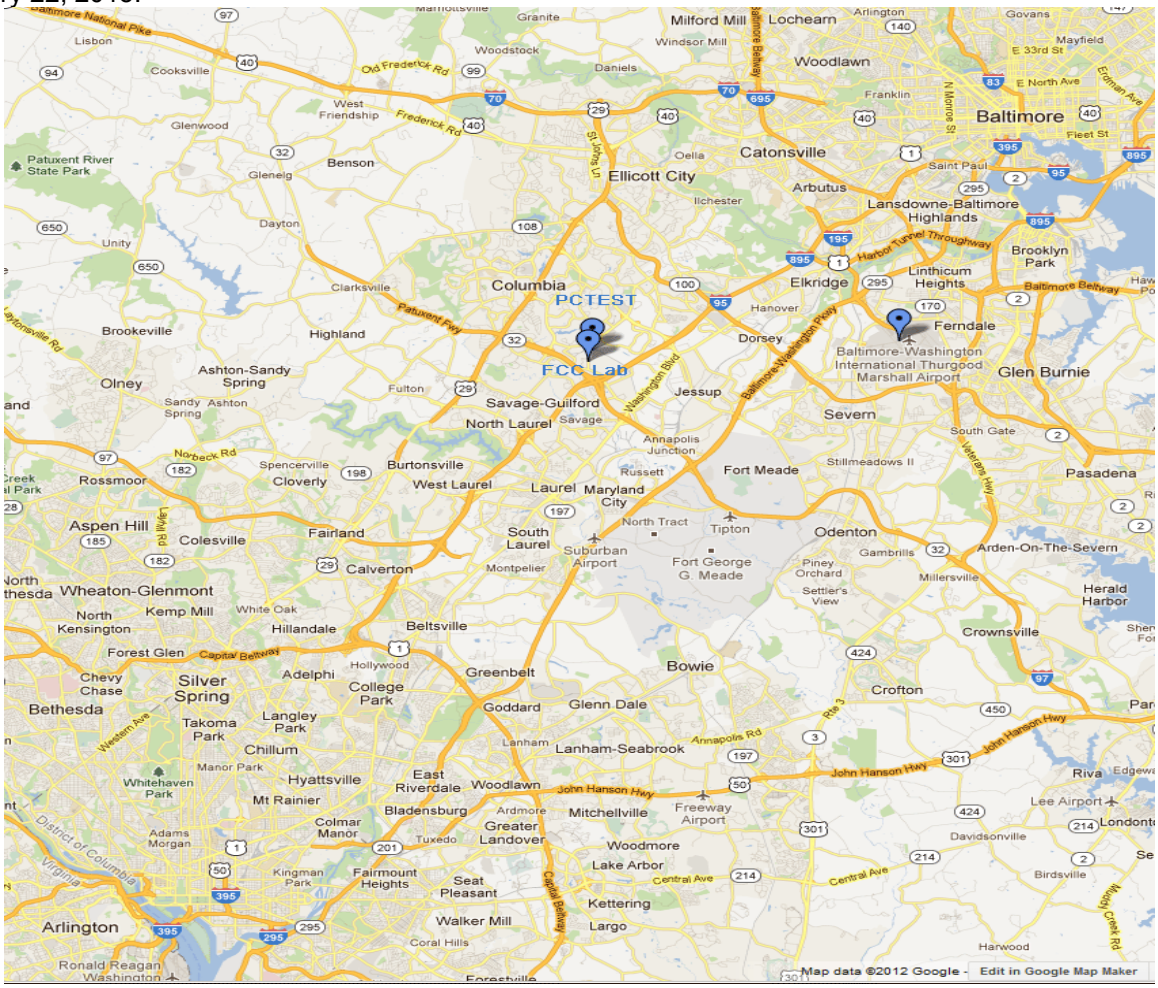


**Figure 1-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area**



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# 2.0 PRODUCT INFORMATION

## 2.1 Equipment Description

The Equipment Under Test (EUT) is the **LGE Portable Handset FCC ID: ZNFVS995**. The test data contained in this report pertains only to the emissions due to the EUT's UNII transmitter.

## 2.2 Device Capabilities

This device contains the following capabilities:

850/1900 CDMA (BC0, BC1), 850/1900 GSM/GPRS/EDGE, 850/1700/1900 WCDMA/HSPA, Multi-band LTE, 802.11b/g/n/ac WLAN, 802.11a/n/ac UNII, Bluetooth (1x, EDR, LE), NFC

| Band 1 | | Band 2A | | Band 2C | | Band 3 | |
|---|---|---|---|---|---|---|---|
| Ch. | Frequency (MHz) | Ch. | Frequency (MHz) | Ch. | Frequency (MHz) | Ch. | Frequency (MHz) |
| 36 | 5180 | 52 | 5260 | 100 | 5500 | 149 | 5745 |
| : | : | : | : | : | : | : | : |
| 42 | 5210 | 56 | 5280 | 116 | 5580 | 157 | 5785 |
| : | : | : | : | : | : | : | : |
| 48 | 5240 | 64 | 5320 | 144 | 5720 | 165 | 5825 |

**Table 2-1. 802.11a / 802.11n / 802.11ac (20MHz) Frequency / Channel Operations**

| Band 1 | | Band 2A | | Band 2C | | Band 3 | |
|---|---|---|---|---|---|---|---|
| Ch. | Frequency (MHz) | Ch. | Frequency (MHz) | Ch. | Frequency (MHz) | Ch. | Frequency (MHz) |
| 38 | 5190 | 54 | 5270 | 102 | 5510 | 151 | 5755 |
| : | : | : | : | : | : | : | : |
| 46 | 5230 | 62 | 5310 | 118 | 5590 | | |
| | | | | : | : | | |
| | | | | 142 | 5710 | 159 | 5795 |

**Table 2-2. 802.11n / 802.11ac (40MHz BW) Frequency / Channel Operations**

| Band 1 | | Band 2A | | Band 2C | | Band 3 | |
|---|---|---|---|---|---|---|---|
| Ch. | Frequency (MHz) | Ch. | Frequency (MHz) | Ch. | Frequency (MHz) | Ch. | Frequency (MHz) |
| 42 | 5210 | 58 | 5290 | 106 | 5530 | 155 | 5775 |
| | | | | : | : | | |
| | | | | 138 | 5690 | | |

**Table 2-3. 802.11ac (80MHz BW) Frequency / Channel Operations**



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**Notes:**

1. 5GHz NII operation is possible in 20MHz, and 40MHz, and 80MHz channel bandwidths. The maximum achievable duty cycles for all modes were determined based on measurements performed on a spectrum analyzer in zero-span mode with RBW = 8MHz, VBW = 50MHz, and detector = peak per the guidance of Section B)2)b) of KDB 789033 v01r03. The RBW and VBW were both greater than 50/T, where T is the minimum transmission duration, and the number of sweep points across T was greater than 100. The duty cycles are as follows:

| Maximum Achievable Duty Cycles | | | | |
|---|---|---|---|---|
| 802.11 Mode/Band | | Duty Cycle [%] | | |
| | | ANT1 | ANT2 | MIMO |
| 5GHz | a | 99.4 | 99.4 | N/A |
| | n (HT20) | 99.3 | 99.3 | 99.3 |
| | ac (HT20) | 99.3 | 99.3 | 99.3 |
| | n (HT40) | 99.3 | 99.3 | 99.2 |
| | ac (HT40) | 99.3 | 99.3 | 99.2 |
| | ac (HT80) | 98.4 | 98.4 | 98.5 |

2. The device employs MIMO technology. Below are the possible configurations.

| WiFi Configurations | | SISO | | SDM | | CDD | |
|---|---|---|---|---|---|---|---|
| | | Primary Antenna | Secondary Antenna | Primary Antenna | Secondary Antenna | Primary Antenna | Secondary Antenna |
| 5GHz | 11a | ✓ | × | × | × | ✓ | ✓ |
| | 11n/ac (20MHz) | ✓ | × | ✓ | ✓ | ✓ | ✓ |
| | 11n/ac (40MHz) | ✓ | × | ✓ | ✓ | ✓ | ✓ |
| | 11n/ac (80MHz) | ✓ | × | ✓ | ✓ | ✓ | ✓ |

**Table 2-4. Frequency / Channel Operations**

✓= Support ; × = NOT Support
**SISO** = Single Input Single Output
**SDM** = Spatial Diversity Multiplexing – MIMO function
**CDD –** Cyclic Delay Diversity – 2Tx Function

Data Rate(s) Tested: 6, 9, 12, 18, 24, 36, 48, 54Mbps (802.11a)

6.5/7.2, 13/14.4, 19.5/21.7, 26/28.9, 39/43.3, 52/57.8, 58.5/65, 65/72.2 (n – 20MHz)

13.5/15, 27/30, 40.5/45, 54/60, 81/90, 108/120, 121.5/135, 135/150 (n – 40MHz BW)

29.3/32.5, 58.5/65, 87.8/97.5, 117/130, 175.5/195, 234/260, 263.3/292.5, 292.5/325, 351/390, 390/433.3 (ac – 80MHz BW)

13/14.4, 26.28.9, 39/43.3, 52/57.8, 78/86.7, 104/115.6, 117/130, 130/144.4MBps (MIMO n/ac – 20MHz) 156/173Mbps (MIMO ac – 20MHz)

27/30, 54/60, 81/90, 108/120, 162/180, 216/240, 243,270, 270/300Mbps (MIMO n/ac – 40MHz) 324/360, 360/400Mbps (MIMO ac – 40MHz)

58.5/65, 117/130, 175.5/195, 234/260, 351/390, 468/520, 526.5/585, 585/650, 702/780, 780/866.7Mbps (MIMO ac – 80MHz)


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## 2.3 Test Configuration

The LGE Portable Handset FCC ID: ZNFVS995 was tested per the guidance of KDB 789033 v01r03. ANSI C63.10-2013 was used to reference the appropriate EUT setup for radiated spurious emissions testing. See Section 3.2 for radiated emissions test setups.

## 2.4 EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and/or no modifications were made during testing.


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# 3.0 DESCRIPTION OF TESTS

## 3.1 Evaluation Procedure

The measurement procedures described in the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices (ANSI C63.10-2013) and the guidance provided in KDB 789033 v01r03 were used in the measurement of **LGE Portable Handset FCC ID: ZNFVS995.**

**Deviation from measurement procedure……..…….....None**

## 3.2 Radiated Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. The test site inside the chamber is a 6m x 5.2m elliptical, obstruction-free area in accordance with Figure 5.7 of Clause 5 in ANSI C63.4-2014. A raised turntable is used for radiated measurement. It is a continuously rotatable, remote-controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. Absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections for measurements above 1GHz. A 72.4cm high PVC support structure is placed on top of the turntable. A 3" (~7.6cm) sheet of high density polystyrene is used as the table top and is placed on top of the PVC supports to bring the total height of the table to 80cm. For measurements above 1GHz, a high density expanded polystyrene block is placed on top of the test table to bring the total table height to 1.5m.

For all measurements, the spectrum was scanned through all EUT azimuths and from 1 to 4 meter receive antenna height using a broadband antenna from 30MHz up to the upper frequency shown in 15.33(b)(1) depending on the highest frequency generated or used in the device or on which the device operates or tunes. For frequencies above 1GHz, linearly polarized double ridge horn antennas were used. For frequencies below 30MHz, a calibrated loop antenna was used. When exploratory measurements were necessary, they were performed at 1 meter test distance inside the semi-anechoic chamber using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequencies and modes producing the maximum emissions. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The test set-up was placed on top of the 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Appropriate precaution was taken to ensure that all emissions from the EUT were maximized and investigated. The system configuration, mode of operation, turntable azimuth, and receive antenna height was noted for each frequency found.

Final measurements were made in the semi-anechoic chamber using calibrated, linearly polarized broadband and horn antennas. The test setup was configured to the setup that produced the worst case emissions. The spectrum analyzer was set to investigate all frequencies required for testing to compare the highest radiated disturbances with respect to the specified limits. The turntable containing the EUT was rotated through 360 degrees and the height of the receive antenna was varied 1 to 4 meters and stopped at the azimuth and height producing the maximum emission. Each emission was maximized by changing the orientation of the EUT through three orthogonal planes and changing the polarity of the receive antenna, whichever produced the worst-case emissions.

## 3.3 Environmental Conditions

The temperature is controlled within range of 15ºC to 35ºC. The relative humidity is controlled within range of 10% to 75%. The atmospheric pressure is monitored within the range 86-106kPa (860-1060mbar).


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# 4.0 ANTENNA REQUIREMENTS

**Excerpt from §15.203 of the FCC Rules/Regulations:**
"An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section."

- The antennas of the Portable Handset are **permanently attached.**
- There are no provisions for connection to an external antenna.

**Conclusion:**

The **LGE Portable Handset FCC ID: ZNFVS995** unit complies with the requirement of §15.203.


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# 5.0 MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.10-2013. All measurement uncertainty values are shown with a coverage factor of k = 2 to indicate a 95% level of confidence. The measurement data shown herein meets or exceeds the $U_{CISPR}$ measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

| Contribution | Expanded Uncertainty (±dB) |
|---|---|
| Conducted Bench Top Measurements | 1.13 |
| Line Conducted Disturbance | 3.09 |
| Radiated Disturbance (<1GHz) | 4.98 |
| Radiated Disturbance (>1GHz) | 5.07 |
| Radiated Disturbance (>18GHz) | 5.09 |


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# 6.0 TEST EQUIPMENT CALIBRATION DATA

Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST).

| Manufacturer | Model | Description | Cal Date | Cal Interval | Cal Due | Serial Number |
|---|---|---|---|---|---|---|
| - | RE1 | Radiated Emissions Cable Set (UHF/EHF) | 3/4/2016 | Annual | 3/4/2017 | RE1 |
| Com-Power | PAM-103 | Pre-Amplifier (1-1000MHz) | 2/26/2016 | Annual | 2/26/2017 | 441119 |
| Com-Power | AL-130 | 9kHz - 30MHz Loop Antenna | 7/30/2015 | Biennial | 7/30/2017 | 121034 |
| Emco | 3116 | Horn Antenna (18 - 40GHz) | 3/27/2015 | Triennial | 3/27/2018 | 9203-2178 |
| Huber+Suhner | Sucoflex 102A | 40GHz Radiated Cable | 4/26/2016 | Annual | 10/26/2016 | 251425001 |
| K & L | 11SH10-3075/U18000 | High Pass Filter | 7/6/2016 | Annual | 7/6/2017 | 11SH10-3075/U18000-1 |
| Rhode & Schwarz | TS-PR18 | Pre-Amplifier | 3/7/2016 | Annual | 3/7/2017 | 101622 |
| Rohde & Schwarz | ESU40 | EMI Test Receiver (40GHz) | 7/15/2016 | Annual | 7/15/2017 | 100348 |
| Rohde & Schwarz | TS-PR26 | 18-26.5 GHz Pre-Amplifier | 3/7/2016 | Annual | 3/7/2017 | 100040 |
| Rohde & Schwarz | TS-PR40 | 26.5-40 GHz Pre-Amplifier | 3/7/2016 | Annual | 3/7/2017 | 100037 |
| Rohde & Schwarz | FSW67 | Signal / Spectrum Analyzer | 7/27/2016 | Annual | 7/27/2017 | 103200 |
| Sunol | DRH-118 | Horn Antenna (1 - 18GHz) | 7/30/2015 | Biennial | 7/30/2017 | A050307 |
| Sunol | JB5 | Bi-Log Antenna (30M - 5GHz) | 3/14/2016 | Biennial | 3/14/2018 | A051107 |

**Table 6-1. Annual Test Equipment Calibration Schedule**



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# 7.0 TEST RESULTS

## 7.1 Summary

Company Name: LG Electronics MobileComm U.S.A
FCC ID: ZNFVS995
Method/System: Unlicensed National Information Infrastructure (UNII)

| FCC Part Section(s) | Test Description | Test Limit | Test Condition | Test Result | Reference |
|---|---|---|---|---|---|
| **TRANSMITTER MODE (TX)** | | | | | |
| 15.407(b.1), (2),(3) | Undesirable Emissions | < -27 dBm/MHz EIRP (outside 5150-5350MHz, 5470-5725MHz, 5715-5860MHz)<br><br>< -17 dBm/MHz EIRP (within 5715-5725MHz and 5850-5860MHz) | RADIATED | PASS | Section 7.2 |
| 15.205, 15.407(b.1), (5), (6) | General Field Strength Limits (Restricted Bands and Radiated Emission Limits) | Emissions in restricted bands must meet the radiated limits detailed in 15.209 | | PASS | Section 7.2, 7.3 |

**Table 7-1. Summary of Test Results**

**Notes:**

1) All channels, modes, and modulations/data rates were investigated among all UNII bands. The test results shown in the following sections represent the worst case emissions.


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## 7.2 Radiated Spurious Emission Measurements – Above 1GHz

**§15.407(b.1)(b.6) §15.205 §15.209**

**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 its maximum power control level, as defined in KDB 789033 v01r03, and at the appropriate frequencies. All channels, modes (e.g. 802.11a, 802.11n (20MHz BW), 802.11n (40MHz BW), and 802.11ac (80MHz)), and modulations/data rates were investigated among all UNII bands. 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 must not exceed the limits shown in Table 7-2 per Section 15.209.***

| Frequency | Field Strength [μV/m] | Measured Distance [Meters] |
|---|---|---|
| Above 960.0 MHz | 500 | 3 |

**Table 7-2. Radiated Limits**

**Test Procedures Used**

KDB 789033 v01r03 – Section G

**Test Settings**

**Average Measurements above 1GHz (Method AD)**

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = power average (RMS)
5. Number of measurement points = 1001 (Number of points must be ≥ 2 x span/RBW)
6. Averaging type = power (RMS)
7. Sweep time = auto couple
8. Trace was averaged over 100 sweeps

**Peak Measurements above 1GHz**

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize



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**Peak Measurements below 1GHz**

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. Span was set greater than 1MHz
3. RBW = 120kHz
4. Detector = CISPR quasi-peak
5. Sweep time = auto couple
6. Trace was allowed to stabilize

**Test Setup**

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

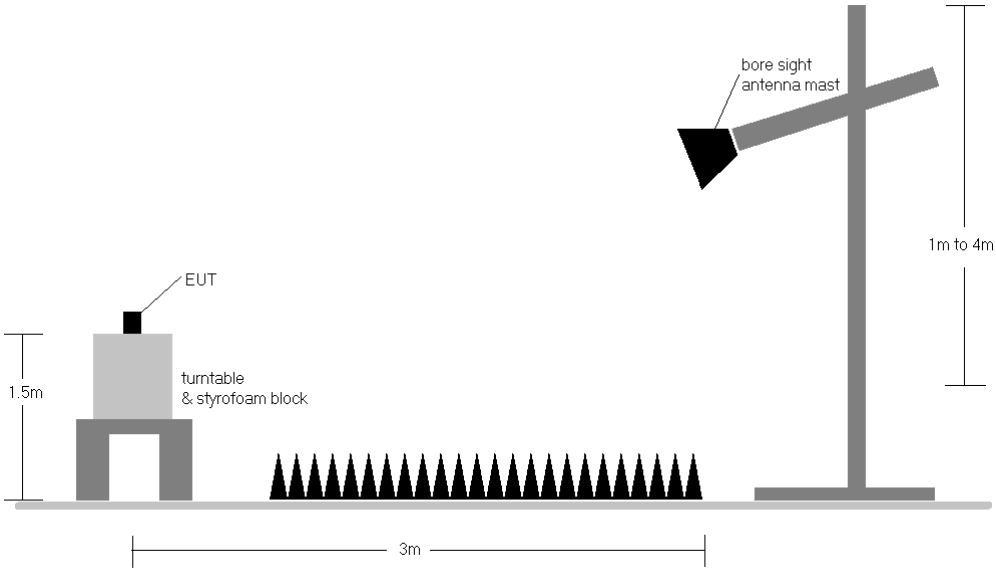


**Figure 7-1. Test Instrument & Measurement Setup**

**Test Notes**

1. All radiated spurious emissions levels were measured in a radiated test setup per the guidance of KDB 789033 v01r03 Section G.
2. All emissions that lie in the restricted bands (denoted by a * next to the frequency) specified in §15.205 are below the limit shown in Table 7-2.
3. All spurious emissions lying in restricted bands specified in §15.205 are below the limit shown in Table 6-11. All spurious emissions that do not lie in a restricted band are subject to a peak limit of -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a “conversion” factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions of 68.2dBμV/m.


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4. The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
5. This unit was tested with its standard battery.
6. The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter using CISPR quasi peak detector below 1GHz. Above 1 GHz, average and peak measurements were taken using linearly polarized horn antennas. The worst-case emissions are reported however emissions whose levels were not within 20dB of the respective limits were not reported.
7. Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.
8. Radiated spurious emissions were investigated while operating in MIMO mode, however, it was determined that single antenna operation produced the worst case emissions. Since the emissions produced from MIMO operation were found to be more than 20dB below the limit, the MIMO emissions are not reported.
9. The wide spectrum spurious emissions plots shown on the following pages are used only for the purpose of emission identification. Any emissions found to be within 20dB of the limit are fully investigated and the results are shown in this section. Rohde & Schwarz EMC32, Version 9.15.00 automated test software was used to perform the Radiated Spurious Emissions Pre-Scan testing.
10. The "-" shown in the following RSE tables are used to denote a noise floor measurement.

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

### Radiated Band Edge Measurement Offset

- The amplitude offset shown in the radiated restricted band edge plots in Section 7.2 was calculated using the formula:
  Offset (dB) = (Antenna Factor + Cable Loss + 10 dB Attenuator) – Preamplifier Gain


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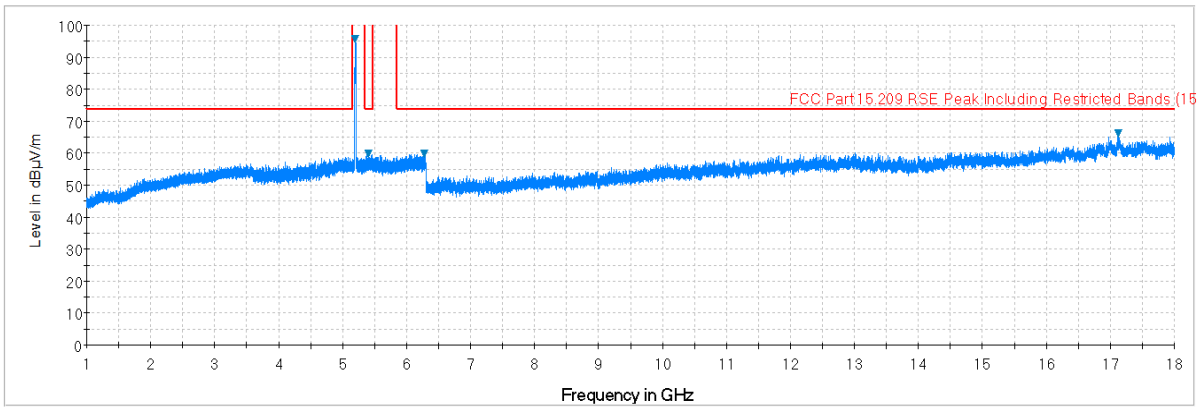
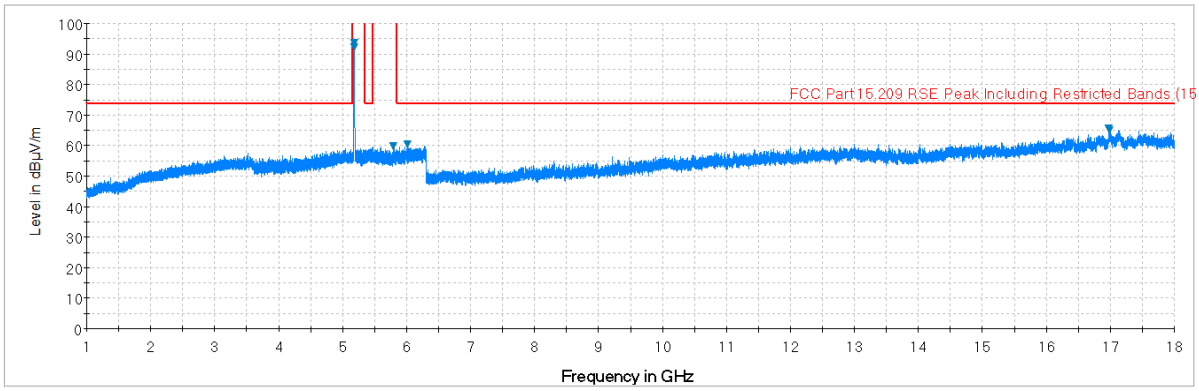
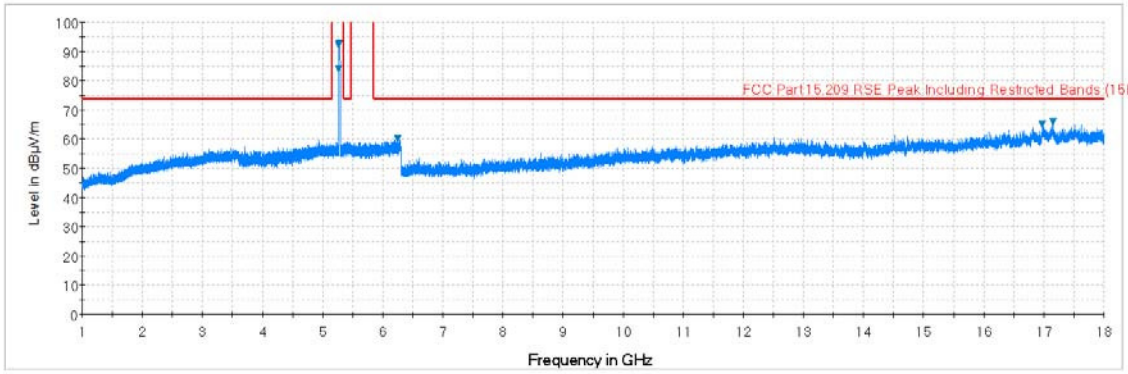
## 7.7.1 Primary Antenna Radiated Spurious Emission Measurements




