



## FCC AND IC RF TEST REPORT

Product Tested

*ShareLink 250 W*

Report Number

2051-2



**Prepared for:**

Extron Electronics  
1025 E. Ball Road  
Anaheim, CA 92805  
714.491.1500

**Prepared by:**

Extron Electronics – Compliance Lab



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## REVISION PAGE

| Issue Date | Revision | Changes  | By            |
|------------|----------|--|---------------|
| 3/15/2016  | A        | Initial Release  | Boni Baniqued |
| 3/29/2016  | B        | Updated product name and corrected typo errors         | Boni Baniqued |
| 4/11/2016  | C        | Updated KDB 789033 D02 reference to the latest version | Boni Baniqued |
|            |          |  |               |
|            |          |  |               |
|            |          |  |               |
|            |          |  |               |
|            |          |  |               |

# CERTIFICATION

**PRODUCT NAME:** Wireless Collaboration Gateway

**BRAND NAME:** Extron

**MODEL NUMBER:** ShareLink 250 W

**FCC ID:** 2AE3WEXTSL250W

**IC:** 10862A-EXTSL250W

**APPLICANT NAME:** Extron Electronics, 1025 E, Ball Road, Anaheim, CA 92805

**DATE OF TESTING:** February 19, 2016 to March 7, 2016

**STANDARDS:** FCC Part 15 Subpart E (Section 15.407)

IC RSS-247 Issue 1 (License-Exempt Local Area Network Devices)

IC RSS-GEN Issue 4

**OPERATING BANDS:** 5150 MHz – 5250 MHz

5725 MHz – 5850 MHz

The above equipment was found to be in compliance with the limits and levels of the standards listed in this report based on the testing results. Unless otherwise stated, the results of this report relate only to the items tested as described in the General Information section of this test report. If any significant changes are made to the EUT, the changes shall be evaluated and a retest may be required.

Test reports shall not be reproduced except in full, without the written approval of the Extron Director of Compliance Engineering, or his designee.

Approved & Released for

Extron Electronics Compliance Engineering By:

Tested By:

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Homi Ahmadi  
Director of Compliance Engineering  
Extron Electronics

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## 1 GENERAL INFORMATION

### 1.1 Applicant Information

Extron Electronics, 1025 E. Ball Road, Anaheim, CA 92805, USA

### 1.2 Application Type

FCC Part 15 Subpart E Section 15.407 and IC RSS-247 Issue 1 (License-Exempt Local Area Network) Certification

### 1.3 Related Submittal(s)/Grant(s) / Technical Acceptance Certificate(s)

N/A

### 1.4 Test Methodology

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, ANSI C63.10-2013, KDB 789033 D02 General UNII Test Procedures New Rules v01r02, RSS-Gen Issue 4, and IC RSS-247 Issue 1.

### 1.5 Test Facilities and Accreditations

- All testing was performed at Extron Electronics – Compliance Laboratory, 1001 E. Ball Road, Anaheim, CA 92805, USA
- [American Association for Laboratory Accreditation: 3429.01, Valid Through June 30, 2017](#)
- FCC Designation Number: US1143, Valid Through 06/30/2016
- VCCI Registration Number: A-0186, Valid Through 06/30/2017
- Industry Canada Site Number: 10862A-1, Valid Through 07/15/2016



This report cannot be used to claim product endorsement by any of the agencies listed above.

**NOTE**



*The Extron Electronics – Compliance Laboratory operates as an independent test lab within Extron Electronics with no organizational or financial relationship.*

**NOTE**

## 1.6 Measurement Uncertainty

Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4-2. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

### Radiated Emissions

| Test Method   | Lab | Uncertainty | Units |
|---|-----|-------------|-------|
| Radiated Emissions 30-1000MHz (Vertical Polarity)   | B   | ±4.88       | dB    |
| Radiated Emissions 30-1000MHz (Horizontal Polarity) | B   | ±4.88       | dB    |
| Radiated Emissions 1-18GHz                          | B   | ±5.01       | dB    |
| Radiated Emissions 18-40GHz                         | B   | ±5.02       | dB    |

### Conducted Emissions

| Test Method                    | Lab | Uncertainty | Units |
|--------------------------------|-----|-------------|-------|
| Conducted Emissions with LISN  | E   | ±3.79       | dB    |
| Conducted Emissions with T-ISN | E   | ±3.75       | dB    |

## 2 PRODUCT INFORMATION

### 2.1 Description of the EUT

The Equipment Under Test (EUT) is a Wireless Collaboration Gateway (P/N: 60-1558-01) with support for 2.4/5.5 GHz IEEE 802.11 a/b/g/n.

\* The test data gathered are from Production samples, serial number EXTN2500151700016, received from the manufacturer on February 19, 2016.

### 2.2 Description of the Antenna

WLAN External Antenna with SMA Male Reverse connector

| Product Number | Manufacturer | Type   | Peak Gain (dBi) |                 |
|----------------|--------------|--------|-----------------|-----------------|
|                |              |        | 2400 ~ 2500 MHz | 5150 ~ 5850 MHz |
| AN2450-4828RS  | Cortec       | Dipole | ≤ 2.0           | ≤ 2.0           |

### 2.3 Description of Power Supply

| Item | Type    | Manufacturer | Model      | Input                     | Output        | Power Line                             |
|------|---------|--------------|------------|---------------------------|---------------|--|
| 1    | Adapter | ENG          | 6A-161WP05 | 100~240Vac, 50~60Hz, 0.6A | 5.0Vdc, 2.6A  | 1.5m unshielded cable with one ferrite |
| 2*   | PoE     | EXTRON       | XTP PI 100 | 100~240Vac, 50~60Hz, 0.4A | +48Vdc, 0.35A | -                                      |

\* PoE is an alternate power supply and provided as support only.

### 2.4 Description of Test Setup

#### Support Equipment List

| Description        | Manufacturer   | Model/Part Number | Serial Number       | Quantity |
|--------------------|----------------|-------------------|---------------------|----------|
| Laptop PC          | Dell           | D630              | N/A                 | 1        |
| Laptop PC          | Dell           | E6400             | N/A                 | 1        |
| 24" LED-LCD HDTV   | Vizio          | VX240M            | VX24120109027       | 1        |
| 24" LED-LCD HDTV   | Vizio          | VX240M            | LSMFAAK3604939      | 1        |
| Gigabit Switch HUB | Allied Telesis | AT-GS950/16       | A04374R121500007 A1 | 1        |
| USB Mouse          | Dell           | M-BAC-DEL5        | N/A                 | 1        |
| USB Keyboard       | Dell           | L100              | N/A                 | 1        |
| USB Flash Drive    | Sony           | USM4GL            | N/A                 | 1        |

I/O Cable List

| Description          | Manufacturer       | Model/Part Number | Serial Number | Quantity |
|----------------------|--------------------|-------------------|---------------|----------|
| CAT-5e UTP 10' cable | Extron Electronics | 26-640-10         | N/A           | 2        |
| CAT-5e UTP 35' cable | Extron Electronics | 26-640-35         | N/A           | 1        |
| HDMI PRO 25' cable   | Extron Electronics | 26-650-25         | N/A           | 1        |
| HDMI ULTRA 15' cable | Extron Electronics | 26-663-15         | N/A           | 1        |
| VGA M-M 35' cable    | Extron Electronics | 26-238-17         | N/A           | 1        |
| Audio Mini 25' cable | Extron Electronics | 26-571-01         | N/A           | 1        |

## 2.5 Worst Test Modes and Channel Details

| Test Condition | Test Item   | Modulation Mode | Data Rate (Mbps / MCS) | Test Frequency (MHz)                     | Application |       |
|----------------|---|-----------------|------------------------|--|-------------|-------|
|                |   |                 |                        |  | Mode 1      | Mode2 |
| RF Conducted   | 6dB EBW and 99% OBW<br>26dB EBW and 99% OBW<br>Maximum Conducted Output Power<br>Maximum Power Spectral Density | 802.11a         | 6 Mbps                 | 5180 / 5200 / 5240<br>5745 / 5785 / 5825 | ✓           | -     |
|                |   | 802.11n (HT20)  | MCS0/6.5 Mbps          | 5180 / 5200 / 5240<br>5745 / 5785 / 5825 | ✓           | -     |
|                |   | 802.11n (HT40)  | MCS0/13.5 Mbps         | 5190 / 5230<br>5755 / 5795               | ✓           | -     |
|                | Frequency Stability   | 802.11a         | 6 Mbps                 | 5180<br>5825                             | ✓           | -     |
| Radiated       | Radiated Emissions < 1GHz   | 802.11a         | 6 Mbps                 | 5200                                     | ✓           | ✓     |
|                | Radiated Spurious Emissions > 1GHz<br><br>Radiated Restricted-band band-edge                                    | 802.11a         | 6 Mbps                 | 5180 / 5200 / 5240<br>5745 / 5785 / 5825 | ✓           | -     |
|                |   | 802.11a         | 6 Mbps                 | 5180 / 5240<br>5745 / 5825               | ✓           | -     |
|                |   | 802.11n (HT20)  | MCS0/6.5 Mbps          | 5180 / 5240<br>5745 / 5825               | ✓           | -     |
|                |   | 802.11n (HT40)  | MCS0/13.5 Mbps         | 5190 / 5230<br>5755 / 5795               | ✓           | -     |
| Line Conducted | AC Power-line Conducted Emissions   | 802.11a         | 6 Mbps                 | 5200                                     | ✓           | ✓     |

NOTE:

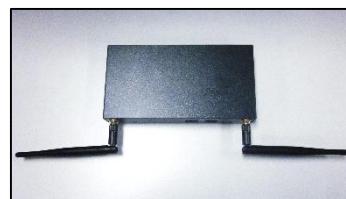
- (1) The fundamental frequency of the EUT was investigated in three orthogonal orientations of the antenna, vertical (V), horizontal 1 (H1), and horizontal 2 (H2) as shown below. It was determined that the vertical antenna orientation was the worst-case orientation; therefore, a final radiated emissions testing was performed with the antenna in the vertical orientation.



1. Vertical (V)



2. Horizontal 1 (H1)



3. Horizontal 2 (H2)

- (2) Per manufacturer, only Antenna 1 is active and Antenna 2 is disabled due to Hardware limitation.  
(3) Mode 1- Power from AC adapter  
(4) Mode 2- Power from PoE

## 2.6 Worst Case Power Setting parameter

### U-NII-1: 5150 ~ 5250 MHz Band

| Modulation Mode | Test Channel | Test Frequency (MHz) | Power Setting |
|-----------------|--------------|----------------------|---------------|
| 802.11a         | 36           | 5180                 | 15            |
|                 | 40           | 5200                 | 15            |
|                 | 48           | 5240                 | 15            |
| 802.11n (HT20)  | 36           | 5180                 | 15            |
|                 | 40           | 5200                 | 15            |
|                 | 48           | 5240                 | 15            |
| 802.11n (HT40)  | 38           | 5190                 | 4             |
|                 | 46           | 5230                 | 4             |

### U-NII-3: 5725 ~ 5850 MHz Band

| Modulation Mode | Test Channel | Test Frequency (MHz) | Power Setting |
|-----------------|--------------|----------------------|---------------|
| 802.11a         | 149          | 5745                 | 15            |
|                 | 157          | 5785                 | 15            |
|                 | 165          | 5825                 | 15            |
| 802.11n (HT20)  | 149          | 5745                 | 15            |
|                 | 157          | 5785                 | 15            |
|                 | 165          | 5825                 | 15            |
| 802.11n (HT40)  | 151          | 5755                 | 6             |
|                 | 159          | 5795                 | 6             |

Note: The power setting was tuned using RF Test (ver 0.1) provided by the manufacturer.

## 2.7 Equipment Modifications

None

## 2.8 Testing Condition

| Test Item                         | Test Site | Environmental Condition |                   |                      | Tested By     |
|-----------------------------------|-----------|-------------------------|-------------------|----------------------|---------------|
|                                   |           | Temperature             | Relative Humidity | Atmospheric Pressure |               |
| RF Conducted Emissions            | Lab M     | 22-25°C                 | 40-60%            | 1002-1018mbar        | Boni Baniqued |
| Radiated Spurious Emissions       | Lab B     | 22-25°C                 | 40-60%            | 1002-1018mbar        | Boni Baniqued |
| AC Power-Line Conducted Emissions | Lab E     | 22-25°C                 | 40-60%            | 1002-1018mbar        | Boni Baniqued |
| Frequency Stability               | Lab J     | 22°C                    | 59%               | 1011mbar             | Boni Baniqued |

## 2.9 Software

- RF Test (Ver0.1) – for Wi-Fi Module control
- R&S Power Viewer Plus – for maximum conducted output power measurement
- R&S EMC32 V8.54.0 - AC power line conducted emissions and radiated spurious emissions measurements
- R&S RSCommander V1.5.9 – for Spectrum Analyzer /Receiver plot capture

### 3 TEST AND MEASUREMENT EQUIPMENT

| Equipment Type               | Manufacturer    | Model Number   | Asset/Serial Number | Calibration Due Date |
|------------------------------|-----------------|----------------|---------------------|----------------------|
| Signal and Spectrum Analyzer | Rohde & Schwarz | FSV40          | 101447              | 08/03/2016           |
| EMI Receiver, 40 GHz         | Rohde & Schwarz | ESU40          | 100161              | 08/27/2016           |
| EMI Receiver, 26 GHz         | Rohde & Schwarz | ESU26          | 100189              | 12/01/2016           |
| AVG Power Sensor             | Rohde & Schwarz | NRP-Z31        | 101721              | 07/20/2016           |
| Antenna – Bilog, 30MHz-1GHz  | ETS-Lingren     | 3142D          | 13988               | 04/13/2016           |
| Antenna, Horn, 1-18 GHz      | ETS-Lingren     | 3117           | 00108478            | 03/31/2016           |
| Antenna, Horn, 18- 40 GHz    | ATM             | 180-442-KF/CAL | L488008-01          | 05/18/2016           |
| Pre-Amplifier, 1-18 GHz      | Rohde & Schwarz | TS-PR18        | 100066              | 04/01/2016           |
| Pre-Amplifier, 18-40 GHz     | Rohde & Schwarz | TS-PR18-40     | 10001               | 05/18/2016           |
| RF Cable, 0.30-18 GHz        | SEMFLEX         | N130SFBN10360  | N/A                 | 08/25/2016           |
| RF Cable, 1-18 GHz           | Huber-Suhner    | Sucoflex 104E  | 232648 003          | 04/01/2016           |
| RF Cable, 1-40 GHz           | SEMFLEX         | 60637-59957    | N/A                 | 05/05/2016           |
| RF Cable, 30 MHz -40 GHz     | Pasternack      | PE3CA1058-12   | N/A                 | 04/21/2016           |
| Notch Filter, 2400-2500 MHz  | Micro-Tronics   | BRM50702-02    | 019                 | 04/20/2016           |
| Notch Filter, 5150-5880 MHz  | Micro-Tronics   | BRM50716-02    | 005                 | 05/11/2016           |
| Attenuator, 10dB             | Bracke          | BM10060.10     | N/A                 | CNR                  |
| LISN                         | Rohde & Schwarz | ENV216         | 13724               | 4/1/2016             |
| LISN                         | Com-Power       | LI115          | 13725               | CNR                  |
| Cable BNC                    | Pasternak       | BNC-2          | N/A                 | 3/25/2016            |
| Pulse Limiter                | Rohde & Schwarz | ESH3-Z2        | 115740              | 9/21/2017            |
| Hygro-Thermometer/Barometer  | VWR             | 89094-760      | 29221               | 4/14/2016            |
| Environmental Chamber        | Thermotron      | SM-8-8200      | 40991               | 9/21/2017            |
| Digital Power Meter          | Yokogawa        | WT210          | 29115               | 4/23/2016            |
| Variable Autotransformer     | WAV             | HY-215         | N/A                 | CNR                  |

Note: CNR – Calibration Not Required

## 4 TEST RESULTS SUMMARY

| FCC Rule Section                                      | IC Rule Section                  | Test Item Description                                      |               | Limits                                   | Test Condition  | Test Results |  |
|---|----------------------------------|--|---------------|--|-----------------|--------------|--|
| N/A   | NA                               | 26 dB EBW & 99% OBW  | 5150-5250 MHz | N/A                                      | Conducted       | PASS         |  |
| § 15.407 (e)  | 247 §6.2.4 (1)                   | 6 dB EBW & 99% OBW   | 5725-5850 MHz | ≥ 500 kHz                                |                 | PASS         |  |
| § 15.407 (a)(1)<br>§ 15.407 (a)(3)                    | 247 §6.2.1 (1)<br>247 §6.2.4 (1) | Maximum Conducted Output Power / e.i.r.p                   | 5150-5250 MHz | < 30dBm (FCC)/<br>< 23dBm e.i.r.p. (IC)  |                 | PASS         |  |
|   |                                  |  | 5725-5850 MHz | < 30dBm                                  |                 | PASS         |  |
| § 15.407 (a)(1)<br>§ 15.407 (a)(3)                    | 247 §6.2.1 (1)<br>247 §6.2.4 (1) | Maximum Power Spectral Density / e.i.r.p. Spectral Density | 5150-5250 MHz | <17dBm/MHz (FCC) / <10dBm/MHz (IC)       |                 | PASS         |  |
|   |                                  |  | 5725-5850 MHz | <30dBm/500kHz                            |                 | PASS         |  |
| § 15.407 (g)  | N/A                              | Transmitter Frequency Stability                            |               | FCC Part 15.407 (g)                      |                 | PASS         |  |
| § 15.407 (h)  | 247 §6.3                         | Dynamic Frequency Selection (DFS)                          |               | N/A                                      |                 | See Note 1   |  |
| § 15.407 (b)(1)<br>§ 15.407 (b)(4)<br>§ 15.407 (b)(5) | 247 §6.2.1 (2)<br>247 §6.2.4 (2) | Unwanted Emissions   | 5150-5250 MHz | < -27dBm/MHz                             | Radiated        | PASS         |  |
|   |                                  |  | 5725-5850 MHz | < -17dBm/MHz w/in 10MHz of the band-edge |                 | PASS         |  |
|   |                                  |  |               | < -27dBm/MHz                             |                 | PASS         |  |
| § 15.407 (b)(5)<br>§ 15.407 (b)(6)<br>§ 15.407 (b)(7) | Gen §8.10                        | Unwanted Emissions in the restricted bands                 |               | FCC Part 15.209 (a)<br>Gen 8.9 Table 4   |                 | PASS         |  |
| § 15.407 (b)(6)                                       | Gen §8.8                         | AC Power-line Conducted Emissions                          |               | FCC Part 15.207 (a)<br>Gen 8.8 Table 3   | Line Conducted  | PASS         |  |
| § 15.407 (f)  | 102 (4)                          | RF Exposure Requirements                                   |               | FCC 1.1310 (e)<br>102 (4) Table 4        | MPE Calculation | PASS         |  |

Note: 1. Not Applicable, the EUT does not operate in the frequency bands 5250 MHz to 5350 MHz and 5470 MHz to 5725 MHz

## 5 DUTY CYCLE

The duty cycles for all modes were determined based on measurements per KDB 789033 D02 v01r02 section II.B.2 b) using spectrum analyzer in zero-span mode with RBW = 10 MHz, VBW = 10 MHz, and detector = Peak. The RBW and VBW are > than 50/T and the number of sweep points across duration T exceeds 100.

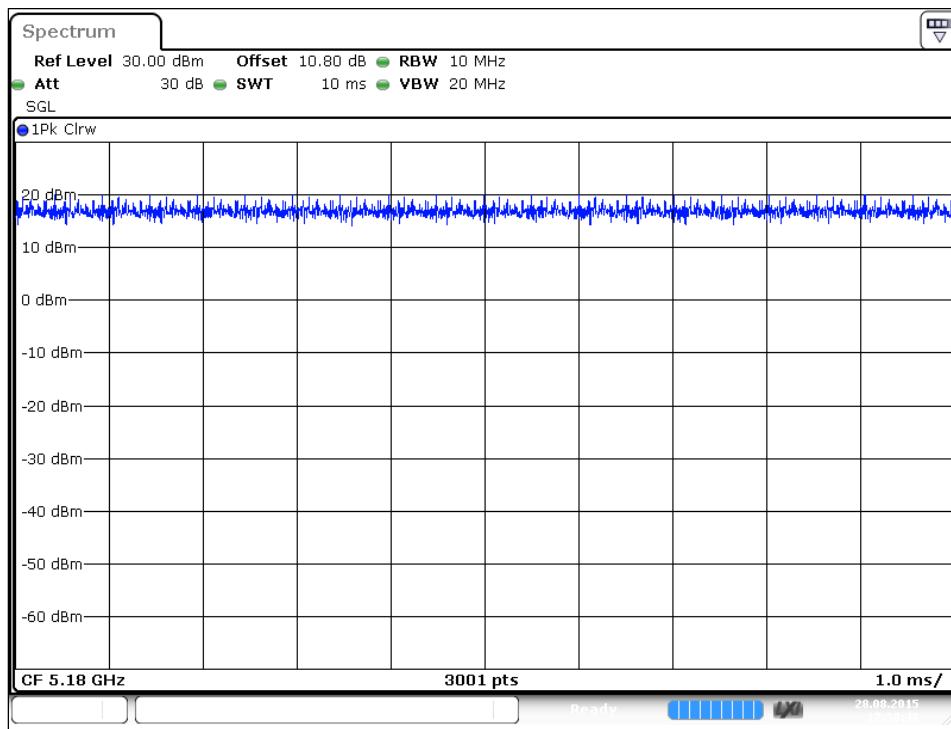
| 802.11 Mode    | Data Rate      | T <sub>OFF</sub><br>(usec) | T <sub>ON</sub><br>(usec) | Duty Cycle<br>[DC] | Duty Cycle<br>(%) | DC Factor<br>(dB) |
|----------------|----------------|----------------------------|---------------------------|--------------------|-------------------|-------------------|
| 802.11a        | 6 Mbps         | 0                          | 10000                     | 1                  | 100               | 0                 |
| 802.11n (HT20) | MCS0/ 6.5 Mbps | 0                          | 10000                     | 1                  | 100               | 0                 |
| 802.11n (HT20) | MCS0/13.5 Mbps | 0                          | 10000                     | 1                  | 100               | 0                 |

Note:

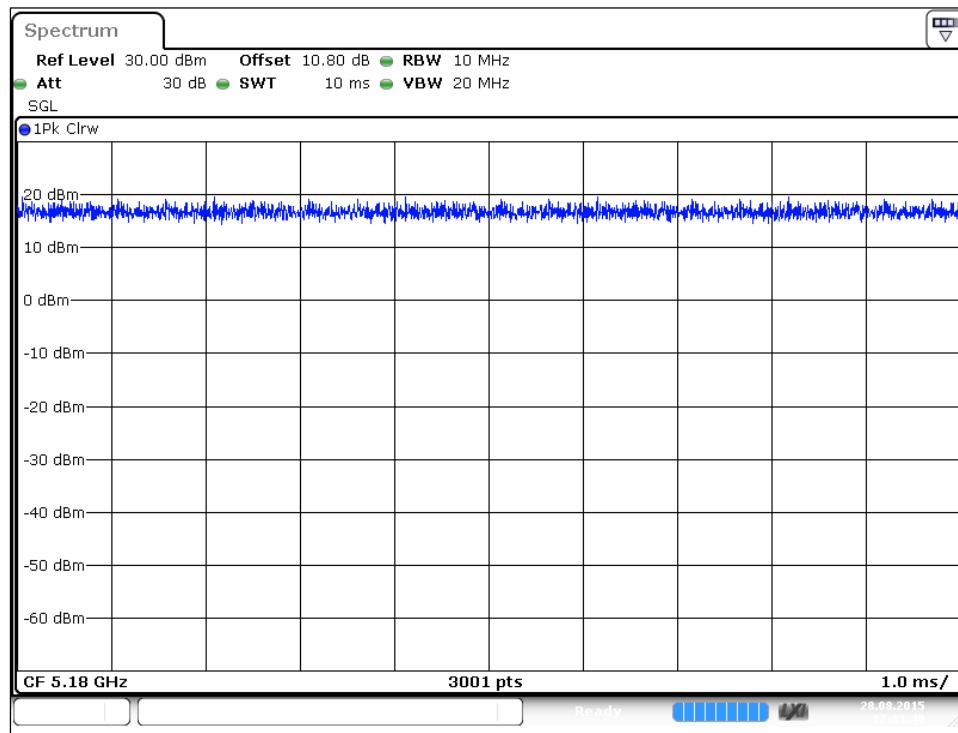
- No DC factor if the duty cycle is > 98%
- T<sub>OFF</sub> – Transmission OFF time
- T<sub>ON</sub> – Transmission ON time (Sweep Time)

## DUTY CYCLE PLOTS

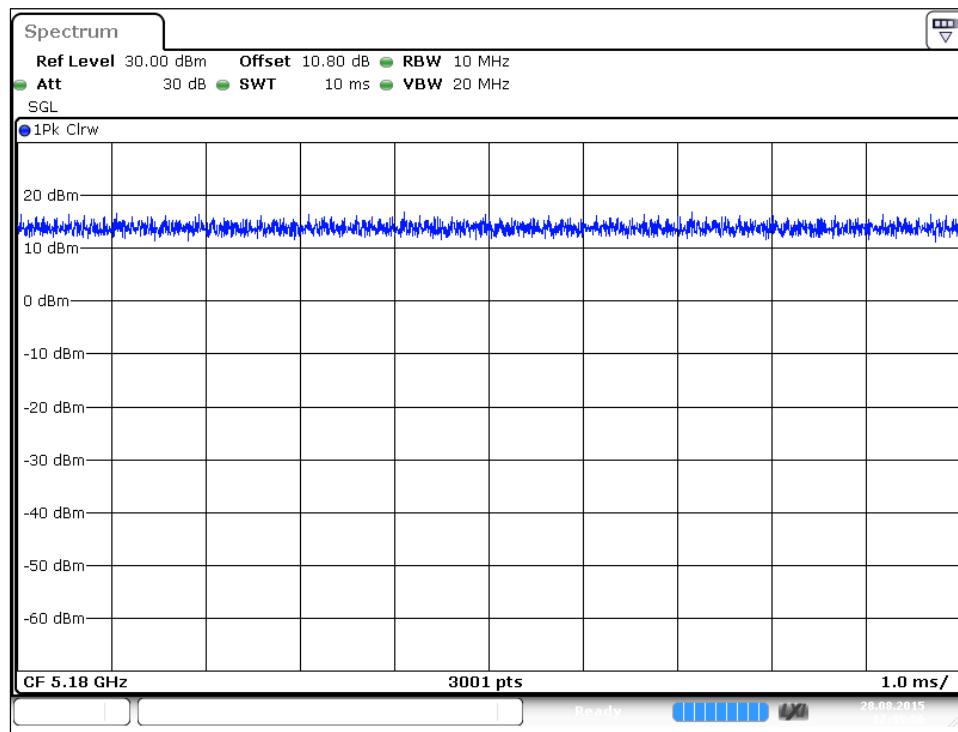
### 1. 802.11a: 6 Mbps



## 2. 802.11n (HT20): MCS0 / 6.5 Mbps



## 3. 802.11n (HT40): MCS0 / 13.5 Mbps



## 6 TEST RESULTS

### 6.1 26dB Emission Bandwidth (EBW) and 99% Occupied Bandwidth (OBW)

#### Limits

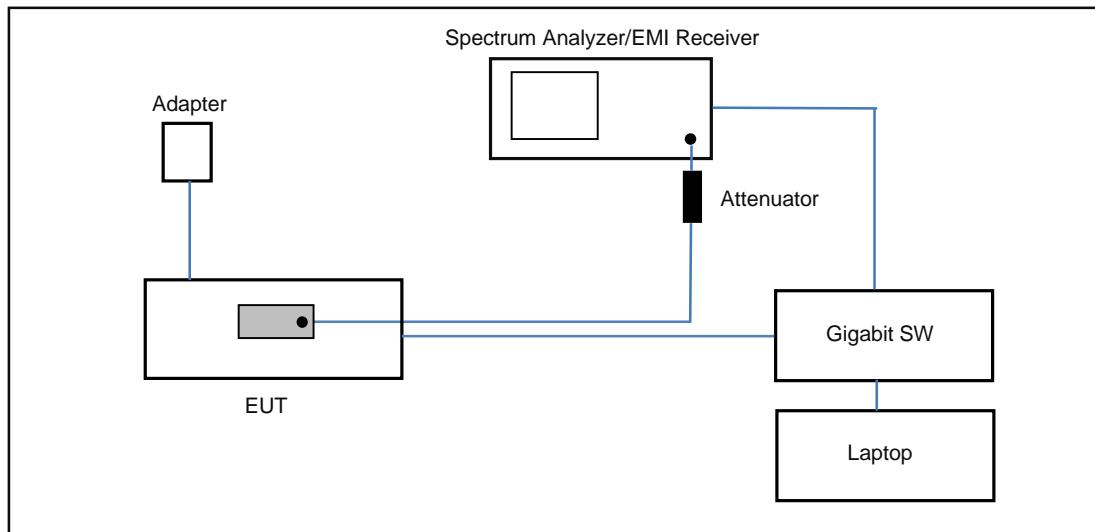
None; the 26dB EBW and 99% OBW are used to determine the conducted power and/or e.i.r.p limits

#### Test Procedures

- KDB 789033 D02 v01r02 Section C.1 and ANSI C63.10-2013 Section 12.4.1 – for 26 dB Emissions Bandwidth:
- KDB 789033 D02 v01r02 Section D and ANSI C63.10-2013 Section 12.4.2 – for 99% Occupied Bandwidth

*Note: EMI Receiver (Spectrum Analyzer) Reference Level Offset = 10.8 dB (10 dB Attenuator Pad + 0.8 cable loss)*

#### Test Setup



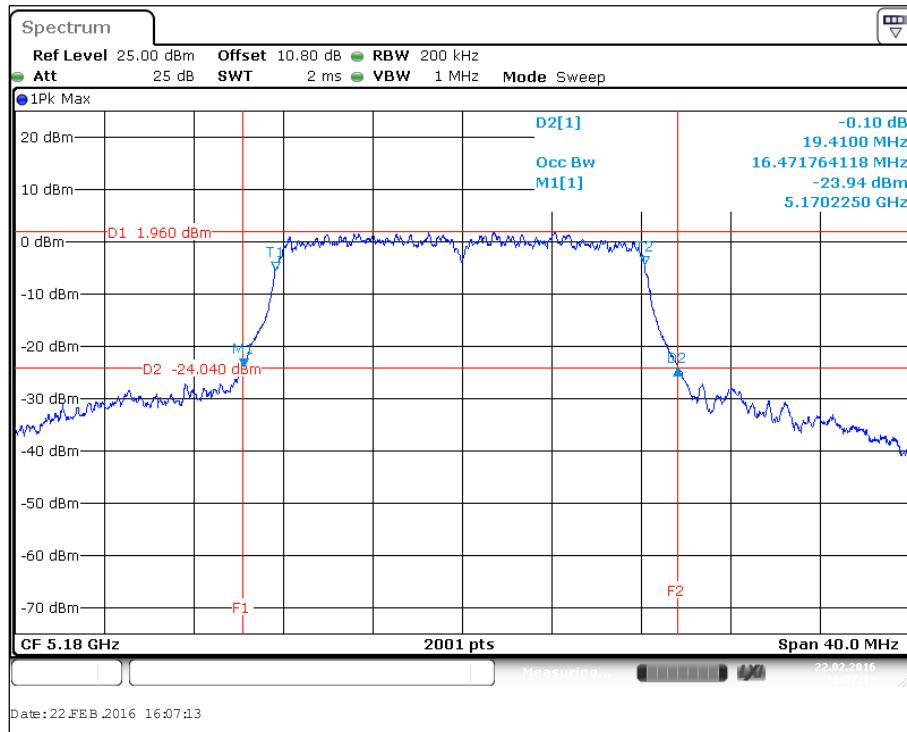
## Test Results

### 6.1.1 26dB EBW and 99% OBW in the 5.15-5.25 GHz Band

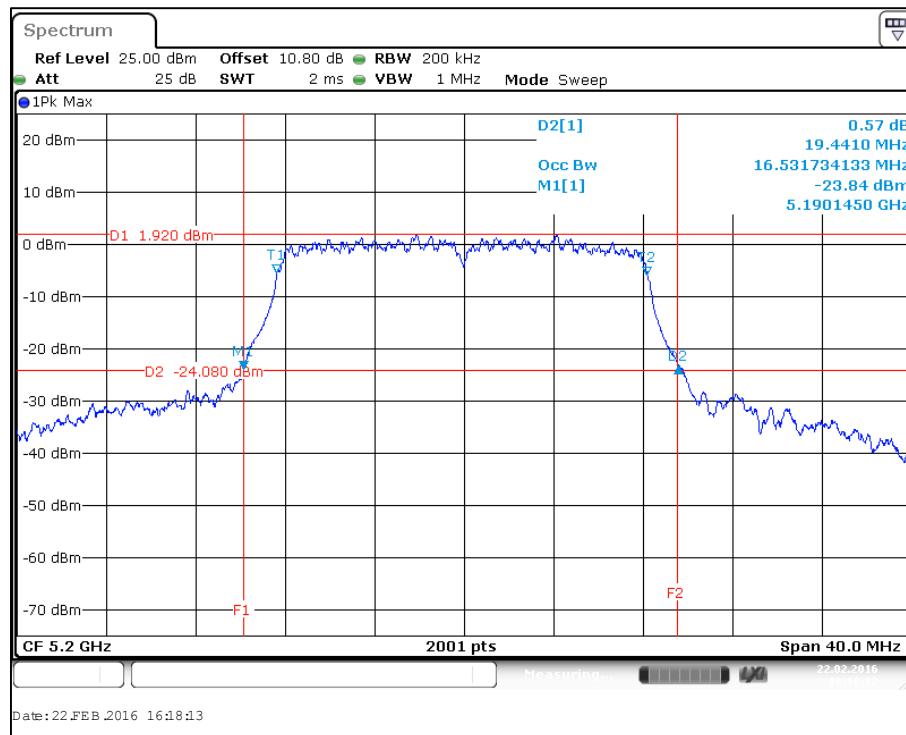
| 802.11 Mode | Data Rate         | Channel | Frequency (MHz) | 26dB EBW (MHz) | 99% OBW (MHz) |
|-------------|-------------------|---------|-----------------|----------------|---------------|
| a           | 6 Mbps            | 36      | 5180            | 19.4           | 16.5          |
|             |                   | 40      | 5200            | 19.4           | 16.5          |
|             |                   | 48      | 5240            | 19.4           | 16.5          |
| n (HT20)    | MCS0/<br>6.5Mbps  | 36      | 5180            | 19.9           | 17.5          |
|             |                   | 40      | 5200            | 19.9           | 17.5          |
|             |                   | 48      | 5240            | 19.9           | 17.5          |
| n (HT40)    | MCS0/<br>13.5Mbps | 38      | 5190            | 39.4           | 35.9          |
|             |                   | 46      | 5230            | 39.4           | 35.9          |

Refer to the following plots

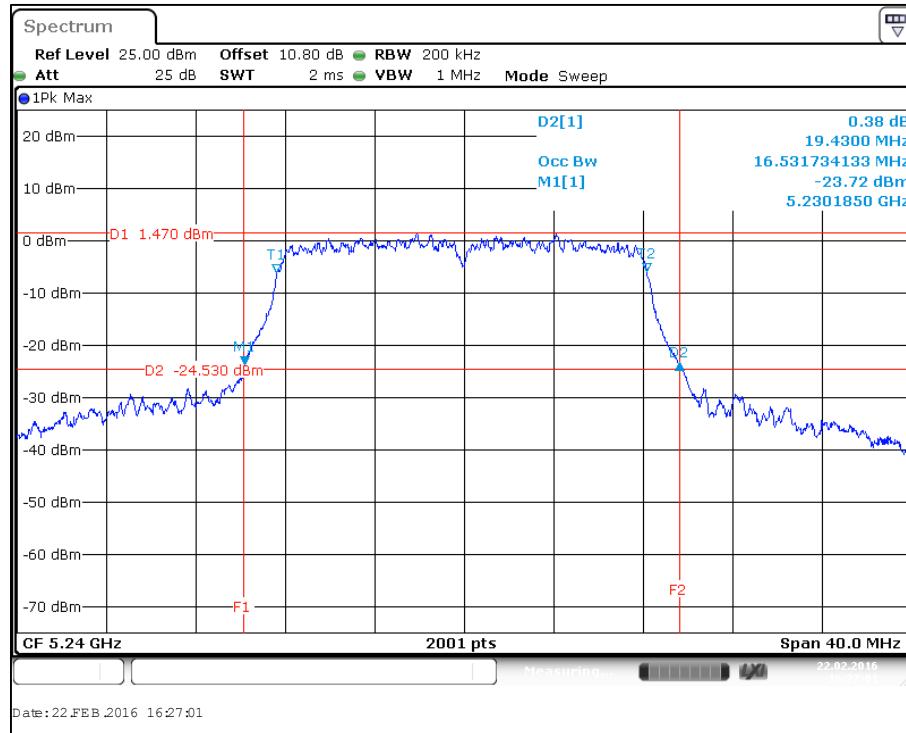
#### 802.11a: 6Mbps



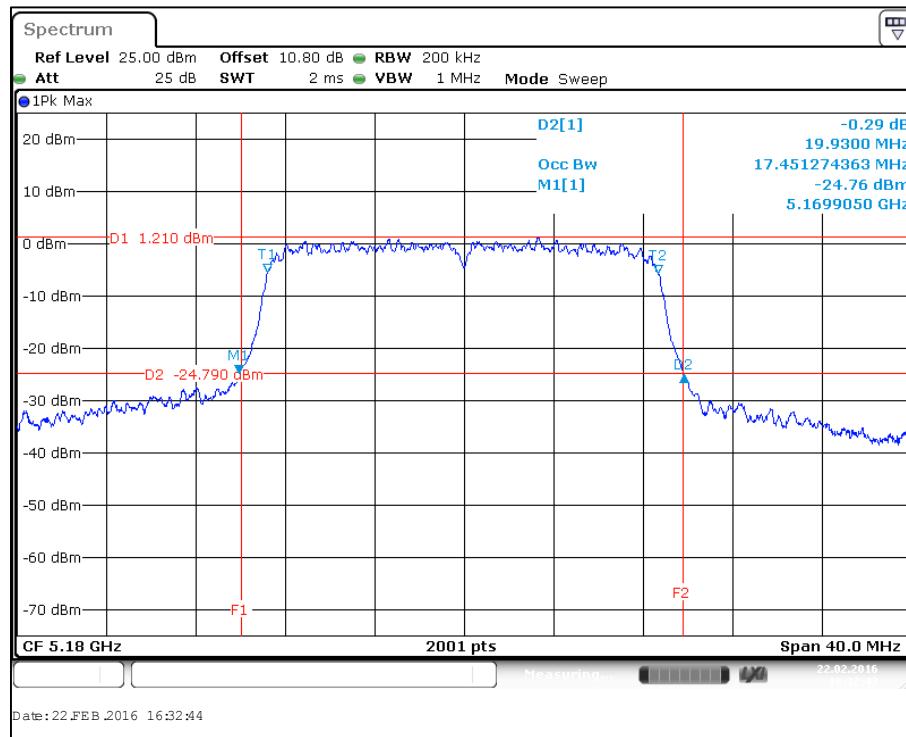
802.11a: 6Mbps – Channel 36 (5180 MHz) 26dB BW and 99% OBW



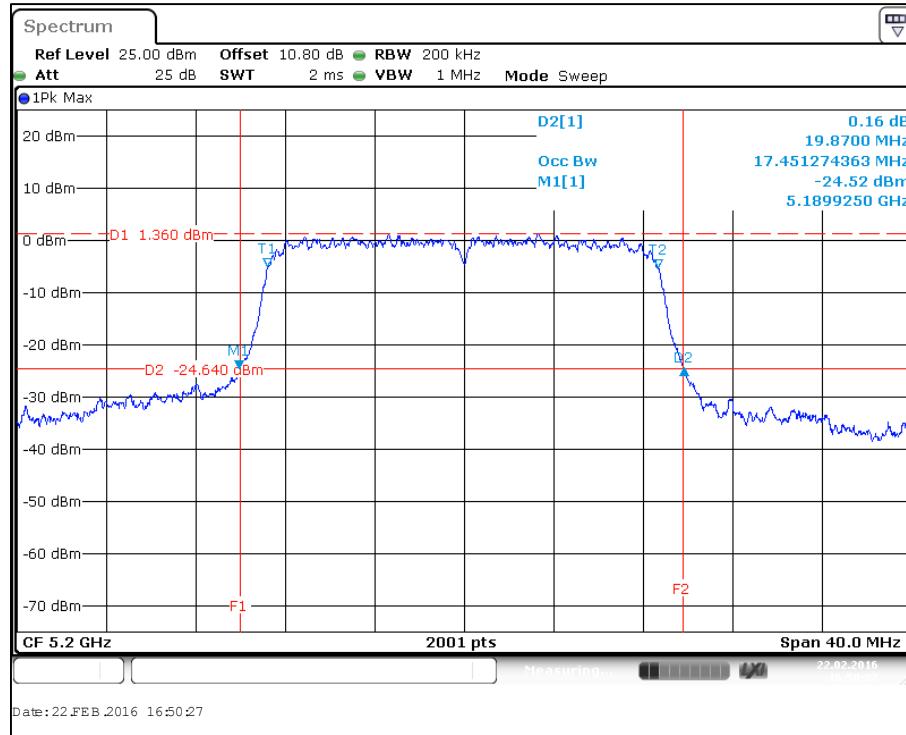
802.11a: 6Mbps – Channel 40 (5200 MHz) 26dB BW and 99% OBW



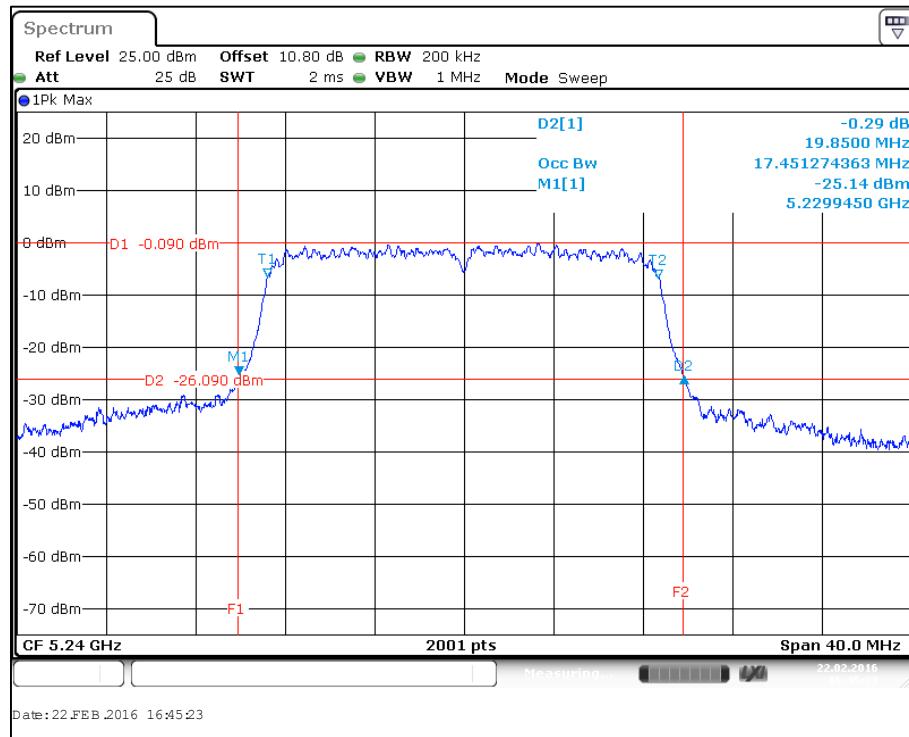
802.11a: 6Mbps – Channel 48 (5240 MHz) 26dB BW and 99% OBW

**802.11n (HT20): MCS0/6.5 Mbps**


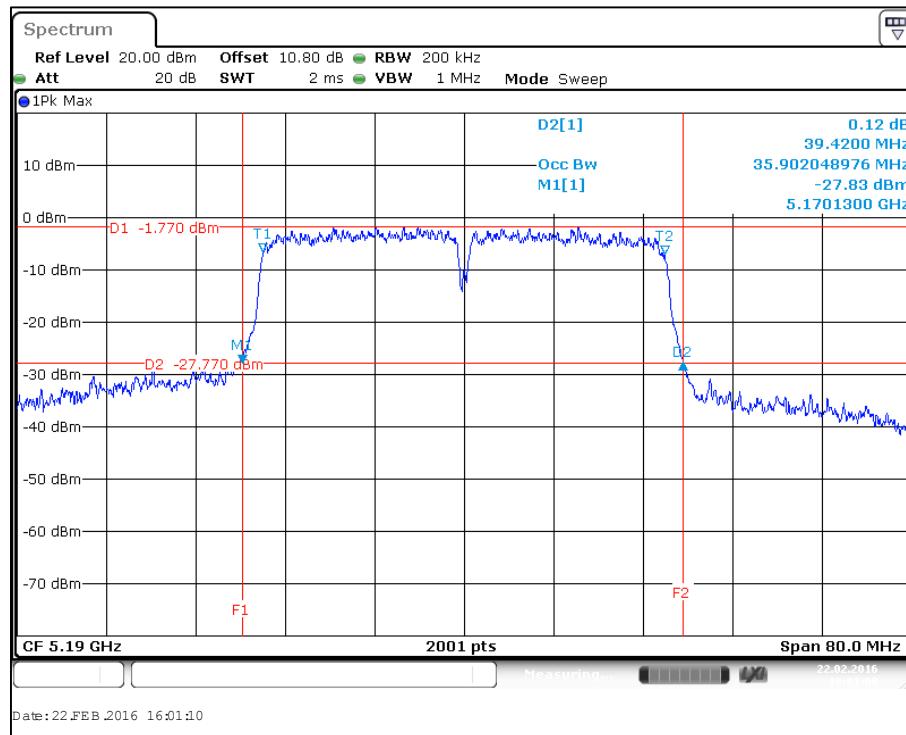
802.11n (HT20): MCS0/6.5 Mbps – Channel 36 (5180 MHz) 26dB BW and 99% OBW



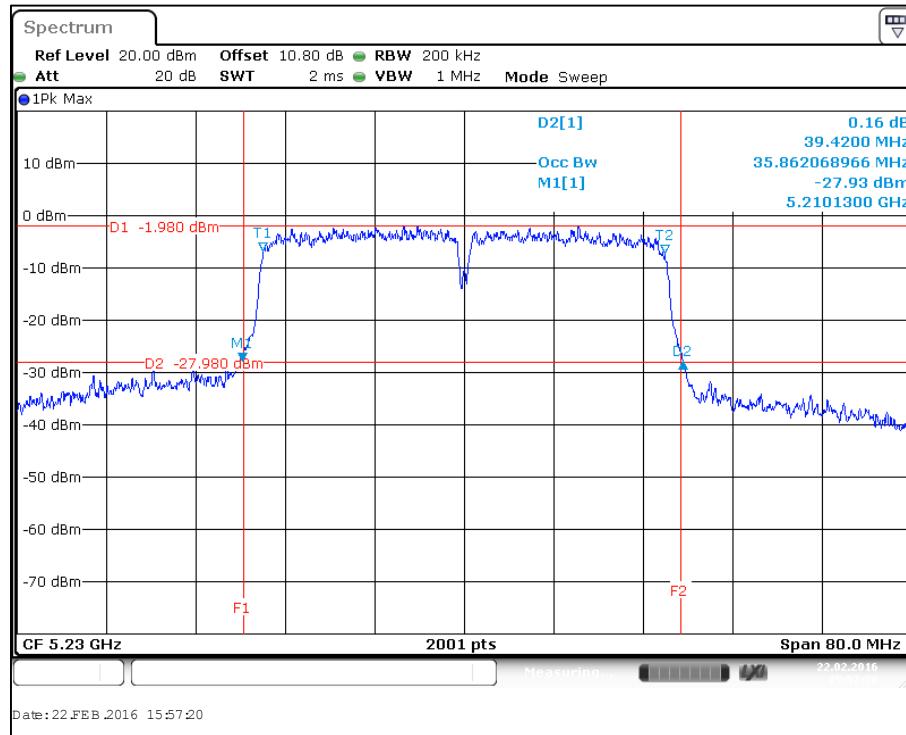
802.11n (HT20): MCS0/6.5 Mbps – Channel 40 (5200 MHz) 26dB BW and 99% OBW



802.11n (HT20): MCS0/6.5 Mbps – Channel 48 (5240 MHz) 26dB BW and 99% OBW

**802.11n (HT40): MCS0/13.5 Mbps**


802.11n (HT40): MCS0/13.5 Mbps – Channel 38 (5190 MHz) 26dB BW and 99% OBW



802.11n (HT40): MCS0/13.5 Mbps – Channel 46 (5230 MHz) 26dB BW and 99% OBW

## 6.2 6dB Emission Bandwidth (EBW) and 99% Occupied Bandwidth (OBW)

### Limits

#### FCC Part 15 Subpart E §15.407 (e)

Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz

#### IC RSS-247 Issue 1 §6.2.4 (1)

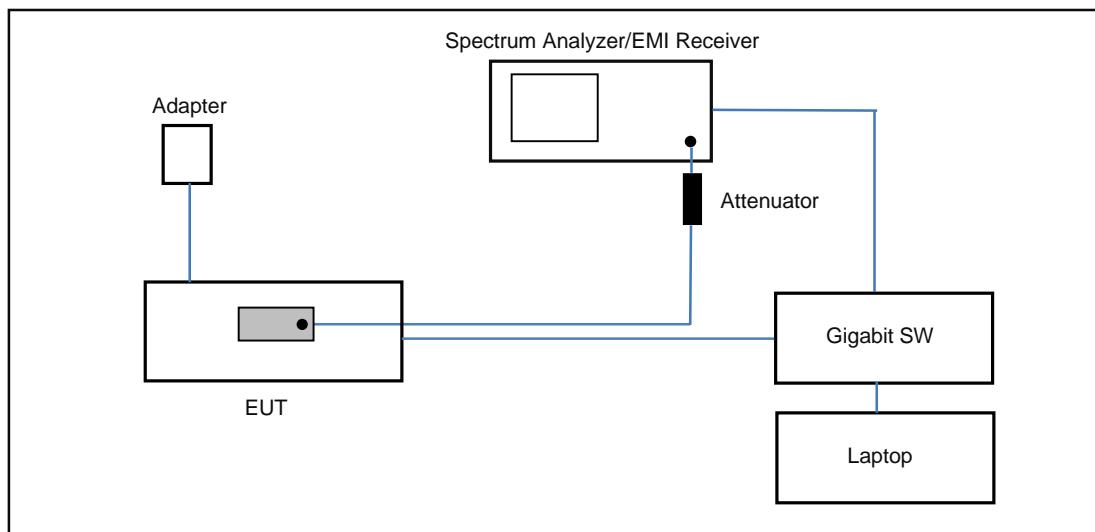
For equipment operating in the band 5725-5850 MHz, the minimum 6 dB bandwidth shall be at least 500 kHz

### Test Procedures

KDB 789033 D02 v01r02 Section C.2

*Note: EMI Receiver (Spectrum Analyzer) Reference Level Offset = 10.8 dB (10 dB Attenuator Pad + 0.8 cable loss)*

### Test Setup



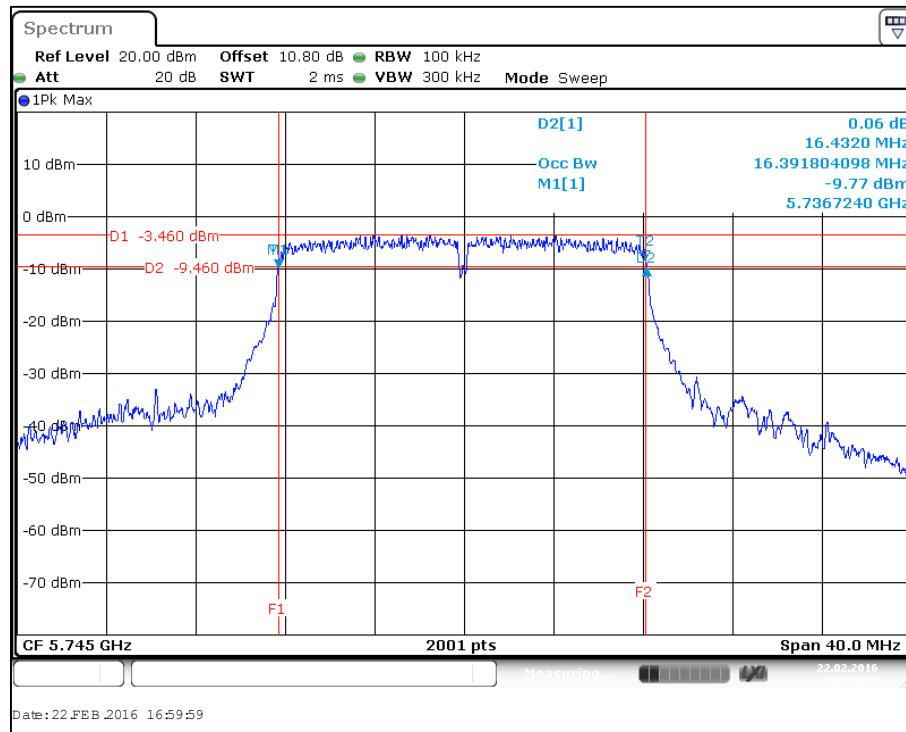
## Test Results

### 6.2.1 6dB EBW and 99% OBW in the 5.725-5.85 GHz Band

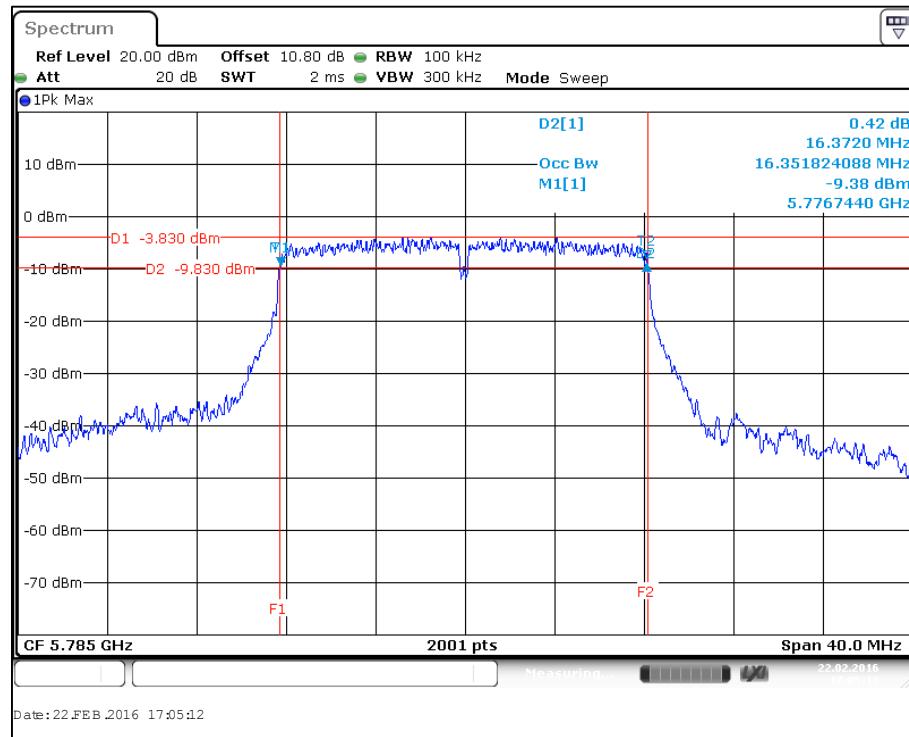
| 802.11 Mode     | Data Rates         | Channel | Frequency (MHz) | 6dB EBW (MHz) | 99% OBW (MHz) | 6dB EBW Limit (kHz) |
|-----------------|--------------------|---------|-----------------|---------------|---------------|---------------------|
| a               | 6 Mbps             | 149     | 5745            | 16.4          | 16.4          | > 500               |
|                 |                    | 157     | 5785            | 16.4          | 16.4          | > 500               |
|                 |                    | 165     | 5825            | 16.4          | 16.4          | > 500               |
| n<br>HT20       | MCS0/<br>6.5 Mbps  | 149     | 5745            | 17.5          | 17.5          | > 500               |
|                 |                    | 157     | 5785            | 17.5          | 17.5          | > 500               |
|                 |                    | 165     | 5825            | 17.5          | 17.5          | > 500               |
| 802.11n<br>HT40 | MCS0/<br>13.5 Mbps | 151     | 5755            | 36.2          | 35.9          | > 500               |
|                 |                    | 159     | 5795            | 36.2          | 35.9          | > 500               |