**Plot 7-1. Radiated Spurious Plot above 1GHz (802.11a – U1 Ch. 40, Ant. Pol. H)**




**Plot 7-2. Radiated Spurious Plot above 1GHz (802.11a – U1 Ch. 40, Ant. Pol. V)**




**Plot 7-3. Radiated Spurious Plot above 1GHz (802.11a – U2A Ch. 56, Ant. Pol. H)**



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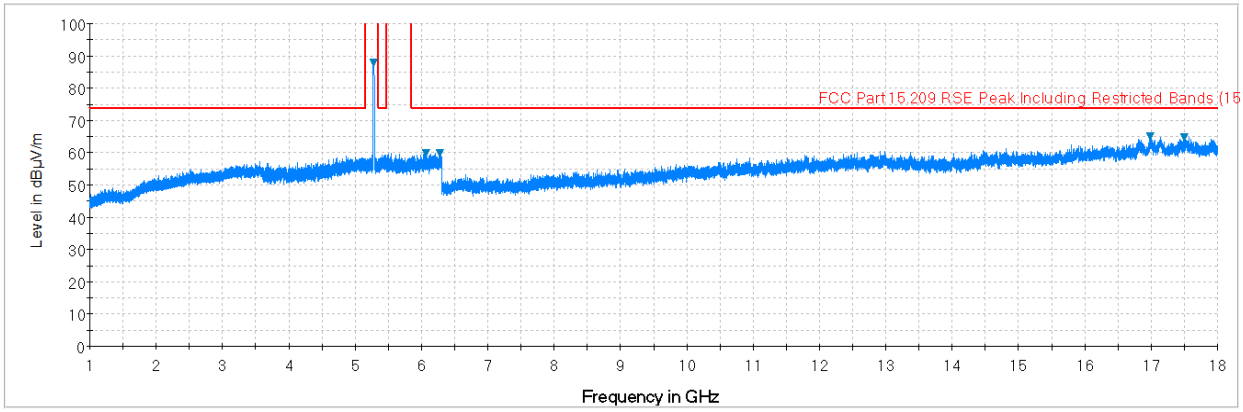
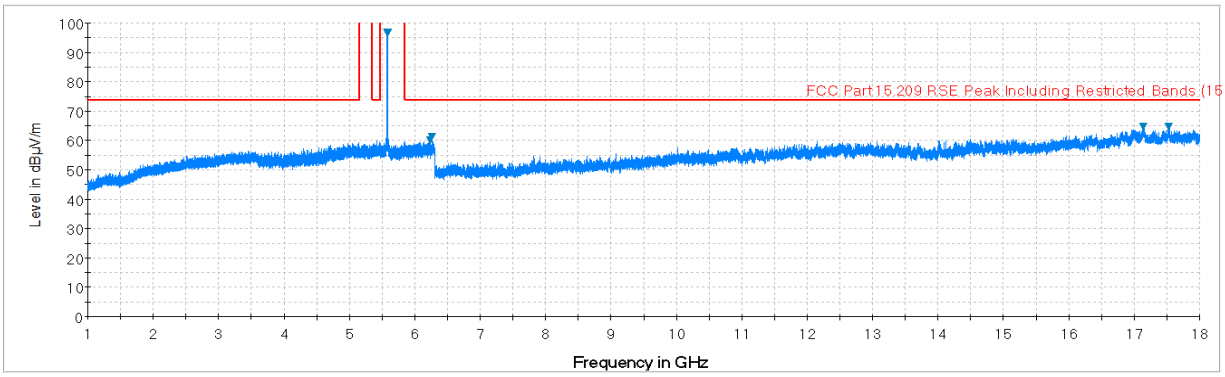
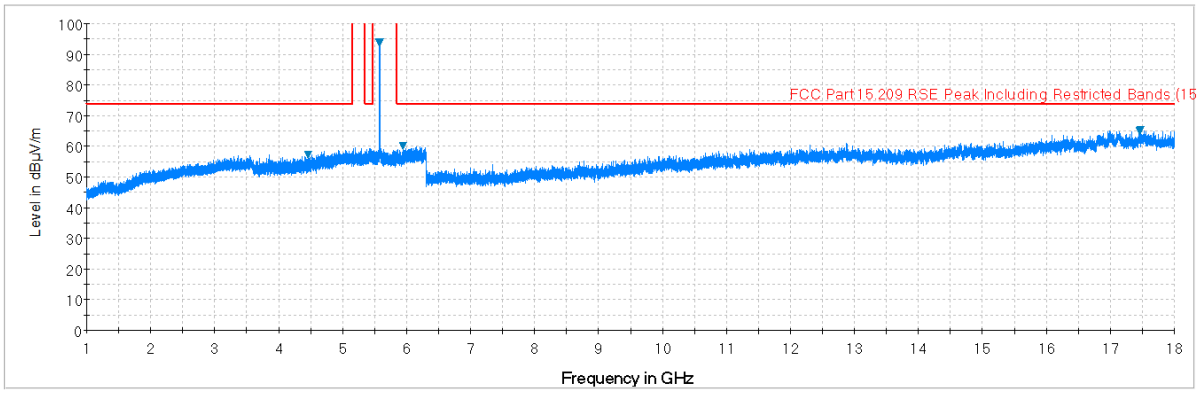



**Plot 7-4. Radiated Spurious Plot above 1GHz (802.11a – U2A Ch. 56, Ant. Pol. V)**




**Plot 7-5. Radiated Spurious Plot above 1GHz (802.11a – U2C Ch. 116, Ant. Pol. H)**




**Plot 7-6. Radiated Spurious Plot above 1GHz (802.11a – U2C Ch. 116, Ant. Pol. V)**



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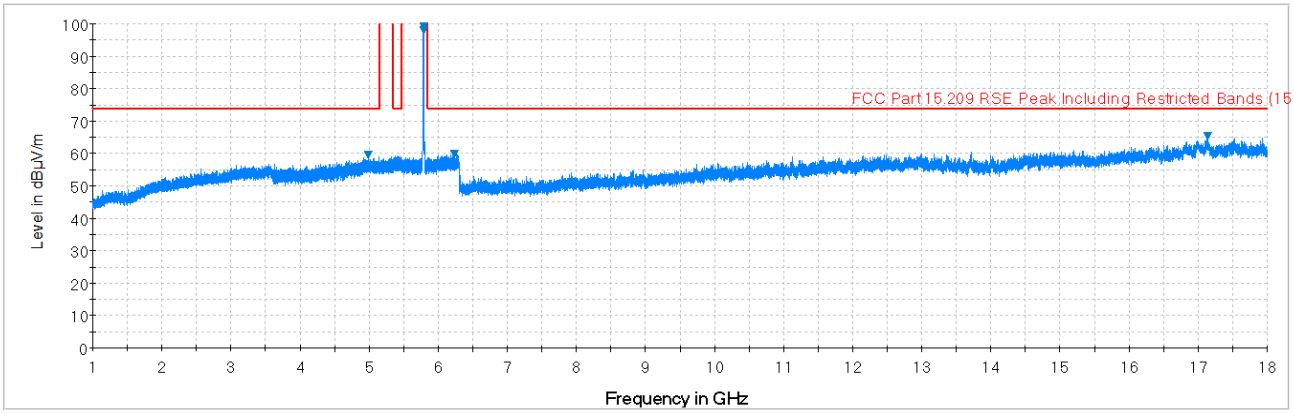
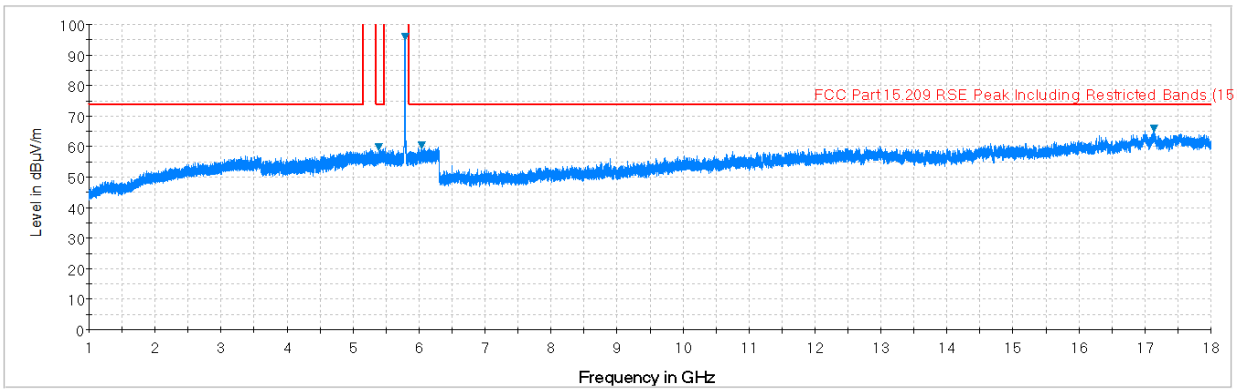



**Plot 7-7. Radiated Spurious Plot above 1GHz (802.11a – U3 Ch. 157, Ant. Pol. H)**




**Plot 7-8. Radiated Spurious Plot above 1GHz (802.11a – U3 Ch. 157, Ant. Pol. V)**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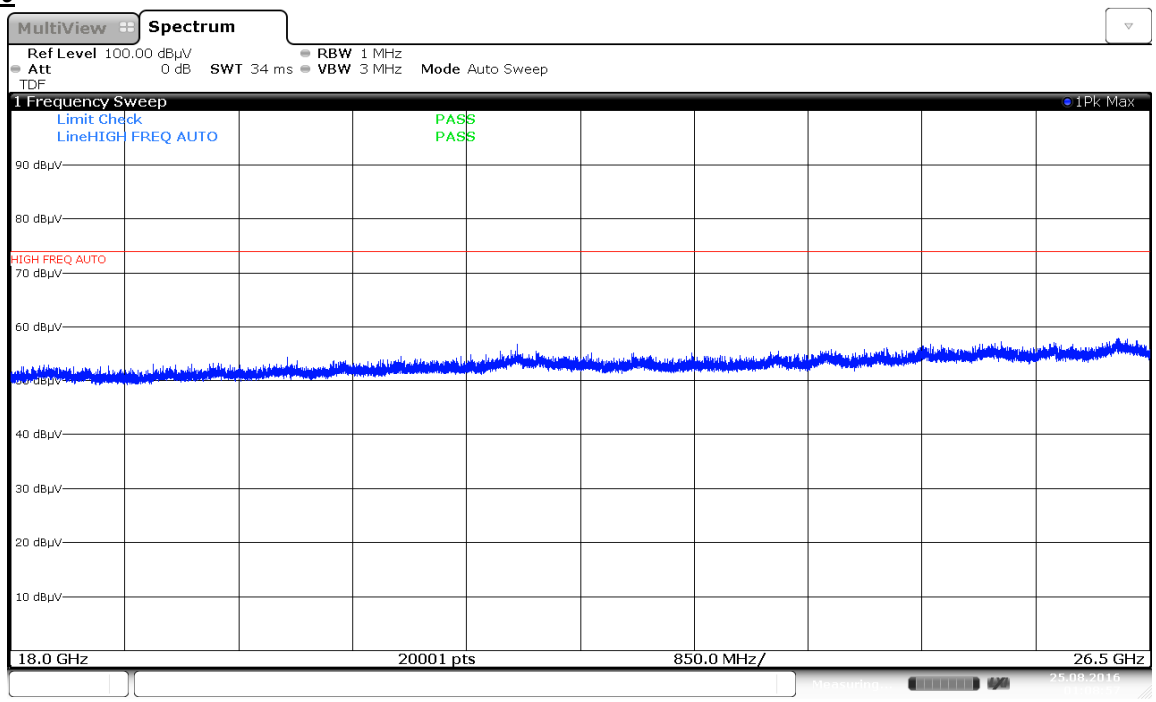
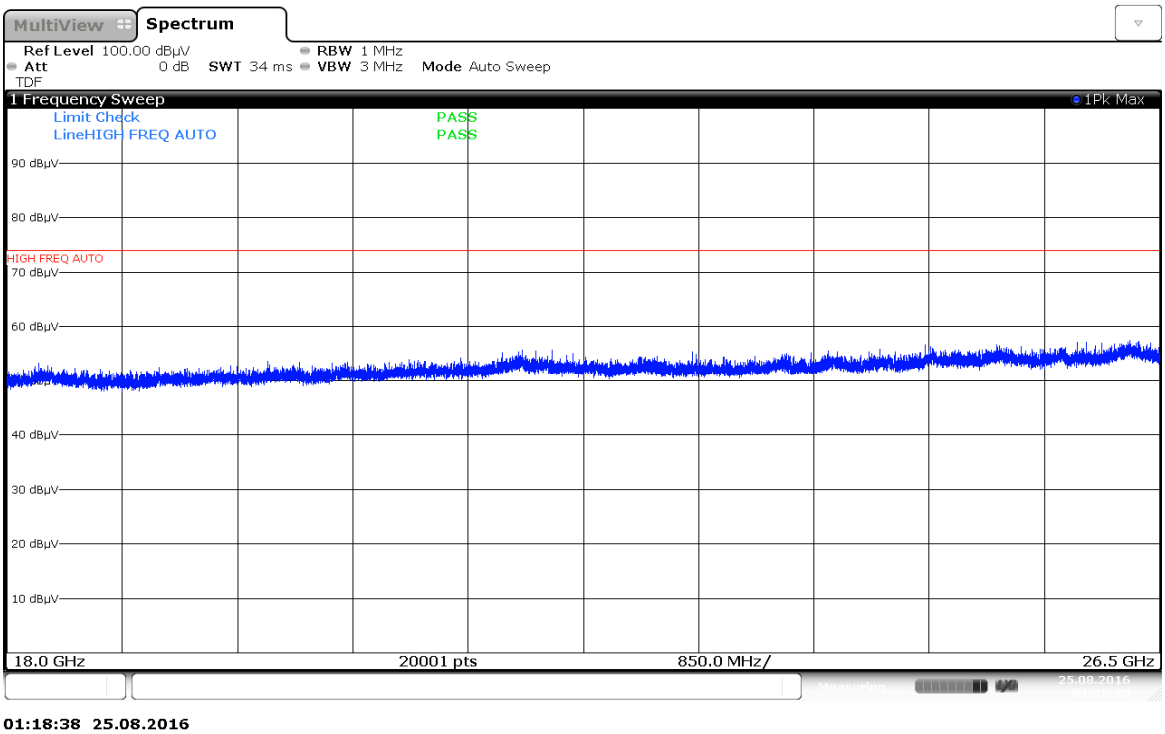
# Primary Antenna Radiated Spurious Emissions Measurements (Above 18GHz)

**§15.209**




**Plot 7-9. Radiated Spurious Plot above 18GHz (802.11a – Ant. Pol. H)**




**Plot 7-10. Radiated Spurious Plot above 18GHz (802.11a – Ant. Pol. V)**



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## Primary Antenna Radiated Spurious Emission Measurements

**§15.247(d) §15.205 & §15.209**

| | |
|---|---|
| Worst Case Mode: | 802.11a |
| Worst Case Transfer Rate: | 6 Mbps |
| Distance of Measurements: | 1 & 3 Meters |
| Operating Frequency: | 5180MHz |
| Channel: | 36 |

| | Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBµV/m] | Limit [dBµV/m] | Margin [dB] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 10360.00 | Peak | H | - | - | -67.87 | 20.58 | 0.00 | 59.71 | 68.20 | -8.49 |
| * | 15540.00 | Average | H | - | - | -78.80 | 22.63 | 0.00 | 50.83 | 53.98 | -3.14 |
| * | 15540.00 | Peak | H | - | - | -69.52 | 22.63 | 0.00 | 60.11 | 73.98 | -13.86 |
| * | 20720.00 | Average | H | - | - | -113.90 | 48.79 | -9.54 | 32.34 | 53.98 | -21.64 |
| * | 20720.00 | Peak | H | - | - | -102.21 | 48.79 | -9.54 | 44.03 | 73.98 | -29.95 |
| | 25900.00 | Peak | H | - | - | -100.91 | 50.98 | -9.54 | 47.54 | 68.20 | -20.66 |

**Table 7-3. Radiated Measurements**

| | |
|---|---|
| Worst Case Mode: | 802.11a |
| Worst Case Transfer Rate: | 6 Mbps |
| Distance of Measurements: | 1 & 3 Meters |
| Operating Frequency: | 5200MHz |
| Channel: | 40 |

| | Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBµV/m] | Limit [dBµV/m] | Margin [dB] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 10400.00 | Peak | H | - | - | -68.22 | 20.24 | 0.00 | 59.02 | 68.20 | -9.18 |
| * | 15600.00 | Average | H | - | - | -80.11 | 21.99 | 0.00 | 48.88 | 53.98 | -5.09 |
| * | 15600.00 | Peak | H | - | - | -68.45 | 21.99 | 0.00 | 60.54 | 73.98 | -13.43 |
| * | 20800.00 | Average | H | - | - | -113.94 | 48.90 | -9.54 | 32.42 | 53.98 | -21.56 |
| * | 20800.00 | Peak | H | - | - | -102.12 | 48.90 | -9.54 | 44.24 | 73.98 | -29.74 |
| | 26000.00 | Peak | H | - | - | -100.42 | 51.05 | -9.54 | 48.08 | 68.20 | -20.12 |

**Table 7-4. Radiated Measurements**



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Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6 Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5240MHz
Channel: 48

| | Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBµV/m] | Limit [dBµV/m] | Margin [dB] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 10480.00 | Peak | H | - | - | -68.45 | 21.52 | 0.00 | 60.07 | 68.20 | -8.13 |
| * | 15720.00 | Average | H | - | - | -80.25 | 22.21 | 0.00 | 48.96 | 53.98 | -5.02 |
| * | 15720.00 | Peak | H | - | - | -68.14 | 22.21 | 0.00 | 61.07 | 73.98 | -12.91 |
| * | 20960.00 | Average | H | - | - | -113.98 | 49.09 | -9.54 | 32.57 | 53.98 | -21.41 |
| * | 20960.00 | Peak | H | - | - | -102.54 | 49.09 | -9.54 | 44.01 | 73.98 | -29.97 |
| | 26200.00 | Peak | H | - | - | -100.35 | 51.19 | -9.54 | 48.29 | 68.20 | -19.91 |

**Table 7-5. Radiated Measurements**

Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6 Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5260MHz
Channel: 52

| | Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBµV/m] | Limit [dBµV/m] | Margin [dB] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 10520.00 | Peak | H | - | - | -68.41 | 20.67 | 0.00 | 59.26 | 68.20 | -8.94 |
| * | 15780.00 | Average | H | - | - | -80.26 | 21.58 | 0.00 | 48.32 | 53.98 | -5.65 |
| * | 15780.00 | Peak | H | - | - | -68.72 | 21.58 | 0.00 | 59.86 | 73.98 | -14.11 |
| * | 21040.00 | Average | H | - | - | -113.79 | 49.17 | -9.54 | 32.84 | 53.98 | -21.14 |
| * | 21040.00 | Peak | H | - | - | -102.40 | 49.17 | -9.54 | 44.23 | 73.98 | -29.75 |
| | 26300.00 | Peak | H | - | - | -99.97 | 51.26 | -9.54 | 48.74 | 68.20 | -19.46 |

**Table 7-6. Radiated Measurements**


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Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6 Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5280MHz
Channel: 56

| | Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBµV/m] | Limit [dBµV/m] | Margin [dB] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 10560.00 | Peak | H | - | - | -68.40 | 20.34 | 0.00 | 58.94 | 68.20 | -9.26 |
| * | 15840.00 | Average | H | - | - | -80.63 | 21.60 | 0.00 | 47.97 | 53.98 | -6.01 |
| * | 15840.00 | Peak | H | - | - | -69.34 | 21.60 | 0.00 | 59.26 | 73.98 | -14.72 |
| * | 21120.00 | Average | H | - | - | -113.61 | 49.24 | -9.54 | 33.09 | 53.98 | -20.89 |
| * | 21120.00 | Peak | H | - | - | -102.14 | 49.24 | -9.54 | 44.56 | 73.98 | -29.42 |
| | 26400.00 | Peak | H | - | - | -100.03 | 51.33 | -9.54 | 48.76 | 68.20 | -19.44 |

**Table 7-7. Radiated Measurements**

Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6 Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5320MHz
Channel: 64

| | Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBµV/m] | Limit [dBµV/m] | Margin [dB] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | 10640.00 | Average | H | - | - | -79.72 | 20.87 | 0.00 | 48.15 | 53.98 | -5.83 |
| * | 10640.00 | Peak | H | - | - | -68.85 | 20.87 | 0.00 | 59.02 | 73.98 | -14.96 |
| * | 15960.00 | Average | H | - | - | -80.31 | 21.94 | 0.00 | 48.63 | 53.98 | -5.35 |
| * | 15960.00 | Peak | H | - | - | -68.52 | 21.94 | 0.00 | 60.42 | 73.98 | -13.56 |
| * | 21280.00 | Average | H | - | - | -113.10 | 49.36 | -9.54 | 33.72 | 53.98 | -20.26 |
| * | 21280.00 | Peak | H | - | - | -102.20 | 49.36 | -9.54 | 44.62 | 73.98 | -29.36 |
| | 26600.00 | Peak | H | - | - | -103.28 | 51.34 | -9.54 | 45.51 | 68.20 | -22.69 |

**Table 7-8. Radiated Measurements**


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Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6 Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5500MHz
Channel: 100

| | Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBµV/m] | Limit [dBµV/m] | Margin [dB] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | 11000.00 | Average | H | - | - | -79.72 | 20.54 | 0.00 | 47.82 | 53.98 | -6.16 |
| * | 11000.00 | Peak | H | - | - | -68.36 | 20.54 | 0.00 | 59.18 | 73.98 | -14.80 |
| | 16500.00 | Peak | H | - | - | -69.21 | 23.25 | 0.00 | 61.04 | 68.20 | -7.16 |
| | 22000.00 | Peak | H | - | - | -102.76 | 49.39 | -9.54 | 44.09 | 68.20 | -24.11 |
| | 27500.00 | Peak | H | - | - | -104.39 | 51.49 | -9.54 | 44.56 | 68.20 | -23.64 |

**Table 7-9. Radiated Measurements**

Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6 Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5580MHz
Channel: 116

| | Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBµV/m] | Limit [dBµV/m] | Margin [dB] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | 11160.00 | Average | H | - | - | -79.56 | 20.57 | 0.00 | 48.01 | 53.98 | -5.97 |
| * | 11160.00 | Peak | H | - | - | -68.05 | 20.57 | 0.00 | 59.52 | 73.98 | -14.46 |
| | 16740.00 | Peak | H | - | - | -68.69 | 23.74 | 0.00 | 62.05 | 68.20 | -6.15 |
| * | 22320.00 | Average | H | - | - | -113.76 | 49.84 | -9.54 | 33.53 | 53.98 | -20.45 |
| * | 22320.00 | Peak | H | - | - | -102.67 | 49.84 | -9.54 | 44.62 | 73.98 | -29.36 |
| | 27900.00 | Peak | H | - | - | -103.50 | 51.57 | -9.54 | 45.53 | 68.20 | -22.67 |

**Table 7-10. Radiated Measurements**


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Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6 Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5720MHz
Channel: 144

| | Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBµV/m] | Limit [dBµV/m] | Margin [dB] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | 11440.00 | Average | H | - | - | -79.64 | 21.60 | 0.00 | 48.96 | 53.98 | -5.01 |
| * | 11440.00 | Peak | H | - | - | -68.35 | 21.60 | 0.00 | 60.25 | 73.98 | -13.72 |
| | 17160.00 | Peak | H | - | - | -68.95 | 25.77 | 0.00 | 63.82 | 68.20 | -4.38 |
| * | 22880.00 | Average | H | - | - | -114.21 | 50.03 | -9.54 | 33.28 | 53.98 | -20.70 |
| * | 22880.00 | Peak | H | - | - | -103.07 | 50.03 | -9.54 | 44.42 | 73.98 | -29.56 |
| | 28600.00 | Peak | H | - | - | -103.55 | 51.42 | -9.54 | 45.33 | 68.20 | -22.87 |

**Table 7-11. Radiated Measurements**

Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6 Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5745MHz
Channel: 149

| | Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBµV/m] | Limit [dBµV/m] | Margin [dB] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | 11490.00 | Average | H | - | - | -79.80 | 21.70 | 0.00 | 48.90 | 53.98 | -5.07 |
| * | 11490.00 | Peak | H | - | - | -68.46 | 21.70 | 0.00 | 60.24 | 73.98 | -13.73 |
| | 17235.00 | Peak | H | - | - | -69.73 | 26.41 | 0.00 | 63.68 | 68.20 | -4.52 |
| * | 22980.00 | Average | H | - | - | -114.28 | 50.04 | -9.54 | 33.21 | 53.98 | -20.77 |
| * | 22980.00 | Peak | H | - | - | -102.18 | 50.04 | -9.54 | 45.31 | 73.98 | -28.67 |
| | 28725.00 | Peak | H | - | - | -104.28 | 51.38 | -9.54 | 44.56 | 68.20 | -23.64 |

**Table 7-12. Radiated Measurements**


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Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6 Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5785MHz
Channel: 157

| | Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBµV/m] | Limit [dBµV/m] | Margin [dB] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | 11570.00 | Average | H | - | - | -79.45 | 22.69 | 0.00 | 50.24 | 53.98 | -3.74 |
| * | 11570.00 | Peak | H | - | - | -68.48 | 22.69 | 0.00 | 61.21 | 73.98 | -12.77 |
| | 17355.00 | Peak | H | - | - | -69.10 | 27.16 | 0.00 | 65.06 | 68.20 | -3.14 |
| | 23140.00 | Peak | H | - | - | -103.16 | 50.11 | -9.54 | 44.41 | 68.20 | -23.79 |
| | 28925.00 | Peak | H | - | - | -102.81 | 51.41 | -9.54 | 46.06 | 68.20 | -22.14 |

**Table 7-13. Radiated Measurements**

Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6 Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5825MHz
Channel: 165

| | Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBµV/m] | Limit [dBµV/m] | Margin [dB] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | 11650.00 | Average | H | - | - | -79.00 | 22.70 | 0.00 | 50.70 | 53.98 | -3.28 |
| * | 11650.00 | Peak | H | - | - | -68.31 | 22.70 | 0.00 | 61.39 | 73.98 | -12.59 |
| | 17475.00 | Peak | H | - | - | -76.95 | 28.99 | 0.00 | 59.04 | 68.20 | -9.16 |
| | 23300.00 | Peak | H | - | - | -102.05 | 50.13 | -9.54 | 45.54 | 68.20 | -22.66 |
| | 29125.00 | Peak | H | - | - | -102.86 | 51.43 | -9.54 | 46.03 | 68.20 | -22.17 |

**Table 7-14. Radiated Measurements**


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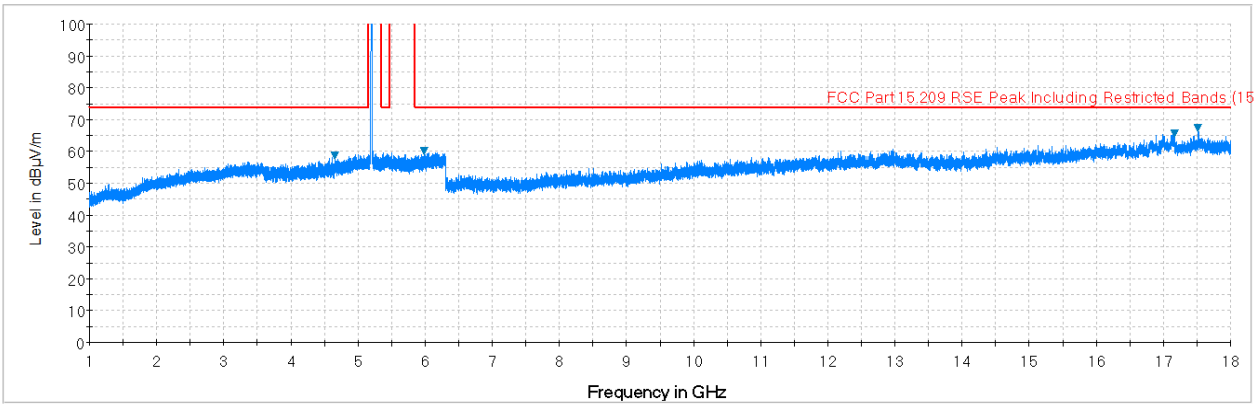
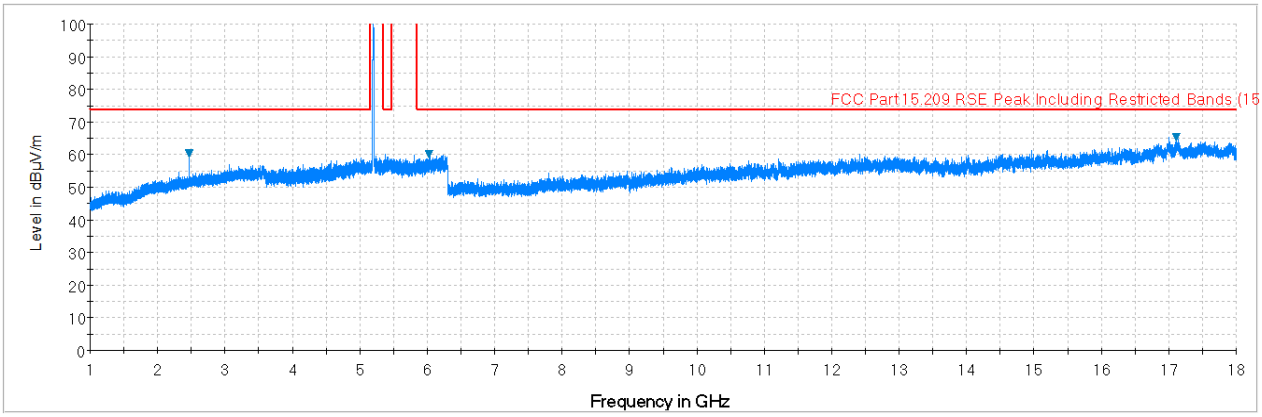
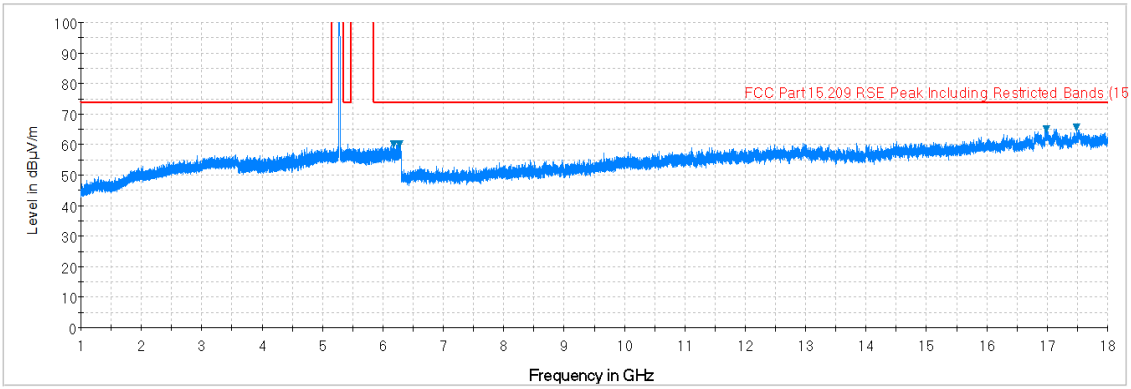
## 7.7.2 Secondary Antenna Radiated Spurious Emission Measurements




**Plot 7-11. Radiated Spurious Plot above 1GHz (802.11a – U1 Ch. 40, Ant. Pol. H)**




**Plot 7-12. Radiated Spurious Plot above 1GHz (802.11a – U1 Ch. 40, Ant. Pol. V)**




**Plot 7-13. Radiated Spurious Plot above 1GHz (802.11a – U2A Ch. 56, Ant. Pol. H)**



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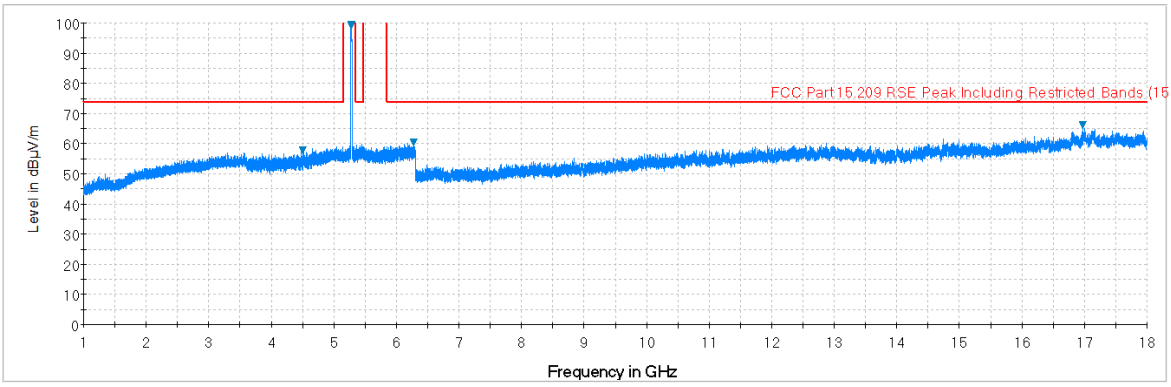
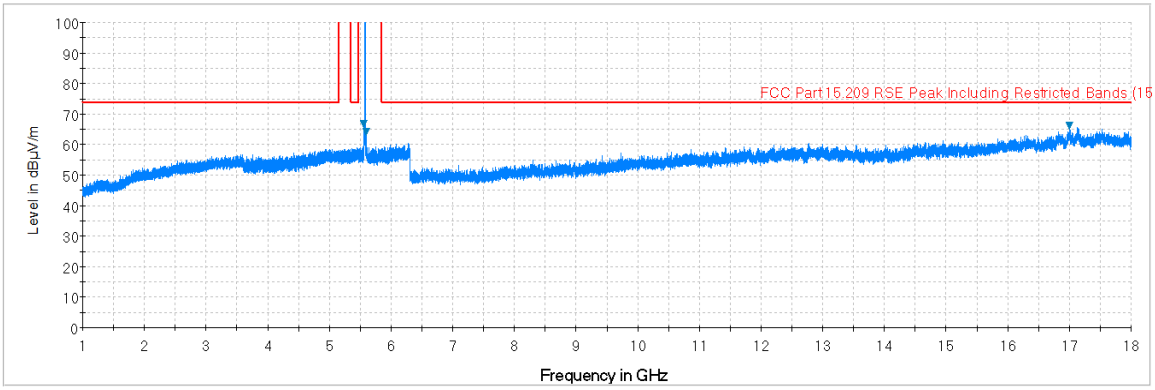
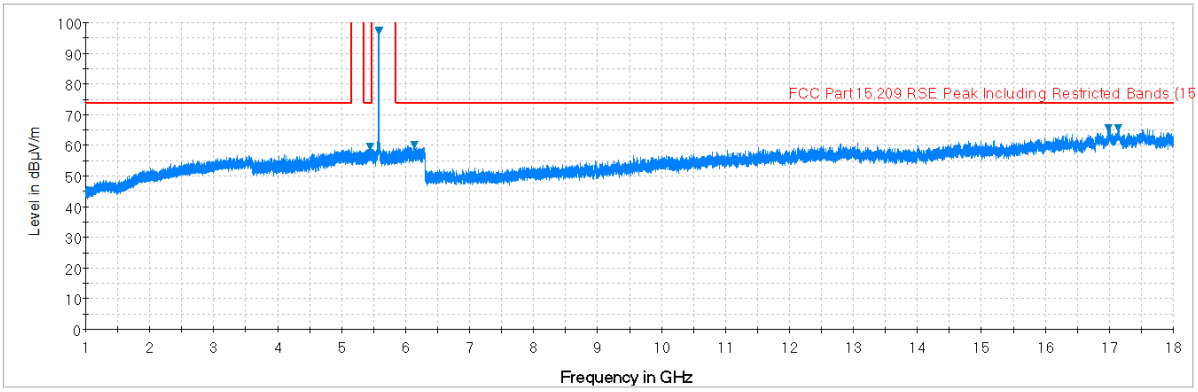



**Plot 7-14. Radiated Spurious Plot above 1GHz (802.11a – U2A Ch. 56, Ant. Pol. V)**




**Plot 7-15. Radiated Spurious Plot above 1GHz (802.11a – U2C Ch. 116, Ant. Pol. H)**




**Plot 7-16. Radiated Spurious Plot above 1GHz (802.11a – U2C Ch. 116, Ant. Pol. V)**



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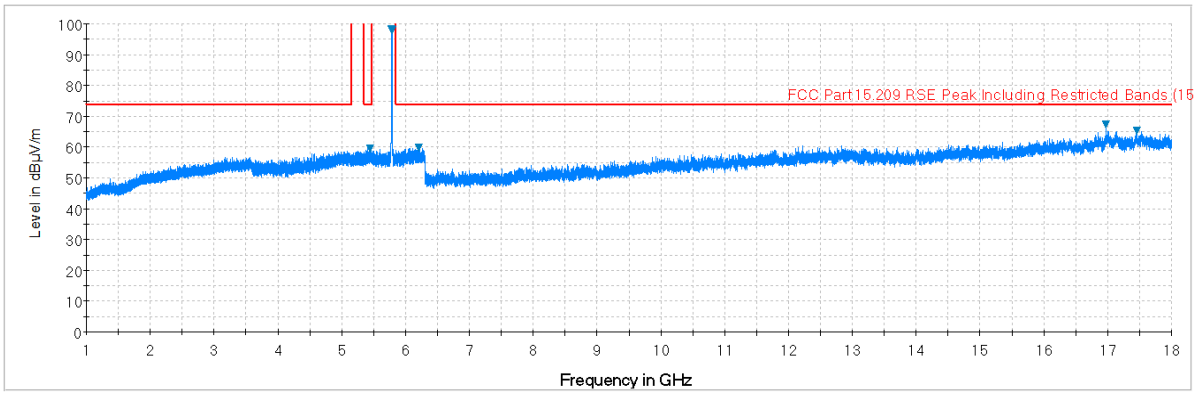
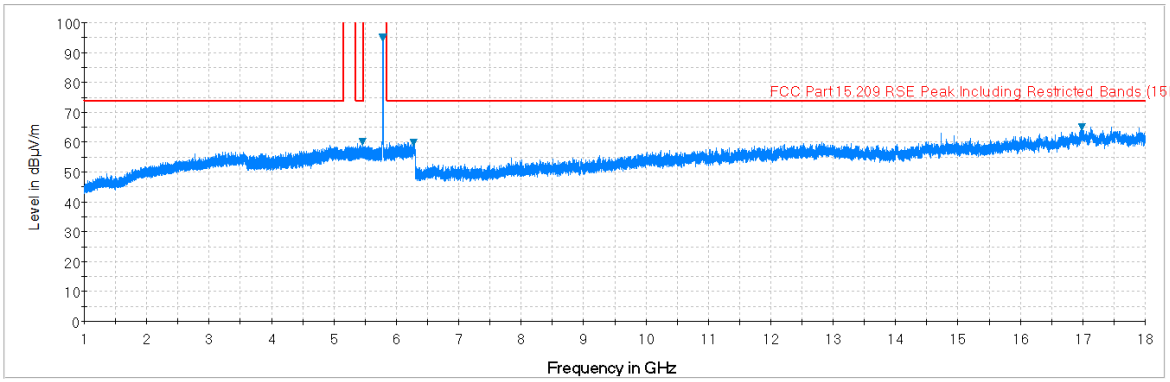



**Plot 7-17. Radiated Spurious Plot above 1GHz (802.11a – U3 Ch. 157, Ant. Pol. H)**




**Plot 7-18. Radiated Spurious Plot above 1GHz (802.11a – U3 Ch. 157, Ant. Pol. V)**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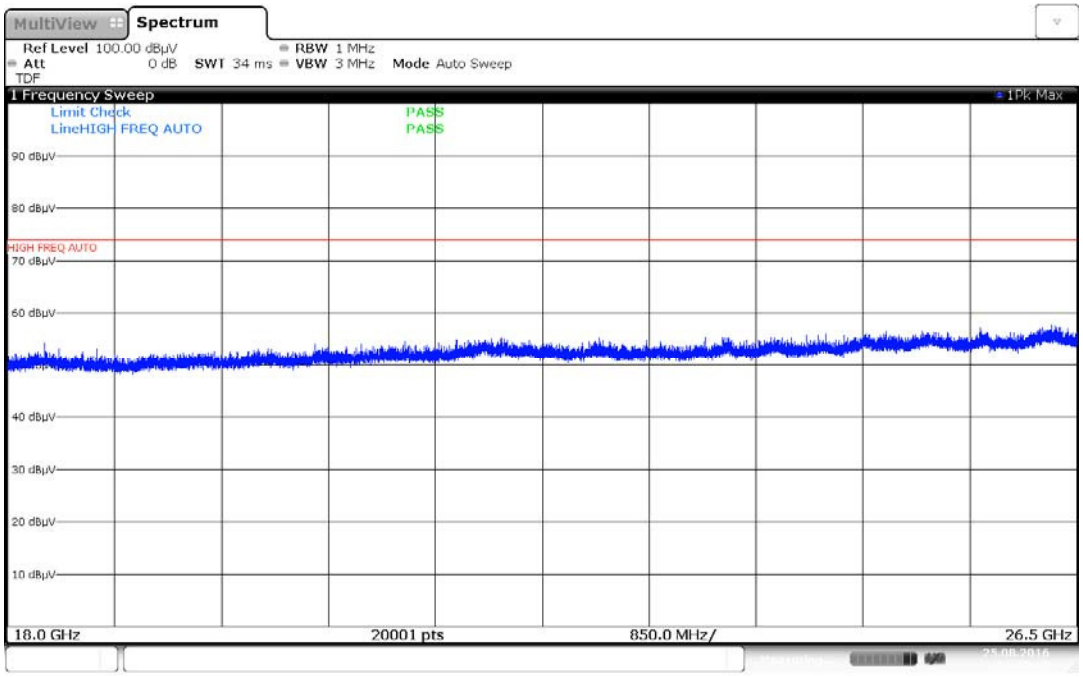
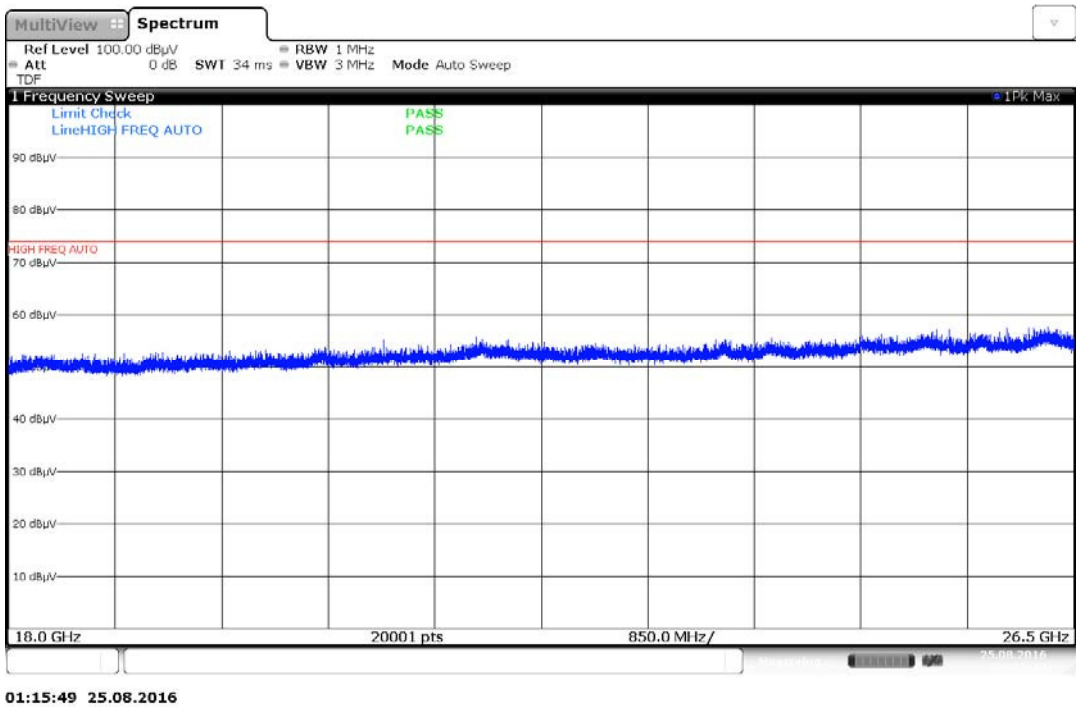
## Secondary Antenna Radiated Spurious Emissions Measurements (Above 18GHz)

**§15.209**




**Plot 7-19. Radiated Spurious Plot above 18GHz (802.11a – Ant. Pol. H)**




**Plot 7-20. Radiated Spurious Plot above 18GHz (802.11a – Ant. Pol. V)**



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## Secondary Antenna Radiated Spurious Emission Measurements

**§15.247(d) §15.205 & §15.209**

Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6 Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5180MHz
Channel: 36

| | Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBµV/m] | Limit [dBµV/m] | Margin [dB] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 10360.00 | Peak | H | - | - | -67.87 | 20.58 | 0.00 | 59.71 | 68.20 | -8.49 |
| * | 15540.00 | Average | H | - | - | -79.51 | 22.63 | 0.00 | 50.12 | 53.98 | -3.85 |
| * | 15540.00 | Peak | H | - | - | -67.67 | 22.63 | 0.00 | 61.96 | 73.98 | -12.01 |
| * | 20720.00 | Average | H | - | - | -113.92 | 48.79 | -9.54 | 32.32 | 53.98 | -21.66 |
| * | 20720.00 | Peak | H | - | - | -102.97 | 48.79 | -9.54 | 43.27 | 73.98 | -30.71 |
| | 25900.00 | Peak | H | - | - | -103.09 | 50.98 | -9.54 | 45.36 | 68.20 | -22.84 |

**Table 7-15. Radiated Measurements**

Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6 Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5200MHz
Channel: 40

| | Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBµV/m] | Limit [dBµV/m] | Margin [dB] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 10400.00 | Peak | H | - | - | -66.64 | 20.24 | 0.00 | 60.60 | 68.20 | -7.60 |
| * | 15600.00 | Average | H | - | - | -79.14 | 21.99 | 0.00 | 49.85 | 53.98 | -4.12 |
| * | 15600.00 | Peak | H | - | - | -68.02 | 21.99 | 0.00 | 60.97 | 73.98 | -13.00 |
| * | 20800.00 | Average | H | - | - | -113.69 | 48.90 | -9.54 | 32.67 | 53.98 | -21.31 |
| * | 20800.00 | Peak | H | - | - | -101.83 | 48.90 | -9.54 | 44.53 | 73.98 | -29.45 |
| | 26000.00 | Peak | H | - | - | -101.30 | 51.05 | -9.54 | 47.20 | 68.20 | -21.00 |

**Table 7-16. Radiated Measurements**



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Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6 Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5240MHz
Channel: 48

| | Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBµV/m] | Limit [dBµV/m] | Margin [dB] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 10480.00 | Peak | H | - | - | -68.24 | 21.52 | 0.00 | 60.28 | 68.20 | -7.92 |
| * | 15720.00 | Average | H | - | - | -79.31 | 22.21 | 0.00 | 49.90 | 53.98 | -4.08 |
| * | 15720.00 | Peak | H | - | - | -62.27 | 22.21 | 0.00 | 66.94 | 73.98 | -7.04 |
| * | 20960.00 | Average | H | - | - | -114.31 | 49.09 | -9.54 | 32.24 | 53.98 | -21.74 |
| * | 20960.00 | Peak | H | - | - | -103.14 | 49.09 | -9.54 | 43.41 | 73.98 | -30.57 |
| | 26200.00 | Peak | H | - | - | -99.84 | 51.19 | -9.54 | 48.80 | 68.20 | -19.40 |

**Table 7-17. Radiated Measurements**

Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6 Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5260MHz
Channel: 52

| | Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBµV/m] | Limit [dBµV/m] | Margin [dB] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 10520.00 | Peak | H | - | - | -66.95 | 20.67 | 0.00 | 60.72 | 68.20 | -7.48 |
| * | 15780.00 | Average | H | - | - | -79.00 | 21.58 | 0.00 | 49.58 | 53.98 | -4.39 |
| * | 15780.00 | Peak | H | - | - | -67.52 | 21.58 | 0.00 | 61.06 | 73.98 | -12.91 |
| * | 21040.00 | Average | H | - | - | -113.97 | 49.17 | -9.54 | 32.66 | 53.98 | -21.32 |
| * | 21040.00 | Peak | H | - | - | -102.77 | 49.17 | -9.54 | 43.86 | 73.98 | -30.12 |
| | 26300.00 | Peak | H | - | - | -100.40 | 51.26 | -9.54 | 48.31 | 68.20 | -19.89 |

**Table 7-18. Radiated Measurements**


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Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6 Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5280MHz
Channel: 56

| | Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBµV/m] | Limit [dBµV/m] | Margin [dB] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 10560.00 | Peak | H | - | - | -68.16 | 20.34 | 0.00 | 59.18 | 68.20 | -9.02 |
| * | 15840.00 | Average | H | - | - | -79.42 | 21.60 | 0.00 | 49.18 | 53.98 | -4.80 |
| * | 15840.00 | Peak | H | - | - | -67.55 | 21.60 | 0.00 | 61.05 | 73.98 | -12.93 |
| * | 21120.00 | Average | H | - | - | -113.68 | 49.24 | -9.54 | 33.02 | 53.98 | -20.96 |
| * | 21120.00 | Peak | H | - | - | -101.50 | 49.24 | -9.54 | 45.20 | 73.98 | -28.78 |
| | 26400.00 | Peak | H | - | - | -100.32 | 51.33 | -9.54 | 48.47 | 68.20 | -19.73 |

**Table 7-19. Radiated Measurements**

Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6 Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5320MHz
Channel: 64

| | Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBµV/m] | Limit [dBµV/m] | Margin [dB] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | 10640.00 | Average | H | - | - | -78.98 | 20.87 | 0.00 | 48.89 | 53.98 | -5.09 |
| * | 10640.00 | Peak | H | - | - | -67.67 | 20.87 | 0.00 | 60.20 | 73.98 | -13.78 |
| * | 15960.00 | Average | H | - | - | -79.30 | 21.94 | 0.00 | 49.64 | 53.98 | -4.34 |
| * | 15960.00 | Peak | H | - | - | -67.39 | 21.94 | 0.00 | 61.55 | 73.98 | -12.43 |
| * | 21280.00 | Average | H | - | - | -113.54 | 49.36 | -9.54 | 33.28 | 53.98 | -20.70 |
| * | 21280.00 | Peak | H | - | - | -102.05 | 49.36 | -9.54 | 44.77 | 73.98 | -29.21 |
| | 26600.00 | Peak | H | - | - | -104.43 | 51.34 | -9.54 | 44.36 | 68.20 | -23.84 |

**Table 7-20. Radiated Measurements**


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Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6 Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5500MHz
Channel: 100

| | Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBµV/m] | Limit [dBµV/m] | Margin [dB] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | 11000.00 | Average | H | - | - | -79.00 | 20.54 | 0.00 | 48.54 | 53.98 | -5.44 |
| * | 11000.00 | Peak | H | - | - | -67.65 | 20.54 | 0.00 | 59.89 | 73.98 | -14.09 |
| | 16500.00 | Peak | H | - | - | -67.79 | 23.25 | 0.00 | 62.46 | 68.20 | -5.74 |
| | 22000.00 | Peak | H | - | - | -102.10 | 49.39 | -9.54 | 44.75 | 68.20 | -23.45 |
| | 27500.00 | Peak | H | - | - | -103.08 | 51.49 | -9.54 | 45.87 | 68.20 | -22.33 |

**Table 7-21. Radiated Measurements**

Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6 Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5580MHz
Channel: 116

| | Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBµV/m] | Limit [dBµV/m] | Margin [dB] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | 11160.00 | Average | H | - | - | -79.10 | 20.57 | 0.00 | 48.47 | 53.98 | -5.51 |
| * | 11160.00 | Peak | H | - | - | -66.78 | 20.57 | 0.00 | 60.79 | 73.98 | -13.19 |
| | 16740.00 | Peak | H | - | - | -67.86 | 23.74 | 0.00 | 62.88 | 68.20 | -5.32 |
| * | 22320.00 | Average | H | - | - | -113.86 | 49.84 | -9.54 | 33.43 | 53.98 | -20.55 |
| * | 22320.00 | Peak | H | - | - | -102.61 | 49.84 | -9.54 | 44.68 | 73.98 | -29.30 |
| | 27900.00 | Peak | H | - | - | -104.46 | 51.57 | -9.54 | 44.57 | 68.20 | -23.63 |

**Table 7-22. Radiated Measurements**


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Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6 Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5720MHz
Channel: 144

| | Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBµV/m] | Limit [dBµV/m] | Margin [dB] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | 11440.00 | Average | H | - | - | -78.87 | 21.60 | 0.00 | 49.73 | 53.98 | -4.24 |
| * | 11440.00 | Peak | H | - | - | -67.93 | 21.60 | 0.00 | 60.67 | 73.98 | -13.30 |
| | 17160.00 | Peak | H | - | - | -67.89 | 25.77 | 0.00 | 64.88 | 68.20 | -3.32 |
| * | 22880.00 | Average | H | - | - | -114.71 | 50.03 | -9.54 | 32.78 | 53.98 | -21.20 |
| * | 22880.00 | Peak | H | - | - | -103.08 | 50.03 | -9.54 | 44.41 | 73.98 | -29.57 |
| | 28600.00 | Peak | H | - | - | -103.96 | 51.42 | -9.54 | 44.92 | 68.20 | -23.28 |

**Table 7-23. Radiated Measurements**

Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6 Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5745MHz
Channel: 149

| | Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBµV/m] | Limit [dBµV/m] | Margin [dB] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | 11490.00 | Average | H | - | - | -78.97 | 21.70 | 0.00 | 49.73 | 53.98 | -4.24 |
| * | 11490.00 | Peak | H | - | - | -67.20 | 21.70 | 0.00 | 61.50 | 73.98 | -12.47 |
| | 17235.00 | Peak | H | - | - | -69.58 | 26.41 | 0.00 | 63.83 | 68.20 | -4.37 |
| * | 22980.00 | Average | H | - | - | -114.12 | 50.04 | -9.54 | 33.37 | 53.98 | -20.61 |
| * | 22980.00 | Peak | H | - | - | -102.61 | 50.04 | -9.54 | 44.88 | 73.98 | -29.10 |
| | 28725.00 | Peak | H | - | - | -103.42 | 51.38 | -9.54 | 45.42 | 68.20 | -22.78 |