Refer to the following plots

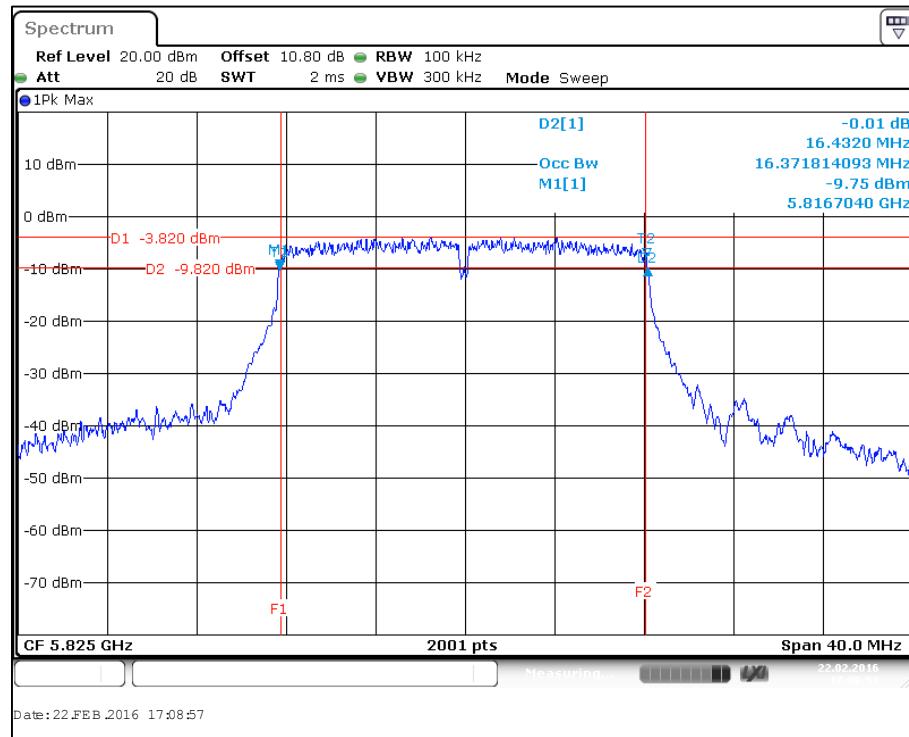
#### 802.11a: 6 Mbps



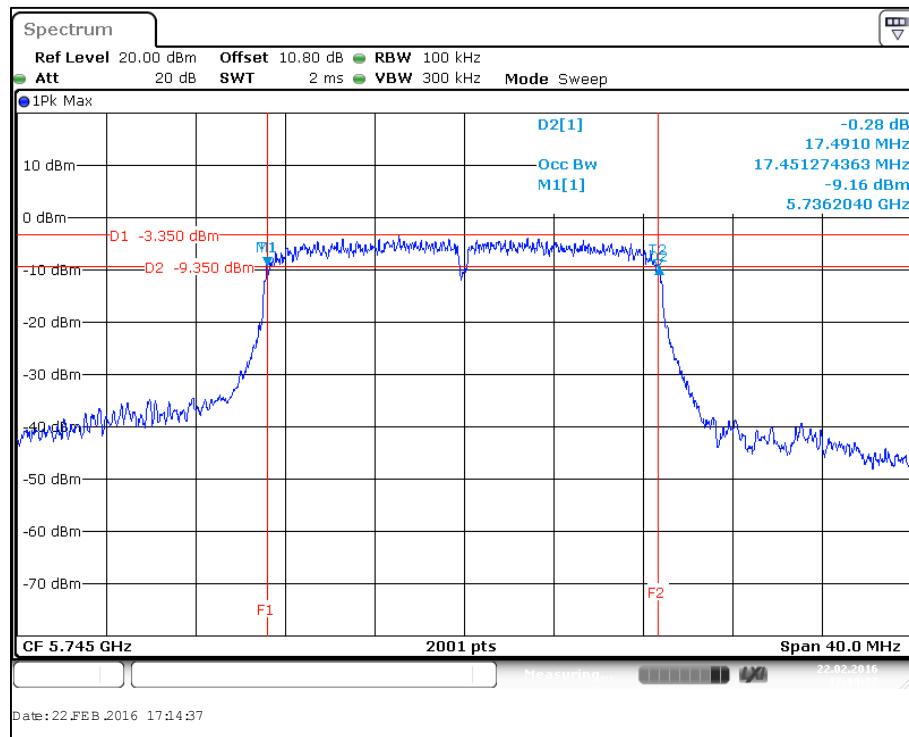
802.11a: 6 Mbps – Channel 149 (5745 MHz) 6dB DTS BW and 99% OBW



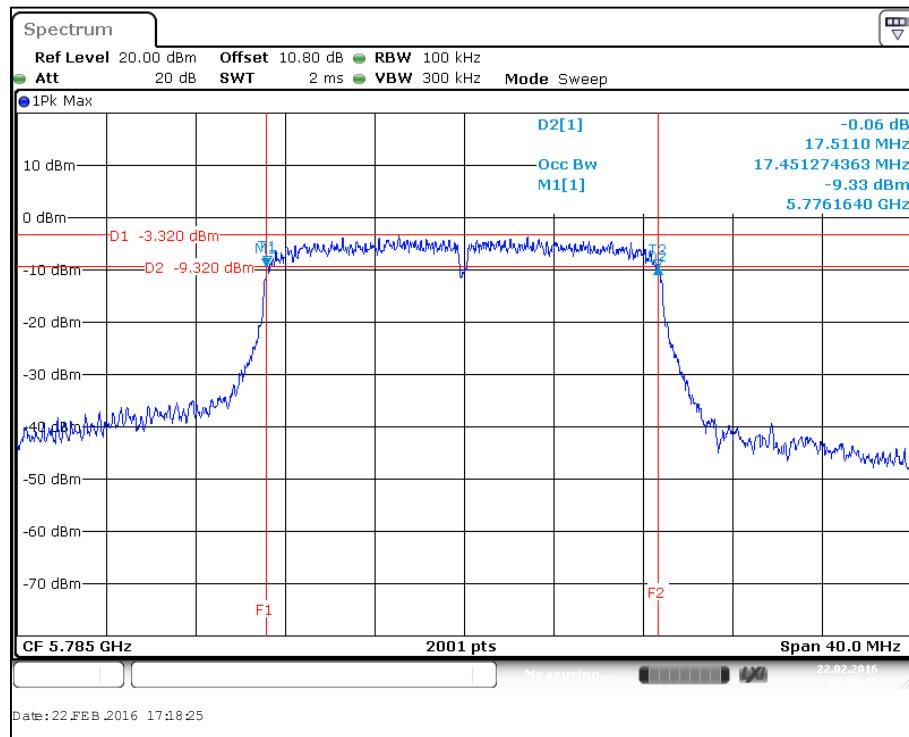
802.11a: 6 Mbps – Channel 157 (5785 MHz) 6dB DTS BW and 99% OBW



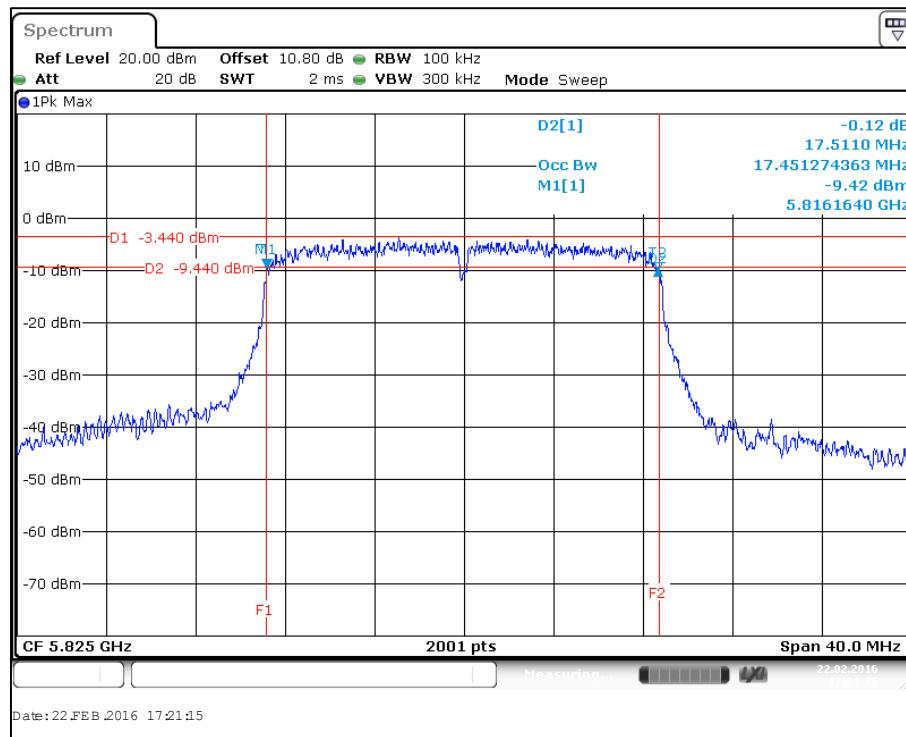
802.11a: 6 Mbps – Channel 165 (5825 MHz) 6dB DTS BW and 99% OBW

**802.11n (HT20): MCS0/6.5 Mbps**


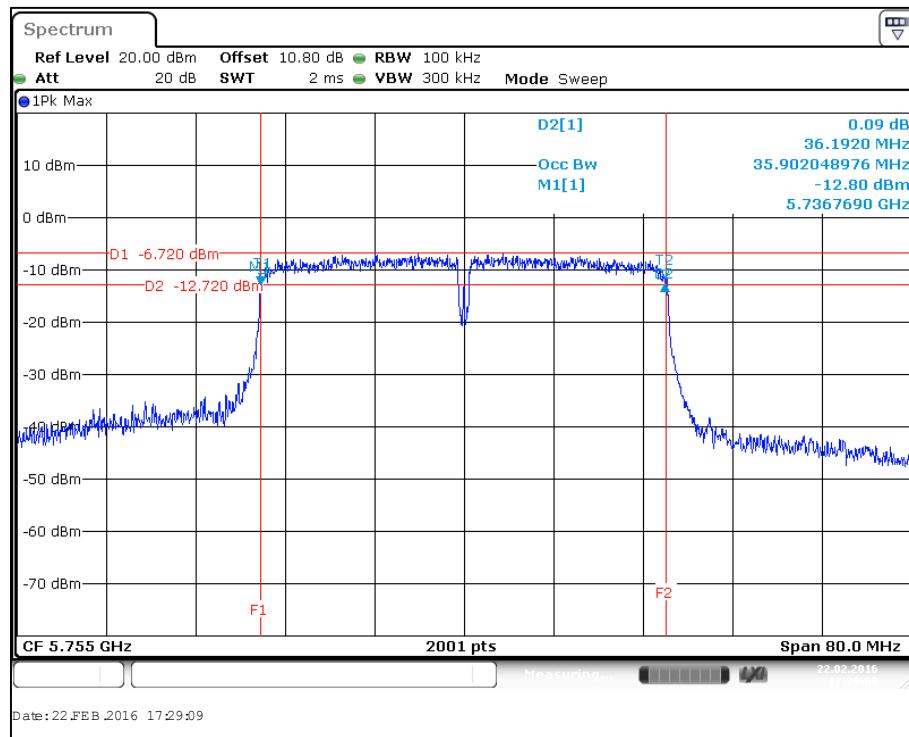
802.11n (HT20): MCS0/6.5 Mbps – Channel 149 (5745 MHz) 6dB DTS BW and 99% OBW



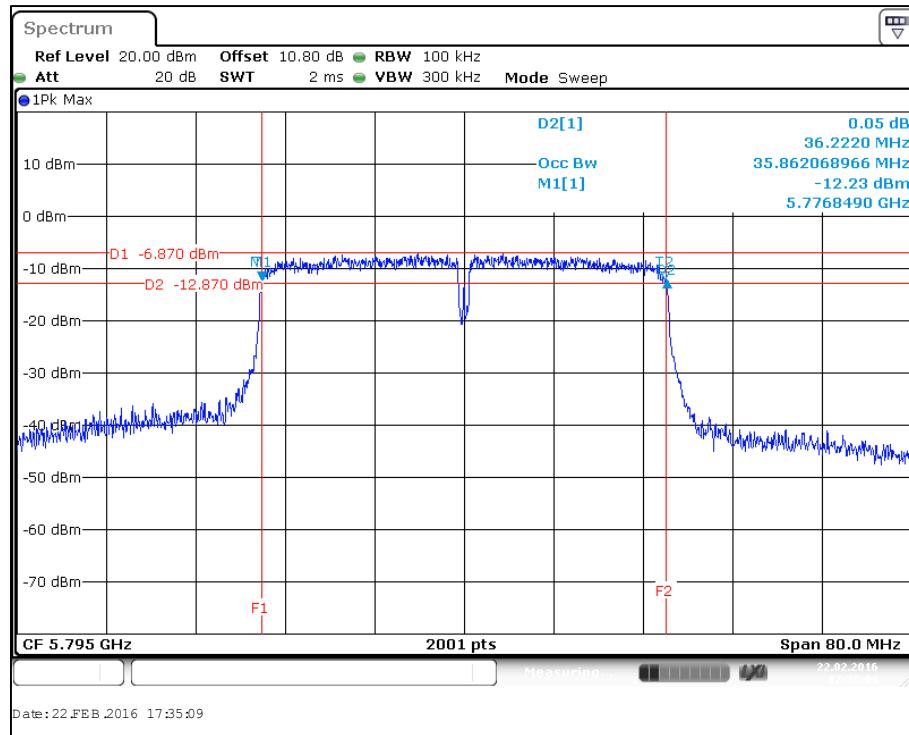
802.11n (HT20): MCS0/6.5 Mbps – Channel 157 (5785 MHz) 6dB DTS BW and 99% OBW



802.11n (HT20): MCS0/6.5 Mbps – Channel 165 (5825 MHz) 6dB DTS BW and 99% OBW

**802.11n (HT40): MCS0/13.5 Mbps**


802.11n (HT40): MCS0/13.5 Mbps – Channel 151 (5755 MHz) 6dB EBW and 99% OBW



802.11n (HT40): MCS0/13.5 Mbps – Channel 159 (5795 MHz) 6dB EBW and 99% OBW

## 6.3 Maximum Conducted Output Power and e.i.r.p.

### Limits

#### FCC Part 15 Subpart E §15.407 (a)

§15.407 (a)(1)(ii) - For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi.

§15.407 (a)(3) - For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm)

#### IC RSS-247 Issue 1 §6.2

§6.2.1 (1) - Frequency Band 5150-5250 MHz, the maximum e.i.r.p. shall not exceed 200 mW or  $10 + 10 \log_{10}B$ , dBm, whichever power is less. B is the 99% emission bandwidth in megahertz.

§6.2.4 (1) - Frequency Band 5725-5850 MHz; the maximum conducted output power shall not exceed 1 W

### Test Procedures

KDB 789033 D02 v01r02 Section E.3.a) – Method PM (Measurement using RF average power meter)  
ANSI C63.10-2013 Section 12.3.3.1 – Method PM

Notes:

AVG Power Meter Offset level Calculation:

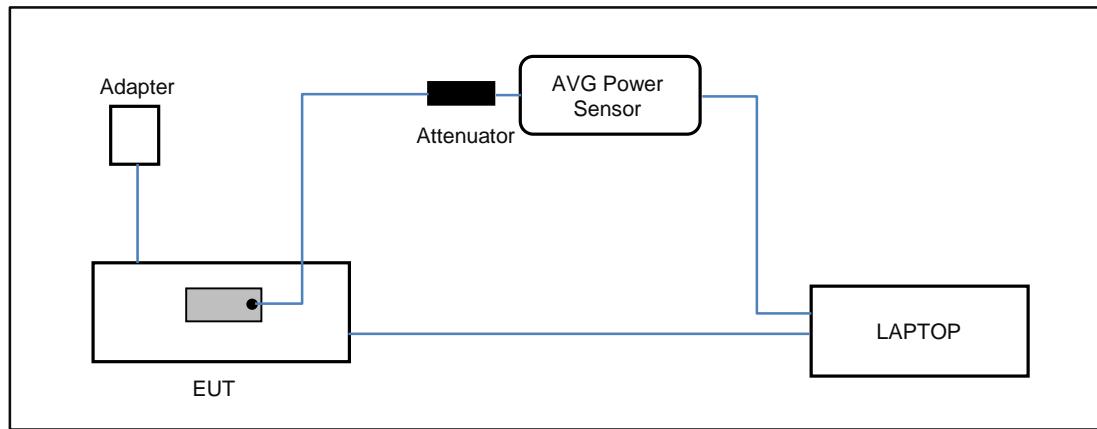
$$\text{OFFSET } (\text{dB}) = 10.8 \text{ dB} (10 \text{ dB Attenuator Pad} + 0.8 \text{ dB cable loss})$$

Directional Antenna Gain: There is only one transmitter output therefore the directional gain is equal to the antenna gain

$$\text{e.i.r.p } (\text{dBm}) = \text{Maximum Conducted Output Power } (\text{dBm}) + \text{Directional Gain } (\text{dBi})$$

$$\text{Margin } (\text{dB}) = \text{Results (e.i.r.p. or Maximum conducted output power) } (\text{dBm}) - \text{Limit } (\text{dBm})$$

## Test Setup



## Test Results

### 6.3.1 Maximum Conducted Output Power and e.i.r.p. in the 5.15-5.25 GHz Band

| 802.11 Mode | Data Rate      | Channel | Frequency (MHz) | Maximum Conducted Output Power |                 |             | e.i.r.p.               |               |                |
|-------------|----------------|---------|-----------------|--------------------------------|-----------------|-------------|------------------------|---------------|----------------|
|             |                |         |                 | Results (dBm)                  | FCC Limit (dBm) | Margin (dB) | Directional Gain (dBi) | Results (dBm) | IC Limit (dBm) |
| a           | 6 Mbps         | 36      | 5180            | 13.3                           | 30.0            | -16.7       | 2.0                    | 15.3          | 22.2           |
|             |                | 40      | 5200            | 12.8                           | 30.0            | -17.2       | 2.0                    | 14.8          | 22.2           |
|             |                | 48      | 5240            | 12.1                           | 30.0            | -17.9       | 2.0                    | 14.1          | 22.2           |
| n (HT20)    | MCS0/ 6.5Mbps  | 36      | 5180            | 13.2                           | 30.0            | -16.8       | 2.0                    | 15.2          | 22.4           |
|             |                | 40      | 5200            | 12.7                           | 30.0            | -17.3       | 2.0                    | 14.7          | 22.4           |
|             |                | 48      | 5240            | 12.0                           | 30.0            | -18.0       | 2.0                    | 14.0          | 22.4           |
| n (HT40)    | MCS0/ 13.5Mbps | 38      | 5190            | 7.4                            | 30.0            | -22.6       | 2.0                    | 9.4           | 23.0           |
|             |                | 46      | 5230            | 6.7                            | 30.0            | -23.3       | 2.0                    | 8.7           | 23.0           |

### 6.3.2 Maximum Conducted Output Power in the 5.725-5.85 GHz Band

| 802.11 Mode | Data Rate      | Channel | Frequency (MHz) | Maximum Conducted Output Power |                        |             |
|-------------|----------------|---------|-----------------|--------------------------------|------------------------|-------------|
|             |                |         |                 | Results (dBm)                  | FCC and IC Limit (dBm) | Margin (dB) |
| a           | 6 Mbps         | 149     | 5745            | 11.5                           | 30.0                   | -18.5       |
|             |                | 157     | 5785            | 11.4                           | 30.0                   | -18.6       |
|             |                | 165     | 5825            | 11.1                           | 30.0                   | -18.9       |
| n (HT20)    | MCS0/ 6.5Mbps  | 149     | 5745            | 11.4                           | 30.0                   | -18.6       |
|             |                | 157     | 5785            | 11.2                           | 30.0                   | -18.8       |
|             |                | 165     | 5825            | 11.0                           | 30.0                   | -19.0       |
| n (HT40)    | MCS0/ 13.5Mbps | 151     | 5755            | 6.3                            | 30.0                   | -23.7       |
|             |                | 159     | 5795            | 6.2                            | 30.0                   | -23.8       |

## 6.4 Maximum Power Spectral Density (PSD) and e.i.r.p. Spectral Density

### Limits

#### FCC Part 15 Subpart E §15.407

§15.407 (a) (1)(ii) – For an indoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 MHz band.

§15.407 (a) (3) – For the band 5.725-5.85 GHz band, the maximum power spectral density shall not exceed 30dBm/500kHz

#### IC RSS-247 Issue 1 §6.2

§16.2.1 (1) - Frequency Band 5150-5250 MHz, The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band

§16.2.4 (1) - Frequency Band 5725-5850 MHz; The power spectral density shall not exceed 30 dBm in any 500 kHz band.

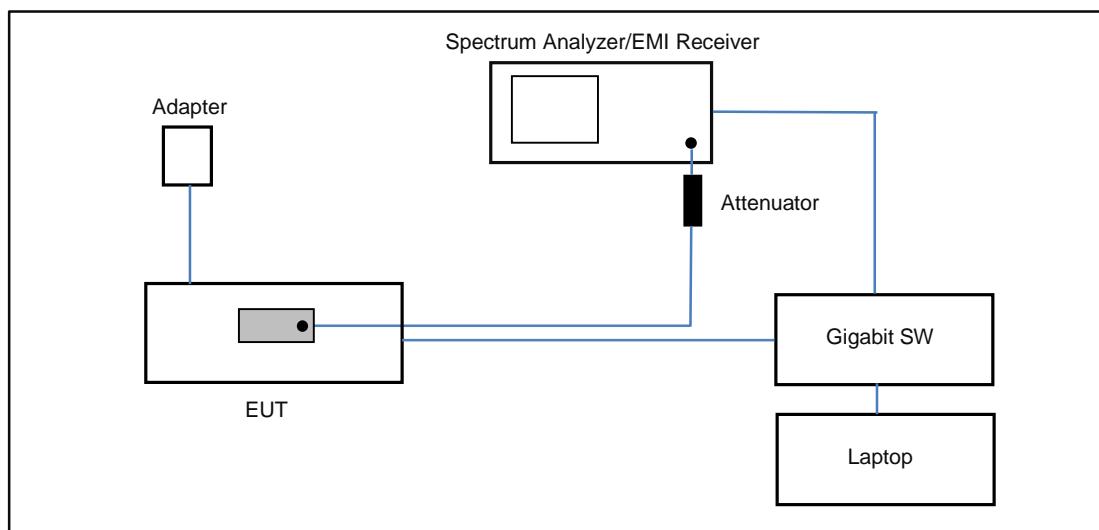
### Test Procedures

- KDB 789033 D02 v01r02 Section F
- ANSI C63.10-2013 Section 12.5

*Note: Spectrum Analyzer Offset level Calculation:*

$$\text{OFFSET (dB)} = 10.8 \text{ dB} (10 \text{ dB Attenuator Pad} + 0.8 \text{ dB cable loss})$$

### Test Setup



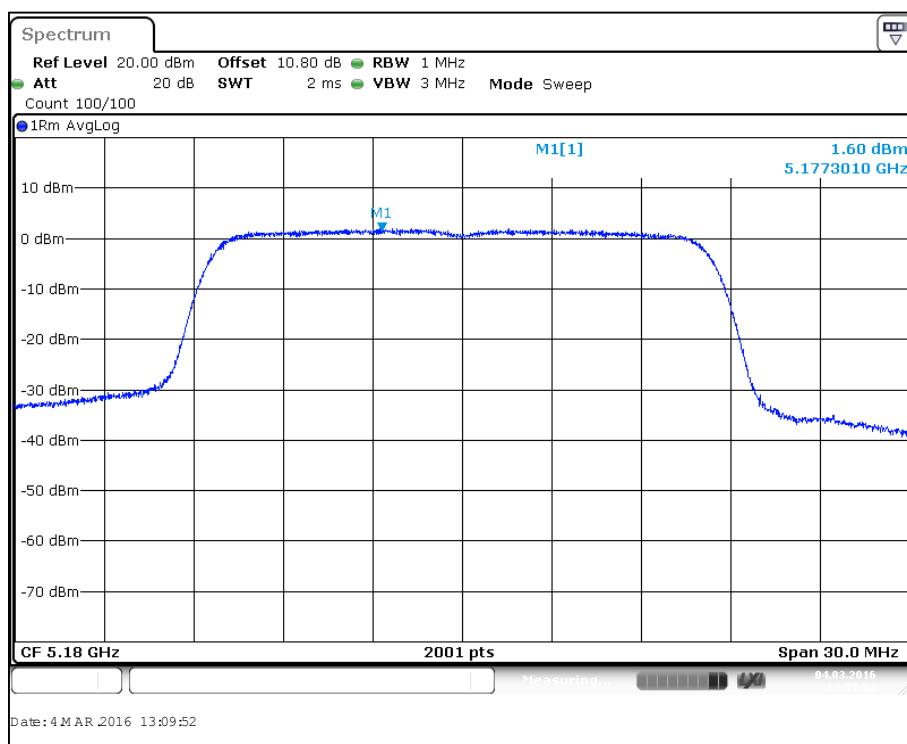
## Test Results

### 6.4.1 Maximum Power Spectral Density and e.i.r.p. Spectral Density in the 5.15-5.25 GHz Band

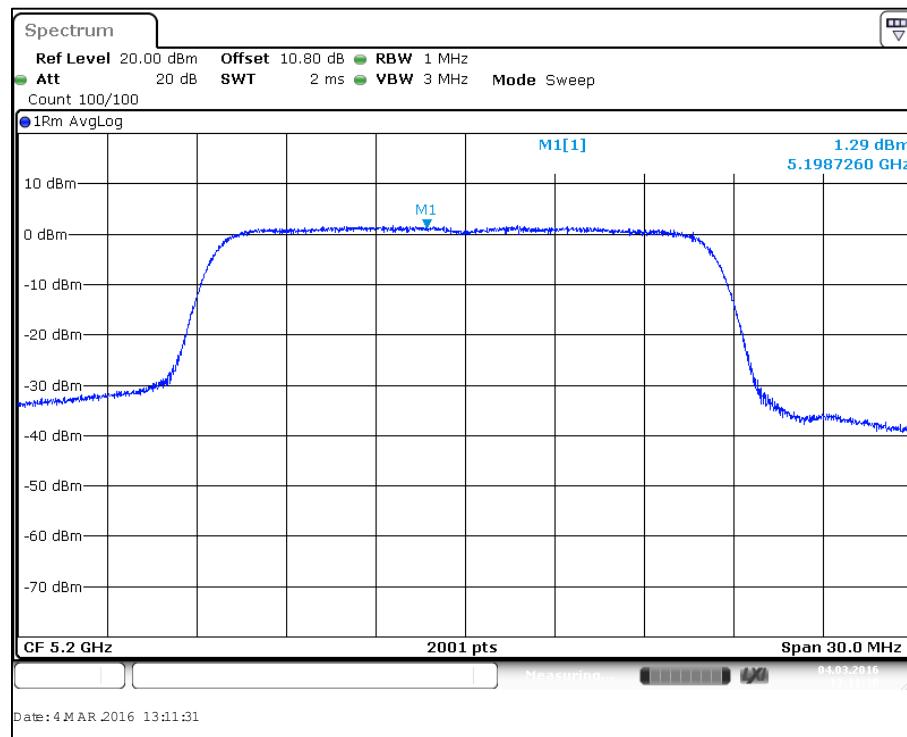
| 802.11 Mode | Data Rate      | Channel | Frequency (MHz) | Maximum Power Spectral Density (PSD) |                     |             | e.i.r.p. Spectral Density |                   |                    |             |
|-------------|----------------|---------|-----------------|--------------------------------------|---------------------|-------------|---------------------------|-------------------|--------------------|-------------|
|             |                |         |                 | Results (dBm/MHz)                    | FCC Limit (dBm/MHz) | Margin (dB) | Directional Gain (dBi)    | Results (dBm/MHz) | IC Limit (dBm/MHz) | Margin (dB) |
| a           | 6 Mbps         | 36      | 5180            | 1.60                                 | 17.0                | -15.4       | 2.0                       | 3.6               | 10                 | -6.4        |
|             |                | 40      | 5200            | 1.29                                 | 17.0                | -15.7       | 2.0                       | 3.3               | 10                 | -6.7        |
|             |                | 48      | 5240            | 0.40                                 | 17.0                | -16.6       | 2.0                       | 2.4               | 10                 | -7.6        |
| n (HT20)    | MCS0/ 6.5Mbps  | 36      | 5180            | 1.11                                 | 17.0                | -15.9       | 2.0                       | 3.1               | 10                 | -6.9        |
|             |                | 40      | 5200            | 0.31                                 | 17.0                | -16.7       | 2.0                       | 2.3               | 10                 | -7.7        |
|             |                | 48      | 5240            | 0.00                                 | 17.0                | -17.0       | 2.0                       | 2.0               | 10                 | -8.0        |
| n (HT40)    | MCS0/ 13.5Mbps | 38      | 5190            | -8.17                                | 17.0                | -25.2       | 2.0                       | -6.2              | 10                 | -16.2       |
|             |                | 46      | 5230            | -8.76                                | 17.0                | -25.8       | 2.0                       | -6.8              | 10                 | -16.8       |