**Table 7-24. Radiated Measurements**


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Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6 Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5785MHz
Channel: 157

| | Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBµV/m] | Limit [dBµV/m] | Margin [dB] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | 11570.00 | Average | H | - | - | -78.82 | 22.69 | 0.00 | 50.87 | 53.98 | -3.11 |
| * | 11570.00 | Peak | H | - | - | -67.15 | 22.69 | 0.00 | 62.54 | 73.98 | -11.44 |
| | 17355.00 | Peak | H | - | - | -69.35 | 27.16 | 0.00 | 64.81 | 68.20 | -3.39 |
| | 23140.00 | Peak | H | - | - | -103.05 | 50.11 | -9.54 | 44.52 | 68.20 | -23.68 |
| | 28925.00 | Peak | H | - | - | -102.66 | 51.41 | -9.54 | 46.21 | 68.20 | -21.99 |

**Table 7-25. Radiated Measurements**

Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6 Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5825MHz
Channel: 165

| | Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBµV/m] | Limit [dBµV/m] | Margin [dB] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | 11650.00 | Average | H | - | - | -79.50 | 22.70 | 0.00 | 50.20 | 53.98 | -3.78 |
| * | 11650.00 | Peak | H | - | - | -65.64 | 22.70 | 0.00 | 64.06 | 73.98 | -9.92 |
| | 17475.00 | Peak | H | - | - | -71.30 | 28.99 | 0.00 | 64.69 | 68.20 | -3.51 |
| | 23300.00 | Peak | H | - | - | -103.54 | 50.13 | -9.54 | 44.05 | 68.20 | -24.15 |
| | 29125.00 | Peak | H | - | - | -103.49 | 51.43 | -9.54 | 45.40 | 68.20 | -22.80 |

**Table 7-26. Radiated Measurements**


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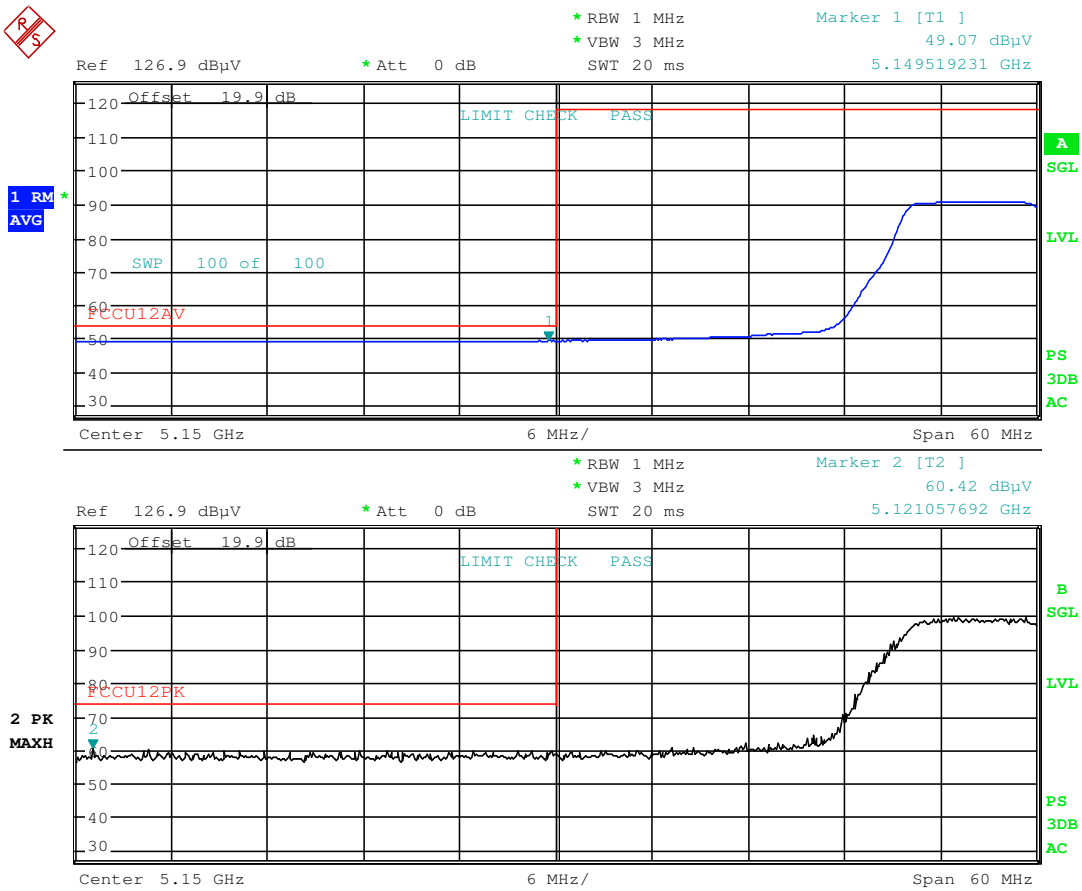
## 7.7.3 Primary Antenna Radiated Band Edge Measurements (20MHz BW)

**§15.407(b.1)(b.2) §15.205 §15.209**

| | |
|---|---|
| Worst Case Mode: | 802.11a |
| Worst Case Transfer Rate: | 6 Mbps |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 5180MHz |
| Channel: | 36 |




Date: 9.AUG.2016 18:44:41

**Plot 7-21. Radiated Restricted Lower Band Edge Plot (Average & Peak – UNII Band 1)**



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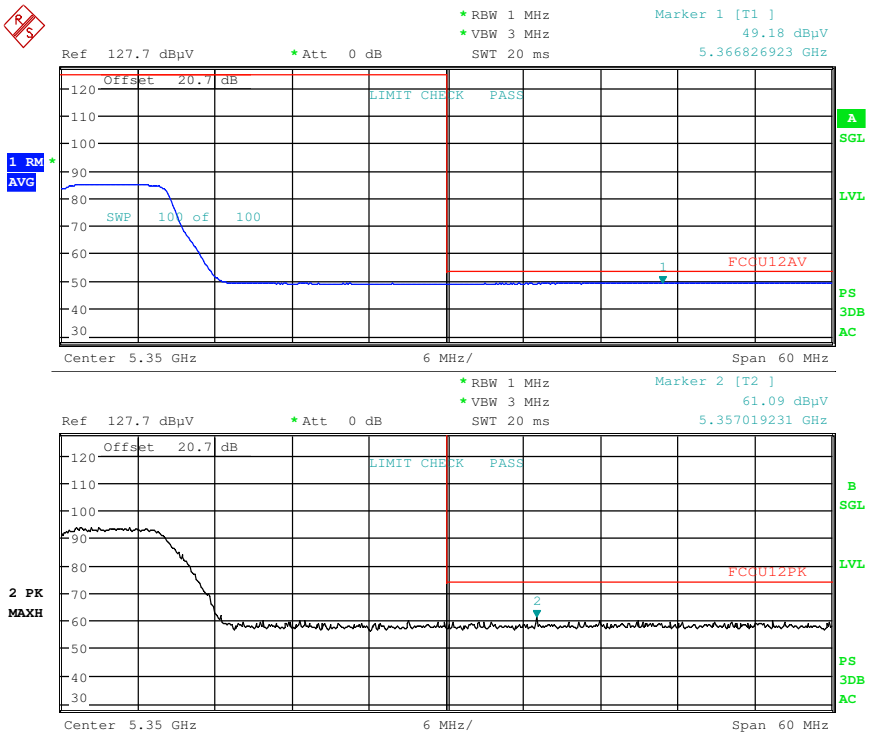
# Primary Antenna Radiated Band Edge Measurements (20MHz BW)

**§15.407(b.1)(b.2) §15.205 §15.209**

| | |
|---|---|
| Worst Case Mode: | 802.11a |
| Worst Case Transfer Rate: | 6 Mbps |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 5320MHz |
| Channel: | 64 |




Date: 9.AUG.2016 19:11:57

**Plot 7-22. Radiated Restricted Upper Band Edge Plot (Average & Peak – UNII Band 2A)**



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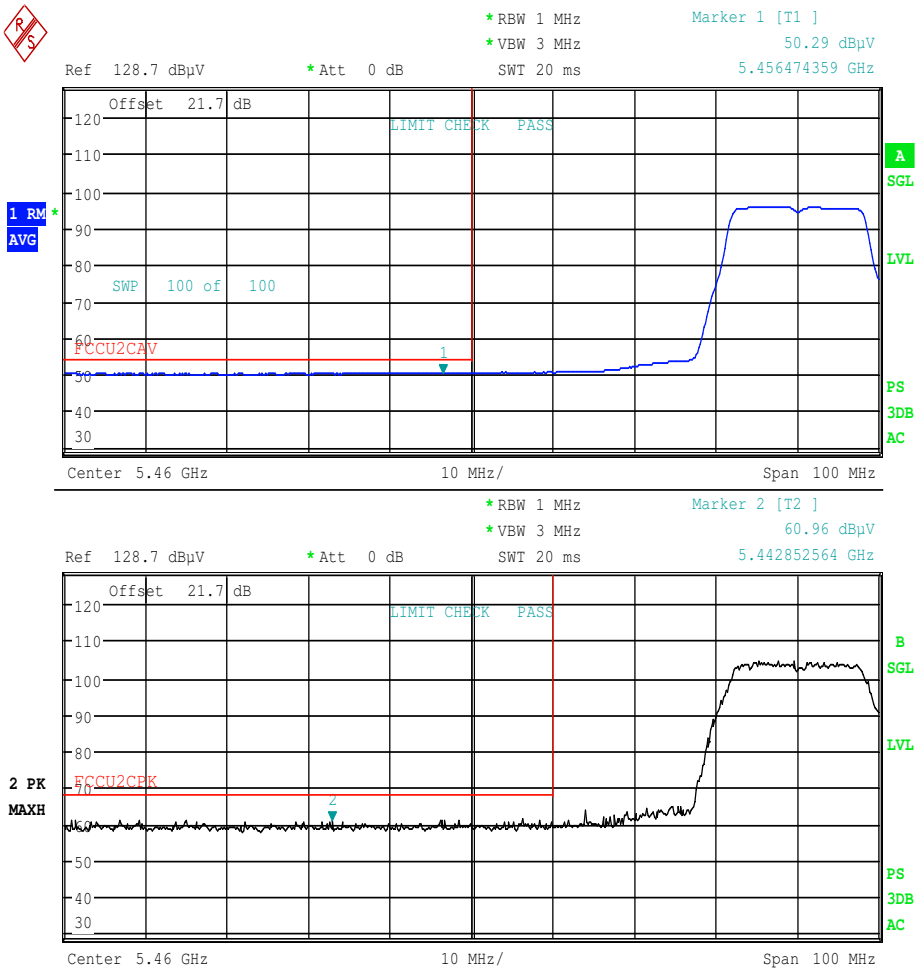
## Radiated Band Edge Measurements (20MHz BW)

**§15.407(b.1)(b.2) §15.205 §15.209**

| | |
|---|---|
| Worst Case Mode: | 802.11a |
| Worst Case Transfer Rate: | 6 Mbps |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 5500MHz |
| Channel: | 100 |




Date: 9.AUG.2016 19:18:04

**Plot 7-23. Radiated Restricted Lower Band Edge Plot (Average & Peak – UNII Band 2C)**



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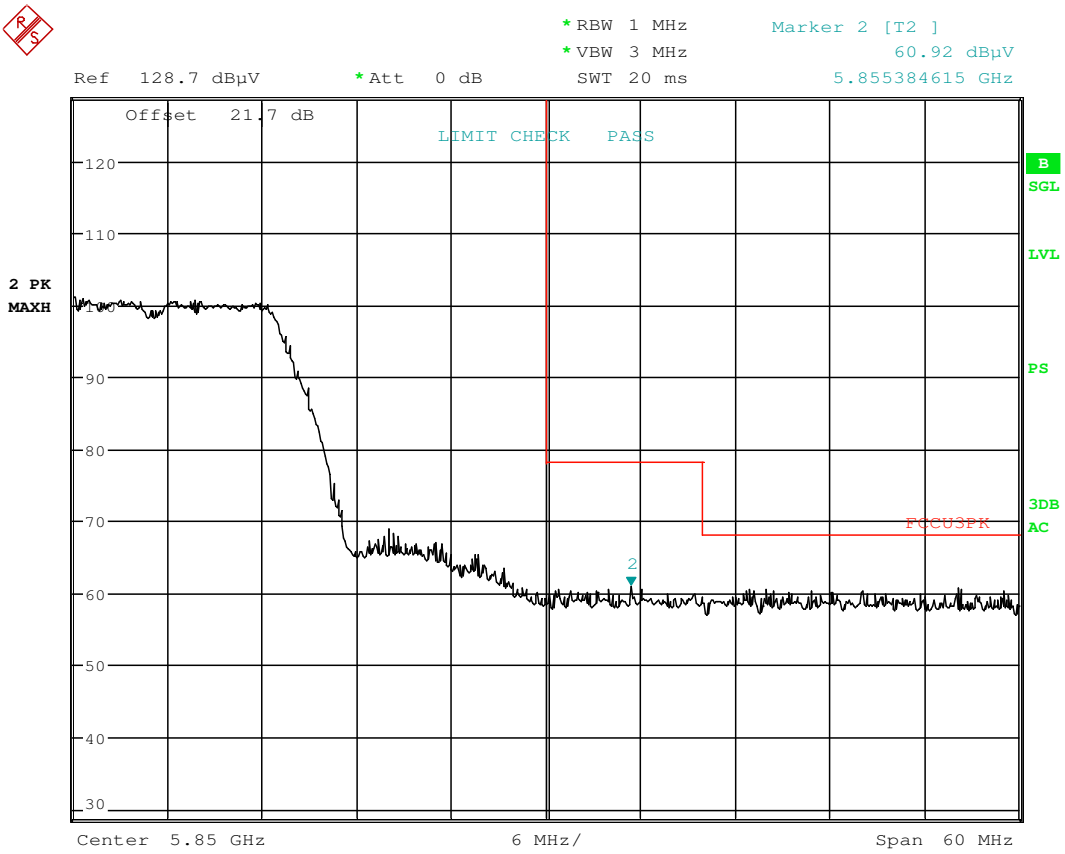
## Radiated Band Edge Measurements (20MHz BW)

**§15.407(b.1)(b.2) §15.205 §15.209**

| | |
|---|---|
| Worst Case Mode: | 802.11a |
| Worst Case Transfer Rate: | 6 Mbps |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 5825MHz |
| Channel: | 165 |




Date: 9.AUG.2016 19:23:59

**Plot 7-24. Radiated Upper Band Edge Plot (Peak – UNII Band 3)**



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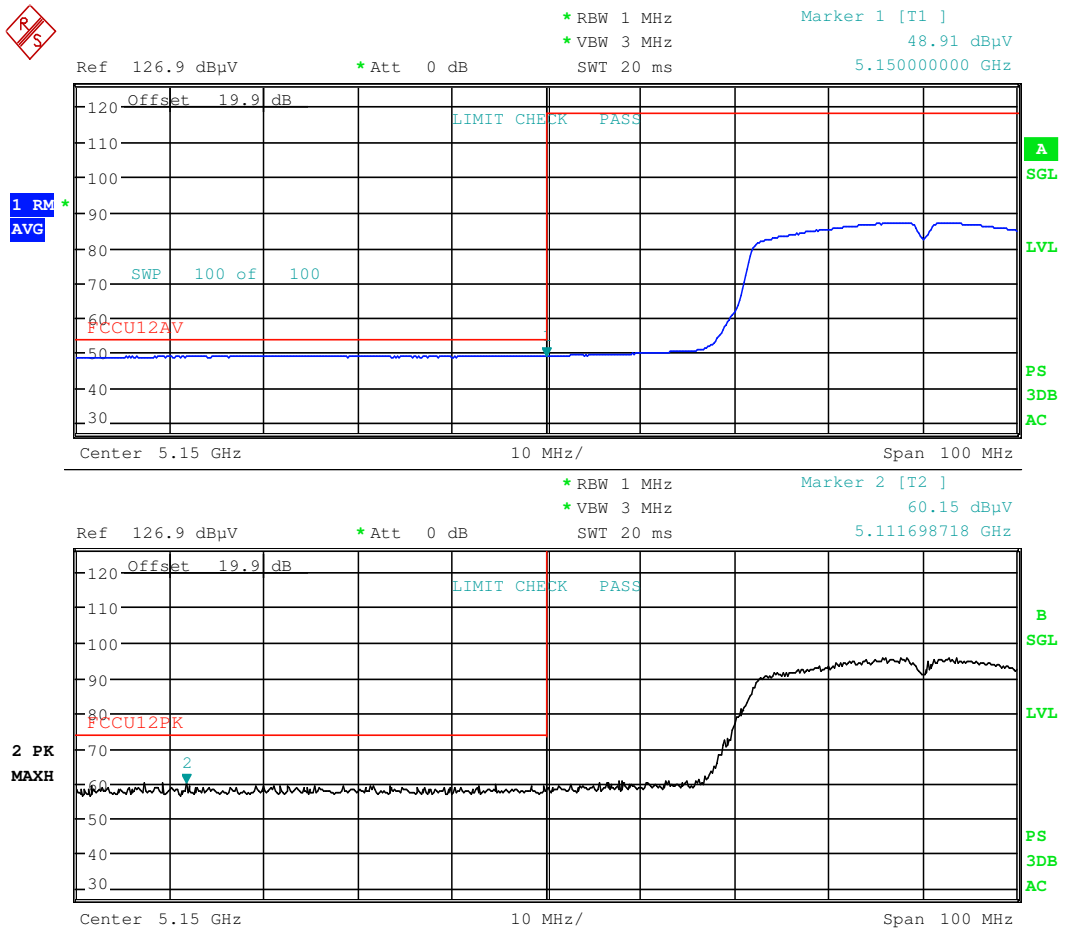
## 7.7.4 Primary Antenna Radiated Band Edge Measurements (40MHz BW)

**§15.407(b.1)(b.2) §15.205 §15.209**

| | |
|---|---|
| Worst Case Mode: | 802.11n (40MHz) |
| Worst Case Transfer Rate: | MCS0 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 5190MHz |
| Channel: | 38 |




Date: 10.AUG.2016 12:32:56

**Plot 7-25. Radiated Restricted Lower Band Edge Plot (Average & Peak – UNII Band 1)**



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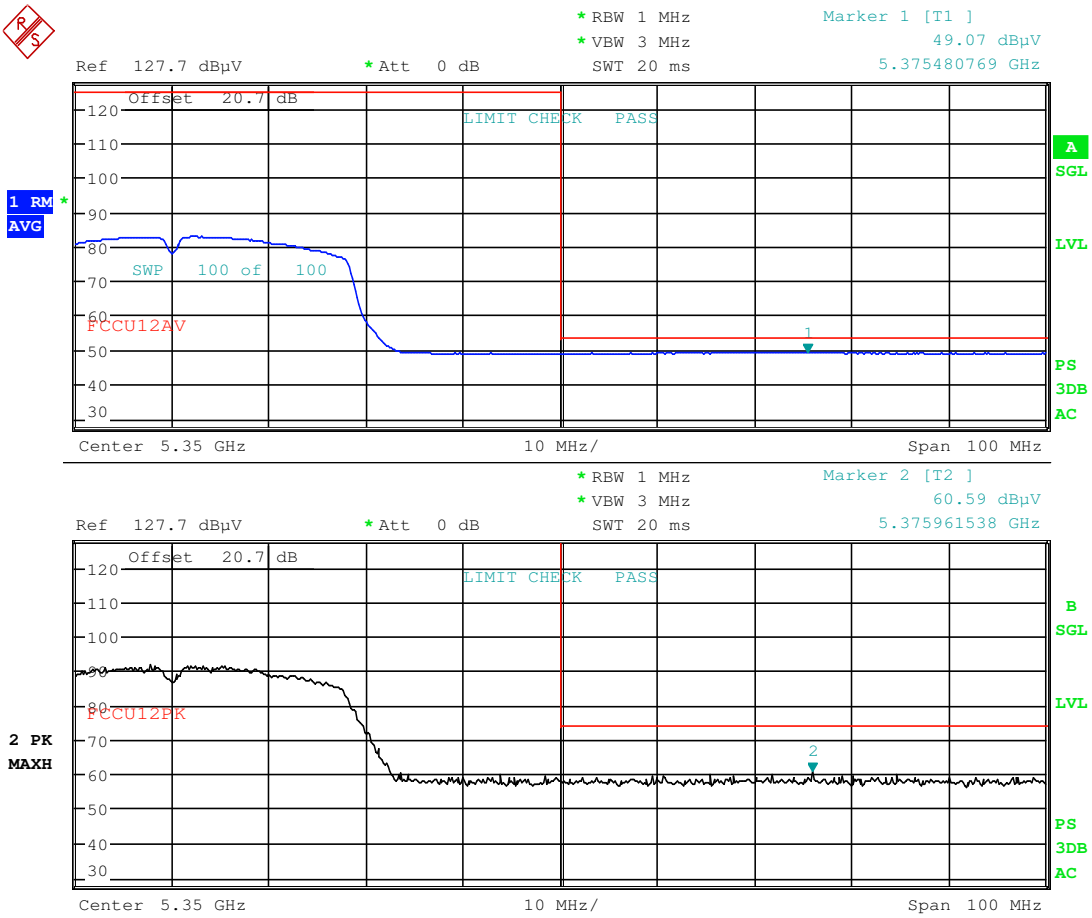
# Primary Antenna Radiated Band Edge Measurements (40MHz BW)

**§15.407(b.1)(b.2) §15.205 §15.209**

| | |
|---|---|
| Worst Case Mode: | 802.11n (40MHz) |
| Worst Case Transfer Rate: | MCS0 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 5310MHz |
| Channel: | 62 |




Date: 10.AUG.2016 12:37:24

**Plot 7-26. Radiated Restricted Upper Band Edge Plot (Average & Peak – UNII Band 2A)**



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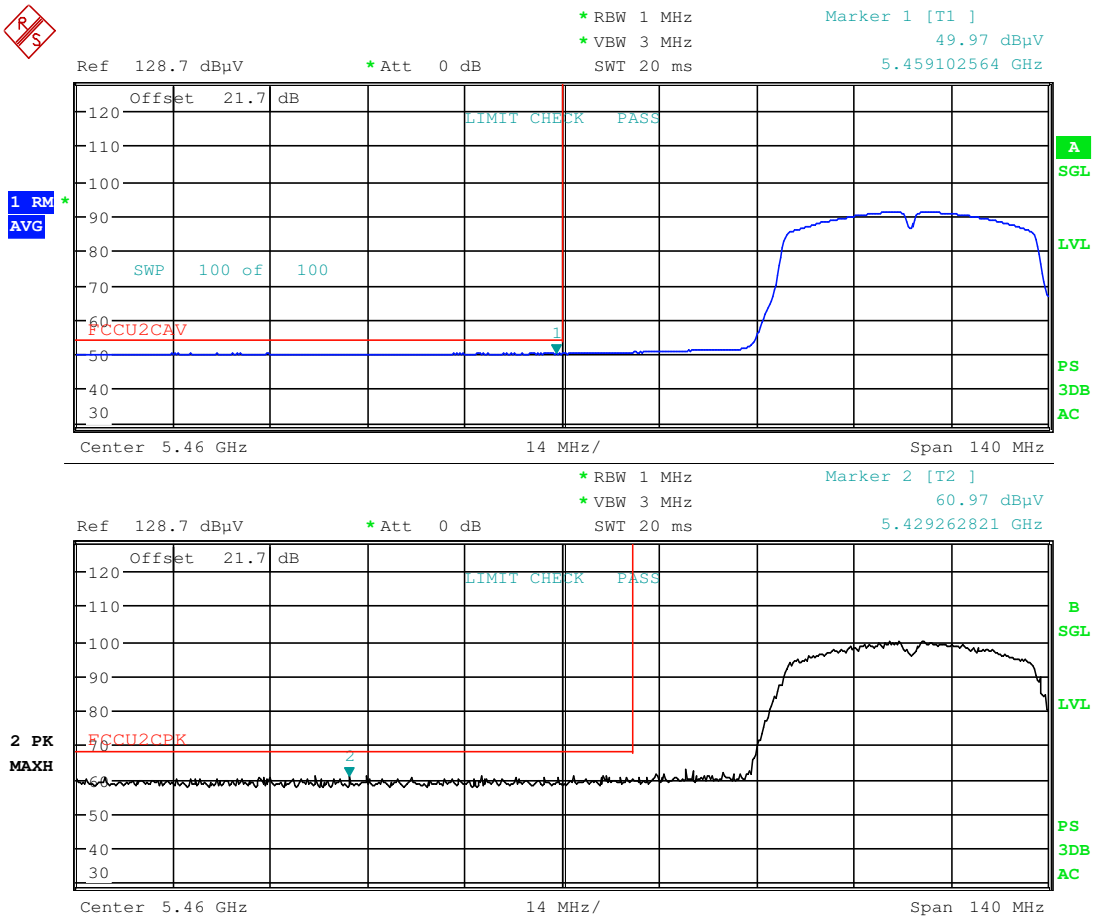
## Primary Antenna Radiated Band Edge Measurements (40MHz BW)

**§15.407(b.1)(b.2) §15.205 §15.209**

| | |
|---|---|
| Worst Case Mode: | 802.11n (40MHz) |
| Worst Case Transfer Rate: | MCS0 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 5510MHz |
| Channel: | 102 |




Date: 10.AUG.2016 12:42:33

**Plot 7-27. Radiated Restricted Lower Band Edge Plot (Average & Peak – UNII Band 2C)**



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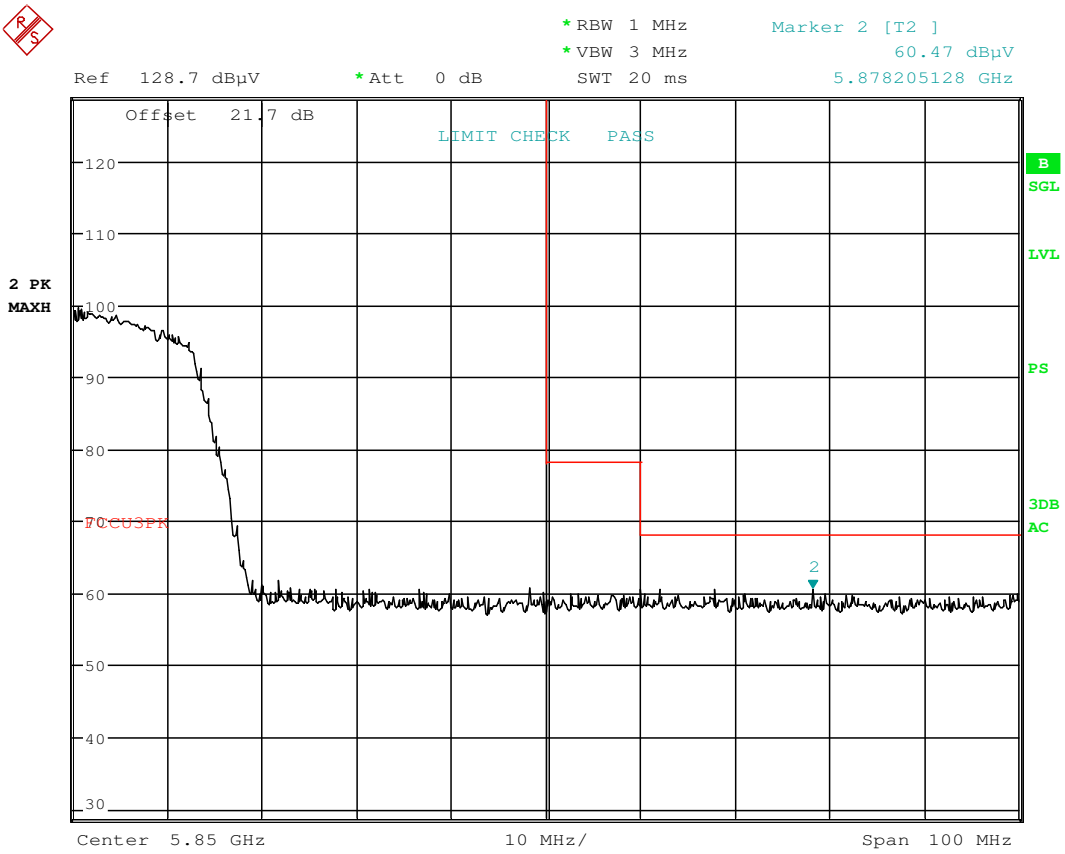
## Primary Antenna Radiated Band Edge Measurements (40MHz BW)

**§15.407(b.1)(b.2) §15.205 §15.209**

| | |
|---|---|
| Worst Case Mode: | 802.11n (40MHz) |
| Worst Case Transfer Rate: | MCS0 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 5795MHz |
| Channel: | 159 |




**Plot 7-28. Radiated Upper Band Edge Plot (Peak – UNII Band 3)**



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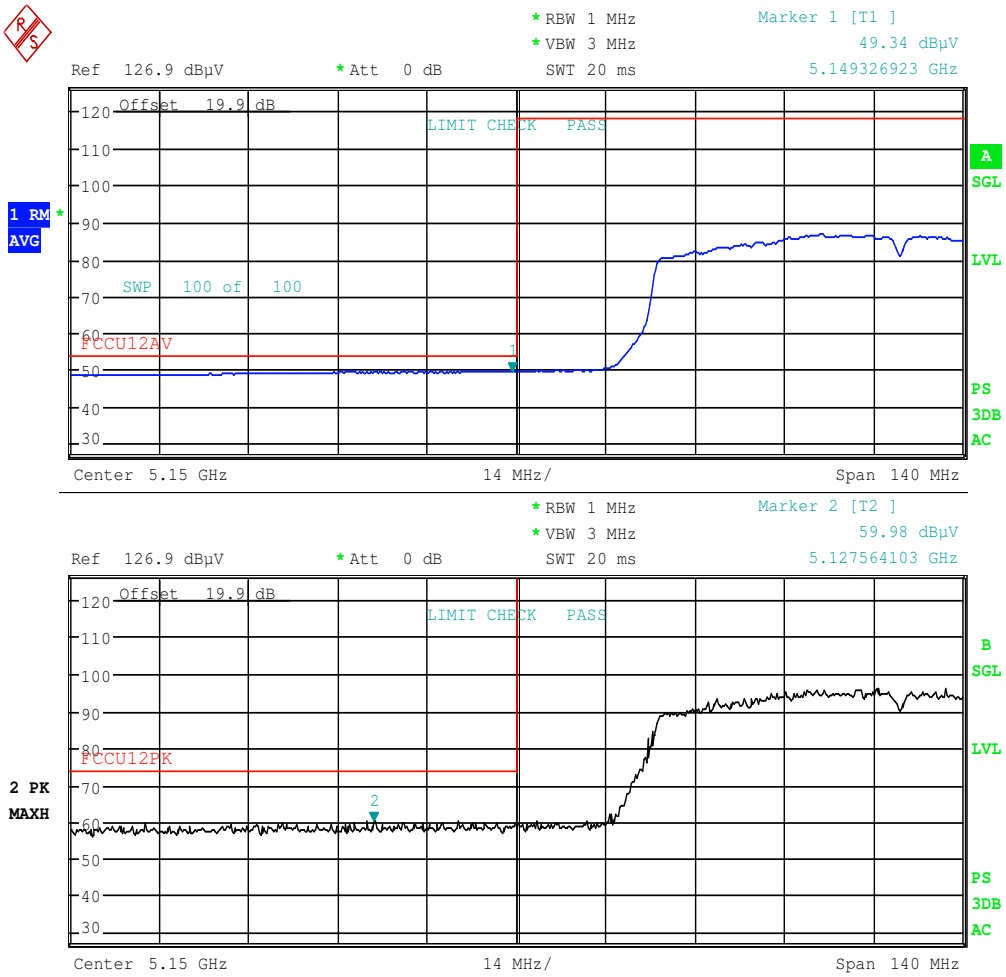
## 7.7.5 Primary Antenna Radiated Band Edge Measurements (80MHz BW)

**§15.407(b.1)(b.2) §15.205 §15.209**

| | |
|---|---|
| Worst Case Mode: | 802.11n (80MHz) |
| Worst Case Transfer Rate: | MCS0 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 5210MHz |
| Channel: | 42 |




Date: 10.AUG.2016 12:54:19

**Plot 7-29. Radiated Restricted Lower Band Edge Plot (Average & Peak – UNII Band 1)**



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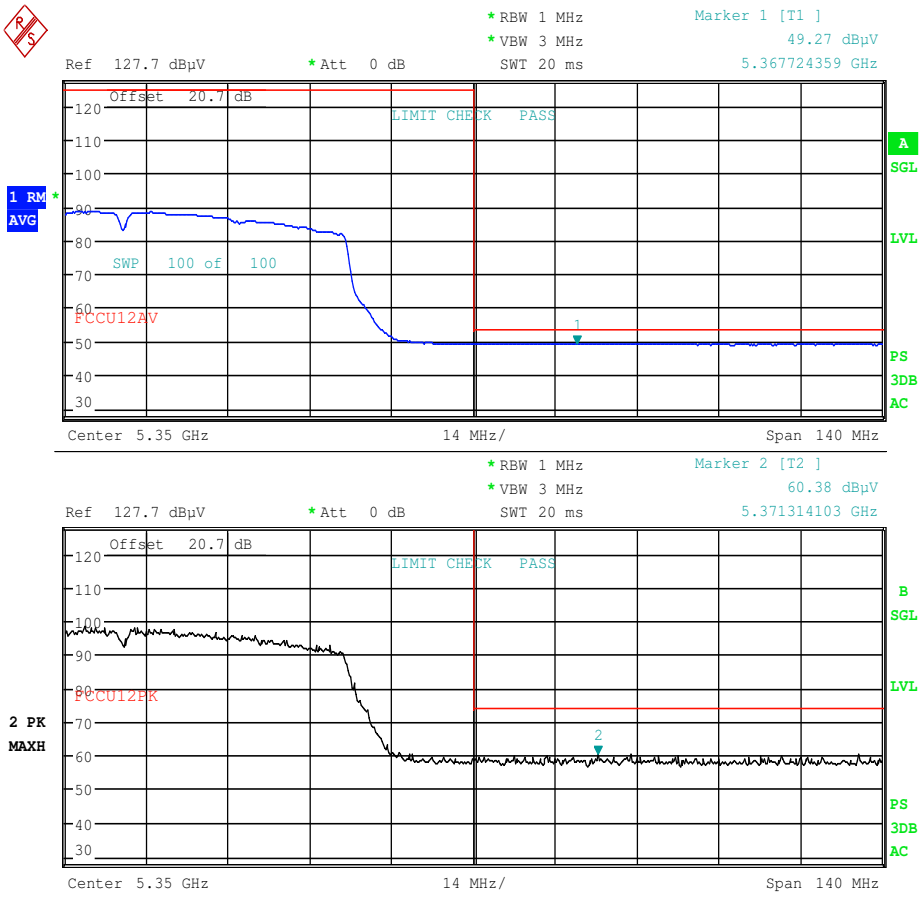
# Primary Antenna Radiated Band Edge Measurements (80MHz BW)

**§15.407(b.1)(b.2) §15.205 §15.209**

| | |
|---|---|
| Worst Case Mode: | 802.11ac (80MHz) |
| Worst Case Transfer Rate: | MCS0 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 5290MHz |
| Channel: | 58 |




Date: 10.AUG.2016 13:04:43

**Plot 7-30. Radiated Restricted Upper Band Edge Plot (Average & Peak – UNII Band 2A)**



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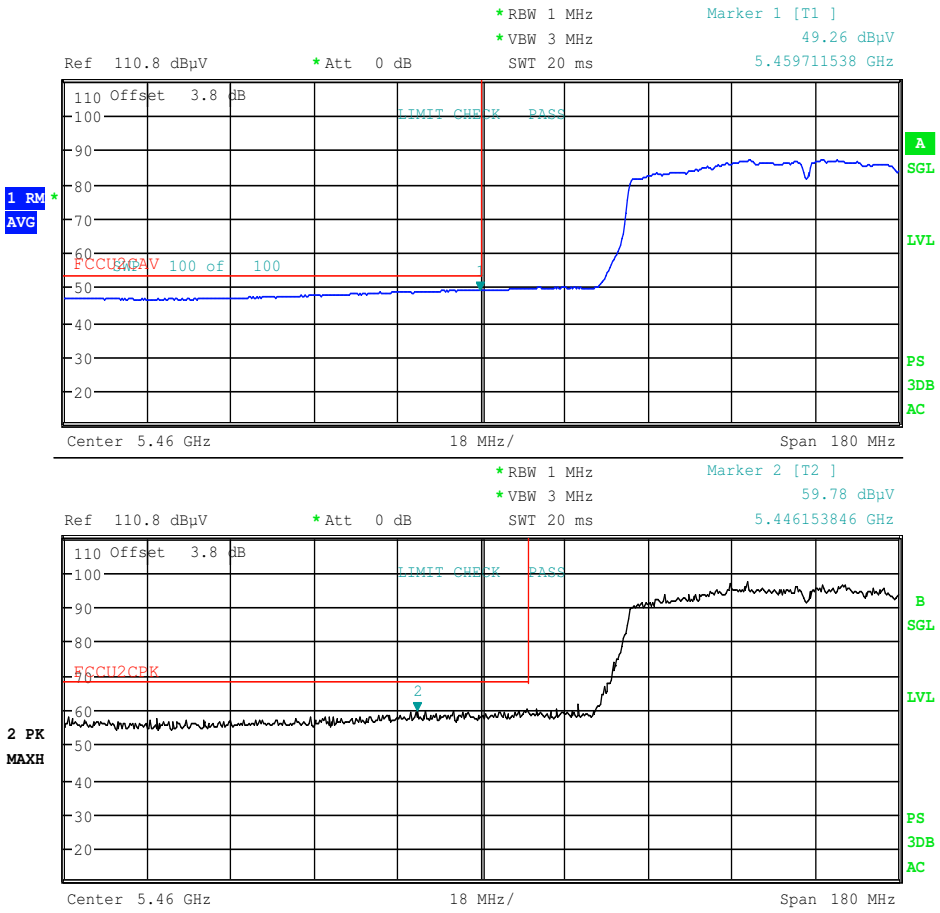
# Primary Antenna Radiated Band Edge Measurements (80MHz BW)

**§15.407(b.1)(b.2) §15.205 §15.209**

| | |
|---|---|
| Worst Case Mode: | 802.11ac (80MHz) |
| Worst Case Transfer Rate: | MCS0 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 5530MHz |
| Channel: | 106 |




Date: 23.AUG.2016 17:42:28

**Plot 7-31. Radiated Restricted Lower Band Edge Plot (Average & Peak – UNII Band 2C)**



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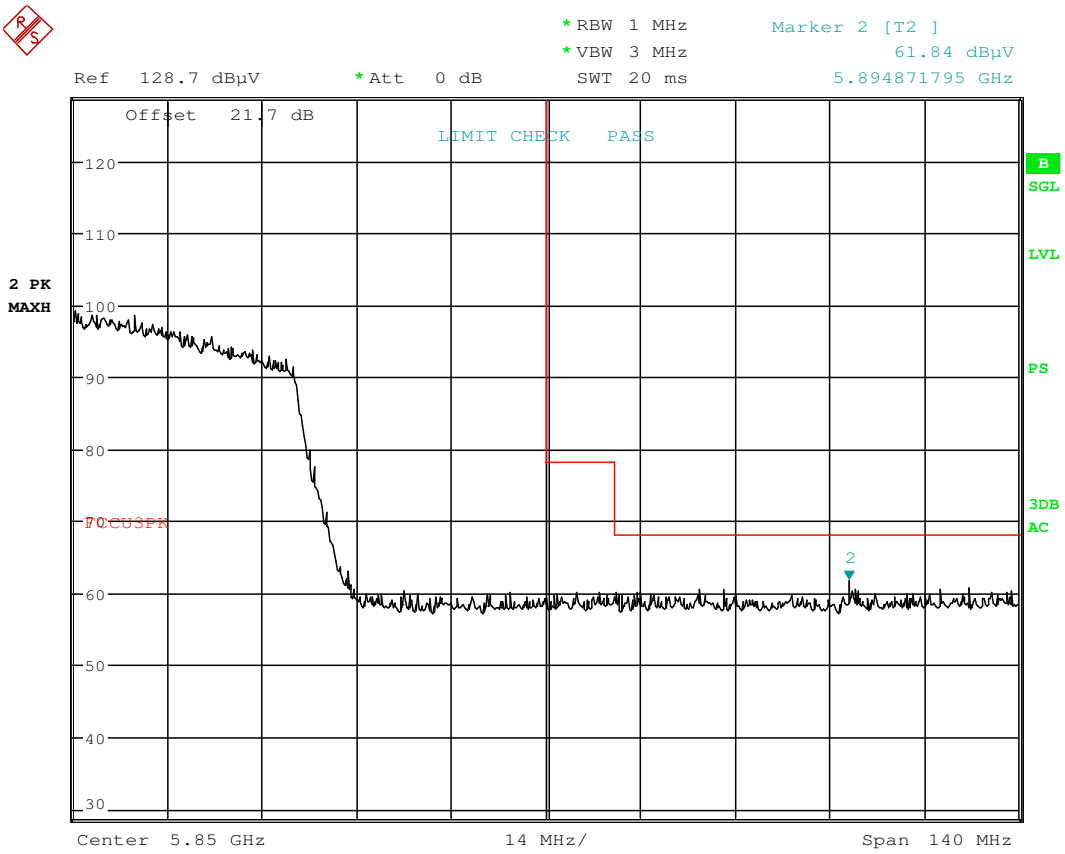
## Primary Antenna Radiated Band Edge Measurements (80MHz BW)

**§15.407(b.1)(b.2) §15.205 §15.209**

| | |
|---|---|
| Worst Case Mode: | 802.11ac (80MHz) |
| Worst Case Transfer Rate: | MCS0 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 5775MHz |
| Channel: | 155 |




Date: 10.AUG.2016 13:17:56

**Plot 7-32. Radiated Upper Band Edge Plot (Peak – UNII Band 3)**



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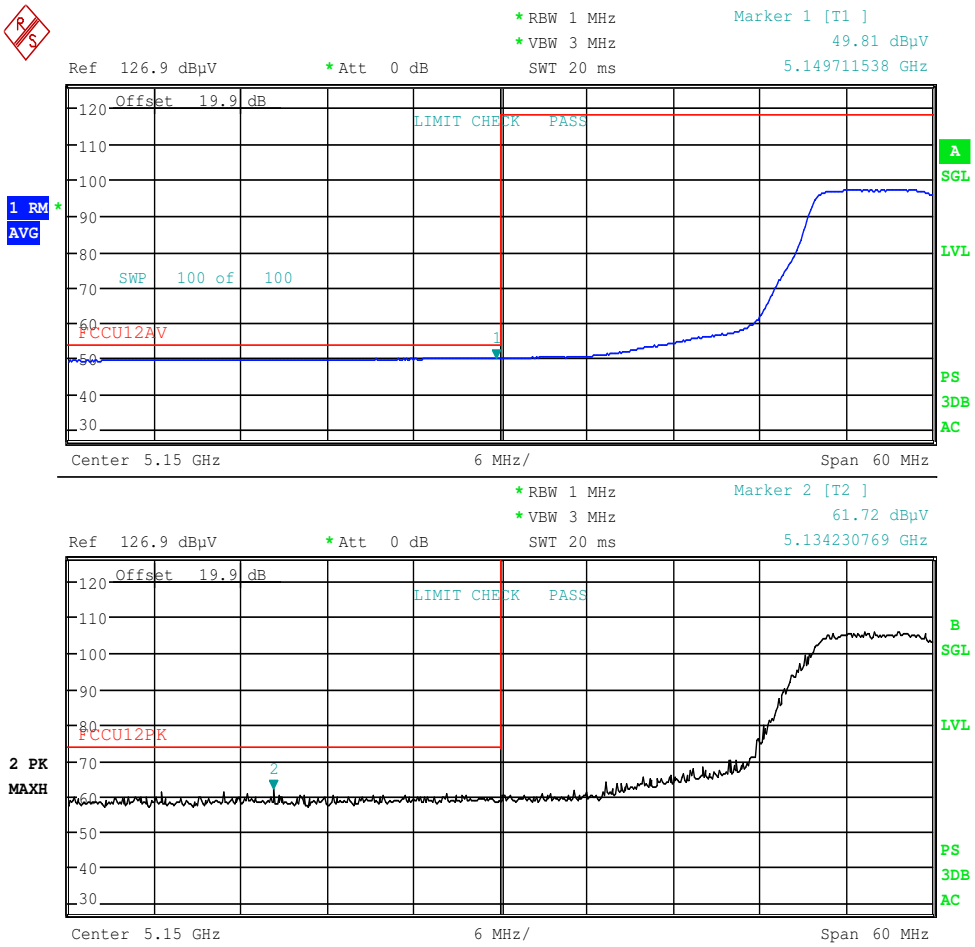
## 7.7.6 Secondary Antenna Radiated Band Edge Measurements (20MHz BW)

**§15.407(b.1)(b.2) §15.205 §15.209**

| | |
|---|---|
| Worst Case Mode: | 802.11a |
| Worst Case Transfer Rate: | 6 Mbps |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 5180MHz |
| Channel: | 36 |




Date: 10.AUG.2016 13:25:14

**Plot 7-33. Radiated Restricted Lower Band Edge Plot (Average & Peak – UNII Band 1)**



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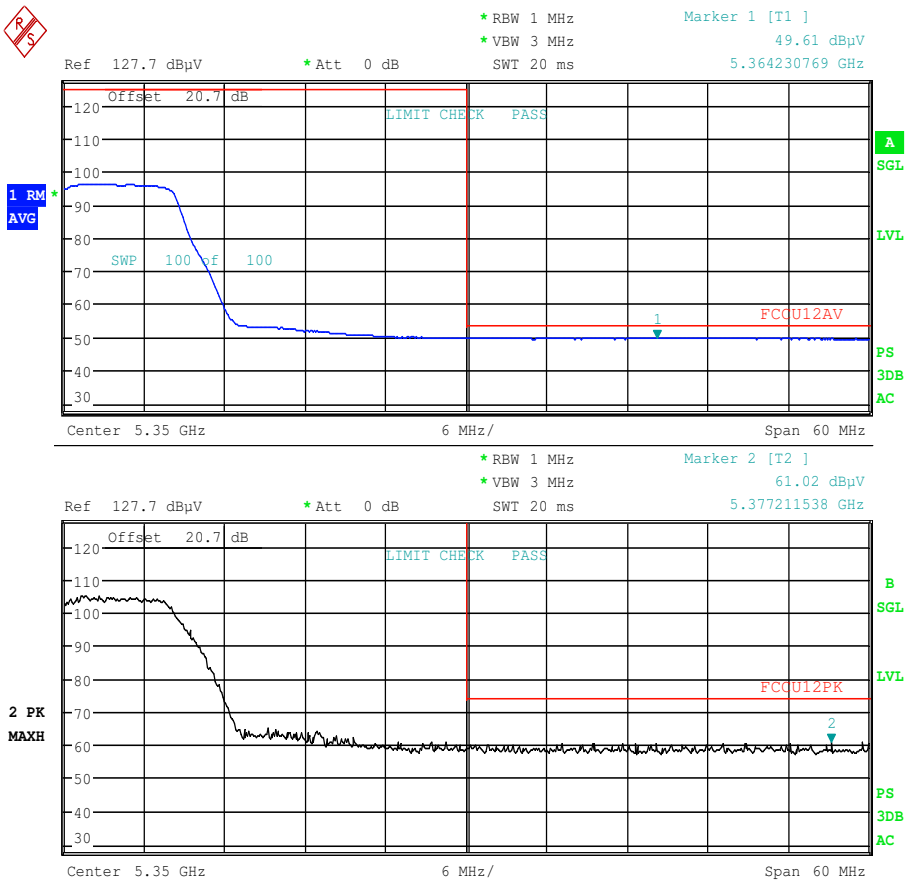
# Secondary Antenna Radiated Band Edge Measurements (20MHz BW)

**§15.407(b.1)(b.2) §15.205 §15.209**

| | |
|---|---|
| Worst Case Mode: | 802.11a |
| Worst Case Transfer Rate: | 6 Mbps |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 5320MHz |
| Channel: | 64 |




Date: 10.AUG.2016 13:29:47

**Plot 7-34. Radiated Restricted Upper Band Edge Plot (Average & Peak – UNII Band 2A)**



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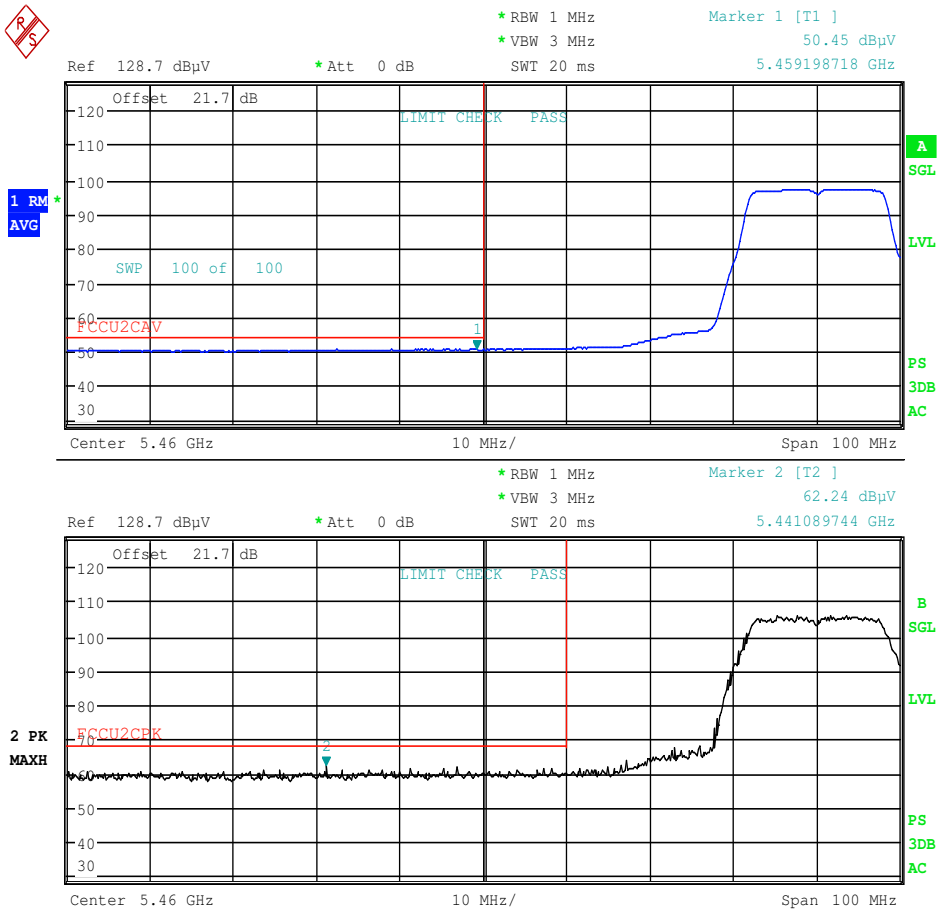
# Secondary Antenna Radiated Band Edge Measurements (20MHz BW)

**§15.407(b.1)(b.2) §15.205 §15.209**

| | |
|---|---|
| Worst Case Mode: | 802.11a |
| Worst Case Transfer Rate: | 6 Mbps |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 5500MHz |
| Channel: | 100 |




Date: 10.AUG.2016 13:34:57

**Plot 7-35. Radiated Restricted Lower Band Edge Plot (Average & Peak – UNII Band 2C)**



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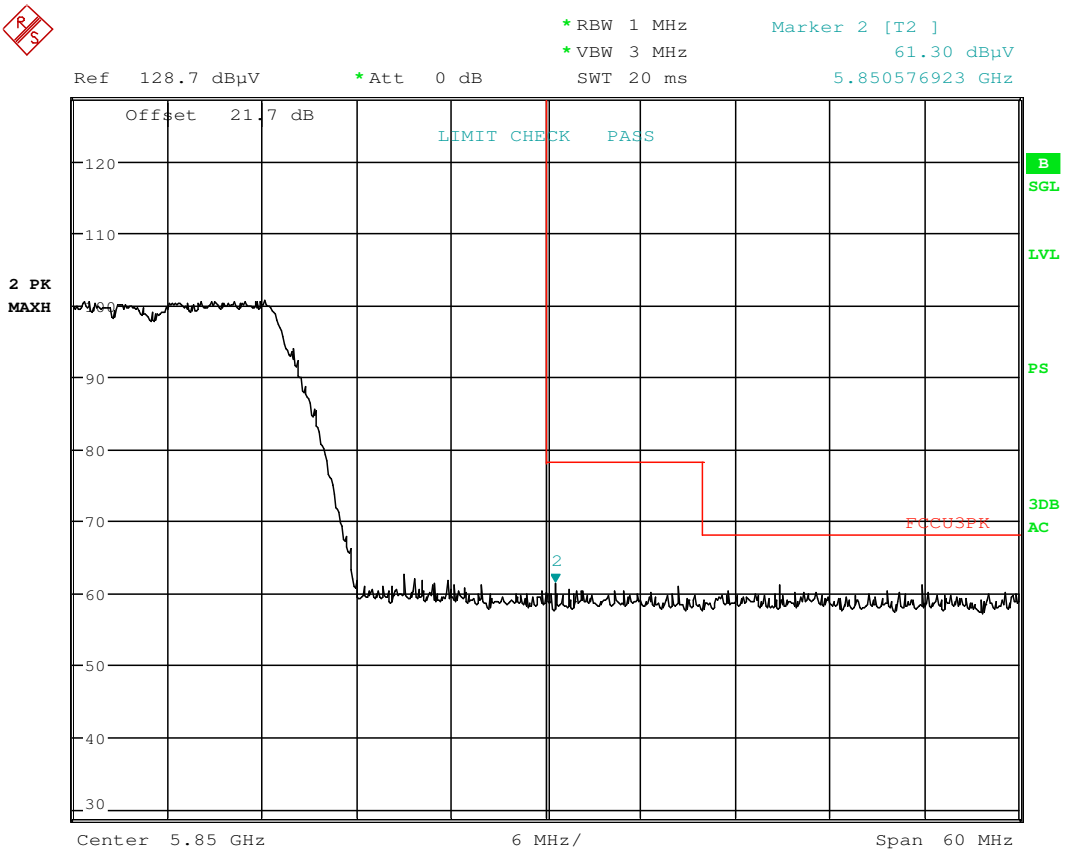
## Secondary Antenna Radiated Band Edge Measurements (20MHz BW)