Refer to the following plots

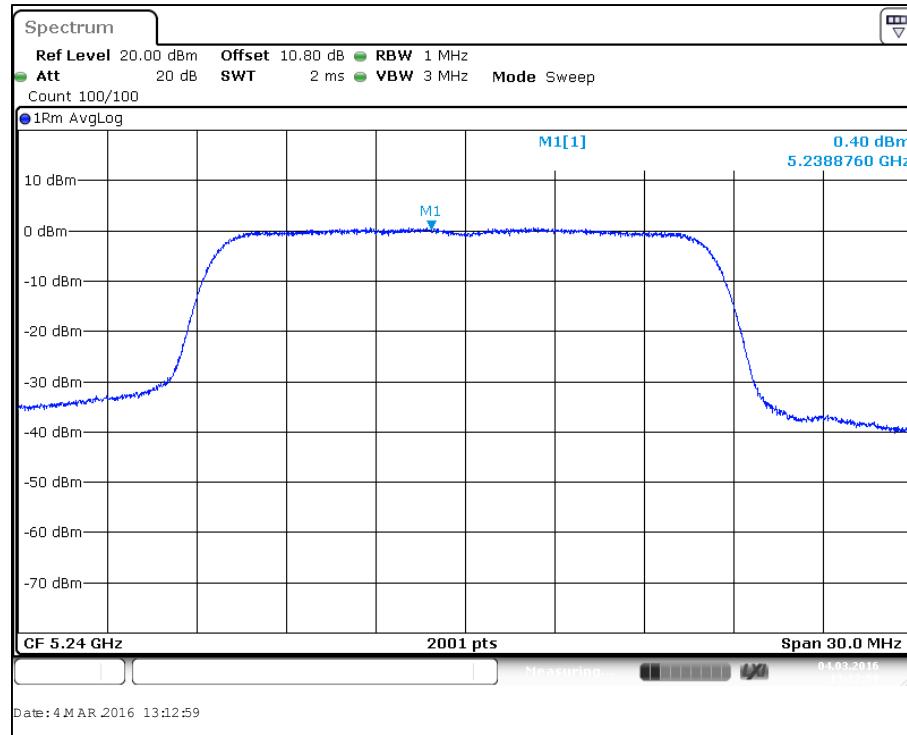
#### 802.11a: 6 Mbps



802.11a: 6 Mbps - Channel 36 (5180 MHz) Maximum PSD

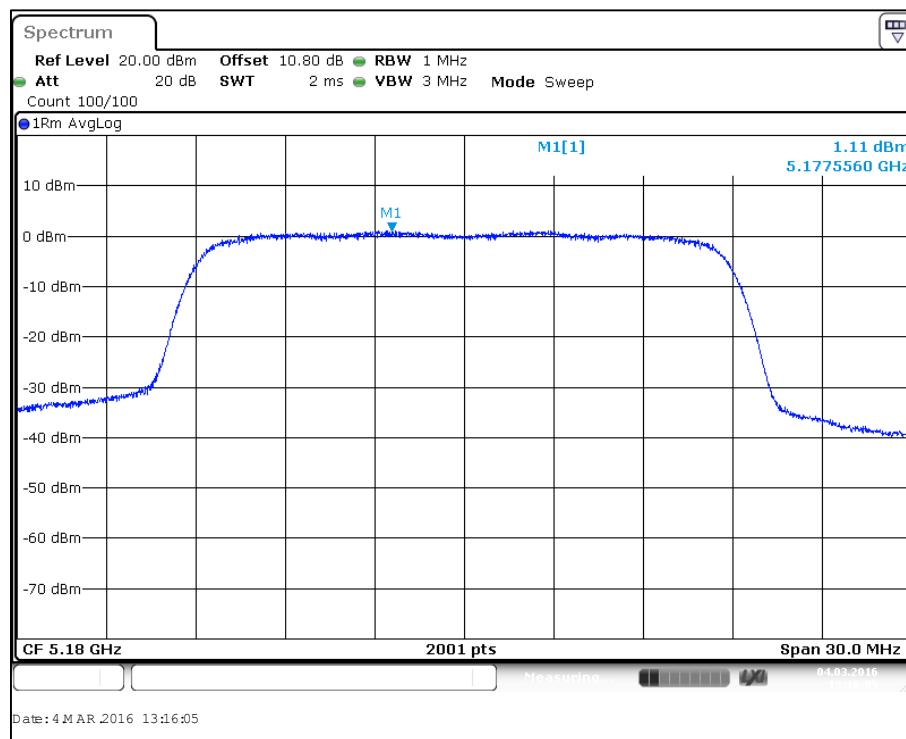


802.11a: 6 Mbps - Channel 40 (5200 MHz) Maximum PSD

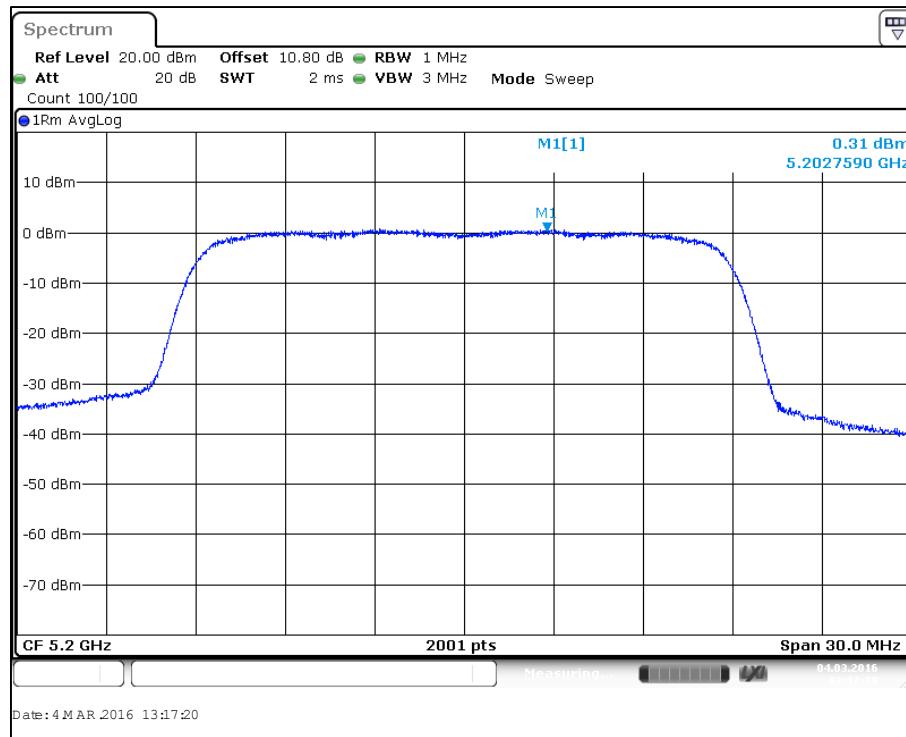


802.11a: 6 Mbps - Channel 48 (5240 MHz) Maximum PSD

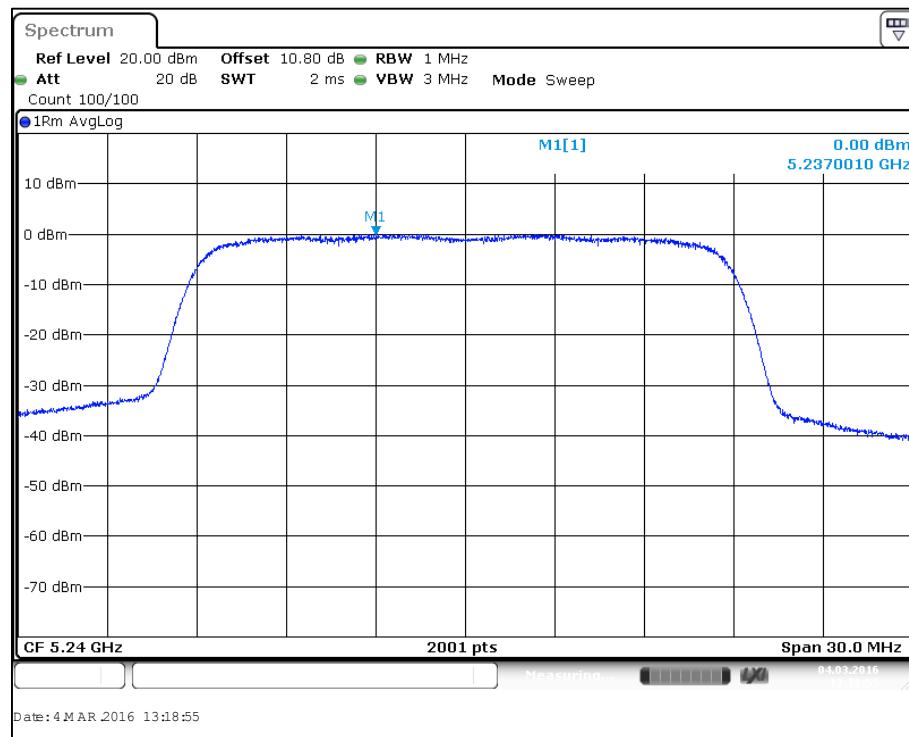
## 802.11n (HT20): MCS0/6.5 Mbps



802.11n (HT20): MCS0/6.5 Mbps - Channel 36 (5180 MHz) Maximum PSD

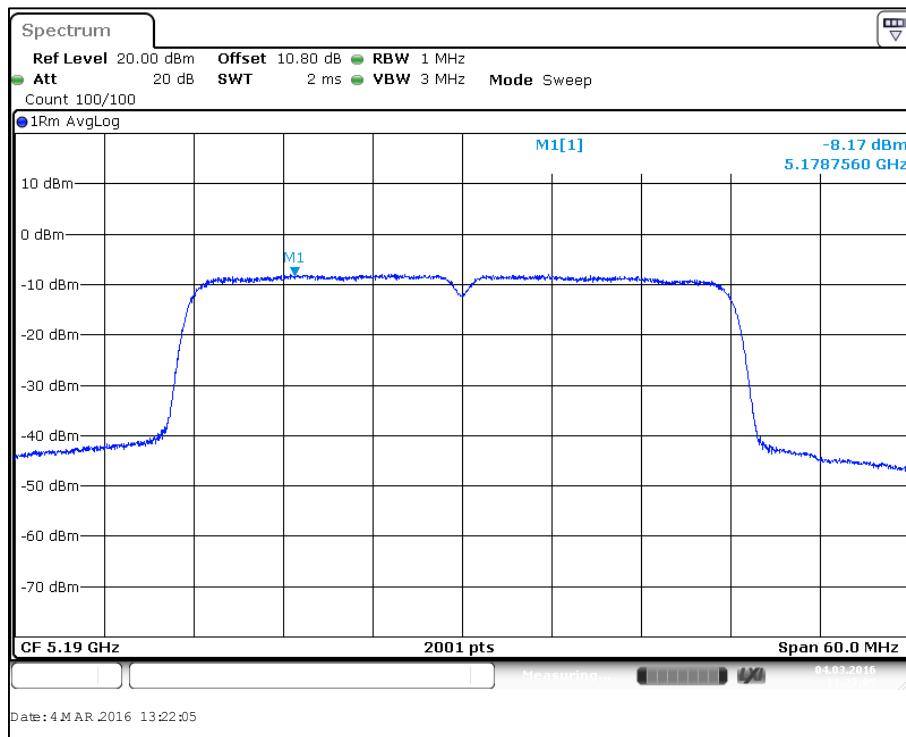


802.11n (HT20): MCS0/6.5 Mbps - Channel 40 (5200 MHz) Maximum PSD

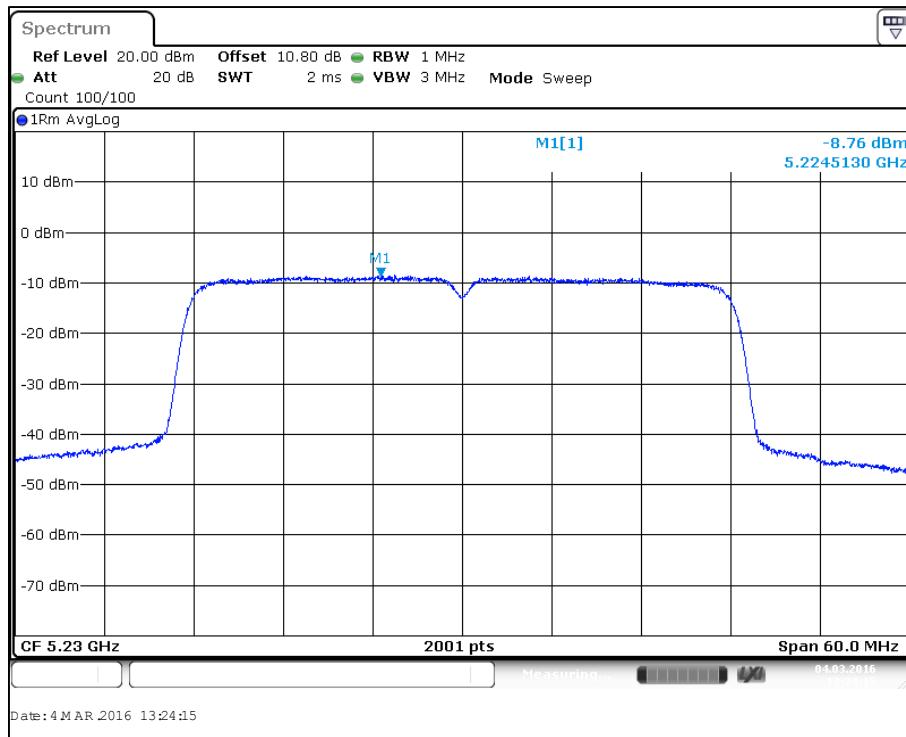


802.11n (HT20): MCS0/6.5 Mbps - Channel 48 (5240 MHz) Maximum PSD

## 802.11n (HT40): MCS0/13.5 Mbps



802.11n (HT40): MCS0/13.5 Mbps - Channel 38 (5190 MHz) Maximum PSD



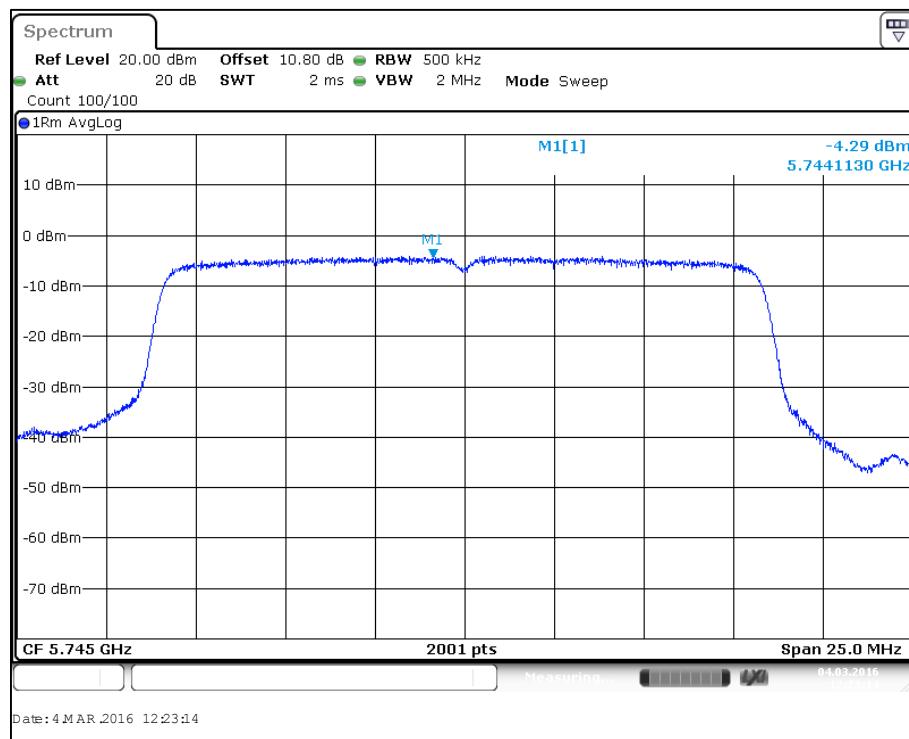
802.11n (HT40): MCS0/13.5 Mbps - Channel 46(5230 MHz) Maximum PSD

#### 6.4.2 Maximum Power Spectral Density in the 5.725-5.85 GHz Band

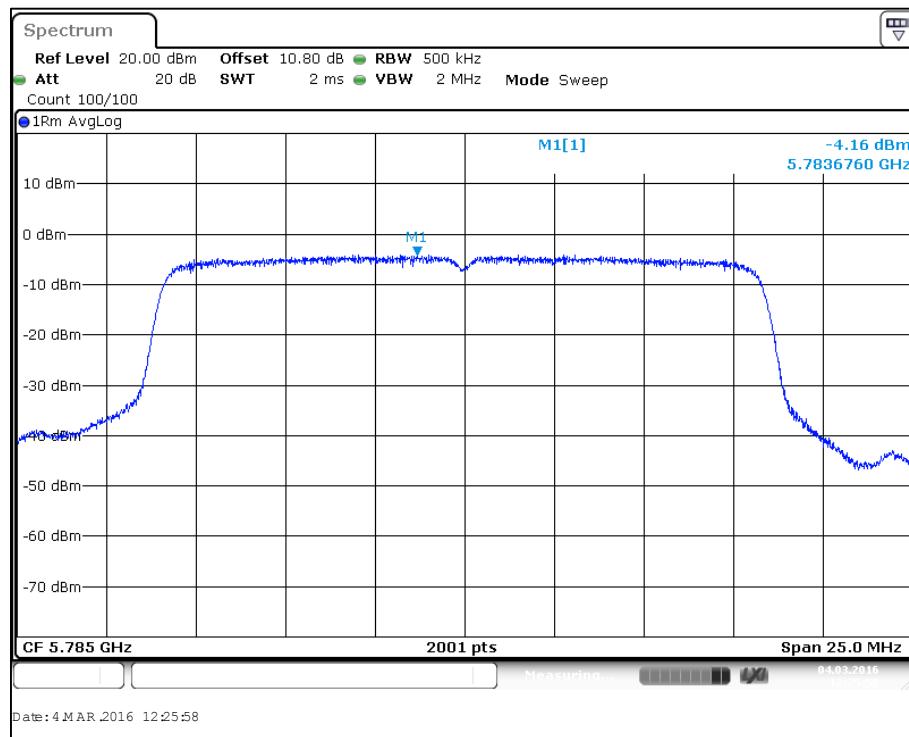
| 802.11 Mode   | Data Rate         | Channel | Frequency (MHz) | Maximum PSD (dBm/500kHz) | FCC and IC PSD Limit (dBm/500kHz) | Margin (dB) |
|---------------|-------------------|---------|-----------------|--------------------------|-----------------------------------|-------------|
| a             | 6 Mbps            | 149     | 5745            | -4.29                    | 30.0                              | -34.3       |
|               |                   | 157     | 5785            | -4.16                    | 30.0                              | -34.2       |
|               |                   | 165     | 5825            | -4.59                    | 30.0                              | -34.6       |
| n (HT20)      | MCS0/<br>6.5Mbps  | 149     | 5745            | -4.86                    | 30.0                              | -34.9       |
|               |                   | 157     | 5785            | -4.70                    | 30.0                              | -34.7       |
|               |                   | 165     | 5825            | -4.88                    | 30.0                              | -34.9       |
| n (HT40)<br>a | MCS0/<br>13.5Mbps | 151     | 5755            | -12.77                   | 30.0                              | -42.8       |
|               |                   | 159     | 5795            | -12.65                   | 30.0                              | -42.7       |

Refer to the following plots

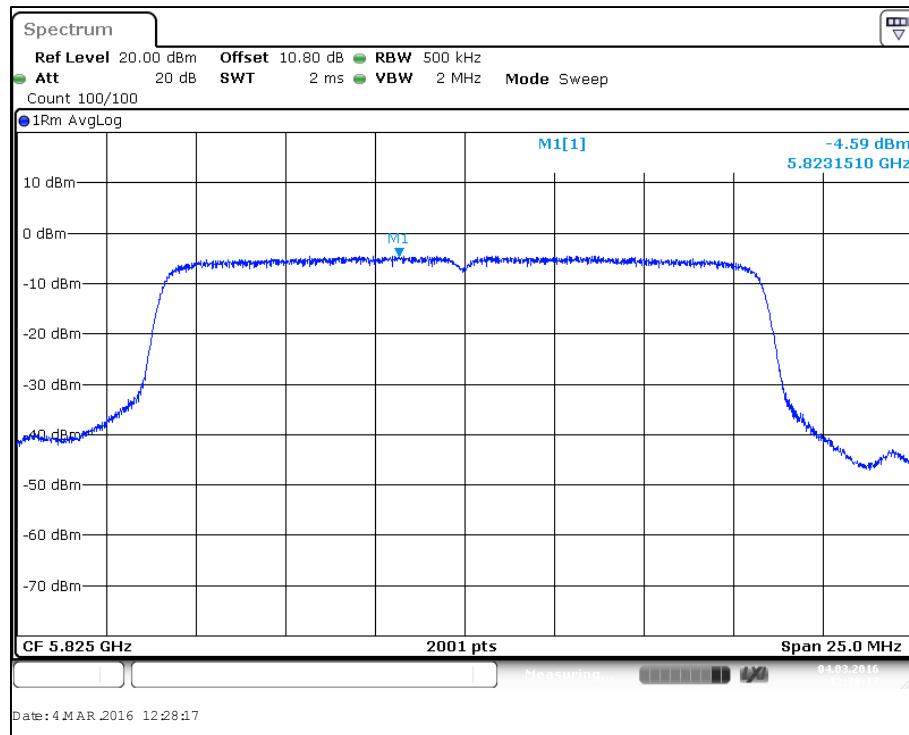
##### 802.11a: 6 Mbps



802.11a: 6 Mbps - Channel 149 (5745 MHz) Maximum PSD

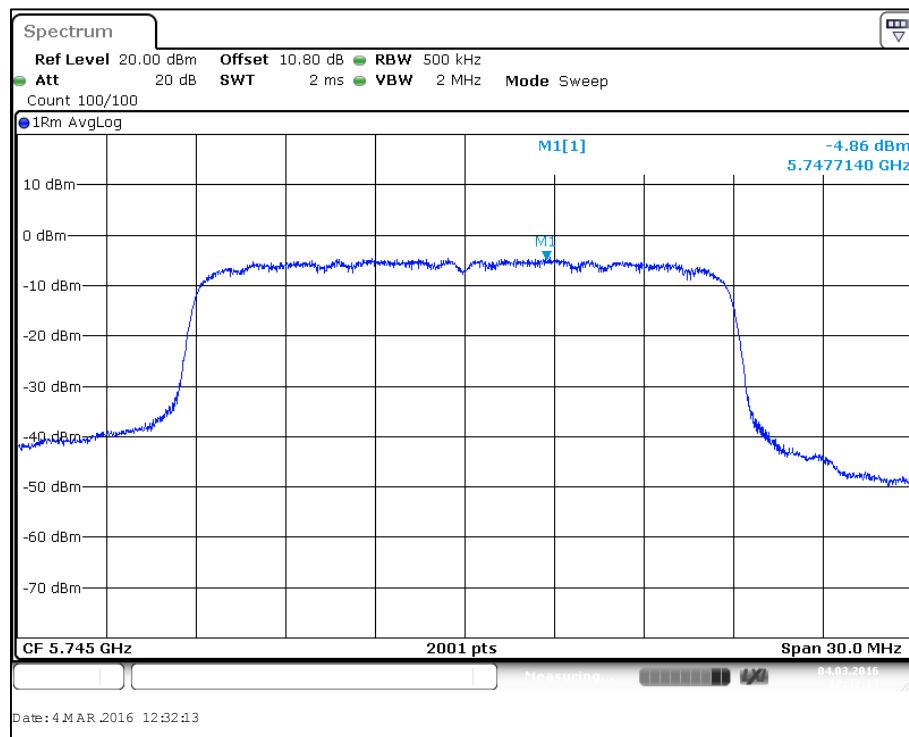


802.11a: 6 Mbps - Channel 157 (5785 MHz) Maximum PSD

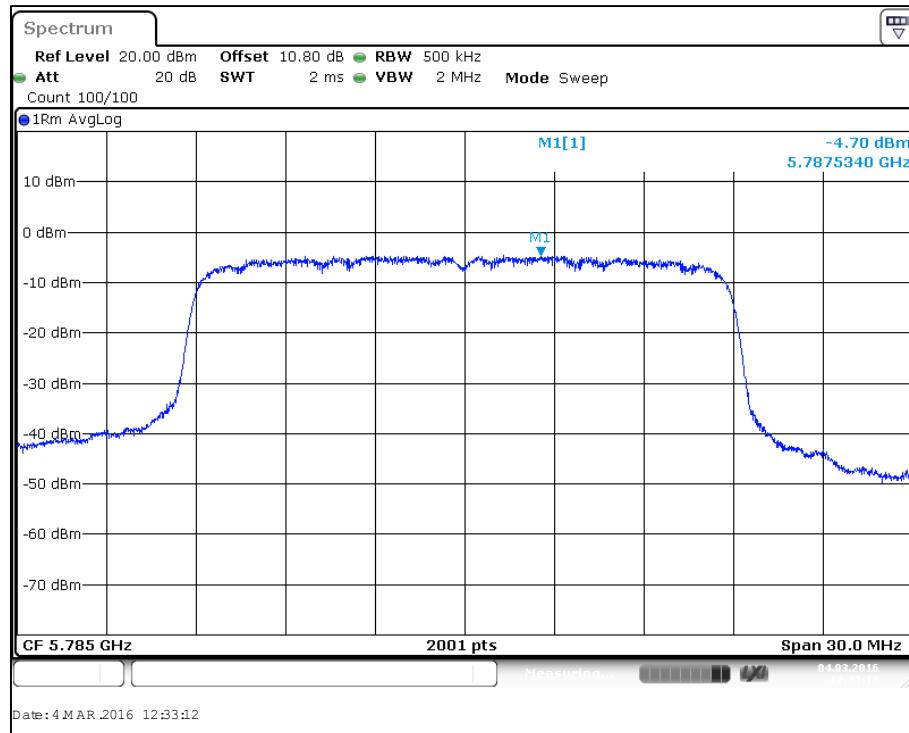


802.11a: 6 Mbps - Channel 165 (5825 MHz) Maximum PSD

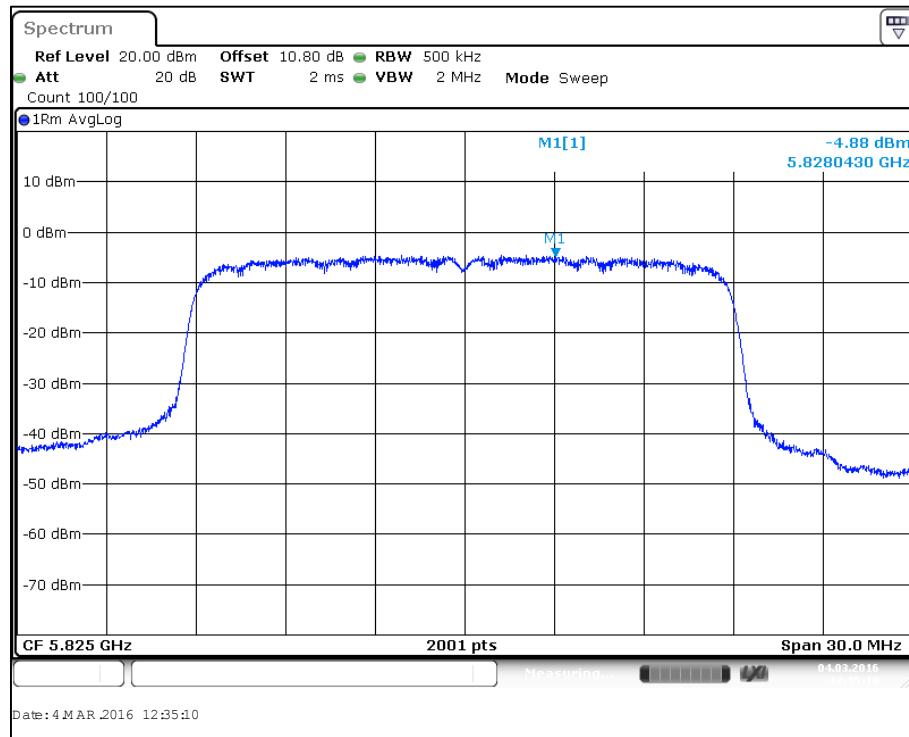
## 802.11n (HT20): MCS0/6.5 Mbps



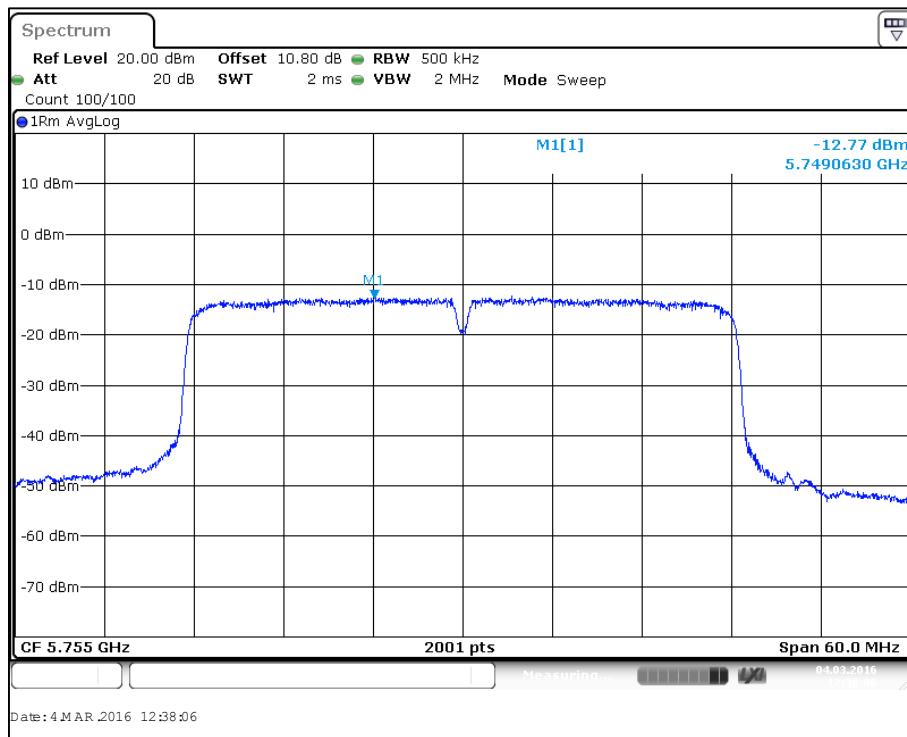
802.11n (HT20): MCS0/6.5 Mbps - Channel 149 (5745 MHz) Maximum PSD



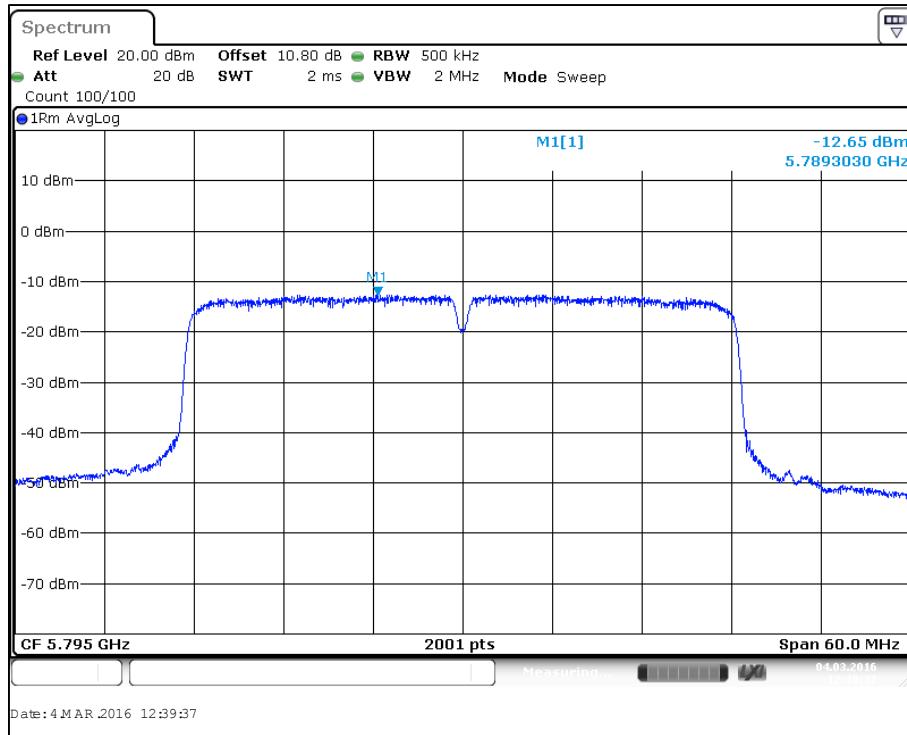
802.11n (HT20): MCS0/6.5 Mbps - Channel 157 (5785 MHz) Maximum PSD



802.11n (HT20): MCS0/6.5 Mbps - Channel 165 (5825 MHz) Maximum PSD

**802.11n (HT40): MCS0/13.5 Mbps**


802.11n (HT40): MCS0/13.5 Mbps - Channel 151 (5755 MHz) Maximum PSD



802.11n (HT40): MCS0/13.5 Mbps - Channel 159 (5795 MHz) Maximum PSD

## 6.5 Unwanted Emissions

### Limits

#### FCC Part 15 Subpart E §15.407 (b)

- (1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (4) For transmitters operating in the 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (6) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209.
- (7) The provisions of §15.205 apply to intentional radiators operating under this section.

*All field strength of emissions appearing within the restricted frequency bands as specified in §15.205 shall not exceed the limits shown in the following table (§15.209 Radiated Emission limits)*

| Frequency (MHz) | Field strength (microvolts/meter) | Measurement distance (meters) |
|-----------------|-----------------------------------|-------------------------------|
| 30-88           | 100                               | 3                             |
| 88-216          | 150                               | 3                             |
| 216-960         | 200                               | 3                             |
| Above 960       | 500                               | 3                             |

§15.209 Radiated Emission limits

#### IC RSS-247 Issue 1 §6.2

6.2.1 (2) - For transmitters operating in the band 5150-5250 MHz, all emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p. However, any unwanted emissions that fall into the band 5250-5350 MHz must be 26 dBc, when measured using a resolution bandwidth between 1 and 5% of the occupied bandwidth, above 5.25 GHz.

6.2.4 (2) - For the band 5725-5850 MHz, emissions at frequencies from the band edges to 10 MHz above or below the band edges shall not exceed -17 dBm/MHz e.i.r.p.

For emissions at frequencies more than 10 MHz above or below the band edges, the emissions power shall not exceed -27 dBm/MHz.

### Test Procedure used

- KDB 789033 D02 v01r02 Section II.G.1 and ANSI C63.10-2013 Section 12.7.2: for unwanted emissions in restricted frequency bands
- KDB 789033 D02 v01r02 Section II.G.2 and ANSI C63.10-2013 Section 12.7.3: for unwanted emissions that fall outside of the restricted frequency bands

### Sample Calculations

#### For Radiated Band-edge Measurement

- Corrected Level  $(\text{dB}\mu\text{V}/\text{m})$  = Spectrum Analyzer (SA) Reading  $(\text{dB}\mu\text{V}/\text{m})$  + Duty Cycle Factor  $(\text{dB})$
- Spectrum Analyzer (SA) Reading  $(\text{dB}\mu\text{V}/\text{m})$  = Amplitude (Raw)  $(\text{dB}\mu\text{V}/\text{m})$  + Transducer Factor  $(\text{dB}/\text{m})$  + Offset  $(\text{dB})$
- Transducer Factor  $(\text{dB}/\text{m})$  = Antenna Factor  $(\text{dB}/\text{m})$  + Cable Loss  $(\text{dB})$  – Pre-amplifier Gain  $(\text{dB})$
- Offset  $(\text{dB})$  = 10 dB Attenuator
- Margin  $(\text{dB})$  = Corrected Level  $(\text{dB}\mu\text{V}/\text{m})$  – Limit  $(\text{dB}\mu\text{V}/\text{m})$

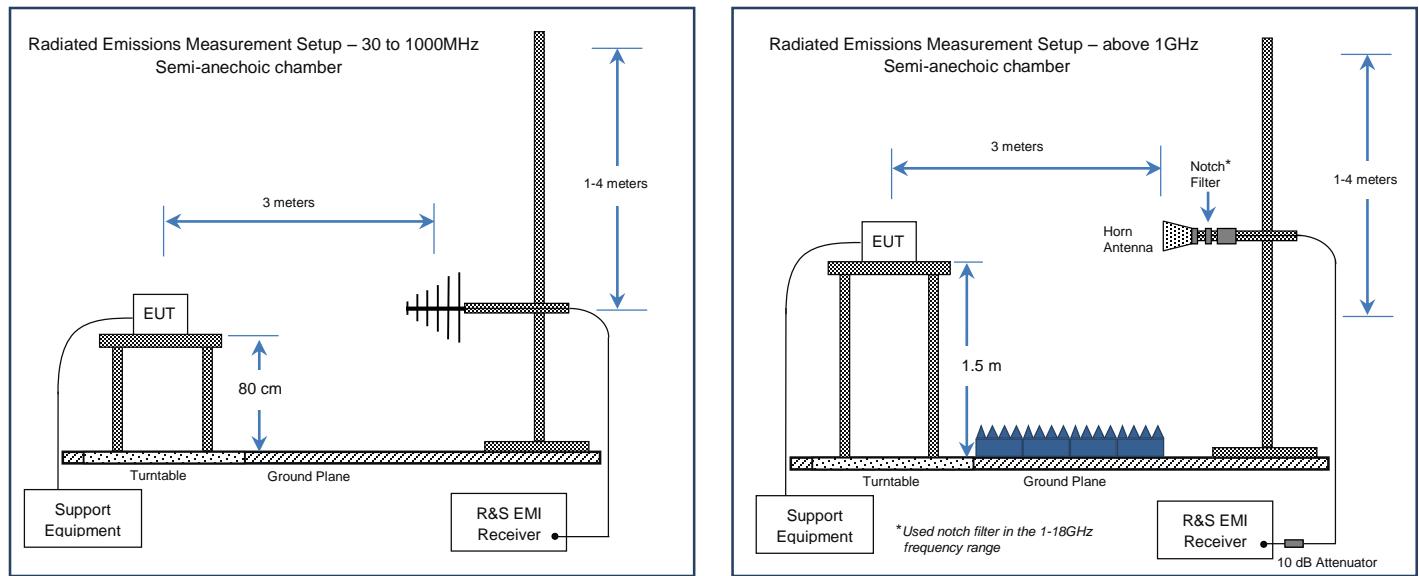
#### For Spurious Emissions Levels above 1GHz

- Corrected Level  $(\text{dB}\mu\text{V}/\text{m})$  = Spectrum Analyzer (SA) Reading  $(\text{dB}\mu\text{V}/\text{m})$  + Correction Factor  $(\text{dB})$  + Duty Cycle Factor  $(\text{dB})$
- Correction Factor  $(\text{dB})$  = Antenna Factor  $(\text{dB}/\text{m})$  + Cable Loss  $(\text{dB})$  + Filter Insertion Loss  $(\text{dB})$
- Margin  $(\text{dB})$  = Corrected Level  $(\text{dB}\mu\text{V}/\text{m})$  – Limit  $(\text{dB}\mu\text{V}/\text{m})$

#### For Spurious Emissions Levels below 1GHz

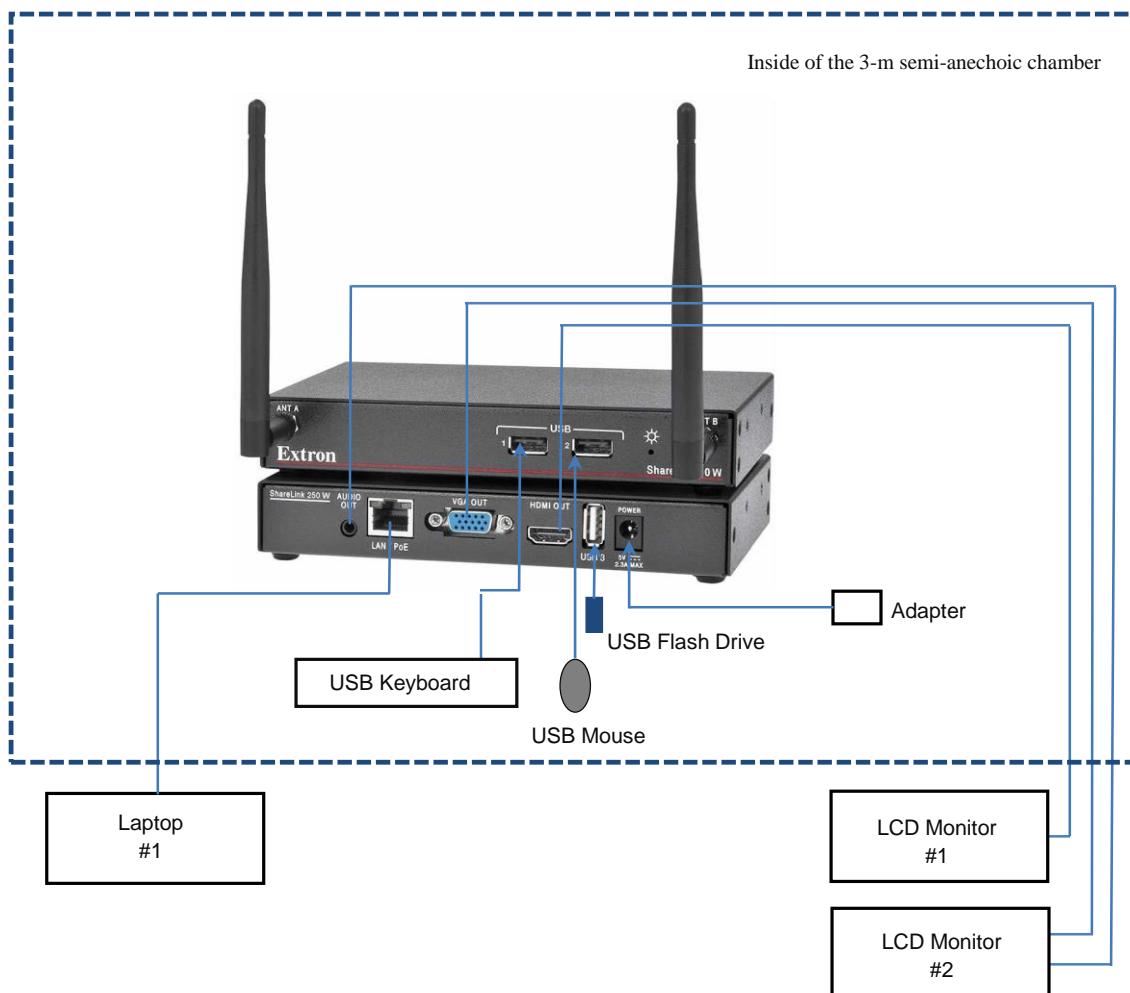
- Amplitude  $(\text{dB}\mu\text{V}/\text{m})$  = Receiver Reading  $(\text{dB}\mu\text{V}/\text{m})$  + Correction Factor  $(\text{dB})$  + Duty Cycle Factor  $(\text{dB})$
- Correction Factor  $(\text{dB})$  = Antenna Factor  $(\text{dB}/\text{m})$  + Cable Loss  $(\text{dB})$
- Margin  $(\text{dB})$  = Amplitude  $(\text{dB}\mu\text{V}/\text{m})$  – Limit  $(\text{dB}\mu\text{V}/\text{m})$

## Test Setup



EUT Connection Diagram:

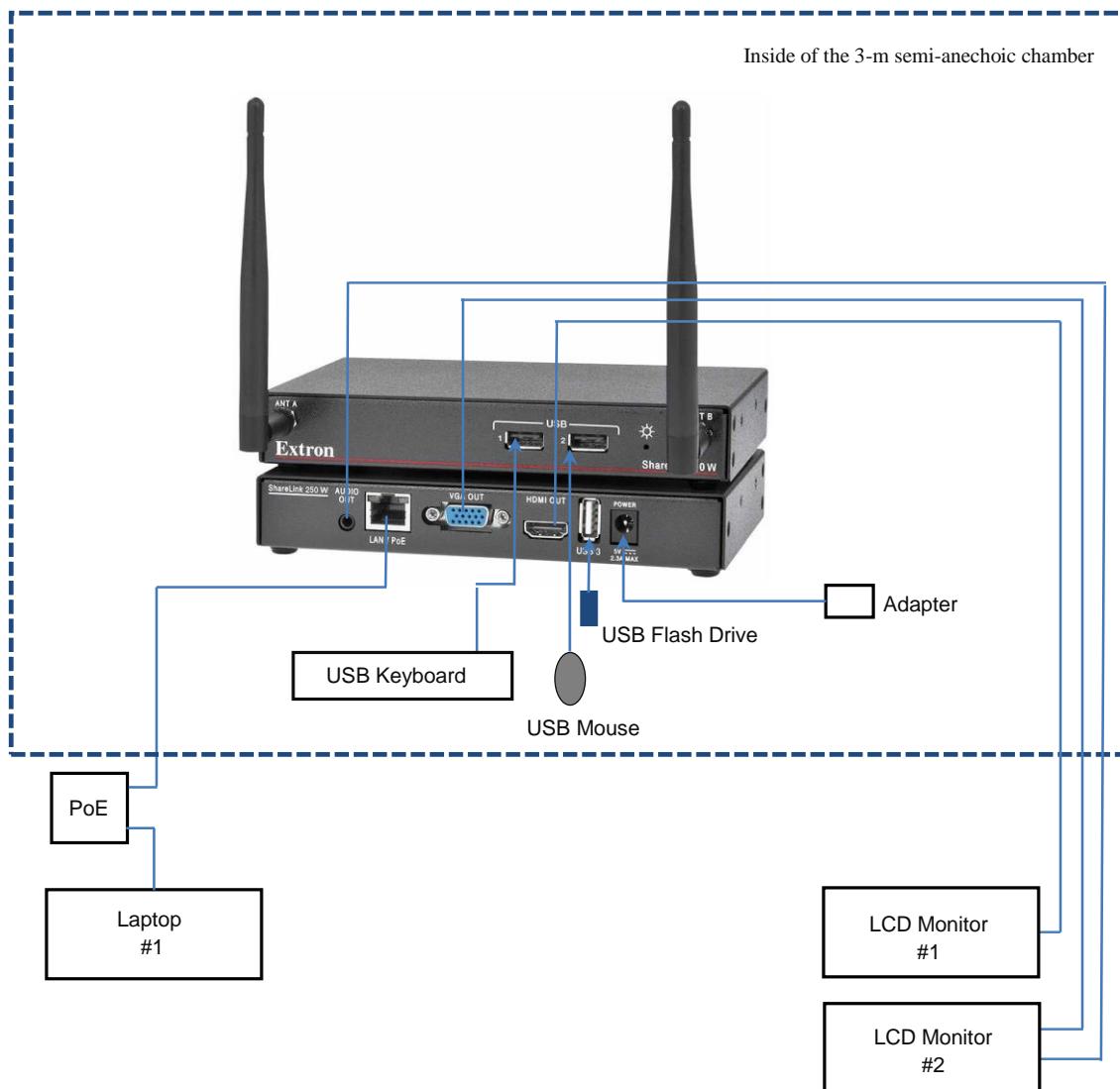
## a. Using Adapter 6A-161WP05, 5Vdc



- HDMI OUT connected to LCD monitor #1 with 25' HDMI PRO cable.
- VGA OUT connected to LCD monitor #2 with 35' VGA cable.
- Audio OUT connected to LCD monitor #2 (PC Audio IN) with 25' Audio mini cable
- USB 1 with USB keyboard
- USB 2 with USB mouse
- USB 3 with USB Flash Drive
- LAN/POE connected to Laptop #1 with 35' CAT-53 UTP cable
- Power connected to AC Adapter

Note: EUT at Full Screen Display with 1080p, 60Hz resolution; W-Fi Transmitter ON; LAN at 1GB Connection

## b. Using PoE XTP PI 100, +48Vdc



- HDMI OUT connected to LCD monitor #1 with 25' HDMI PRO cable.
- VGA OUT connected to LCD monitor #2 with 35' VGA cable.
- Audio OUT connected to LCD monitor #2 (PC Audio IN) with 25' Audio mini cable
- USB 1 with USB keyboard
- USB 2 with USB mouse
- USB 3 with USB Flash Drive
- LAN/POE connected to PoE Power Supply with 35' CAT-5e UTP cable
- PoE Power Supply connected to Laptop #1 with 10' CAT-5e UTP cable

Note: EUT at Full Screen Display with 1080p, 60Hz resolution; W-Fi Transmitter ON; LAN at 1GB Connection

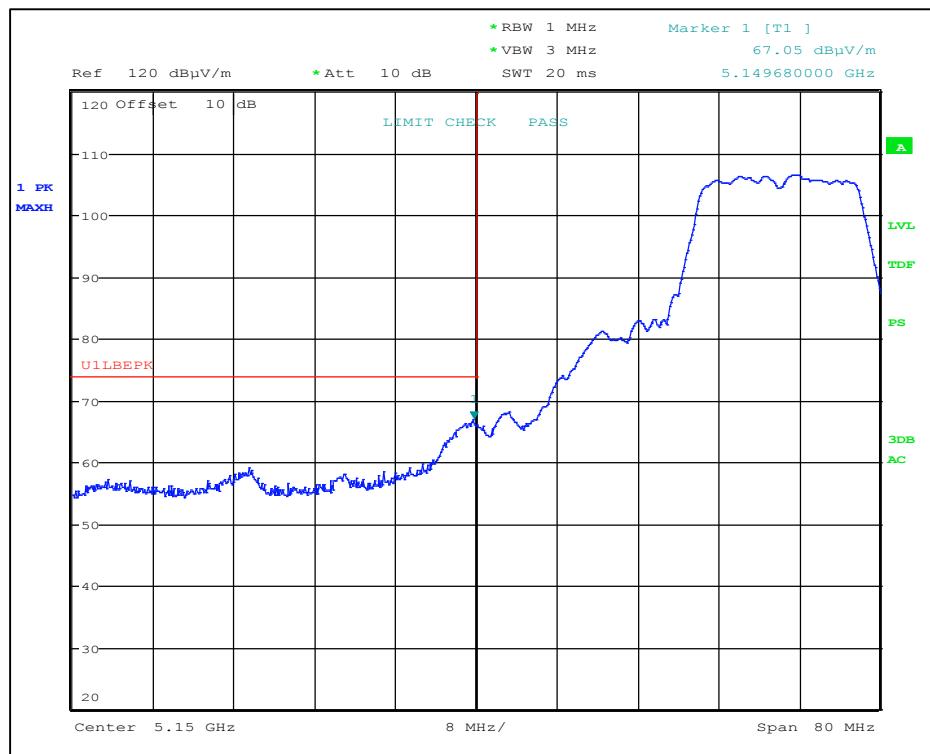
## Test Results

### 6.5.1 Radiated Restricted-band band-edge at 5150 MHz (802.11a, 6Mbps)

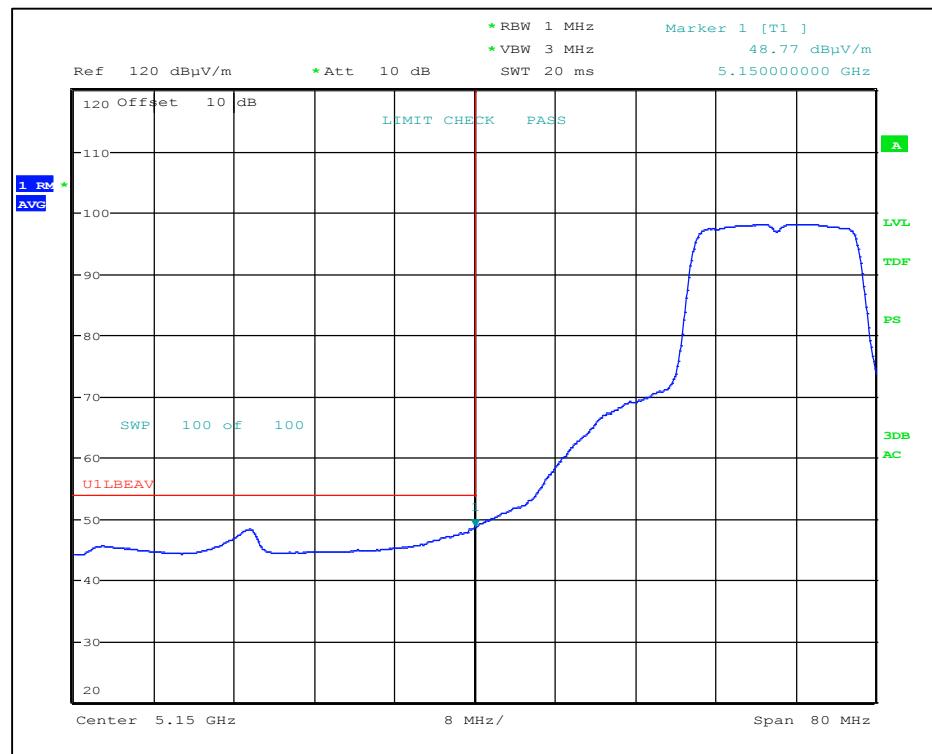
802.11a: 6Mbps, Channel 36 (5180 MHz)

| Frequency<br>(MHz) | SA<br>Reading<br>(dBuV/m) | Detector<br>PK/AV | Antenna        |                   | Turntable | EUT<br>Antenna<br>Polarity<br>(V/H1/H2) | DC<br>Factor<br>(dB) | Transducer<br>Factor<br>(dB) | Corrected<br>Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) |
|--------------------|---------------------------|-------------------|----------------|-------------------|-----------|---|----------------------|------------------------------|--------------------------------|-------------------|----------------|
|                    |                           |                   | Height<br>(cm) | Polarity<br>(V/H) |           |   |                      |                              |                                |                   |                |
| 5149.7             | 67.1                      | PK                | 170            | V                 | 200       | V                                       | 0.00                 | 3.9                          | 67.1                           | 74.0              | -6.9           |
| 5150.0             | 48.8                      | AV                | 170            | V                 | 200       | V                                       | 0.00                 | 3.9                          | 48.8                           | 54.0              | -5.2           |
| 5149.9             | 60.6                      | PK                | 150            | H                 | 295       | H1                                      | 0.00                 | 3.9                          | 60.6                           | 74.0              | -13.4          |
| 5150.0             | 47.0                      | AV                | 150            | H                 | 295       | H1                                      | 0.00                 | 3.9                          | 47.0                           | 54.0              | -7.0           |

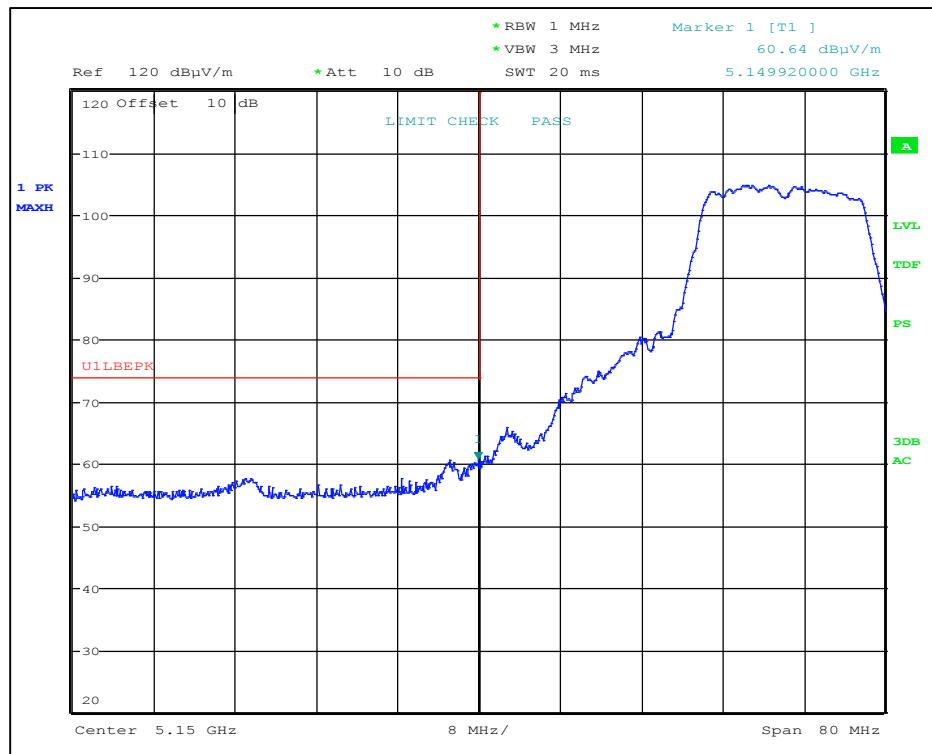
Refer to the following Plots



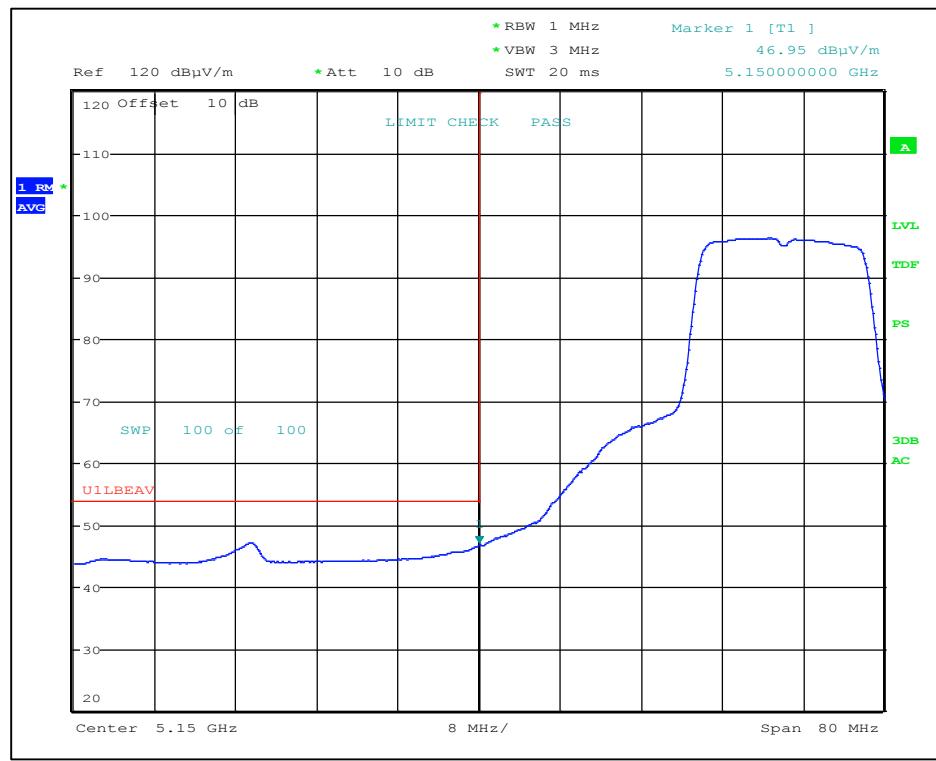
802.11a: 6Mbps, Channel 36 – Restricted-band band-edge, Vertical Peak Plot