**§15.407(b.1)(b.2) §15.205 §15.209**

| | |
|---|---|
| Worst Case Mode: | 802.11a |
| Worst Case Transfer Rate: | 6 Mbps |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 5825MHz |
| Channel: | 165 |




Date: 10.AUG.2016 13:39:54

**Plot 7-36. Radiated Upper Band Edge Plot (Peak – UNII Band 3)**



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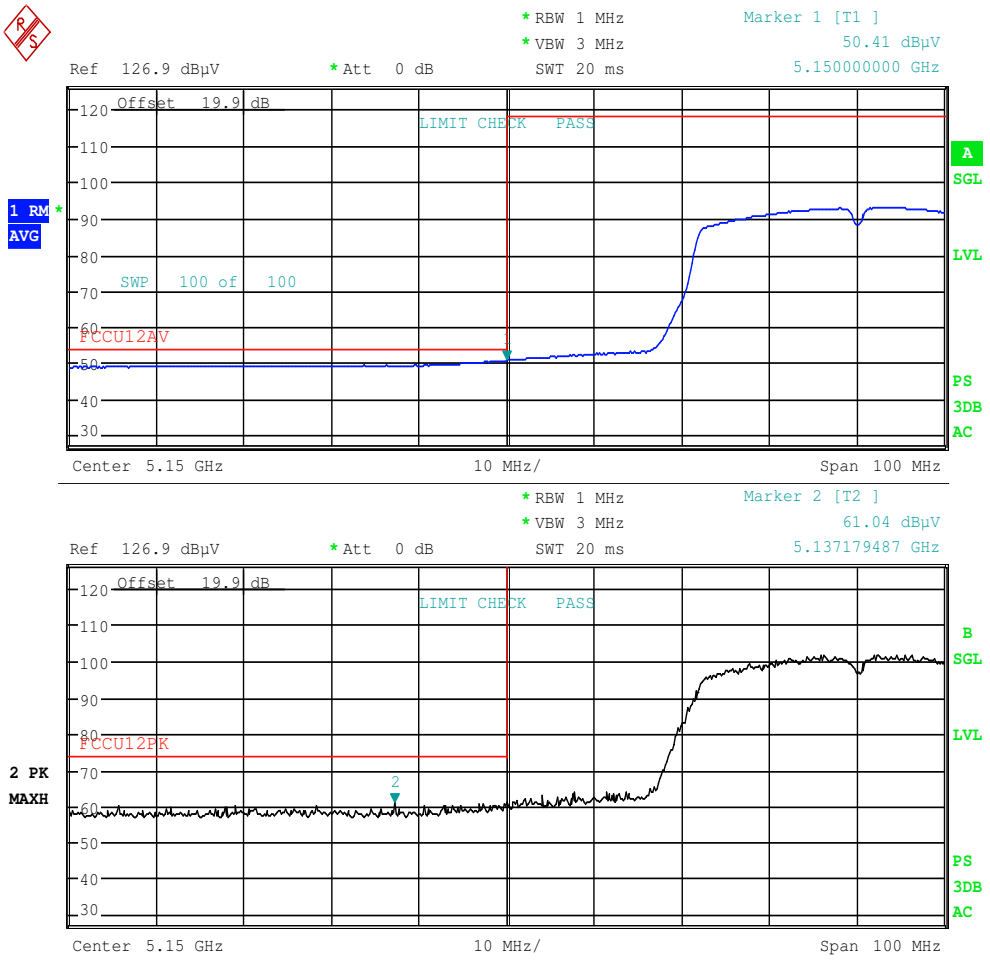
## 7.7.7 Secondary Antenna Radiated Band Edge Measurements (40MHz BW)

**§15.407(b.1)(b.2) §15.205 §15.209**

| | |
|---|---|
| Worst Case Mode: | 802.11n (40MHz) |
| Worst Case Transfer Rate: | MCS0 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 5190MHz |
| Channel: | 38 |




Date: 10.AUG.2016 13:52:08

**Plot 7-37. Radiated Restricted Lower Band Edge Plot (Average & Peak – UNII Band 1)**



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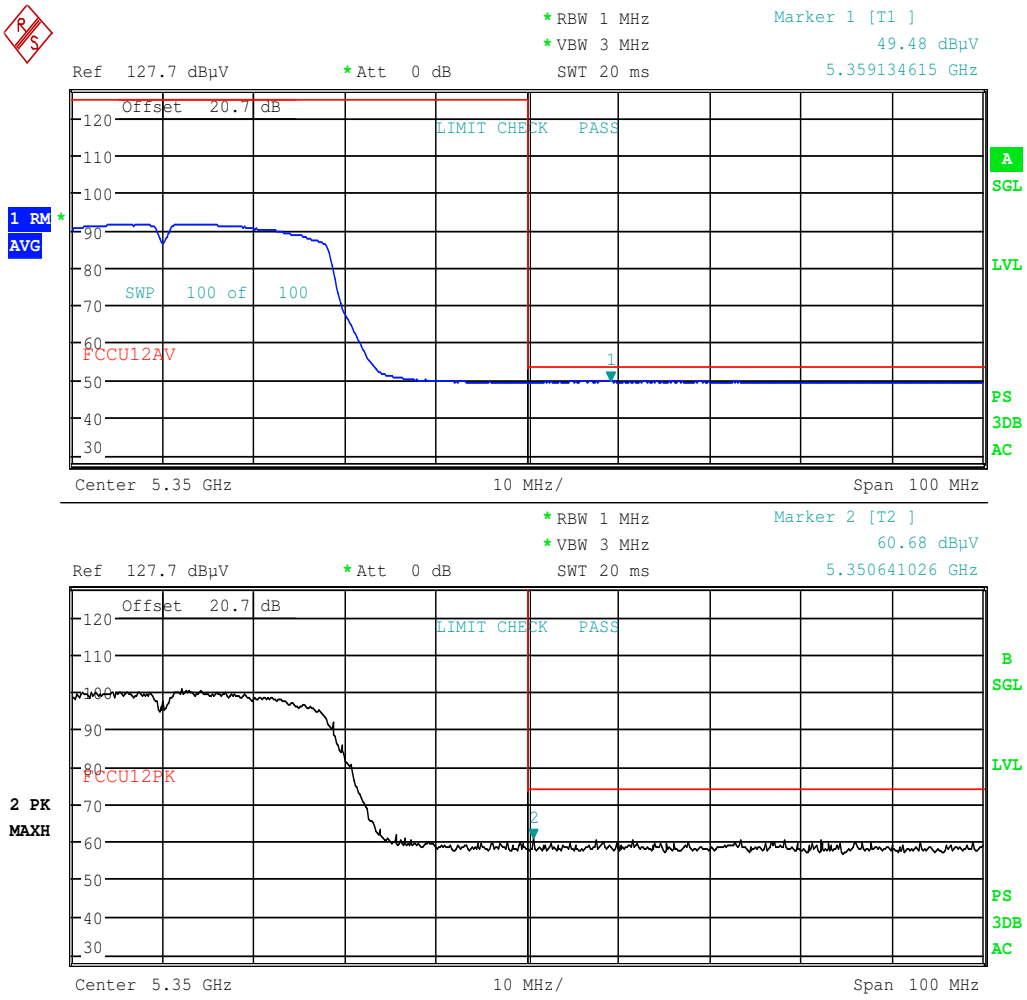
# Secondary Antenna Radiated Band Edge Measurements (40MHz BW)

**§15.407(b.1)(b.2) §15.205 §15.209**

| | |
|---|---|
| Worst Case Mode: | 802.11n (40MHz) |
| Worst Case Transfer Rate: | MCS0 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 5310MHz |
| Channel: | 62 |




Date: 10.AUG.2016 14:00:42

**Plot 7-38. Radiated Restricted Upper Band Edge Plot (Average & Peak – UNII Band 2A)**



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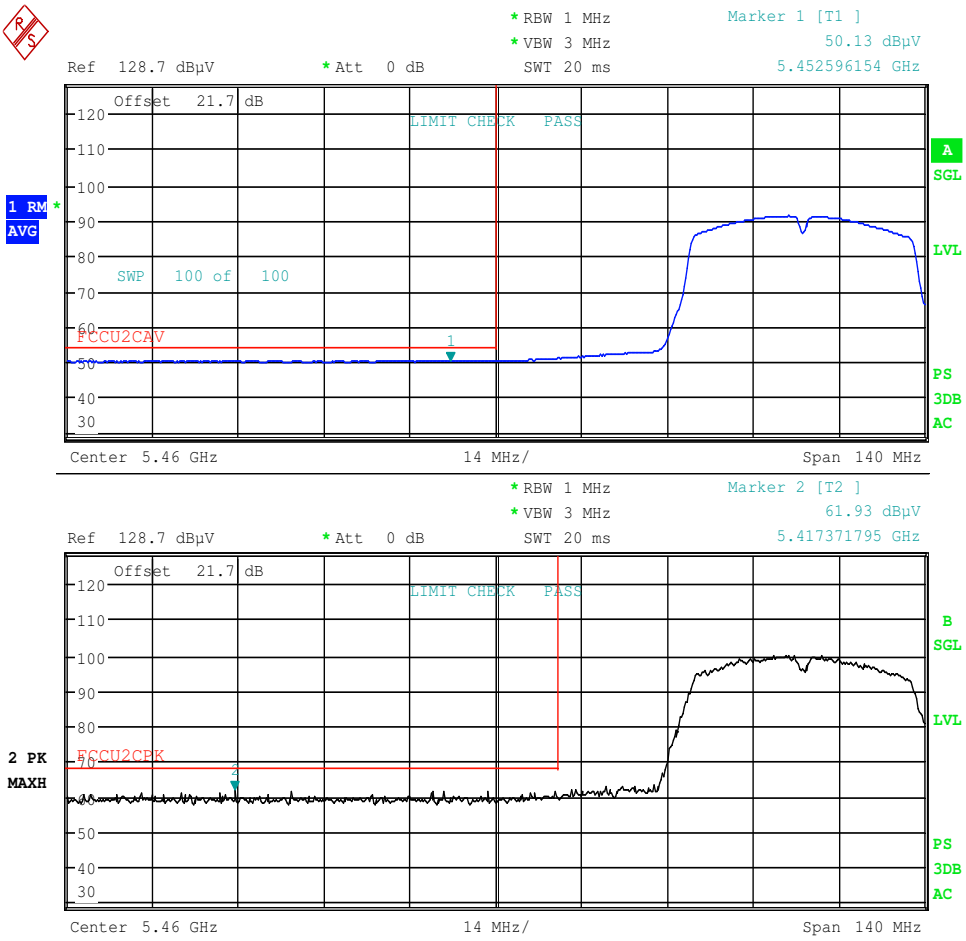
# Secondary Antenna Radiated Band Edge Measurements (40MHz BW)

**§15.407(b.1)(b.2) §15.205 §15.209**

| | |
|---|---|
| Worst Case Mode: | 802.11n (40MHz) |
| Worst Case Transfer Rate: | MCS0 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 5510MHz |
| Channel: | 102 |




Date: 10.AUG.2016 14:09:03

**Plot 7-39. Radiated Restricted Lower Band Edge Plot (Average & Peak – UNII Band 2C)**



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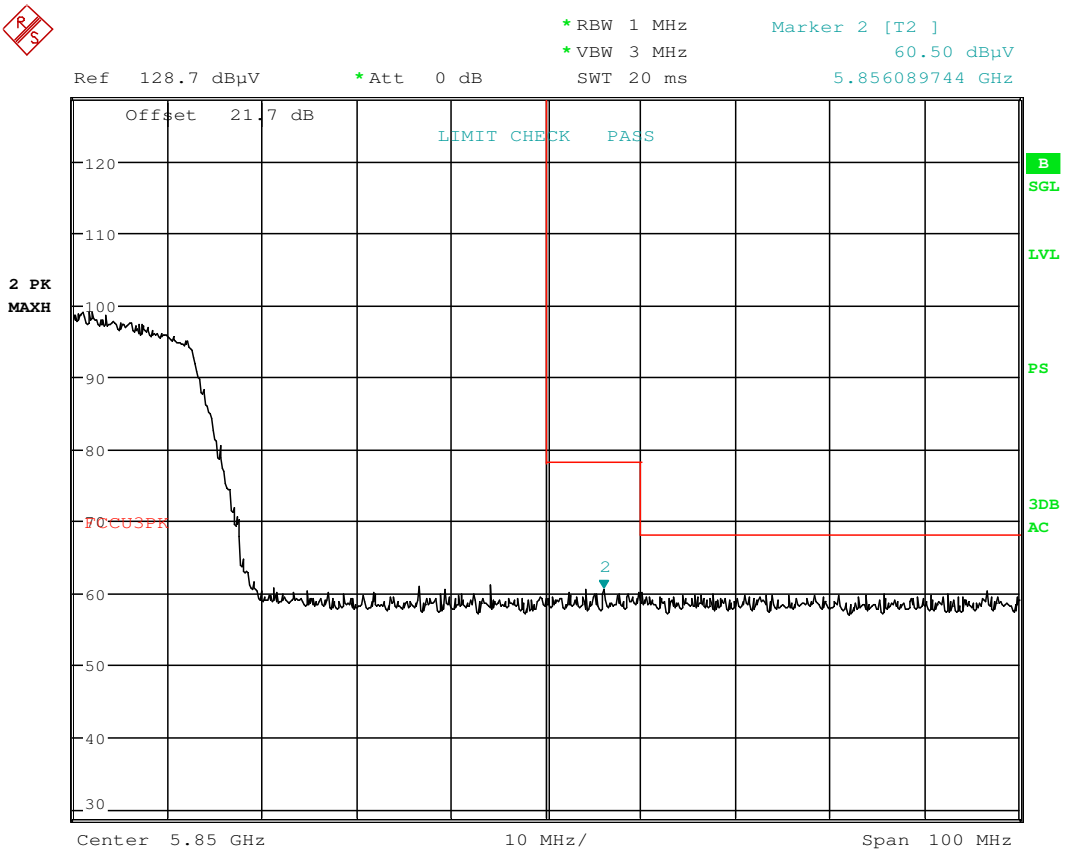
## Secondary Antenna Radiated Band Edge Measurements (40MHz BW)

**§15.407(b.1)(b.2) §15.205 §15.209**

| | |
|---|---|
| Worst Case Mode: | 802.11n (40MHz) |
| Worst Case Transfer Rate: | MCS0 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 5795MHz |
| Channel: | 159 |




Date: 10.AUG.2016 14:13:38

**Plot 7-40. Radiated Upper Band Edge Plot (Peak – UNII Band 3)**



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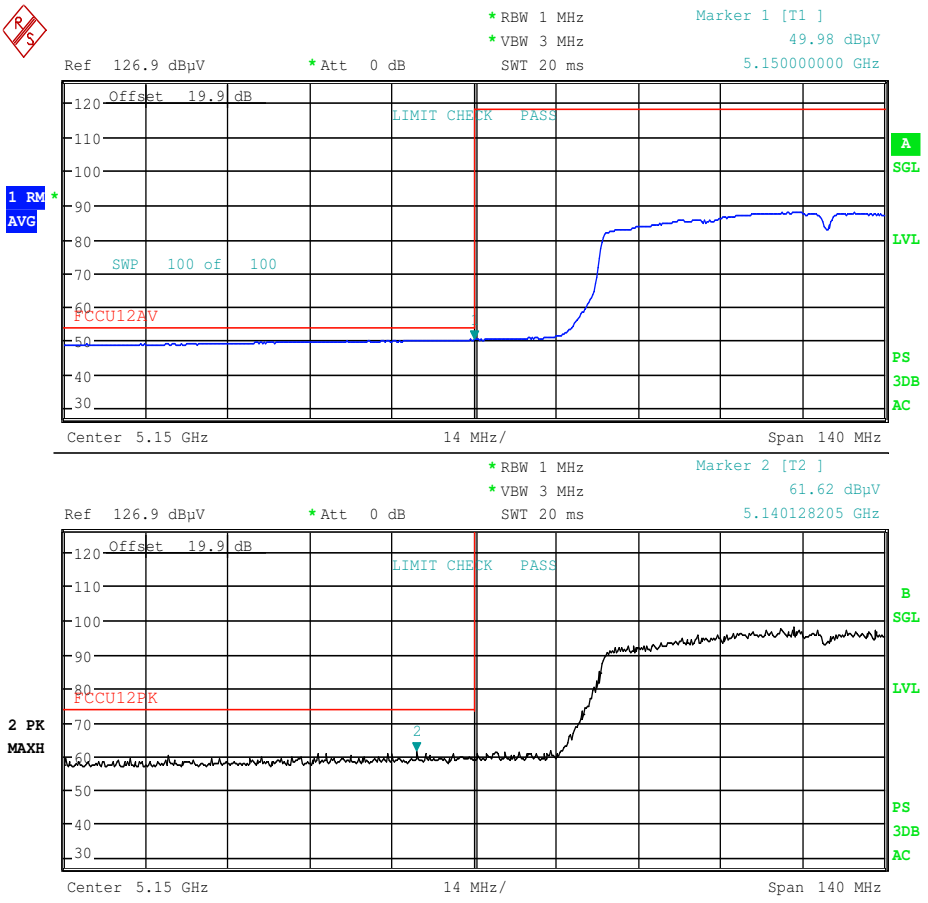
## 7.7.8 Secondary Antenna Radiated Band Edge Measurements (80MHz BW)

**§15.407(b.1)(b.2) §15.205 §15.209**

| | |
|---|---|
| Worst Case Mode: | 802.11n (80MHz) |
| Worst Case Transfer Rate: | MCS0 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 5210MHz |
| Channel: | 42 |




Date: 10.AUG.2016 15:53:55

**Plot 7-41. Radiated Restricted Lower Band Edge Plot (Average & Peak – UNII Band 1)**



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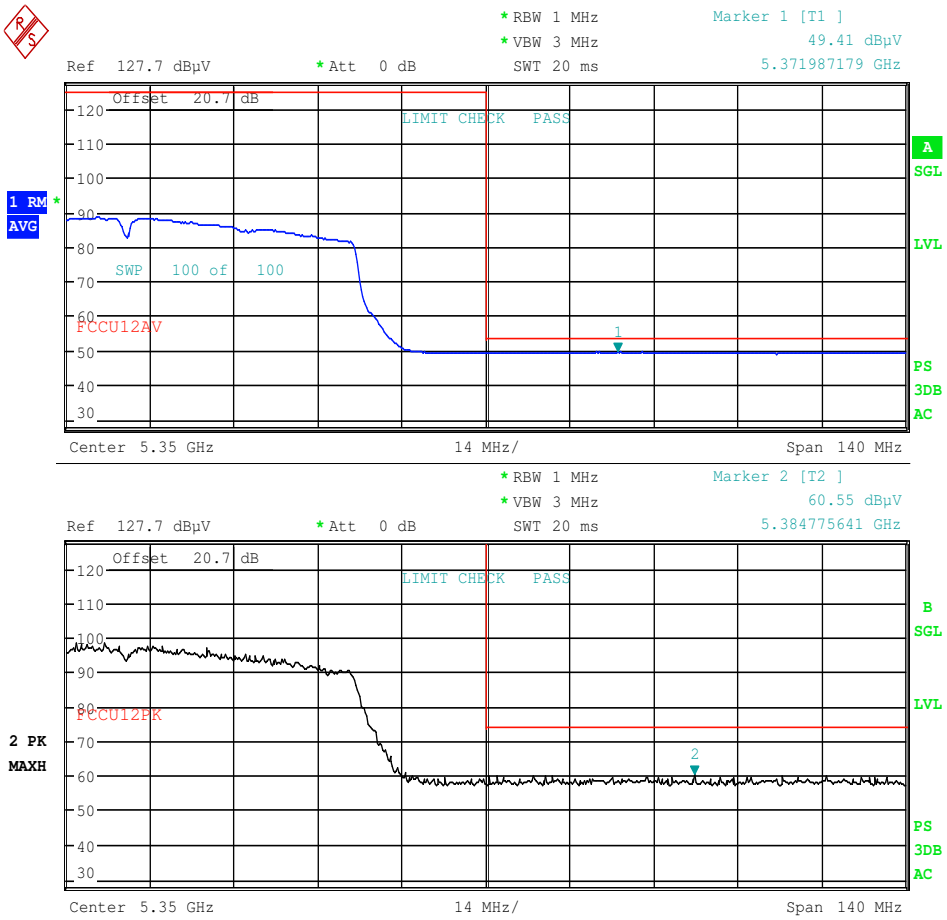
# Secondary Antenna Radiated Band Edge Measurements (80MHz BW)

**§15.407(b.1)(b.2) §15.205 §15.209**

| | |
|---|---|
| Worst Case Mode: | 802.11ac (80MHz) |
| Worst Case Transfer Rate: | MCS0 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 5290MHz |
| Channel: | 58 |




Date: 10.AUG.2016 15:58:49

**Plot 7-42. Radiated Restricted Upper Band Edge Plot (Average & Peak – UNII Band 2A)**



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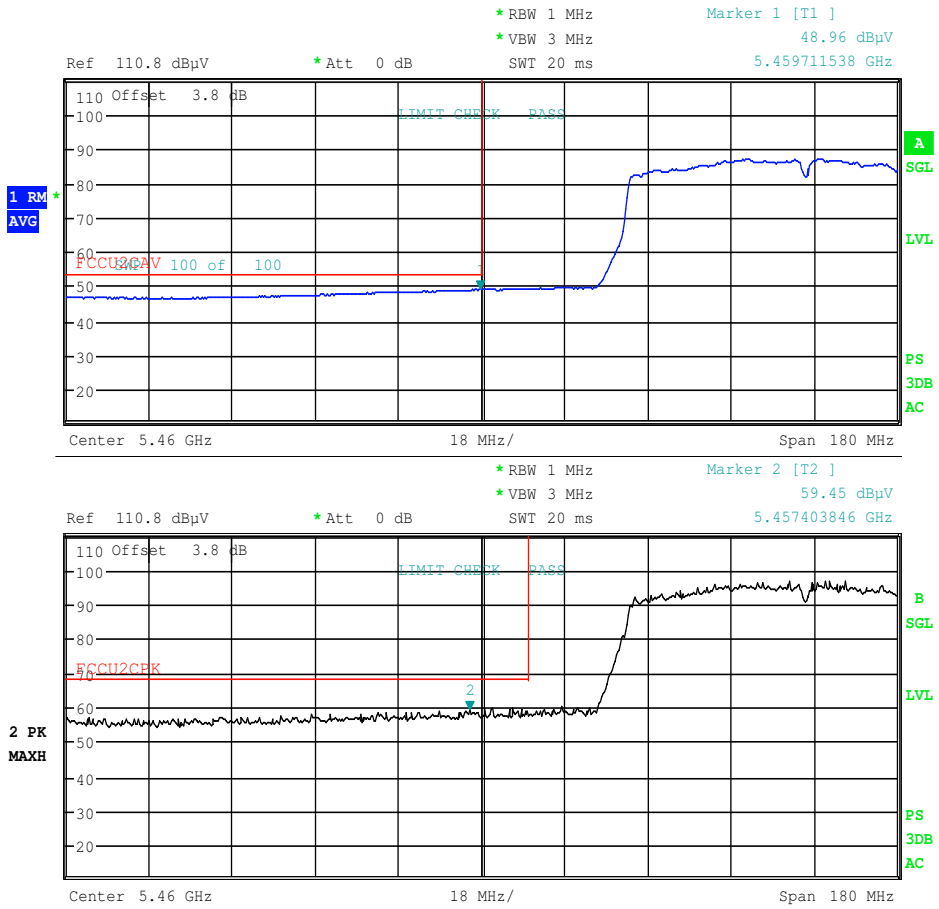
# Secondary Antenna Radiated Band Edge Measurements (80MHz BW)

**§15.407(b.1)(b.2) §15.205 §15.209**

| | |
|---|---|
| Worst Case Mode: | 802.11ac (80MHz) |
| Worst Case Transfer Rate: | MCS0 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 5530MHz |
| Channel: | 106 |




Date: 23.AUG.2016 17:58:10

**Plot 7-43. Radiated Restricted Lower Band Edge Plot (Average & Peak – UNII Band 2C)**



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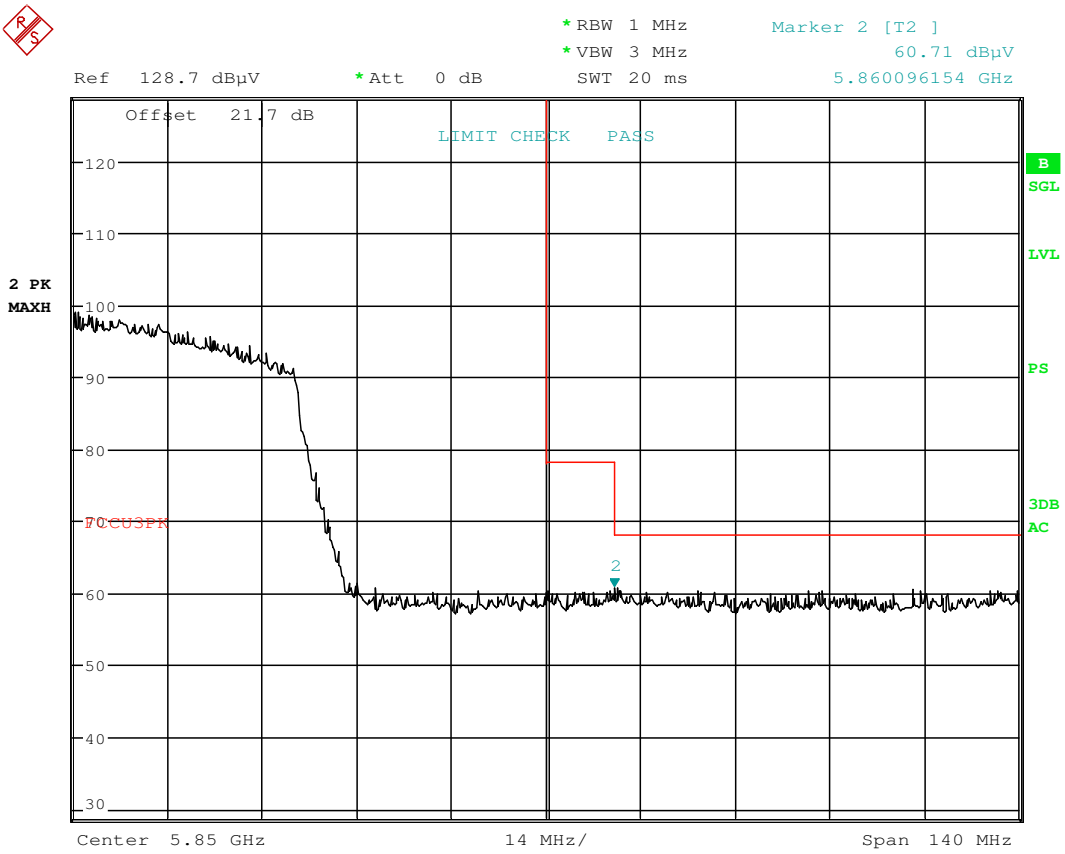
## Secondary Antenna Radiated Band Edge Measurements (80MHz BW)