802.11a: 6Mbps, Channel - Restricted-band band-edge, Vertical Average Plot



802.11a: 6Mbps, Channel 36 - Restricted-band band-edge, Horizontal Peak Plot



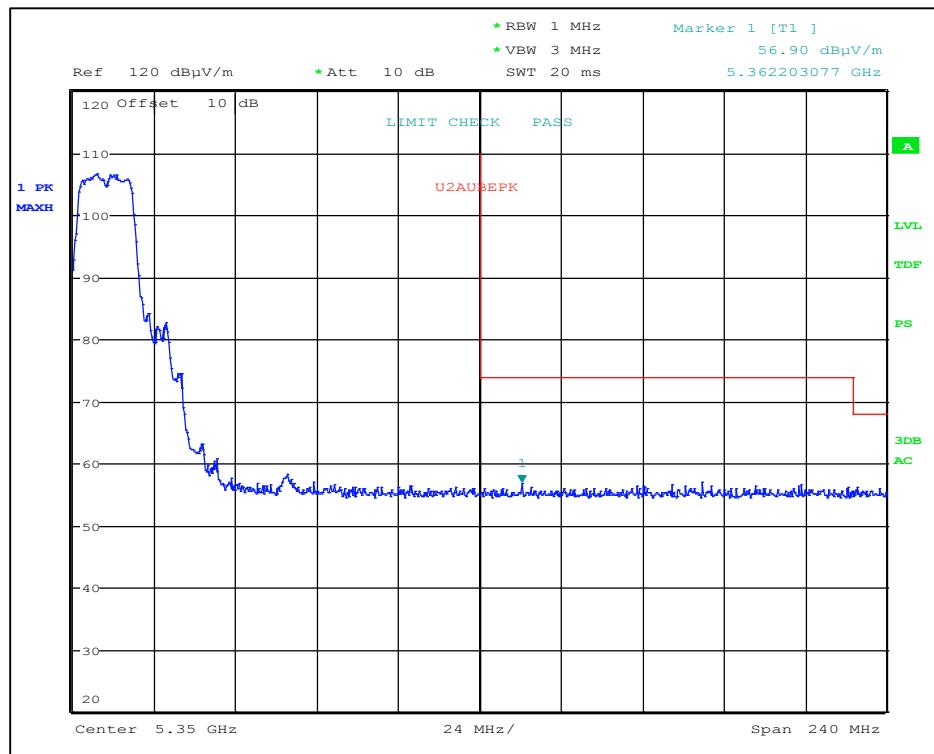
802.11a: 6Mbps, Channel 36 - Restricted-band band-edge, Horizontal Average Plot

### 6.5.2 Radiated Restricted-band band-edge at 5350 MHz (802.11a, 6Mbps)

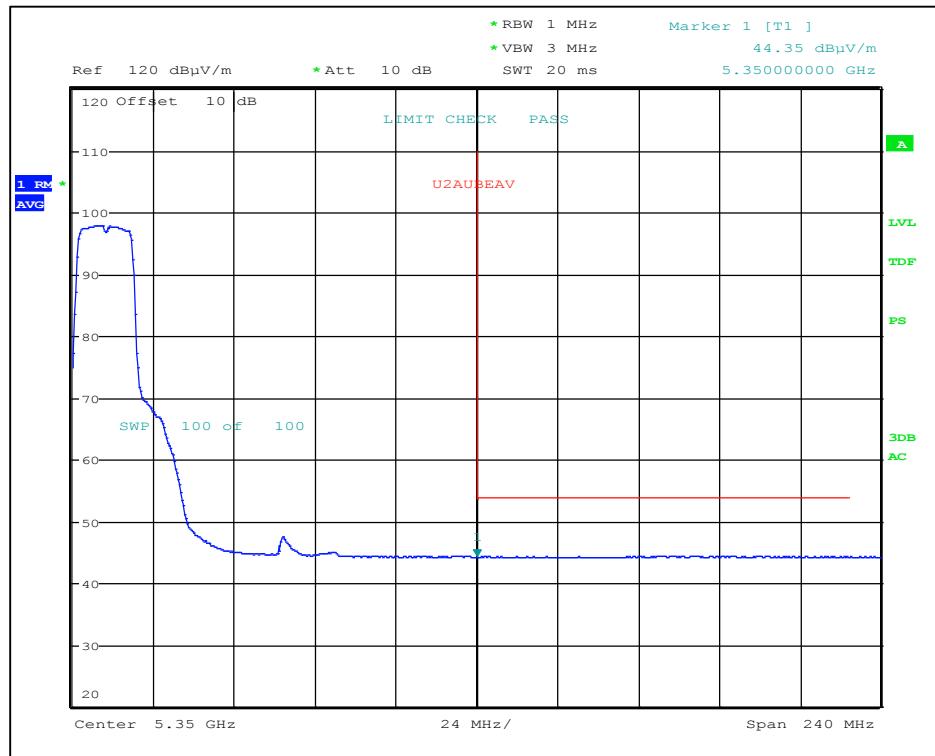
802.11a: 6 Mbps, Channel 48 (5240 MHz)

| Frequency<br>(MHz) | SA<br>Reading<br>(dB $\mu$ V/m) | Detector<br>PK/AV | Antenna        |                   | Turntable<br>Azimuth<br>(Deg) | EUT<br>Antenna<br>Polarity<br>(V/H1/H2) | DC<br>Factor<br>(dB) | Transducer<br>Factor<br>(dB) | Corrected<br>Level<br>(dB $\mu$ V/m) | Limit<br>(dB $\mu$ V/m) | Margin<br>(dB) |
|--------------------|---------------------------------|-------------------|----------------|-------------------|-------------------------------|---|----------------------|------------------------------|--------------------------------------|-------------------------|----------------|
|                    |                                 |                   | Height<br>(cm) | Polarity<br>(V/H) |                               |   |                      |                              |                                      |                         |                |
| 5362.2             | 56.9                            | PK                | 170            | V                 | 200                           | V                                       | 0.00                 | 3.5                          | 56.9                                 | 74.0                    | -17.1          |
| 5350.0             | 44.4                            | AV                | 170            | V                 | 200                           | V                                       | 0.00                 | 3.5                          | 44.4                                 | 54.0                    | -9.6           |
| 5404.5             | 56.3                            | PK                | 150            | H                 | 295                           | H1                                      | 0.00                 | 3.4                          | 56.3                                 | 74.0                    | -17.7          |
| 5350.0             | 44.1                            | AV                | 150            | H                 | 295                           | H1                                      | 0.00                 | 3.4                          | 44.1                                 | 54.0                    | -9.9           |

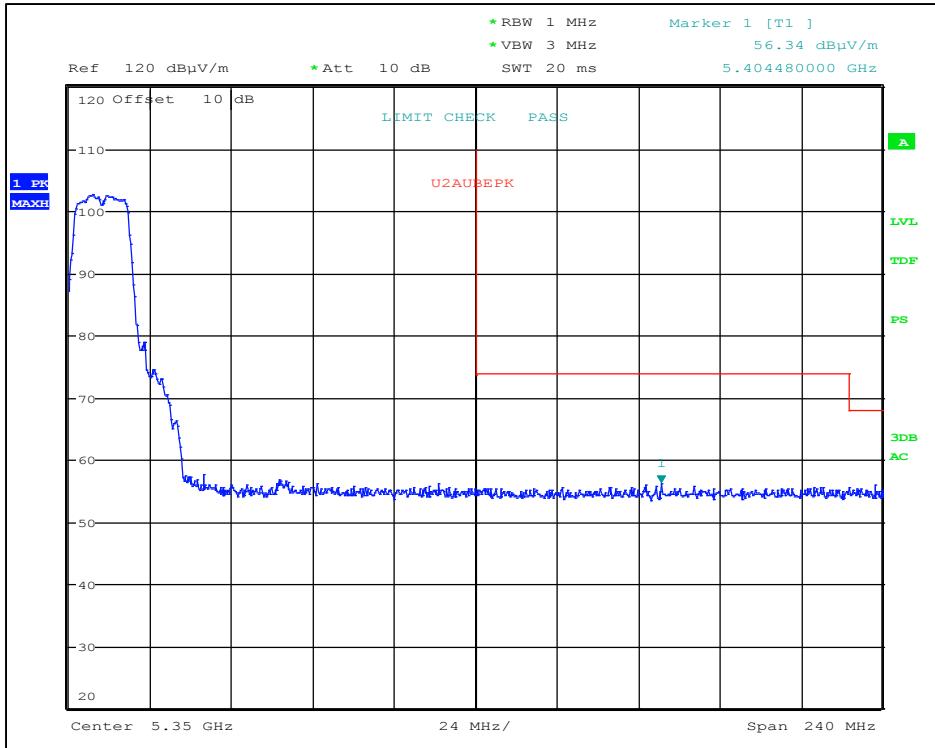
Refer to the following Plots



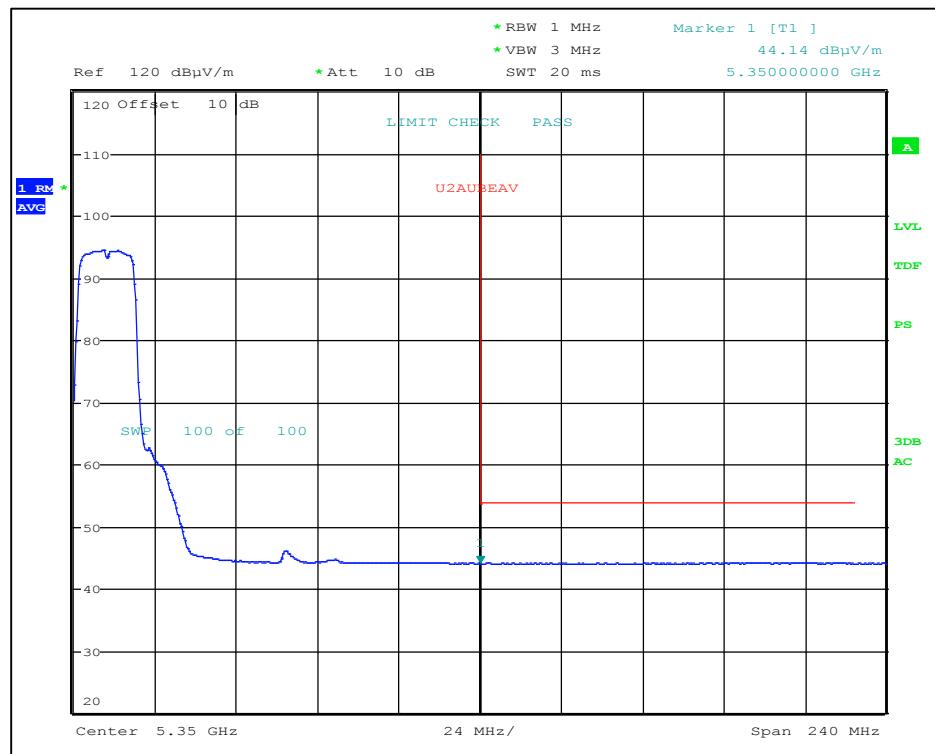
802.11a at 6Mbps, Channel 48 - Restricted-band band-edge, Vertical Peak Plot



802.11a at 6Mbps, Channel 48 - Restricted-band band-edge, Vertical Average Plot



802.11a at 6Mbps, Channel 48 - Restricted-band band-edge, Horizontal Peak Plot



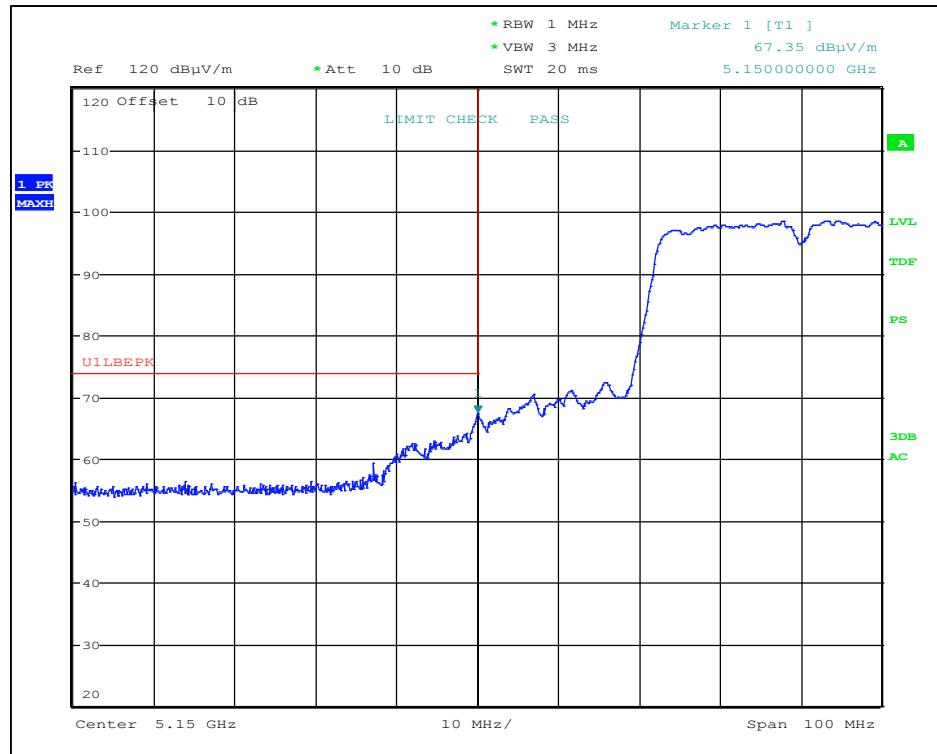
802.11a at 6Mbps, Channel 48 - Restricted-band band-edge, Horizontal Average Plot

### 6.5.3 Radiated Restricted-band band-edge at 5150 MHz [802.11n (HT20), MCS0/6.5 Mbps]

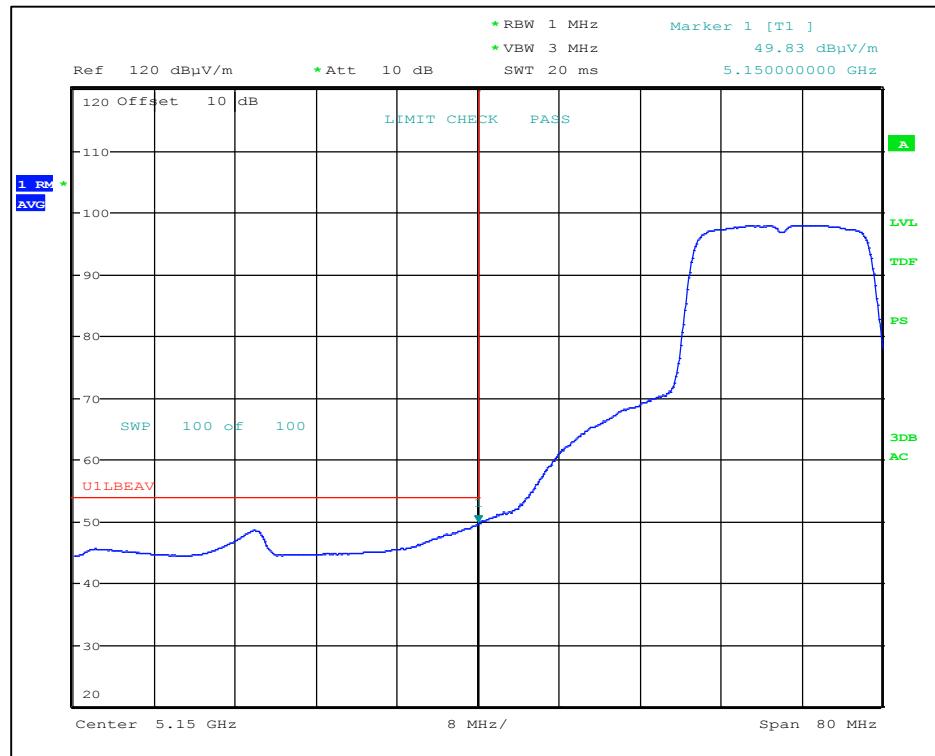
802.11n (HT20): MCS0/6.5 Mbps, Channel 36 (5180 MHz)

| Frequency (MHz) | SA Reading (dB $\mu$ V/m) | Detector PK/AV | Antenna     |                | Turntable | EUT Antenna Polarity (V/H1/H2) | DC Factor (dB) | Transducer Factor (dB) | Corrected Level (dB $\mu$ V/m) | Limit (dB $\mu$ V/m) | Margin (dB) |
|-----------------|---------------------------|----------------|-------------|----------------|-----------|--------------------------------|----------------|------------------------|--------------------------------|----------------------|-------------|
|                 |                           |                | Height (cm) | Polarity (V/H) |           |                                |                |                        |                                |                      |             |
| 5150.0          | 67.4                      | PK             | 170         | V              | 200       | V                              | 0.00           | 3.9                    | 67.4                           | 74.0                 | -6.6        |
| 5150.0          | 49.8                      | AV             | 170         | V              | 200       | V                              | 0.00           | 3.9                    | 49.8                           | 54.0                 | -4.2        |
| 5149.9          | 63.1                      | PK             | 150         | H              | 295       | H1                             | 0.00           | 3.9                    | 63.1                           | 74.0                 | -10.9       |
| 5150.0          | 46.9                      | AV             | 150         | H              | 295       | H1                             | 0.00           | 3.9                    | 46.9                           | 54.0                 | -7.1        |

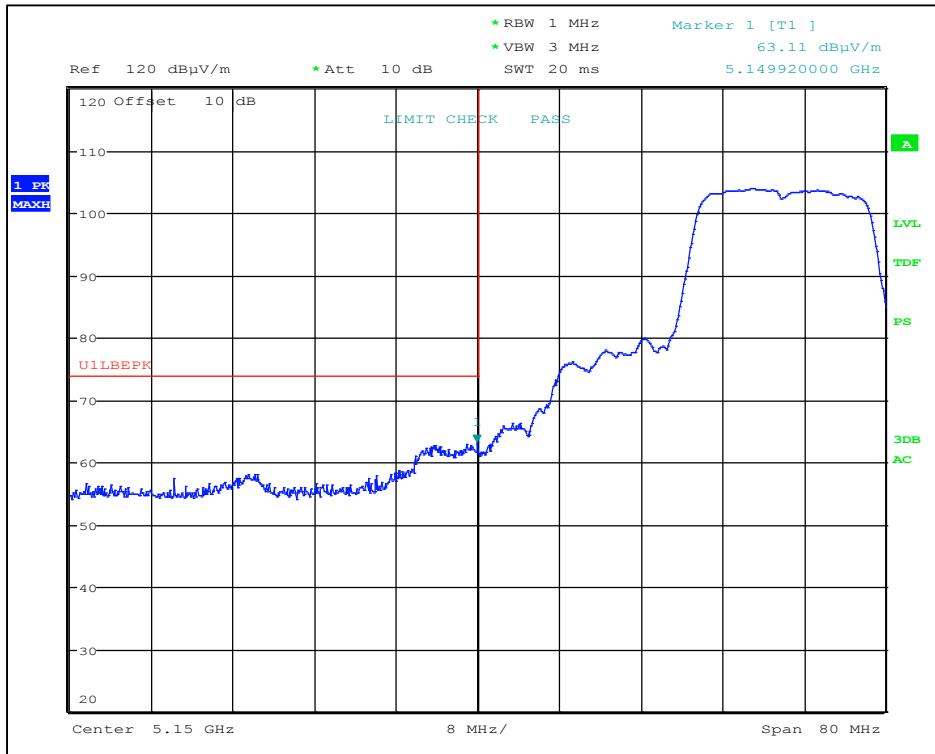
Refer to the following Plots



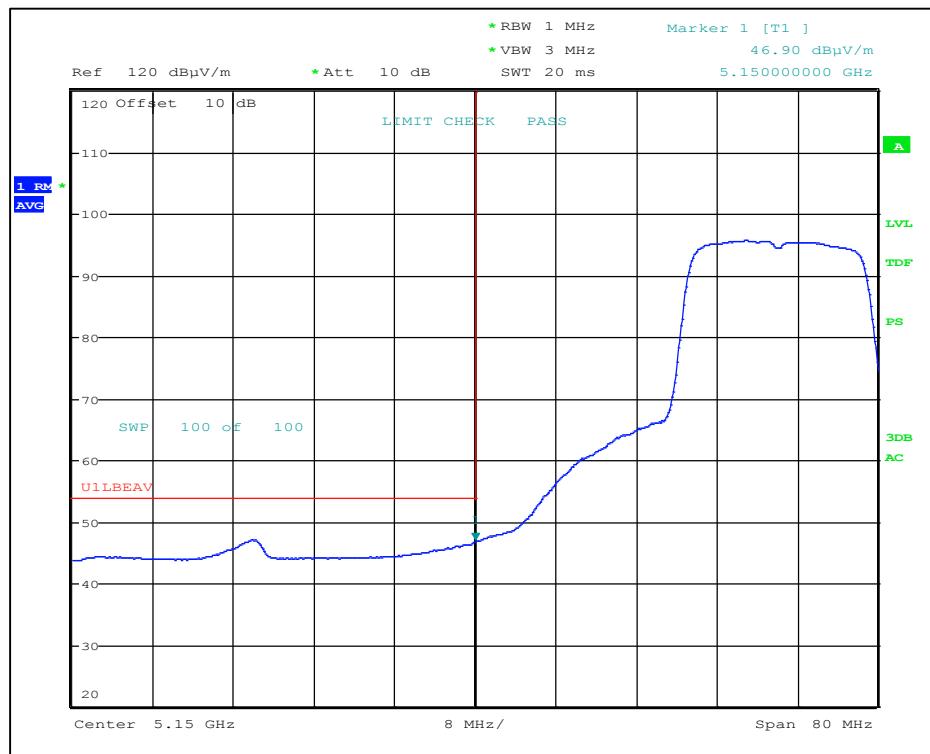
802.11n (HT20): MCS0/6.5 Mbps, Channel 36 - Restricted-band band-edge, Vertical Peak Plot



802.11n (HT20): MCS0/6.5 Mbps, Channel 36 - Restricted-band band-edge, Vertical Average Plot



802.11n (HT20): MCS0/6.5 Mbps, Channel 36 - Restricted-band band-edge, Horizontal Peak Plot



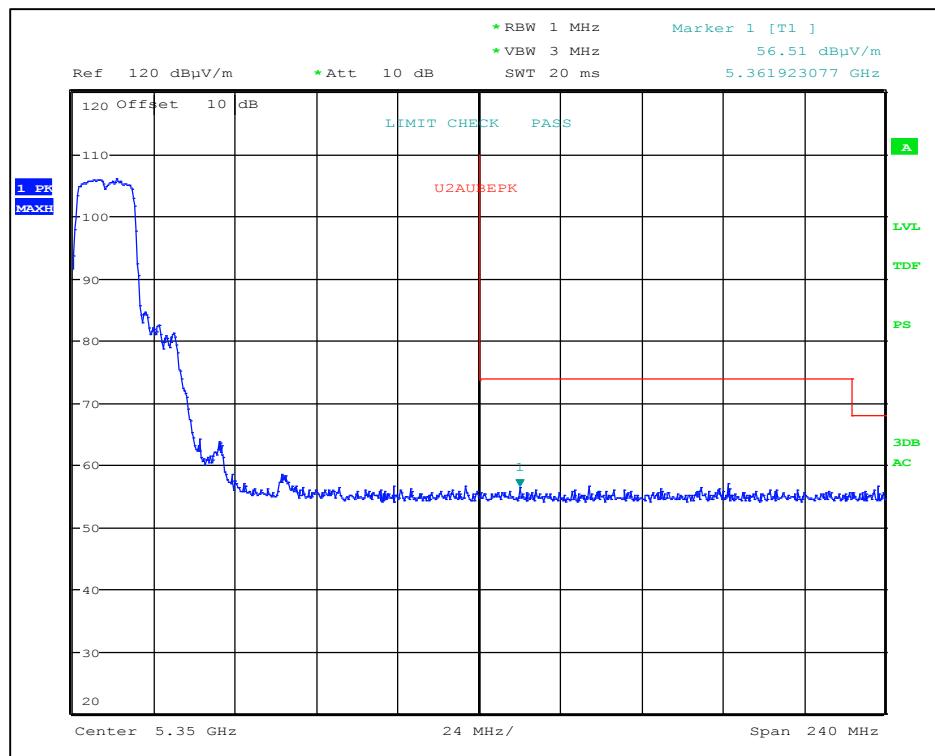
802.11n (HT20): MCS0/6.5 Mbps, Channel 36 - Restricted-band band-edge, Horizontal Average Plot

#### 6.5.4 Radiated Restricted-band band-edge at 5350 MHz [802.11n (HT20), MCS0/6.5 Mbps]

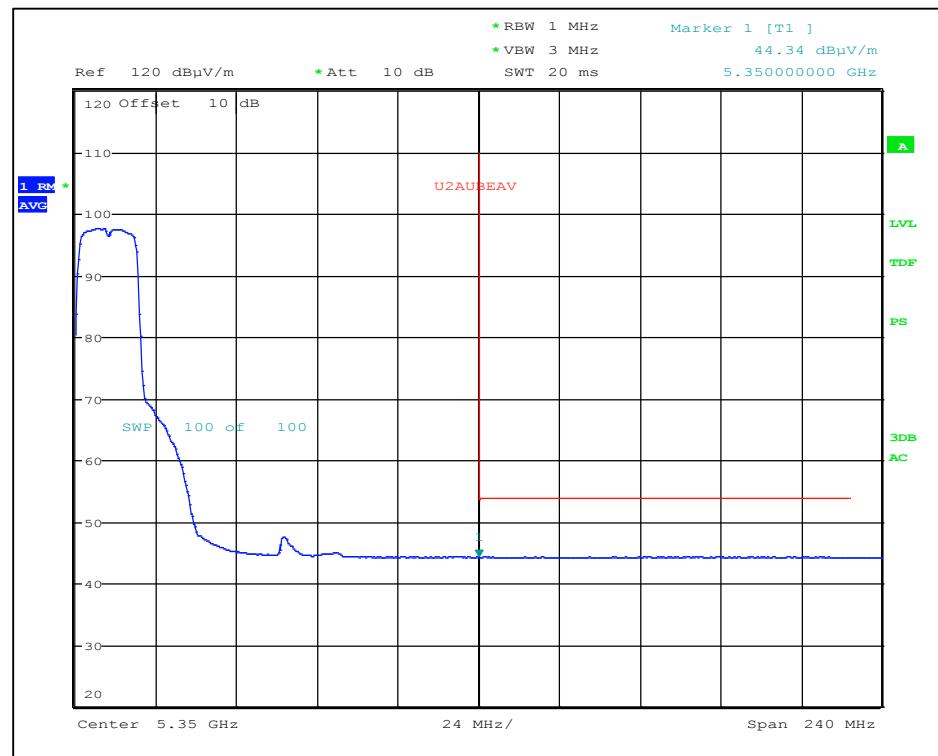
802.11n (HT20): MCS0/6.5 Mbps, Channel 48 (5240 MHz)

| Frequency (MHz) | SA Reading (dB $\mu$ V/m) | Detector PK/AV | Antenna     |                | Turntable | EUT Antenna Polarity (V/H1/H2) | DC Factor (dB) | Transducer Factor (dB) | Corrected Level (dB $\mu$ V/m) | Limit (dB $\mu$ V/m) | Margin (dB) |
|-----------------|---------------------------|----------------|-------------|----------------|-----------|--------------------------------|----------------|------------------------|--------------------------------|----------------------|-------------|
|                 |                           |                | Height (cm) | Polarity (V/H) |           |                                |                |                        |                                |                      |             |
| 5361.9          | 56.5                      | PK             | 170         | V              | 200       | V                              | 0.00           | 3.5                    | 56.5                           | 74.0                 | -17.5       |
| 5350.0          | 44.3                      | AV             | 170         | V              | 200       | V                              | 0.00           | 3.5                    | 44.3                           | 54.0                 | -9.7        |
| 5367.9          | 55.8                      | PK             | 150         | H              | 295       | H1                             | 0.00           | 3.4                    | 55.8                           | 74.0                 | -18.2       |
| 5350.0          | 44.1                      | AV             | 150         | H              | 295       | H1                             | 0.00           | 3.4                    | 44.1                           | 54.0                 | -9.9        |

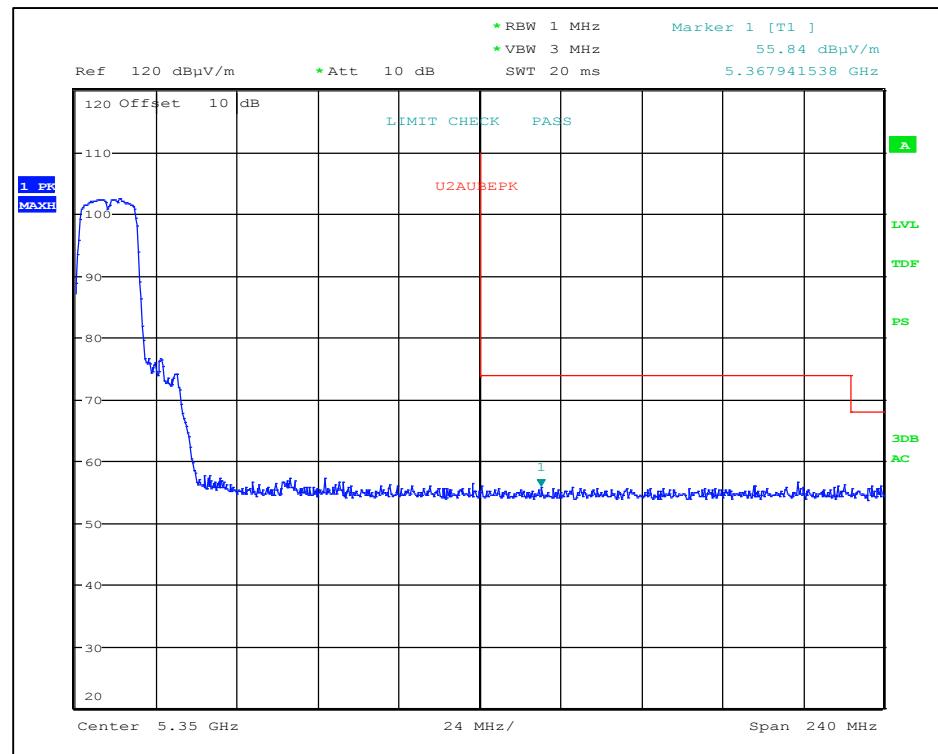
Refer to the following Plots



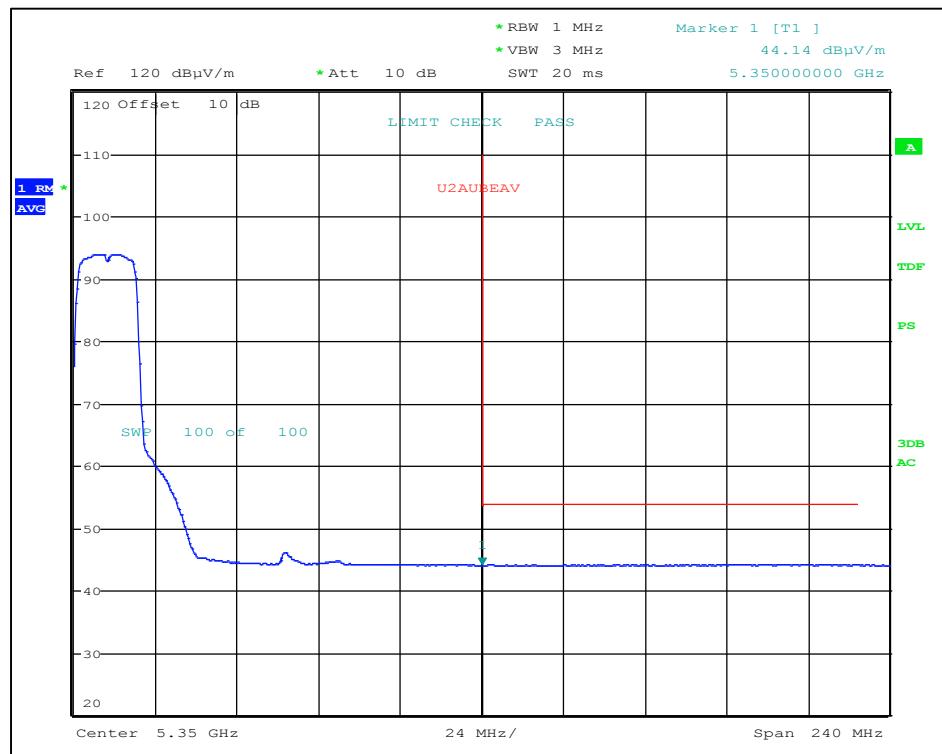
802.11n (HT20) at MCS0/6.5 Mbps, Channel 48 - Restricted-band band-edge, Vertical Peak Plot



802.11n (HT20) at MCS0/6.5 Mbps, Channel 48 - Restricted-band band-edge, Vertical Average Plot



802.11n (HT20) at MCS0/6.5 Mbps, Channel 48 - Restricted-band band-edge, Horizontal Peak Plot



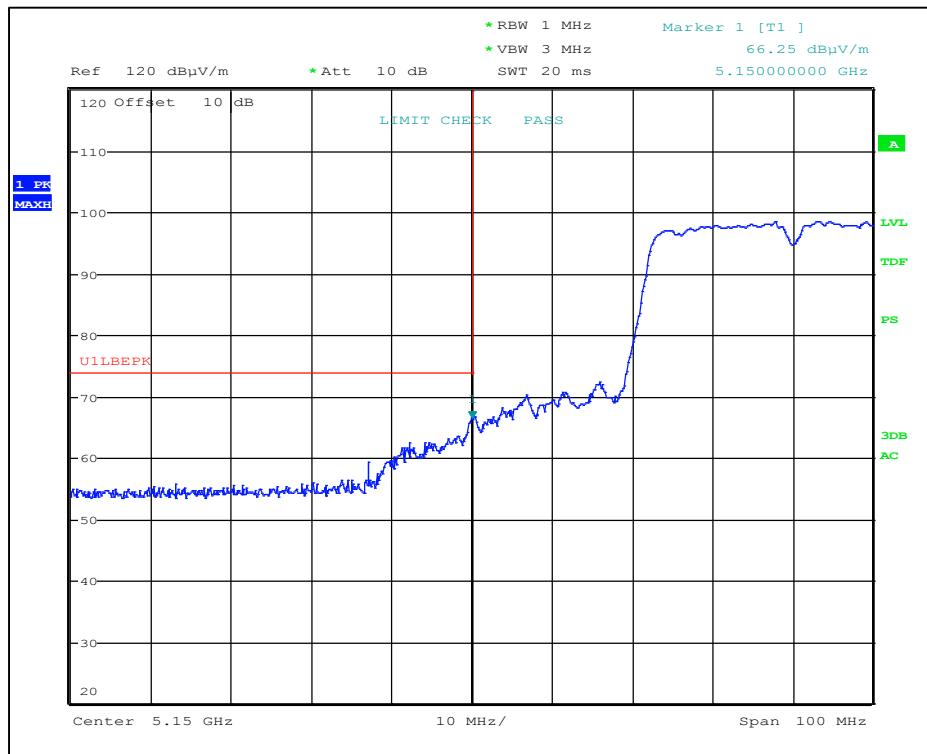
802.11n (HT20) at MCS0/6.5 Mbps, Channel 48 - Restricted-band band-edge, Horizontal Average Plot

### 6.5.5 Radiated Restricted-band band-edge at 5150 MHz [802.11n (HT40), MCS0/13.5 Mbps]

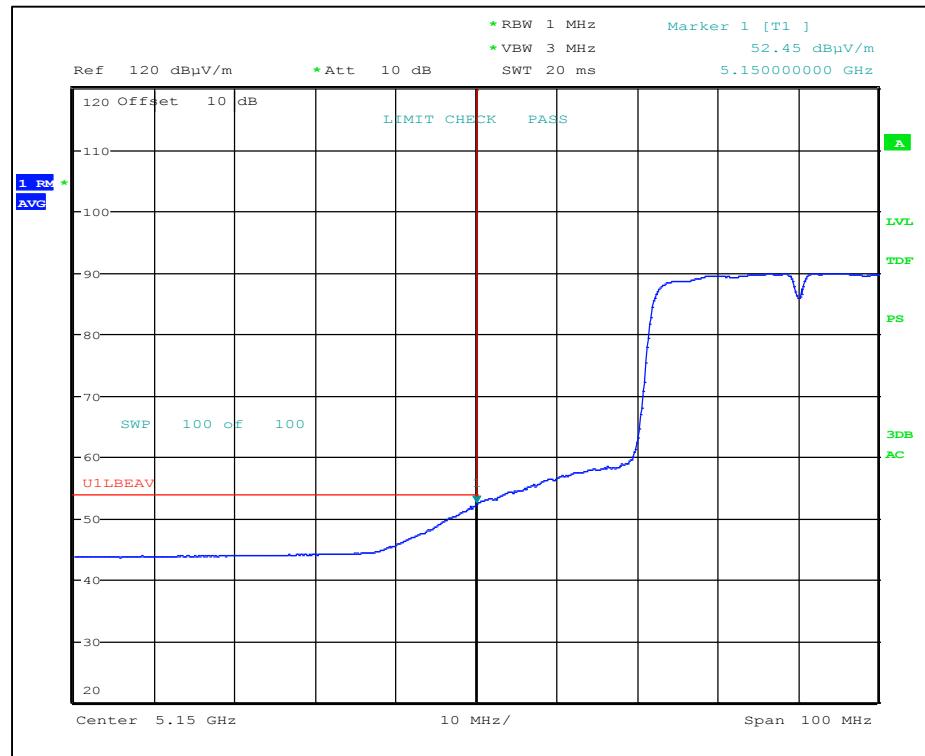
802.11n (HT40): MCS0/13.5 Mbps, Channel 38 (5190 MHz)

| Frequency<br>(MHz) | SA<br>Reading<br>(dB $\mu$ V/m) | Detector<br>PK/AV | Antenna        |                   | Turntable | EUT<br>Antenna<br>Polarity<br>(V/H1/H2) | DC<br>Factor<br>(dB) | Transducer<br>Factor<br>(dB) | Corrected<br>Level<br>(dB $\mu$ V/m) | Limit<br>(dB $\mu$ V/m) | Margin<br>(dB) |
|--------------------|---------------------------------|-------------------|----------------|-------------------|-----------|---|----------------------|------------------------------|--------------------------------------|-------------------------|----------------|
|                    |                                 |                   | Height<br>(cm) | Polarity<br>(V/H) |           |   |                      |                              |                                      |                         |                |
| 5150.0             | 66.3                            | PK                | 170            | V                 | 200       | V                                       | 0.00                 | 3.9                          | 66.3                                 | 74.0                    | -7.7           |
| 5150.0             | 52.5                            | AV                | 170            | V                 | 200       | V                                       | 0.00                 | 3.9                          | 52.5                                 | 54.0                    | -1.5           |
| 5150.0             | 63.4                            | PK                | 150            | H                 | 295       | H1                                      | 0.00                 | 3.9                          | 63.4                                 | 74.0                    | -10.6          |
| 5150.0             | 49.6                            | AV                | 150            | H                 | 295       | H1                                      | 0.00                 | 3.9                          | 49.6                                 | 54.0                    | -4.4           |

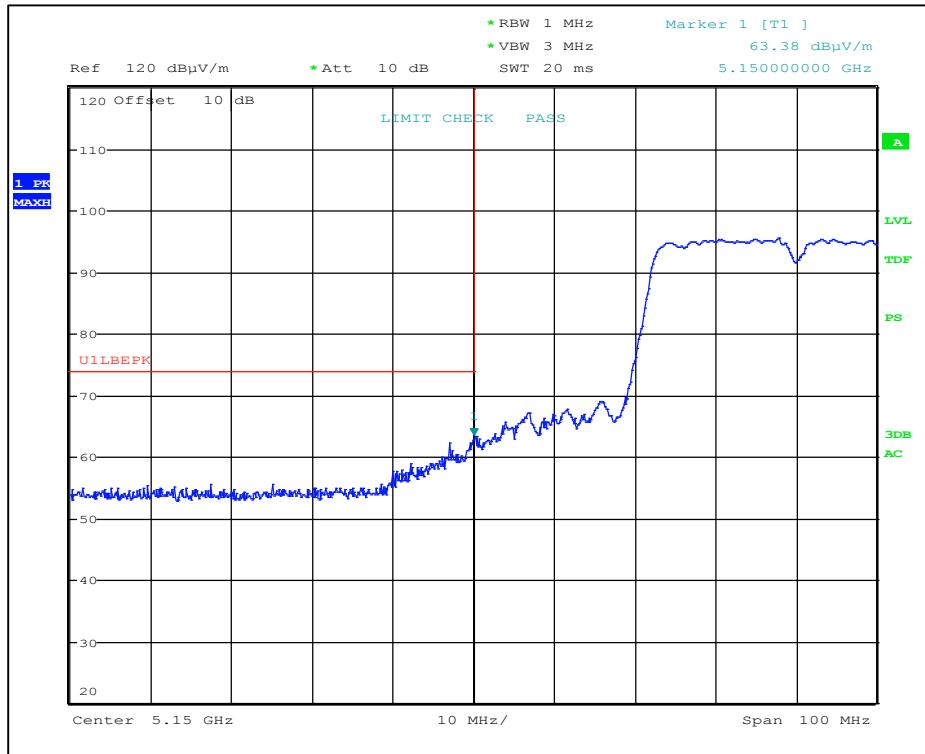
Refer to the following Plots



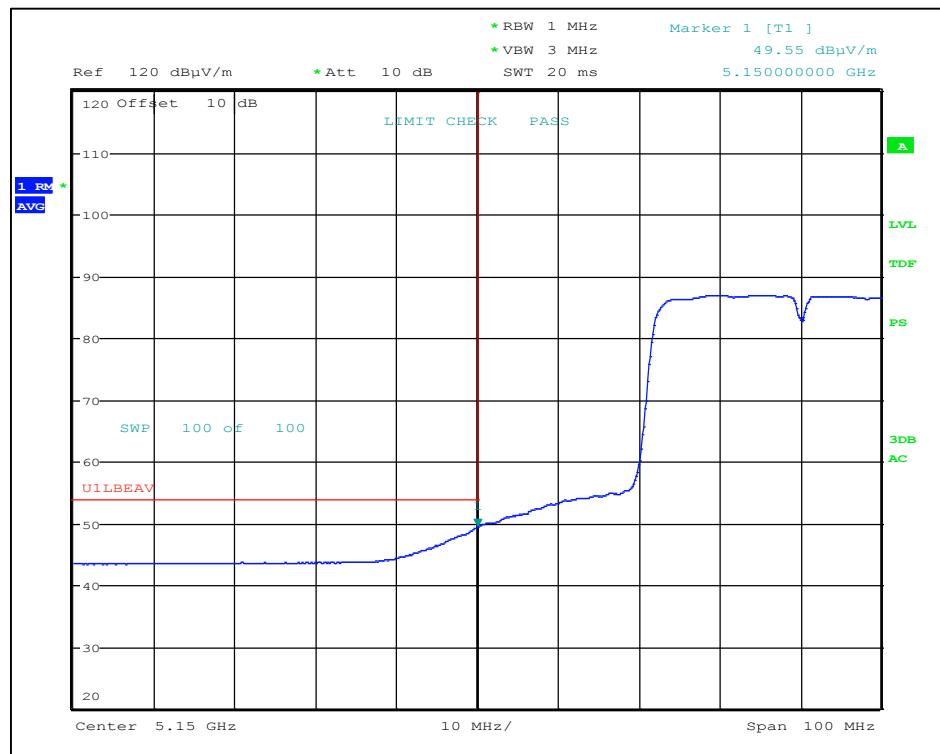
802.11n (HT40): MCS0/13.5 Mbps, Channel 38 - Restricted-band band-edge, Vertical Peak Plot



802.11n (HT40): MCS0/13.5 Mbps, Channel 38 - Restricted-band band-edge, Vertical Average Plot



802.11n (HT40): MCS0/13.5 Mbps, Channel 38 - Restricted-band band-edge, Horizontal Peak Plot



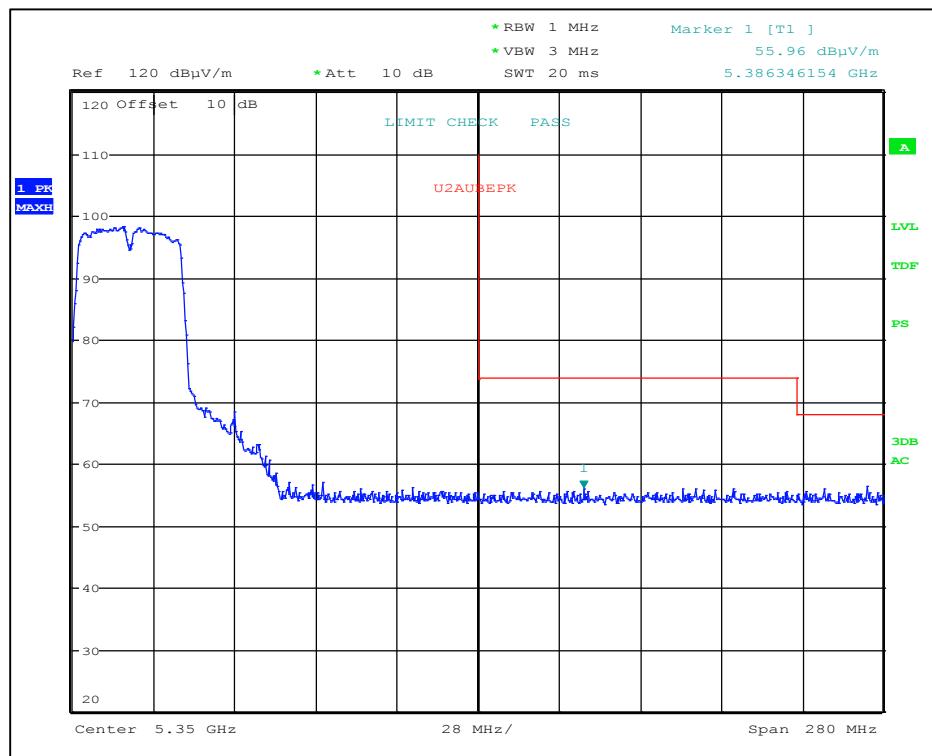
802.11n (HT40): MCS0/13.5 Mbps, Channel 38 - Restricted-band band-edge, Horizontal Average Plot

### 6.5.6 Radiated Restricted-band band-edge at 5350 MHz [802.11n (HT40), MCS0/13.5 Mbps]

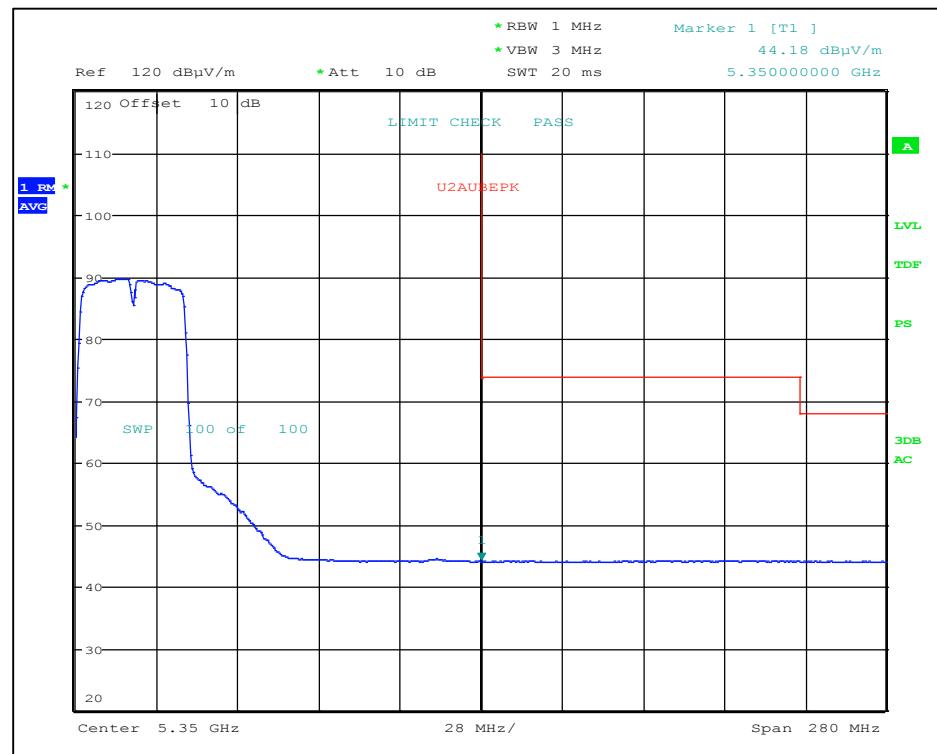
802.11n (HT40): MCS0/13.5 Mbps, Channel 46 (5230 MHz)

| Frequency<br>(MHz) | SA<br>Reading<br>(dB $\mu$ V/m) | Detector<br>PK/AV | Antenna        |                   | Turntable | EUT<br>Antenna<br>Polarity<br>(V/H1/H2) | DC<br>Factor<br>(dB) | Transducer<br>Factor<br>(dB) | Corrected<br>Level<br>(dB $\mu$ V/m) | Limit<br>(dB $\mu$ V/m) | Margin<br>(dB) |
|--------------------|---------------------------------|-------------------|----------------|-------------------|-----------|---|----------------------|------------------------------|--------------------------------------|-------------------------|----------------|
|                    |                                 |                   | Height<br>(cm) | Polarity<br>(V/H) |           |   |                      |                              |                                      |                         |                |
| 5386.3             | 56.0                            | PK                | 170            | V                 | 200       | V                                       | 0.00                 | 3.5                          | 56.0                                 | 74.0                    | -18.0          |
| 5350.0             | 44.2                            | AV                | 170            | V                 | 200       | V                                       | 0.00                 | 3.5                          | 44.2                                 | 54.0                    | -9.8           |
| 5368.4             | 56.6                            | PK                | 150            | H                 | 295       | H1                                      | 0.00                 | 3.4                          | 56.6                                 | 74.0                    | -17.4          |
| 5350.0             | 44.1                            | AV                | 150            | H                 | 295       | H1                                      | 0.00                 | 3.4                          | 44.1                                 | 54.0                    | -9.9           |

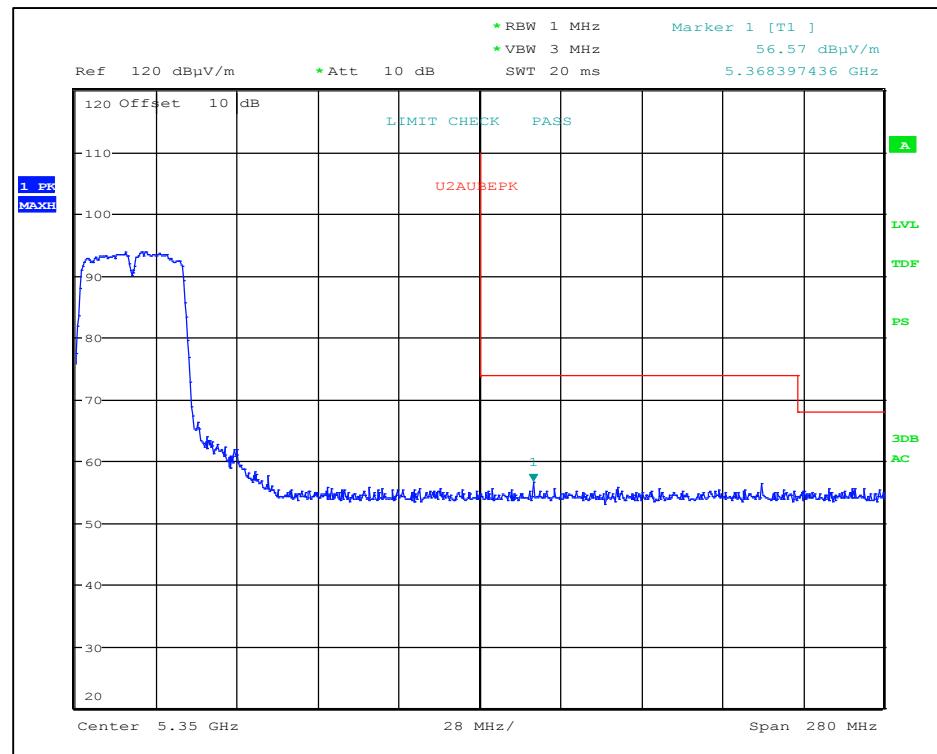
Refer to the following Plots



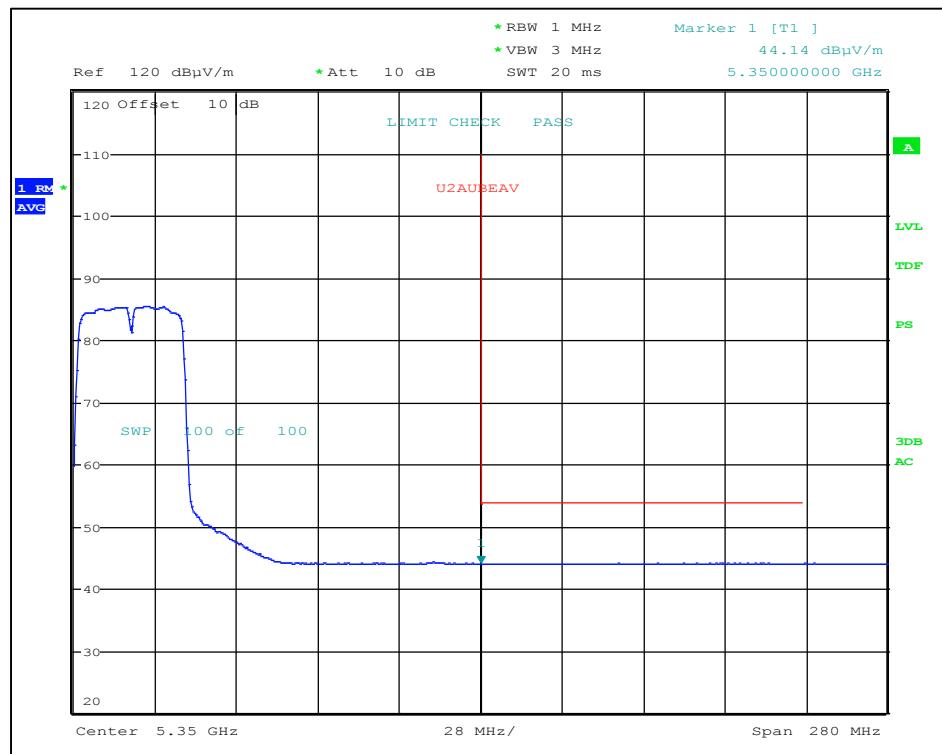
802.11n (HT40): MCS0/13.5 Mbps, Channel 46 - Restricted-band band-edge, Vertical Peak Plot



802.11n (HT40): MCS0/13.5 Mbps, Channel 46 - Restricted-band band-edge, Vertical Average Plot



802.11n (HT40): MCS0/13.5 Mbps, Channel 46 - Restricted-band band-edge, Horizontal Peak Plot



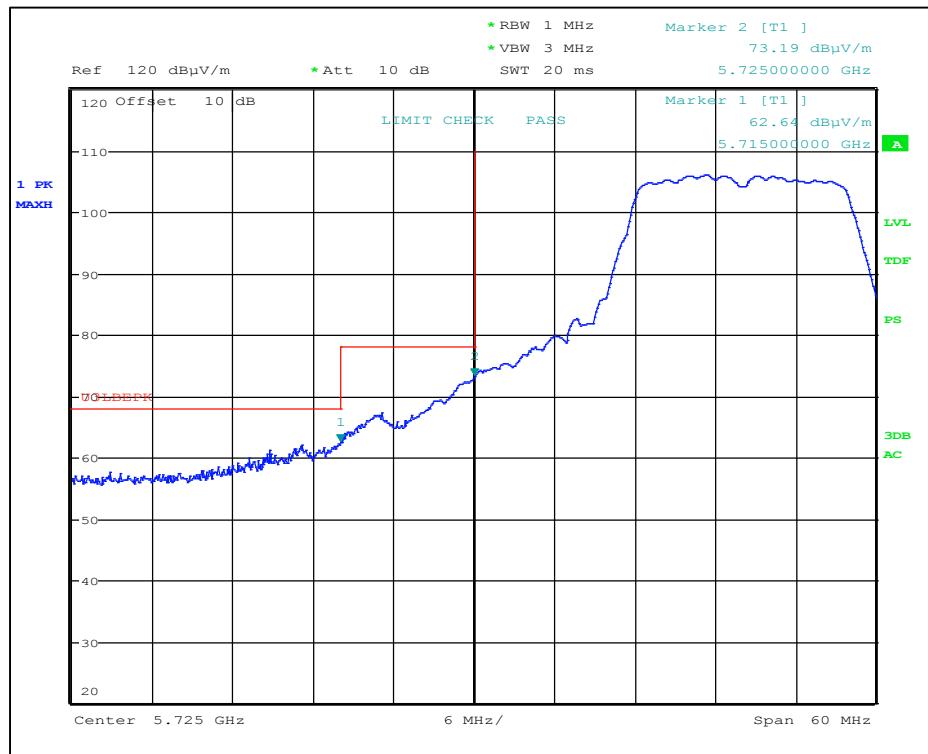
802.11n (HT40): MCS0/13.5 Mbps, Channel 46 - Restricted-band band-edge, Horizontal Average Plot