**§15.407(b.1)(b.2) §15.205 §15.209**

| | |
|---|---|
| Worst Case Mode: | 802.11ac (80MHz) |
| Worst Case Transfer Rate: | MCS0 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 5775MHz |
| Channel: | 155 |




Date: 10.AUG.2016 16:08:38

**Plot 7-44. Radiated Upper Band Edge Plot (Peak – UNII Band 3)**



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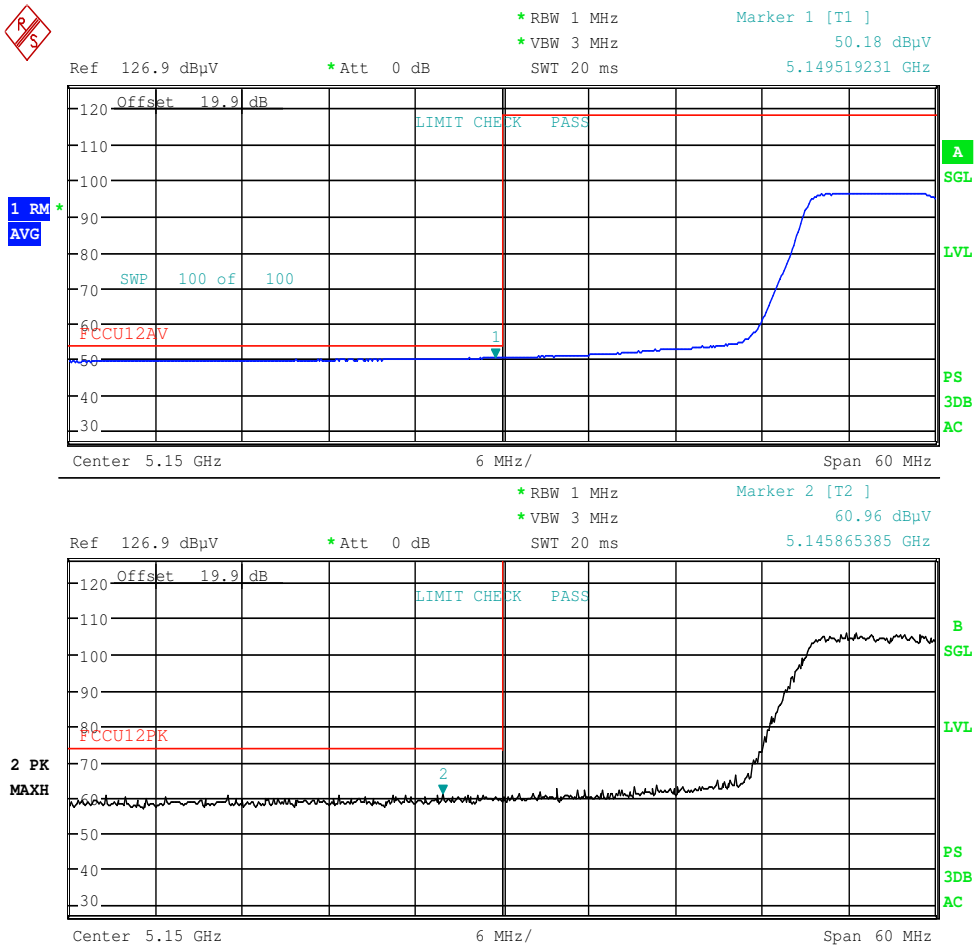
## 7.7.9 MIMO Radiated Band Edge Measurements (20MHz BW)

**§15.407(b.1)(b.2) §15.205 §15.209**

| | |
|---|---|
| Worst Case Mode: | 802.11n (20MHz) |
| Worst Case Transfer Rate: | MCS8 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 5180MHz |
| Channel: | 36 |




Date: 10.AUG.2016 16:22:15

**Plot 7-45. Radiated Restricted Lower Band Edge Plot (Average & Peak – UNII Band 1)**



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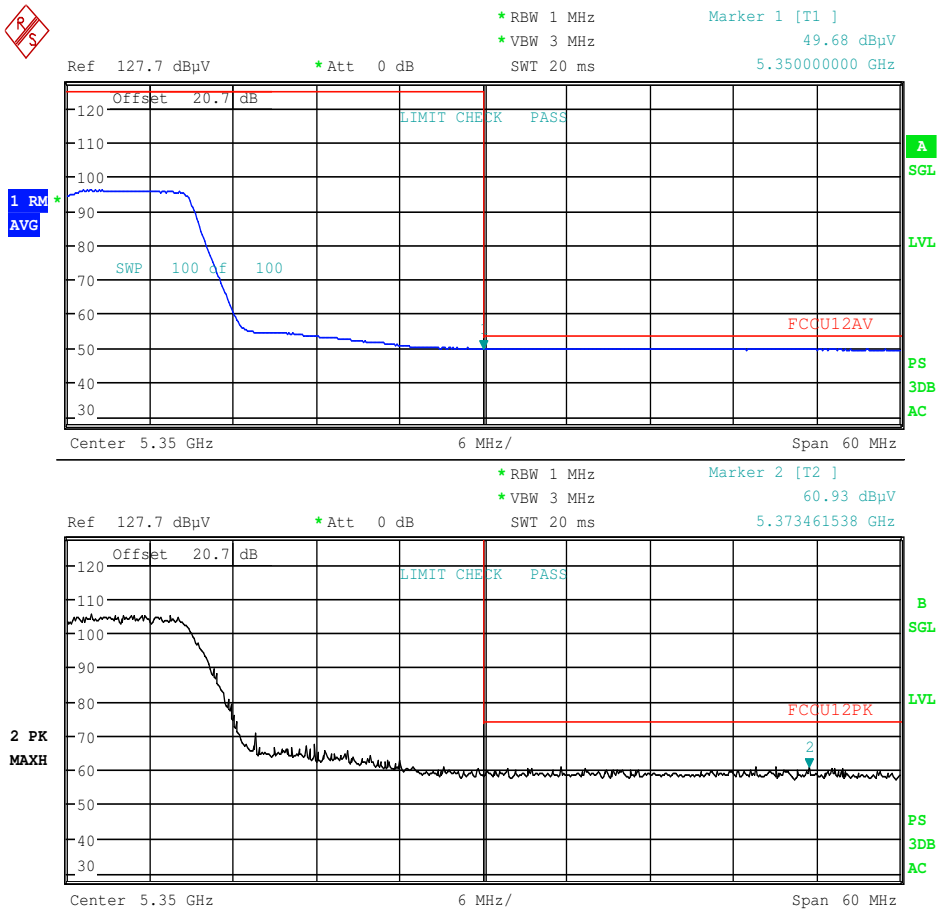
# MIMO Radiated Band Edge Measurements (20MHz BW)

**§15.407(b.1)(b.2) §15.205 §15.209**

| | |
|---|---|
| Worst Case Mode: | 802.11n (20MHz) |
| Worst Case Transfer Rate: | MCS8 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 5320MHz |
| Channel: | 64 |




Date: 10.AUG.2016 16:26:53

**Plot 7-46. Radiated Restricted Upper Band Edge Plot (Average & Peak – UNII Band 2A)**



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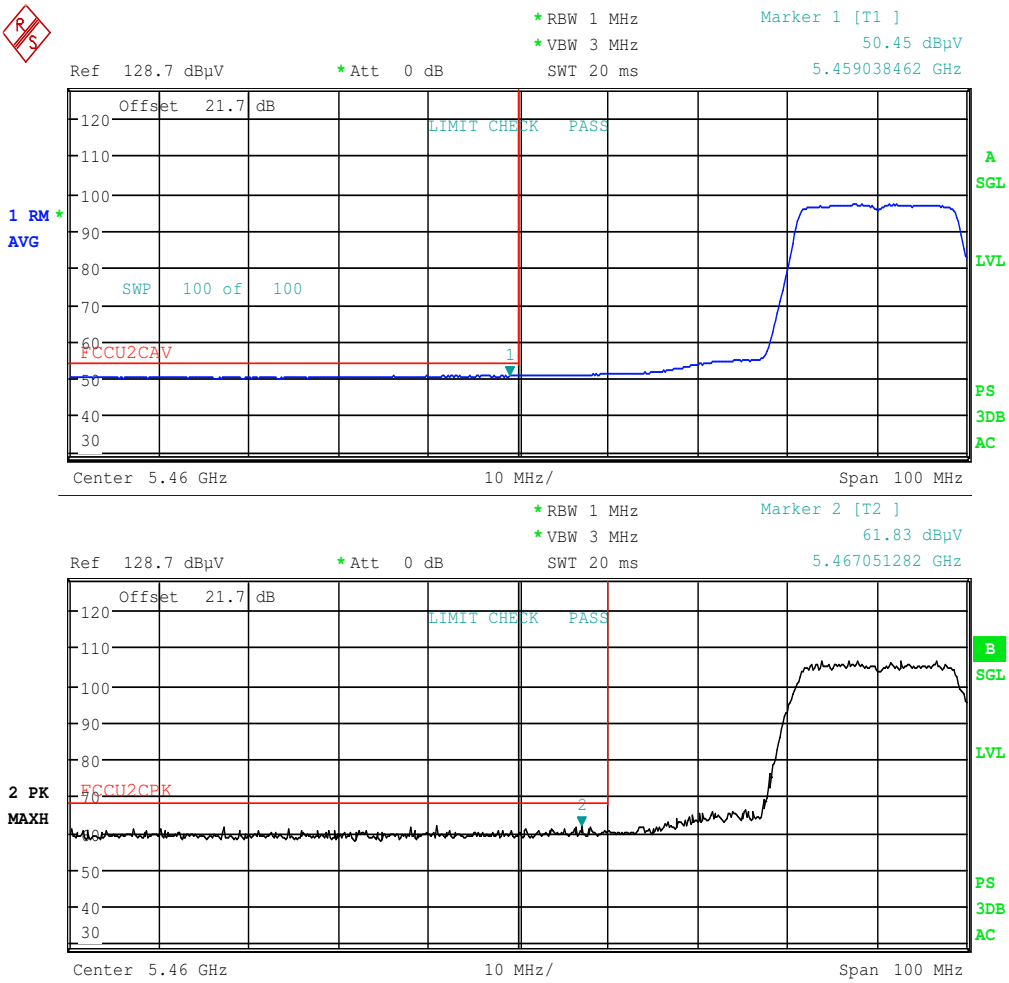
# MIMO Radiated Band Edge Measurements (20MHz BW)

**§15.407(b.1)(b.2) §15.205 §15.209**

| | |
|---|---|
| Worst Case Mode: | 802.11n (20MHz) |
| Worst Case Transfer Rate: | MCS8 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 5500MHz |
| Channel: | 100 |




Date: 10.AUG.2016 16:32:05

**Plot 7-47. Radiated Restricted Lower Band Edge Plot (Average & Peak – UNII Band 2C)**



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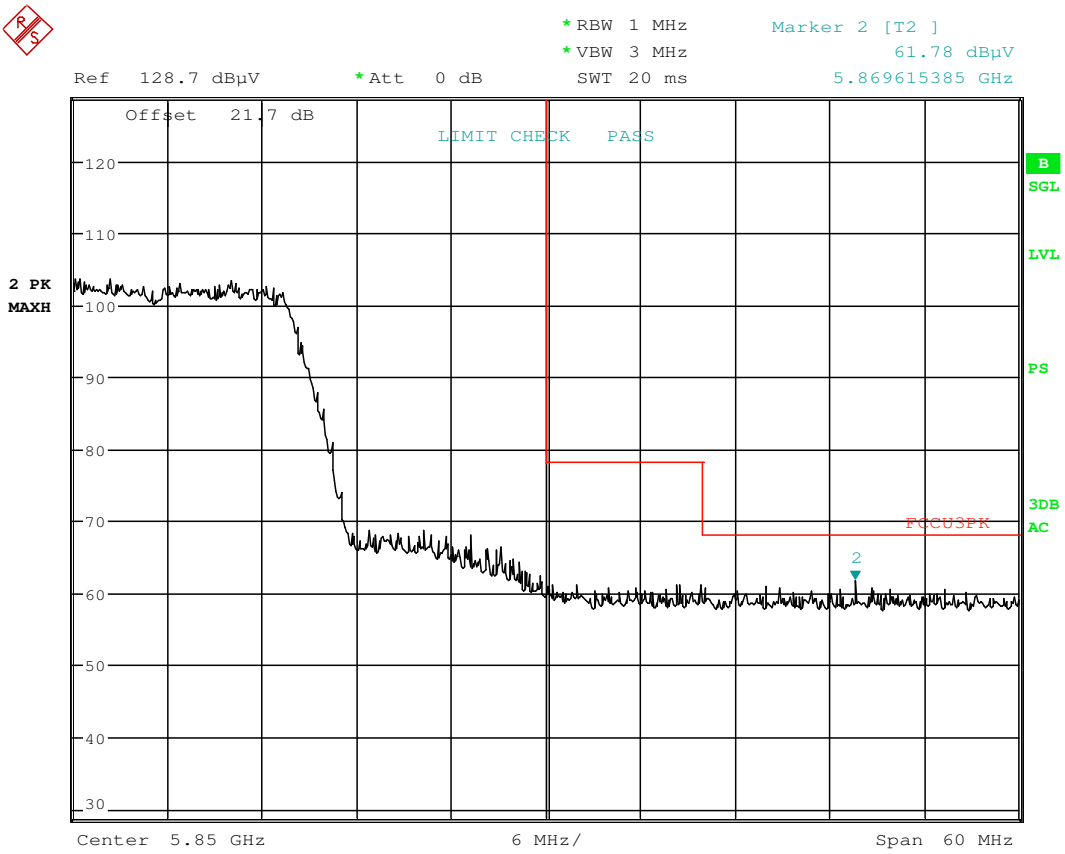
## MIMO Radiated Band Edge Measurements (20MHz BW)

**§15.407(b.1)(b.2) §15.205 §15.209**

| | |
|---|---|
| Worst Case Mode: | 802.11n (20MHz) |
| Worst Case Transfer Rate: | MCS8 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 5825MHz |
| Channel: | 165 |




Date: 10.AUG.2016 16:36:11

**Plot 7-48. Radiated Upper Band Edge Plot (Peak – UNII Band 3)**



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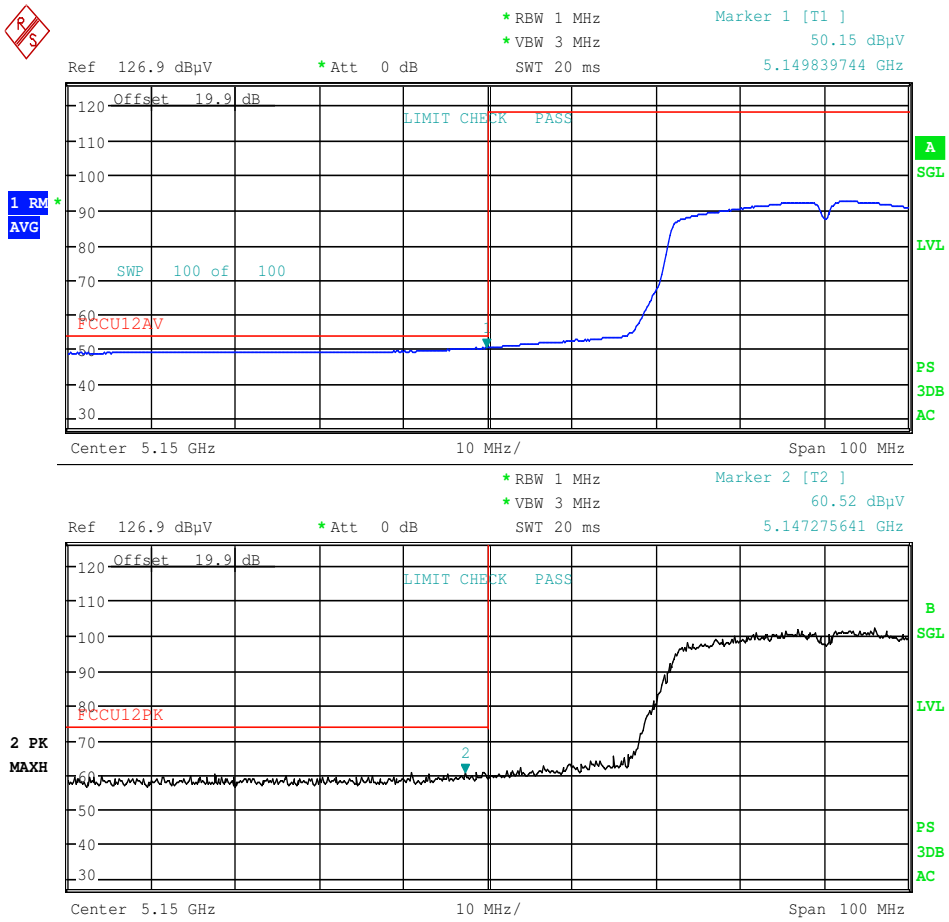
## 7.7.10 MIMO Radiated Band Edge Measurements (40MHz BW)

**§15.407(b.1)(b.2) §15.205 §15.209**

| | |
|---|---|
| Worst Case Mode: | 802.11n (40MHz) |
| Worst Case Transfer Rate: | MCS8 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 5190MHz |
| Channel: | 38 |




Date: 10.AUG.2016 16:45:49

**Plot 7-49. Radiated Restricted Lower Band Edge Plot (Average & Peak – UNII Band 1)**



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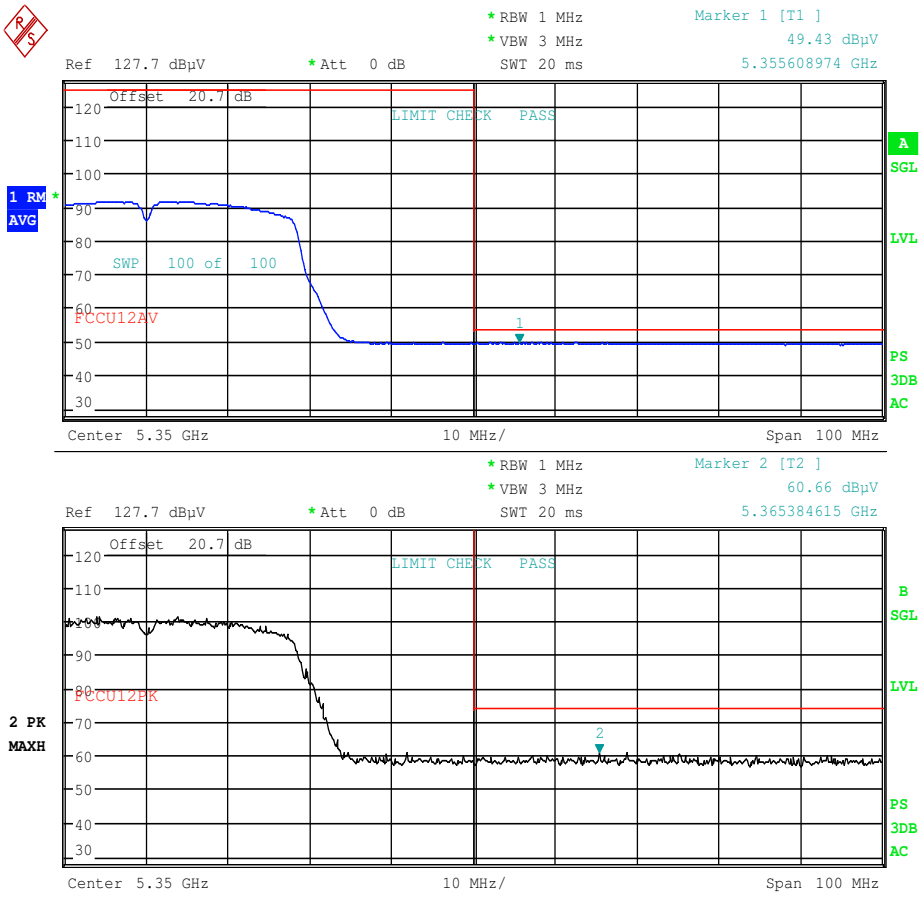
# MIMO Radiated Band Edge Measurements (40MHz BW)

**§15.407(b.1)(b.2) §15.205 §15.209**

| | |
|---|---|
| Worst Case Mode: | 802.11n (40MHz) |
| Worst Case Transfer Rate: | MCS8 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 5310MHz |
| Channel: | 62 |




Date: 10.AUG.2016 17:01:30

**Plot 7-50. Radiated Restricted Upper Band Edge Plot (Average & Peak – UNII Band 2A)**



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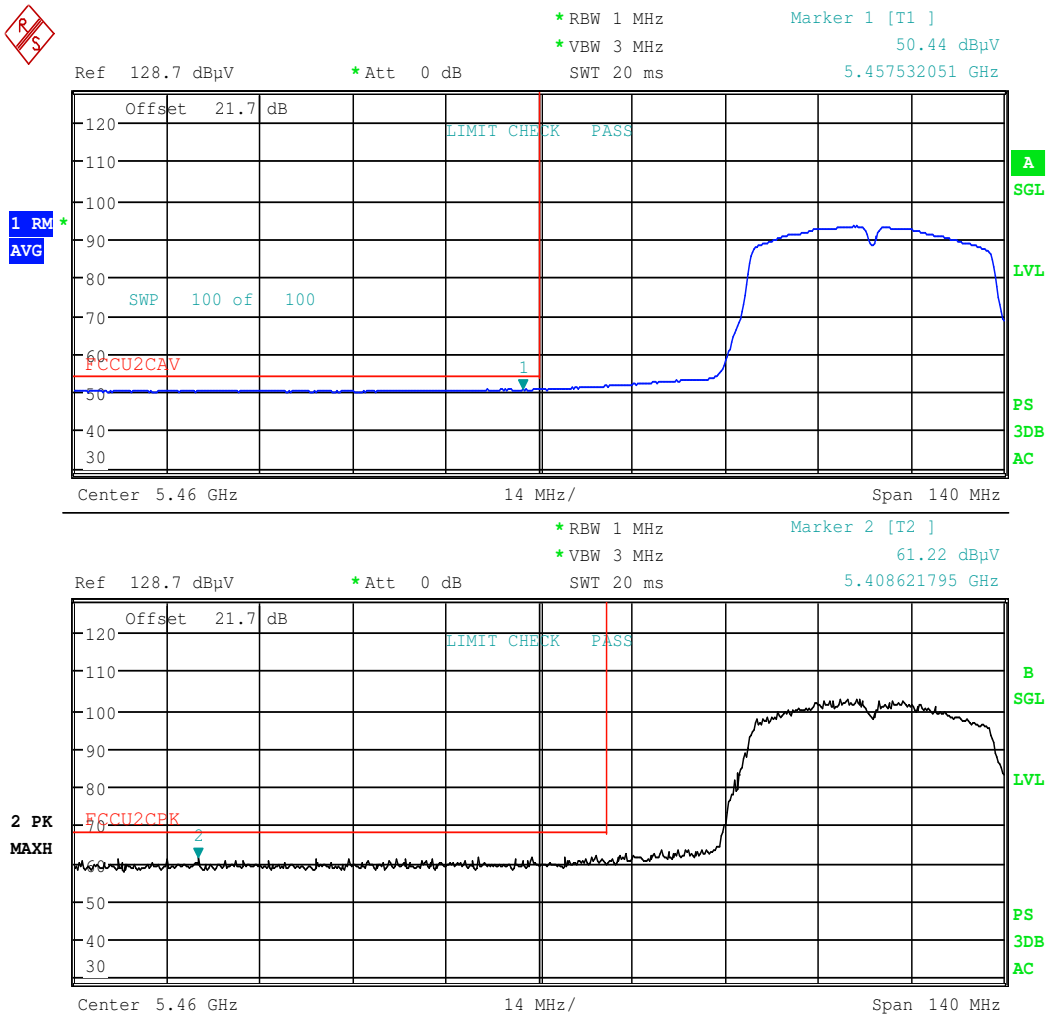
# MIMO Radiated Band Edge Measurements (40MHz BW)

**§15.407(b.1)(b.2) §15.205 §15.209**

| | |
|---|---|
| Worst Case Mode: | 802.11n (40MHz) |
| Worst Case Transfer Rate: | MCS8 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 5510MHz |
| Channel: | 102 |




Date: 10.AUG.2016 17:06:16

**Plot 7-51. Radiated Restricted Lower Band Edge Plot (Average & Peak – UNII Band 2C)**



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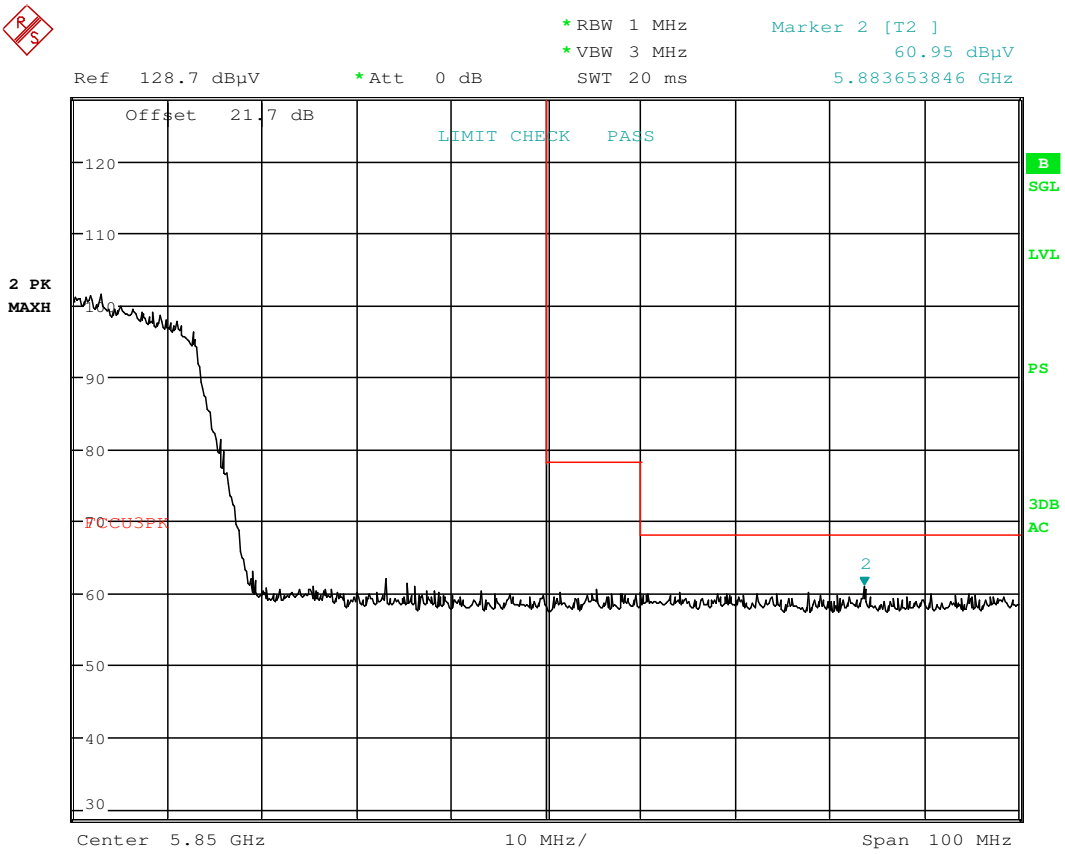
# MIMO Radiated Band Edge Measurements (40MHz BW)

**§15.407(b.1)(b.2) §15.205 §15.209**

| | |
|---|---|
| Worst Case Mode: | 802.11n (40MHz) |
| Worst Case Transfer Rate: | MCS8 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 5795MHz |
| Channel: | 159 |




**Plot 7-52. Radiated Upper Band Edge Plot (Peak – UNII Band 3)**



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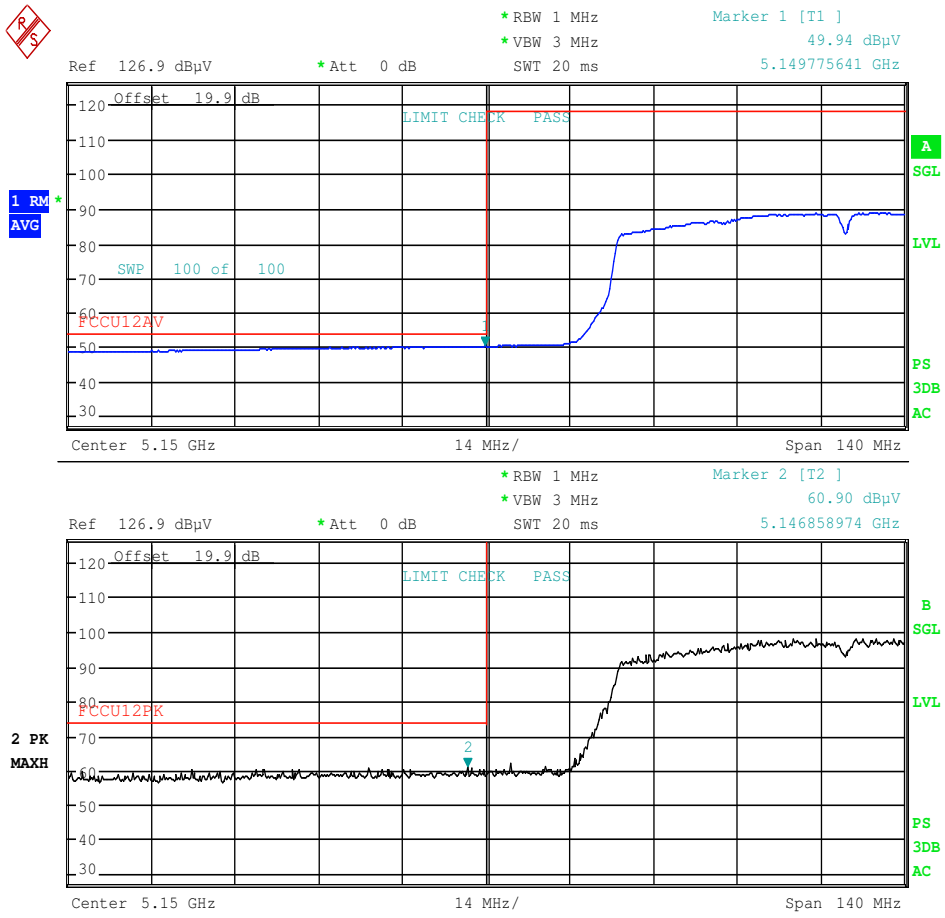
## 7.7.11 MIMO Radiated Band Edge Measurements (80MHz BW)

**§15.407(b.1)(b.2) §15.205 §15.209**

| | |
|---|---|
| Worst Case Mode: | 802.11ac (80MHz) |
| Worst Case Transfer Rate: | MCS0 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 5210MHz |
| Channel: | 42 |




Date: 10.AUG.2016 17:23:55

**Plot 7-53. Radiated Restricted Lower Band Edge Plot (Average & Peak – UNII Band 1)**



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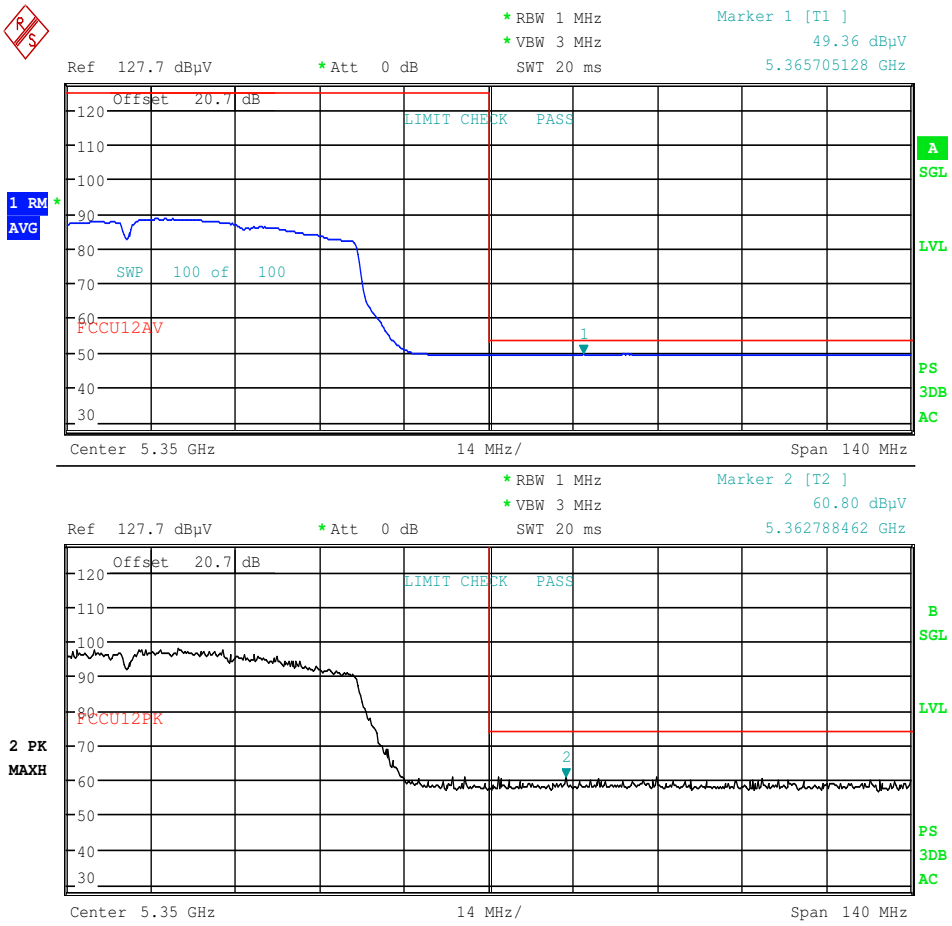
# MIMO Radiated Band Edge Measurements (80MHz BW)

**§15.407(b.1)(b.2) §15.205 §15.209**

| | |
|---|---|
| Worst Case Mode: | 802.11ac (80MHz) |
| Worst Case Transfer Rate: | MCS0 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 5290MHz |
| Channel: | 58 |




Date: 10.AUG.2016 17:30:19

**Plot 7-54. Radiated Restricted Upper Band Edge Plot (Average & Peak – UNII Band 2A)**



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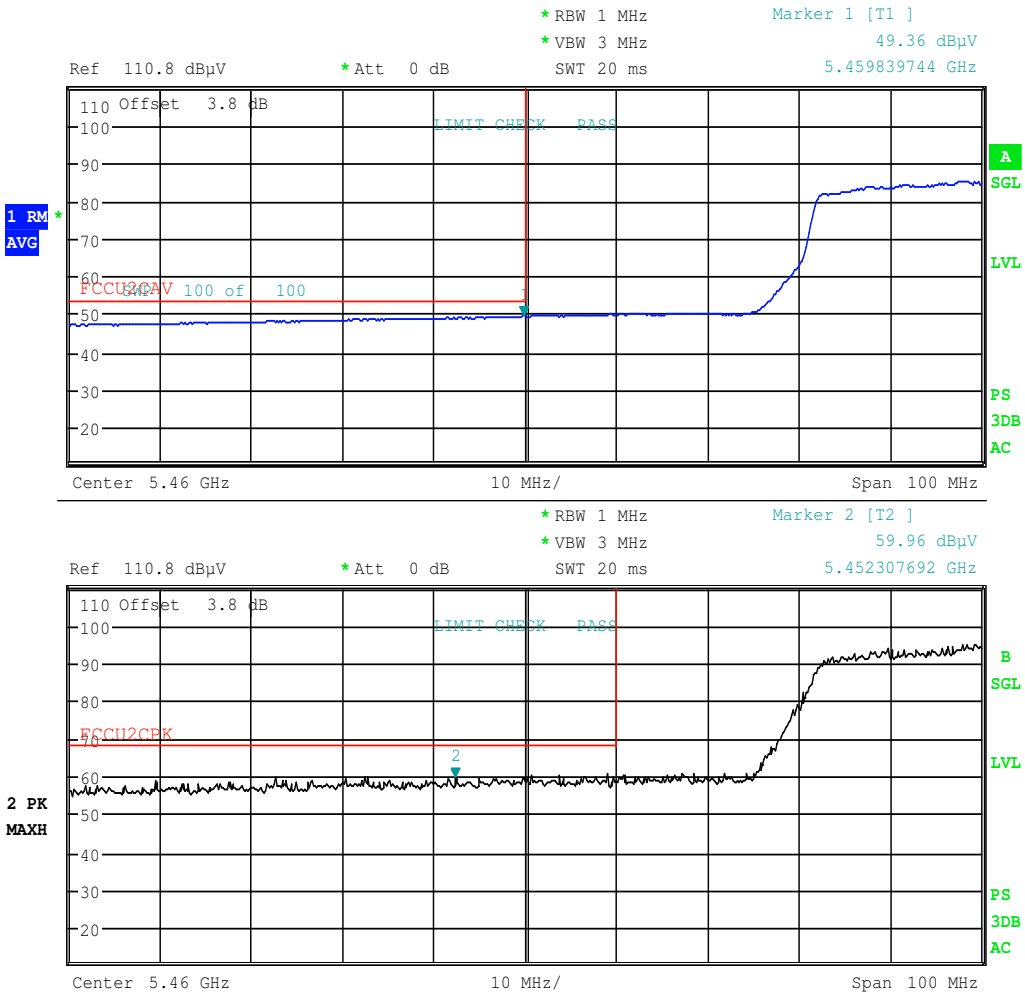
# MIMO Radiated Band Edge Measurements (80MHz BW)

**§15.407(b.1)(b.2) §15.205 §15.209**

| | |
|---|---|
| Worst Case Mode: | 802.11ac (80MHz) |
| Worst Case Transfer Rate: | MCS0 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 5530MHz |
| Channel: | 106 |




Date: 23.AUG.2016 17:26:59

**Plot 7-55. Radiated Restricted Lower Band Edge Plot (Average & Peak – UNII Band 2C)**



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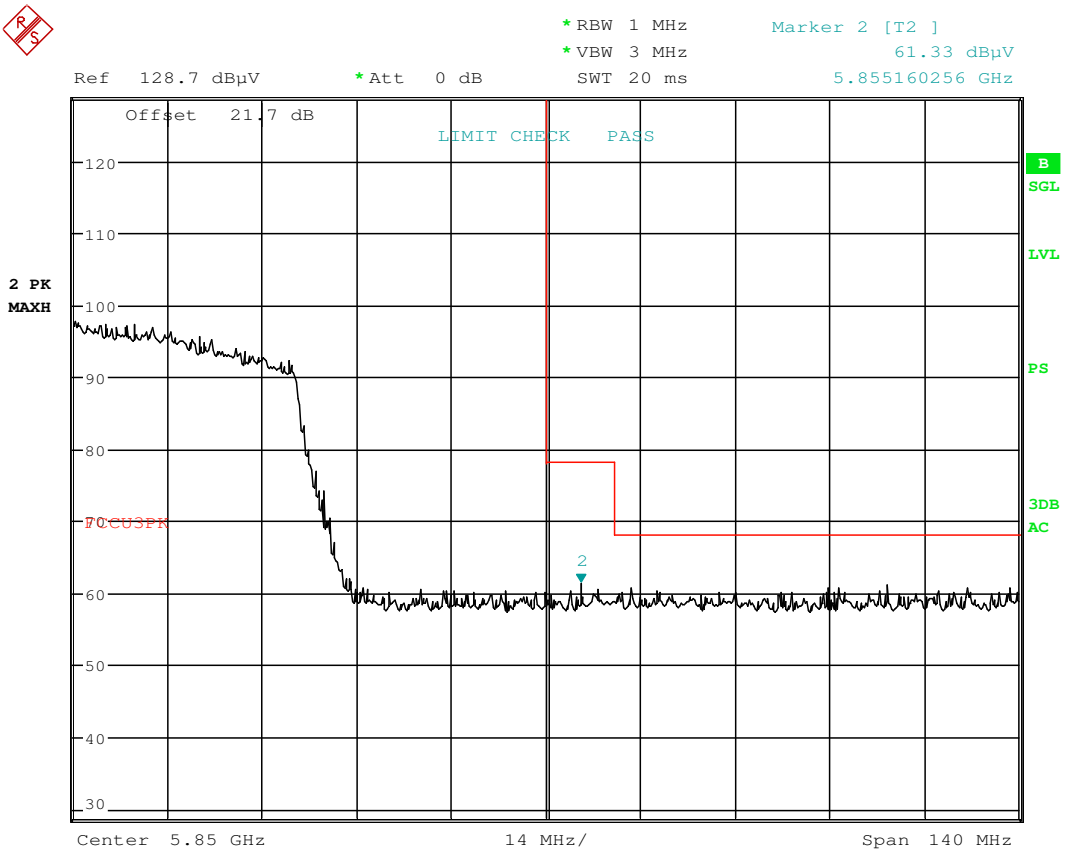
## MIMO Radiated Band Edge Measurements (80MHz BW)

**§15.407(b.1)(b.2) §15.205 §15.209**

| | |
|---|---|
| Worst Case Mode: | 802.11ac (80MHz) |
| Worst Case Transfer Rate: | MCS0 |
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 5775MHz |
| Channel: | 155 |




Date: 10.AUG.2016 17:59:33

**Plot 7-56. Radiated Upper Band Edge Plot (Peak – UNII Band 3)**



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## 7.3 Radiated Spurious Emissions Measurements – Below 1GHz

**§15.209**

**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 must not exceed the limits shown in Table 7-27 per Section 15.209.***

| 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 7-27. 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



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## Test Setup

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

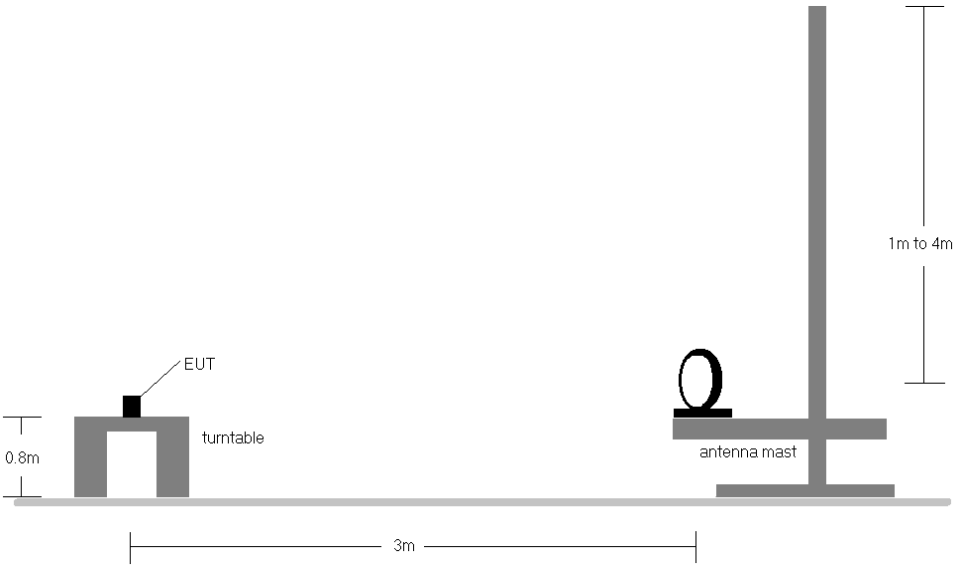


**Figure 7-2. Radiated Test Setup < 30MHz**

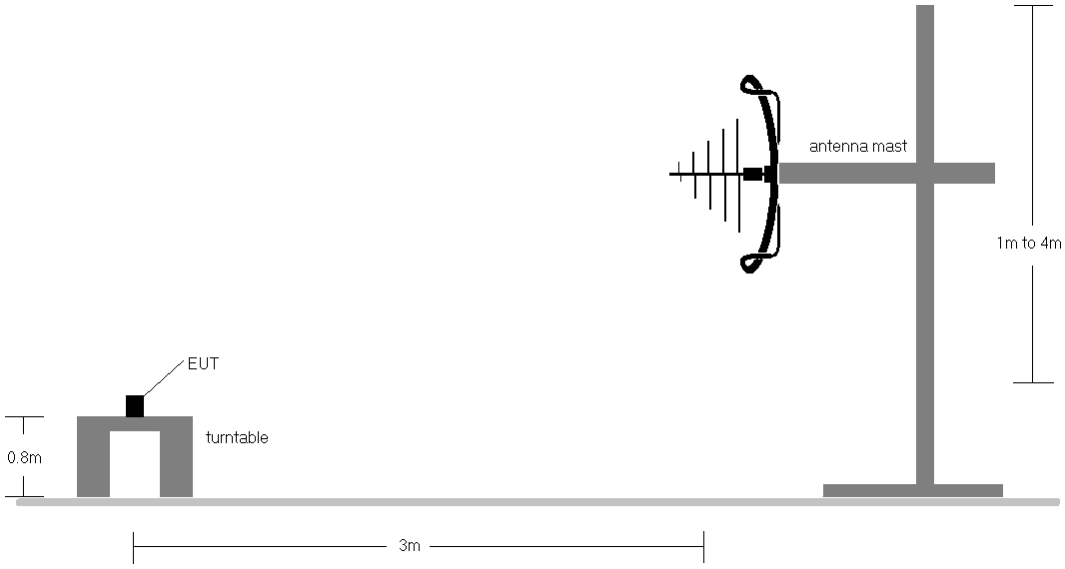


**Figure 7-3. Radiated Test Setup < 1GHz**

## Test Notes

1. All emissions lying in restricted bands specified in §15.205 are below the limit shown in Table 7-27.
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.



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4. The spectrum is investigated using a peak detector and final measurements are recorded using CISPR quasi peak detector. 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.


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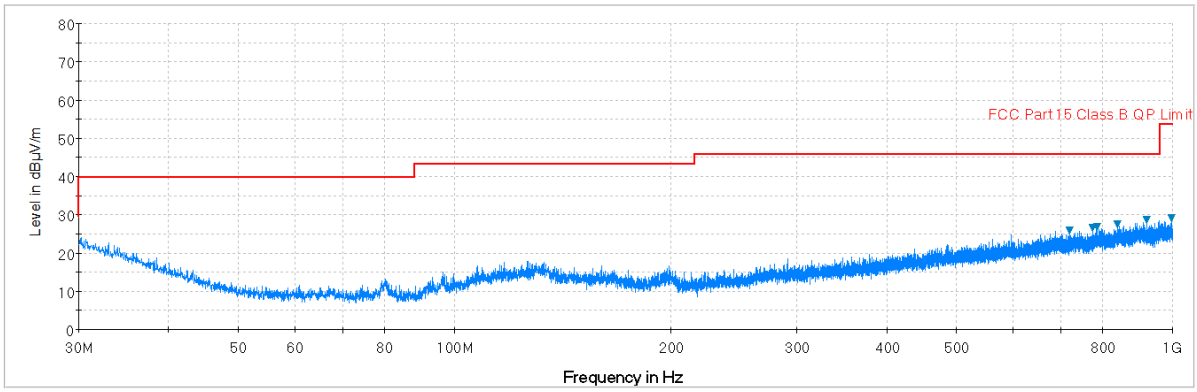
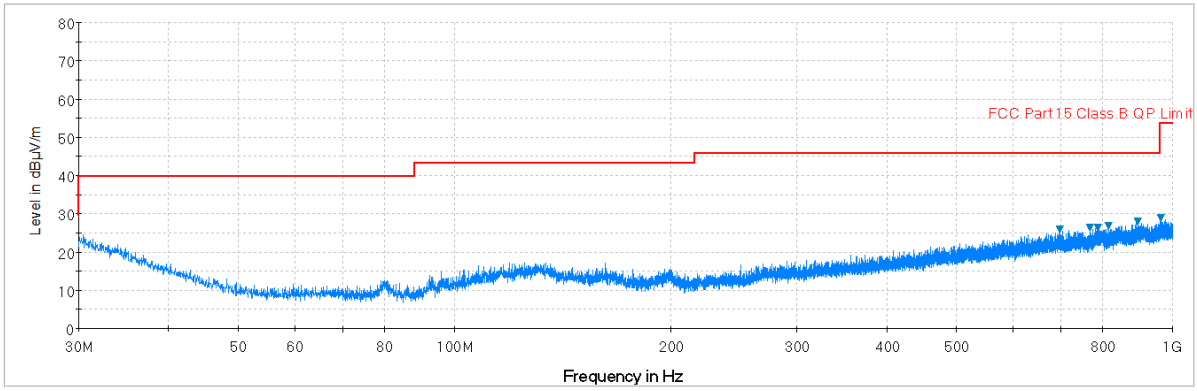
# Primary Antenna Radiated Spurious Emissions Measurements (Below 1GHz)

**§15.209**




**Plot 7-57. Radiated Spurious Plot below 1GHz (802.11a – U3 Ch. 157, Ant. Pol. H)**




**Plot 7-58. Radiated Spurious Plot below 1GHz (802.11a – U3 Ch. 157, Ant. Pol. V)**



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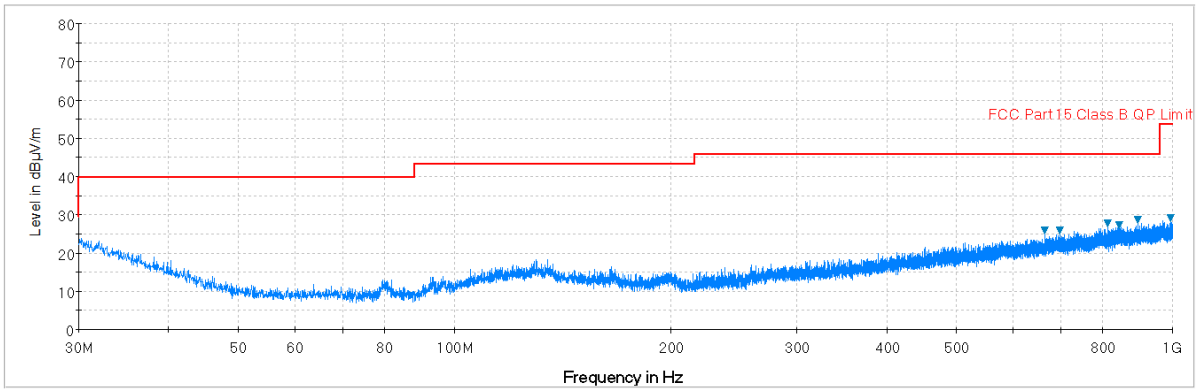
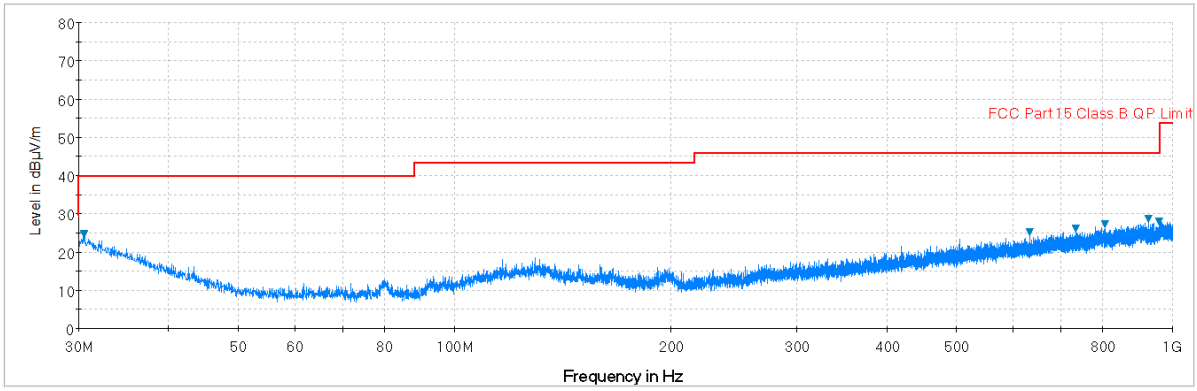
## Secondary Antenna Radiated Spurious Emissions Measurements (Below 1GHz)

**§15.209**




**Plot 7-59. Radiated Spurious Plot below 1GHz (802.11a – U3 Ch. 157, Ant. Pol. H)**




**Plot 7-60. Radiated Spurious Plot below 1GHz (802.11a – U3 Ch. 157, Ant. Pol. V)**



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# 8.0 CONCLUSION

The data collected relate only the item(s) tested and show that the **LGE Portable Handset FCC ID: ZNFVS995** is in compliance with Part 15E of the FCC Rules.



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