### 6.5.7 Radiated Authorized-band band-edge at 5725 MHz [802.11a, 6 Mbps]

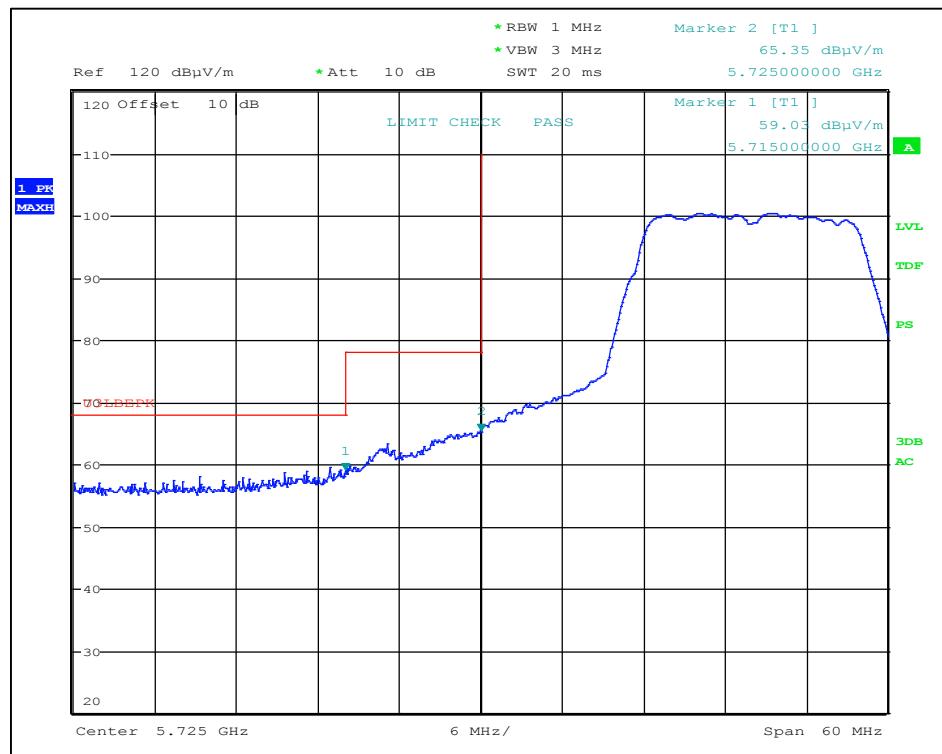
802.11a: 6 Mbps, Channel 149 (5745 MHz)

| Frequency<br>(MHz) | SA<br>Reading<br>(dB $\mu$ V/m) | Detector<br>PK/AV | Antenna        |                   | Turntable<br>Azimuth<br>(Deg) | EUT<br>Antenna<br>Polarity<br>(V/H1/H2) | DC<br>Factor<br>(dB) | Transducer<br>Factor<br>(dB) | Corrected<br>Level<br>(dB $\mu$ V/m) | Limit<br>(dB $\mu$ V/m) | Margin<br>(dB) |
|--------------------|---------------------------------|-------------------|----------------|-------------------|-------------------------------|---|----------------------|------------------------------|--------------------------------------|-------------------------|----------------|
|                    |                                 |                   | Height<br>(cm) | Polarity<br>(V/H) |                               |   |                      |                              |                                      |                         |                |
| 5725.0             | 73.2                            | PK                | 150            | V                 | 195.0                         | V                                       | 0.00                 | 3.8                          | 73.2                                 | 78.2                    | -5.0           |
| 5715.0             | 62.6                            | PK                | 150            | V                 | 195.0                         | V                                       | 0.00                 | 3.8                          | 62.6                                 | 68.2                    | -5.6           |
| 5725.0             | 65.4                            | PK                | 155            | H                 | 305.0                         | H1                                      | 0.00                 | 3.6                          | 65.4                                 | 78.2                    | -12.8          |
| 5715.0             | 59.0                            | PK                | 155            | H                 | 305.0                         | H1                                      | 0.00                 | 3.6                          | 59.0                                 | 68.2                    | -9.2           |

Refer to the following Plots



802.11a: 6Mbps, Channel 149 – Authorized-band band-edge, Vertical Peak Plot



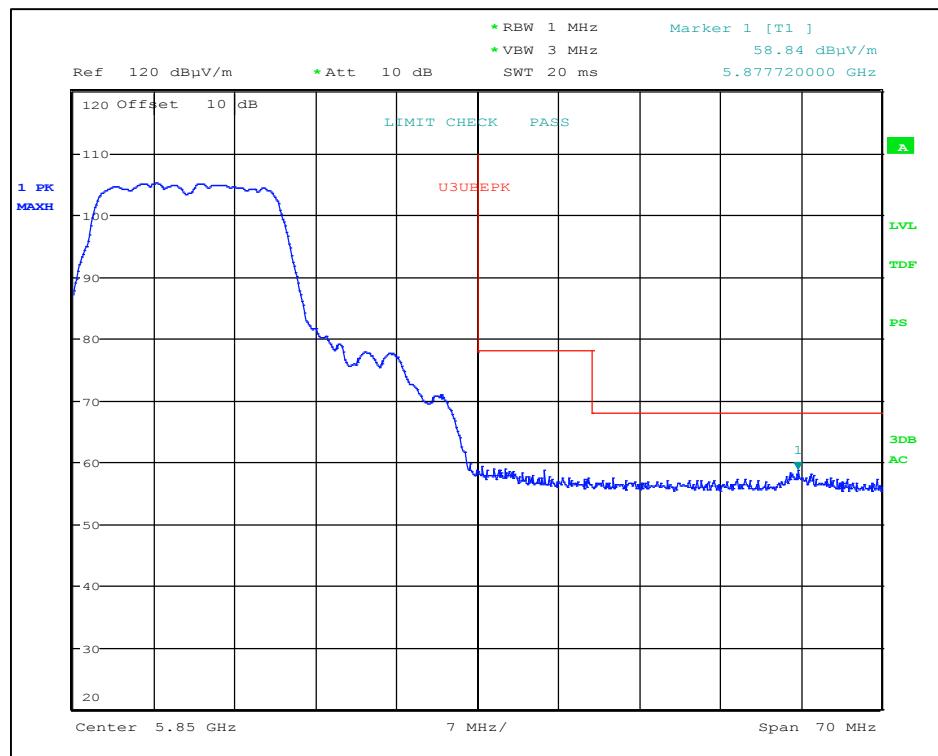
802.11a: 6Mbps, Channel 149 – Authorized-band band-edge, Horizontal Peak Plot

### 6.5.8 Radiated Authorized-band band-edge at 5850 MHz [802.11a, 6 Mbps]

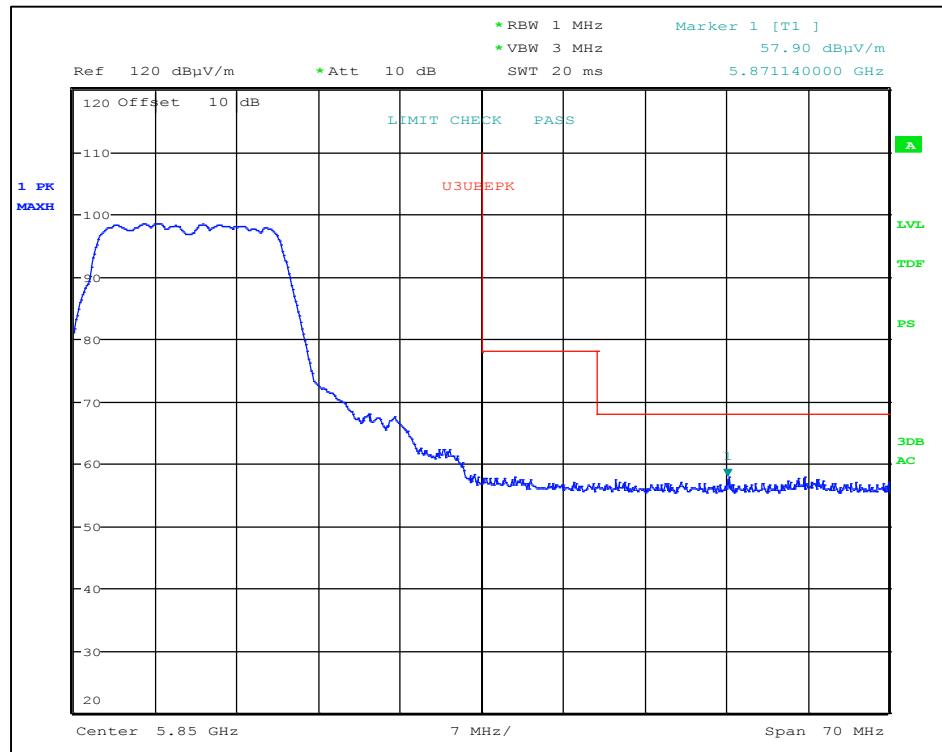
802.11a: 6 Mbps, Channel 165 (5825 MHz)

| Frequency<br>(MHz) | SA<br>Reading<br>(dB $\mu$ V/m) | Detector<br>PK/AV | Antenna        |                   | Turntable<br>Azimuth<br>(Deg) | EUT<br>Antenna<br>Polarity<br>(V/H1/H2) | DC<br>Factor<br>(dB) | Transducer<br>Factor<br>(dB) | Corrected<br>Level<br>(dB $\mu$ V/m) | Limit<br>(dB $\mu$ V/m) | Margin<br>(dB) |
|--------------------|---------------------------------|-------------------|----------------|-------------------|-------------------------------|---|----------------------|------------------------------|--------------------------------------|-------------------------|----------------|
|                    |                                 |                   | Height<br>(cm) | Polarity<br>(V/H) |                               |   |                      |                              |                                      |                         |                |
| 5877.7             | 58.8                            | PK                | 150            | V                 | 195                           | V                                       | 0.00                 | 3.80                         | 58.8                                 | 68.2                    | -9.4           |
| 5871.1             | 57.9                            | PK                | 155            | H                 | 305                           | H1                                      | 0.00                 | 3.60                         | 57.9                                 | 68.2                    | -10.3          |

Refer to the following Plots



802.11a at 6Mbps, Channel 165 – Authorized-band band-edge, Vertical Peak Plot



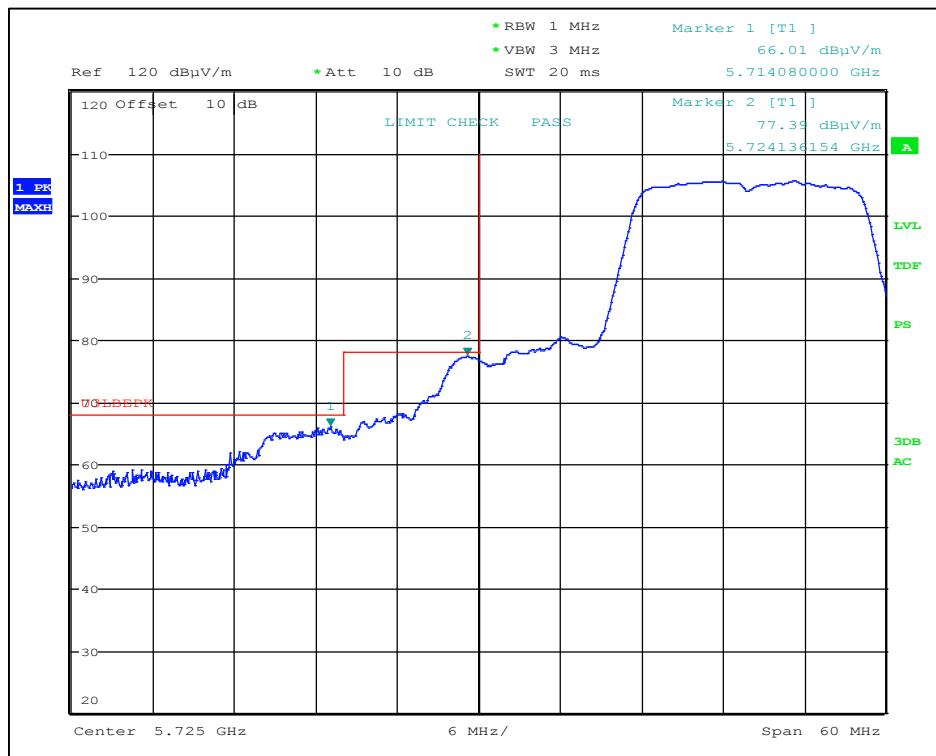
802.11a at 6Mbps, Channel 165 – Authorized-band band-edge, Horizontal Peak Plot

### 6.5.9 Radiated Authorized-band band-edge at 5725 MHz [802.11n (HT20), MCS0/6.5 Mbps]

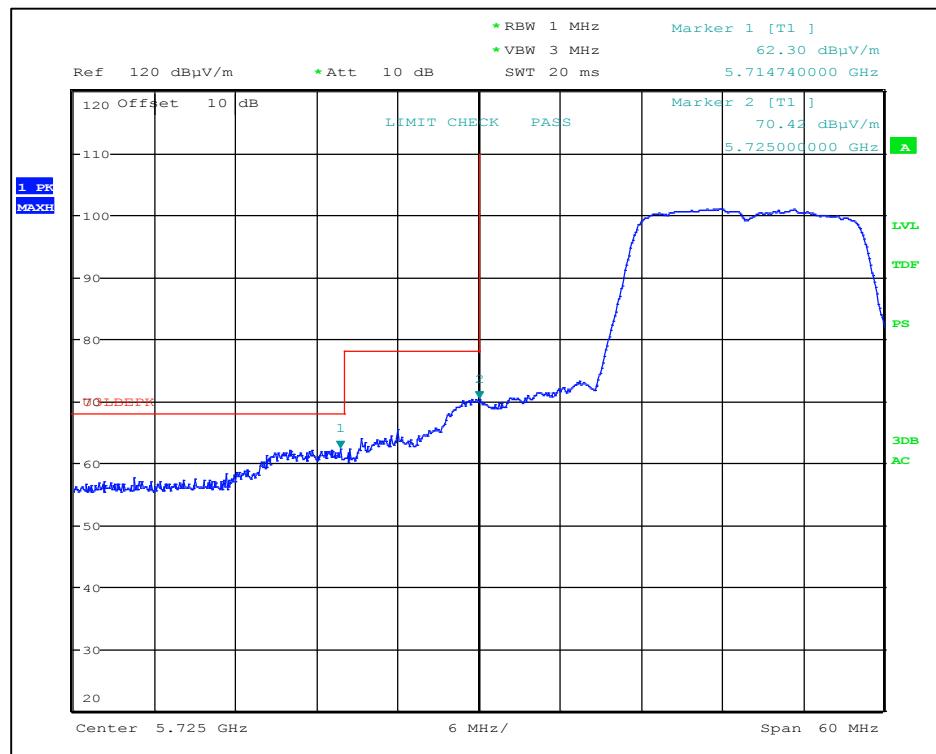
802.11n (HT20): MCS0/6.5 Mbps, Channel 149 (5745 MHz)

| Frequency (MHz) | SA Reading (dB $\mu$ V/m) | Detector PK/AV | Antenna     |                | Turntable | EUT Antenna Polarity (V/H1/H2) | DC Factor (dB) | Transducer Factor (dB) | Corrected Level (dB $\mu$ V/m) | Limit (dB $\mu$ V/m) | Margin (dB) |
|-----------------|---------------------------|----------------|-------------|----------------|-----------|--------------------------------|----------------|------------------------|--------------------------------|----------------------|-------------|
|                 |                           |                | Height (cm) | Polarity (V/H) |           |                                |                |                        |                                |                      |             |
| 5724.1          | 77.4                      | PK             | 150         | V              | 195.0     | V                              | 0.00           | 3.8                    | 77.4                           | 78.2                 | -0.8        |
| 5714.1          | 66.0                      | PK             | 150         | V              | 195.0     | V                              | 0.00           | 3.8                    | 66.0                           | 68.2                 | -2.2        |
| 5725.0          | 70.4                      | PK             | 155         | H              | 305.0     | H1                             | 0.00           | 3.6                    | 70.4                           | 78.2                 | -7.8        |
| 5714.7          | 62.3                      | PK             | 155         | H              | 305.0     | H1                             | 0.00           | 3.6                    | 62.3                           | 68.2                 | -5.9        |

Refer to the following Plots



802.11n (HT20): MCS0/6.5 Mbps, Channel 149 – Authorized-band band-edge, Vertical Peak Plot



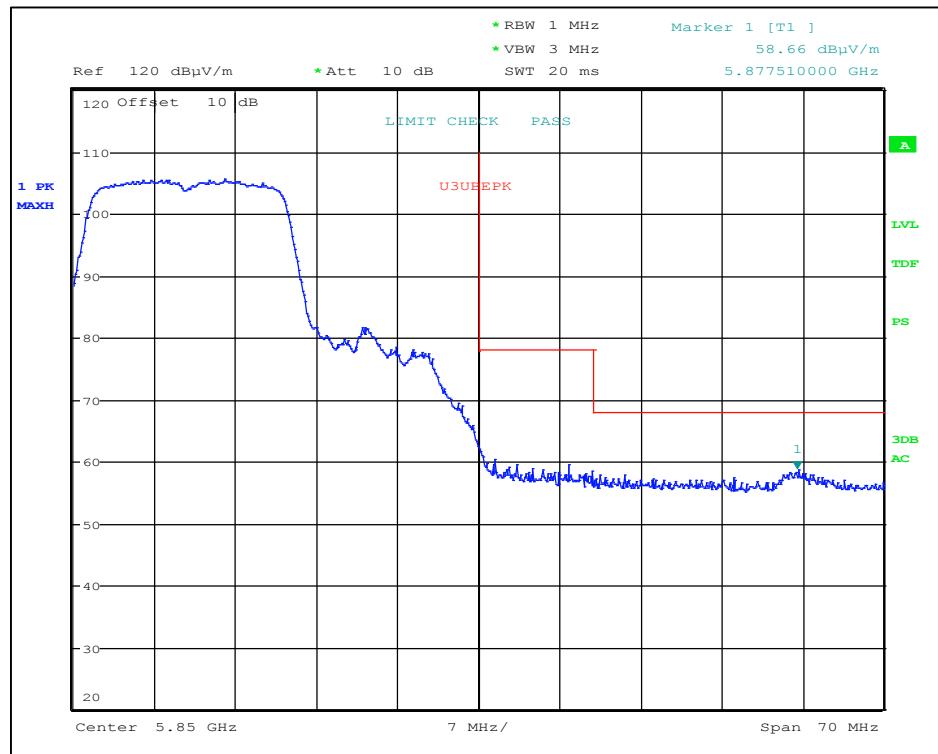
802.11n (HT20): MCS0/6.5 Mbps, Channel 149 – Authorized-band band-edge, Horizontal Peak Plot

### 6.5.10 Radiated Authorized-band band-edge at 5850 MHz [802.11n (HT20), MCS0/6.5 Mbps]

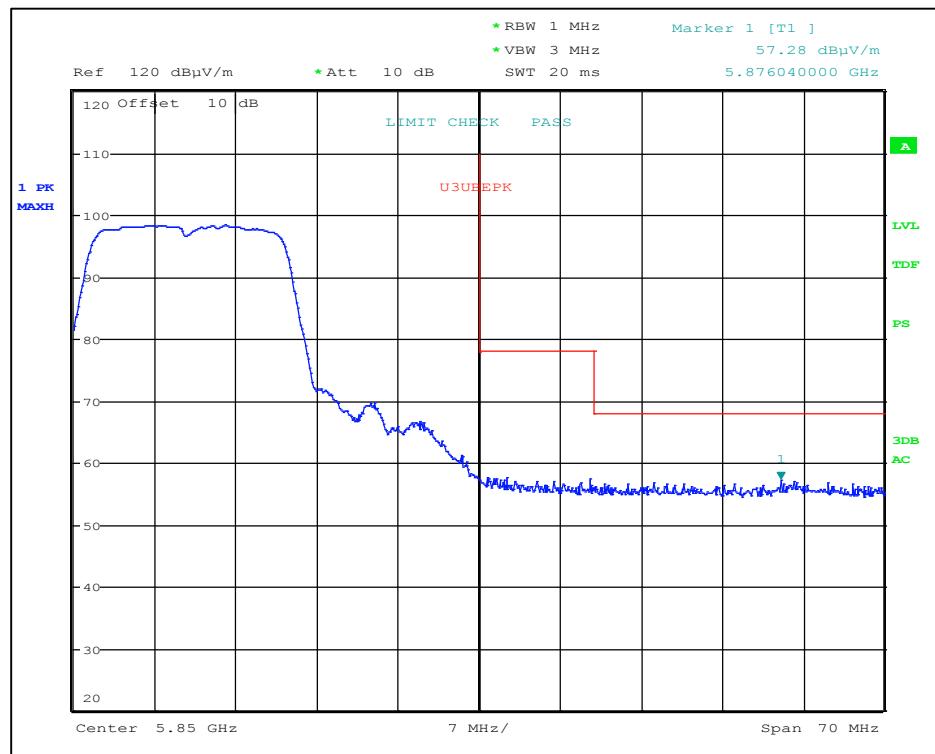
802.11n (HT20): MCS0/6.5 Mbps, Channel 165 (5825 MHz)

| Frequency<br>(MHz) | SA<br>Reading<br>(dB $\mu$ V/m) | Detector<br>PK/AV | Antenna        |                   | Turntable | EUT<br>Antenna<br>Polarity<br>(V/H1/H2) | DC<br>Factor<br>(dB) | Transducer<br>Factor<br>(dB) | Corrected<br>Level<br>(dB $\mu$ V/m) | Limit<br>(dB $\mu$ V/m) | Margin<br>(dB) |
|--------------------|---------------------------------|-------------------|----------------|-------------------|-----------|---|----------------------|------------------------------|--------------------------------------|-------------------------|----------------|
|                    |                                 |                   | Height<br>(cm) | Polarity<br>(V/H) |           |   |                      |                              |                                      |                         |                |
| 5877.5             | 58.7                            | PK                | 150            | V                 | 195       | V                                       | 0.00                 | 3.80                         | 58.7                                 | 68.2                    | -9.5           |
| 5876.0             | 57.3                            | PK                | 155            | H                 | 305       | H1                                      | 0.00                 | 3.60                         | 57.3                                 | 68.2                    | -10.9          |

Refer to the following Plots



802.11n (HT20): MCS0/6.5 Mbps, Channel 165 – Authorized-band band-edge, Vertical Peak Plot



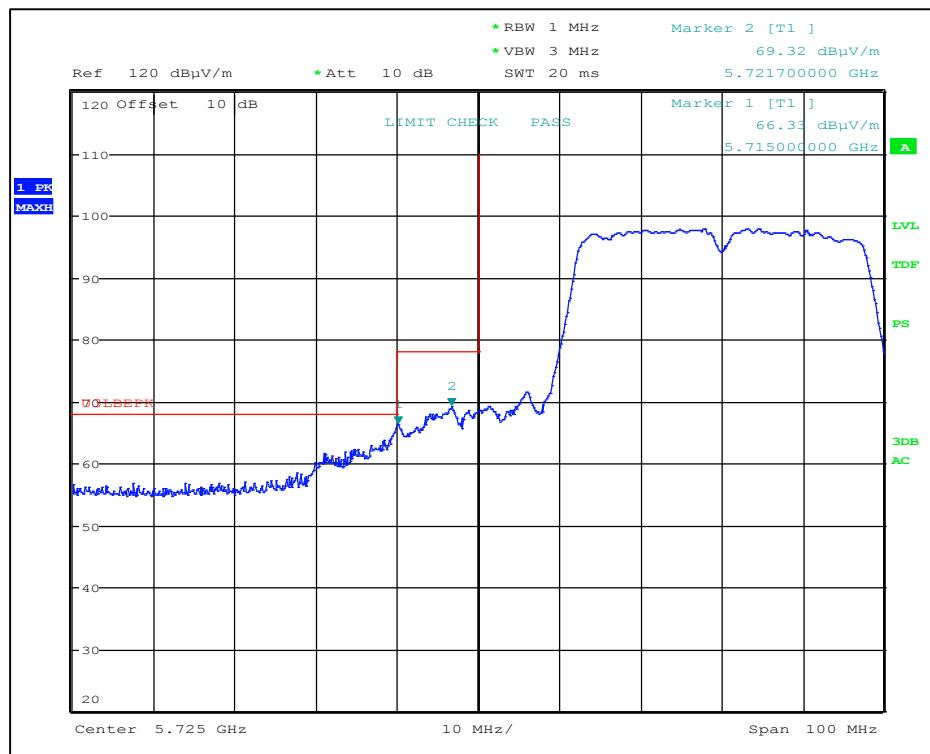
802.11n (HT20): MCS0/6.5 Mbps, Channel 165 – Authorized-band band-edge, Horizontal Peak Plot

### 6.5.11 Radiated Authorized-band band-edge at 5725 MHz [802.11n (HT40), MCS0/13.5 Mbps]

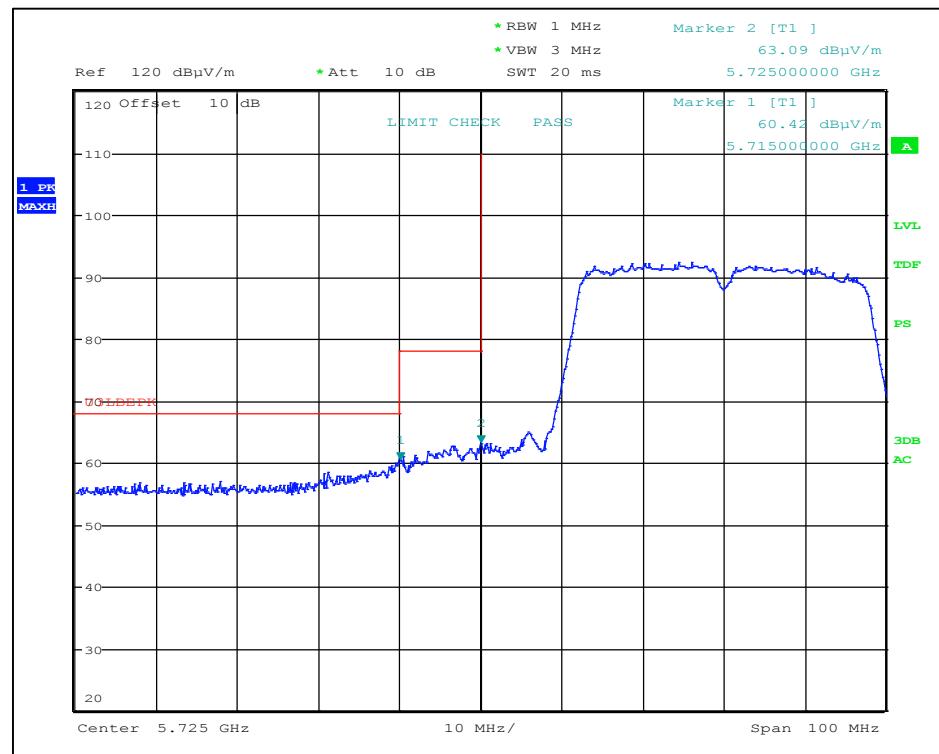
802.11n (HT40): MCS0/13.5 Mbps, Channel 151 (5755 MHz)

| Frequency (MHz) | SA Reading (dB $\mu$ V/m) | Detector PK/AV | Antenna     |                | Turntable | EUT Antenna Polarity (V/H1/H2) | DC Factor (dB) | Transducer Factor (dB) | Corrected Level (dB $\mu$ V/m) | Limit (dB $\mu$ V/m) | Margin (dB) |
|-----------------|---------------------------|----------------|-------------|----------------|-----------|--------------------------------|----------------|------------------------|--------------------------------|----------------------|-------------|
|                 |                           |                | Height (cm) | Polarity (V/H) |           |                                |                |                        |                                |                      |             |
| 5721.7          | 69.3                      | PK             | 150         | V              | 195.0     | V                              | 0.00           | 3.8                    | 69.3                           | 78.2                 | -8.9        |
| 5715.0          | 66.3                      | PK             | 150         | V              | 195.0     | V                              | 0.00           | 3.8                    | 66.3                           | 68.2                 | -1.9        |
| 5725.0          | 63.1                      | PK             | 155         | H              | 305.0     | H1                             | 0.00           | 3.6                    | 63.1                           | 78.2                 | -15.1       |
| 5715.0          | 60.4                      | PK             | 155         | H              | 305.0     | H1                             | 0.00           | 3.6                    | 60.4                           | 68.2                 | -7.8        |

Refer to the following Plots



802.11n (HT40): MCS0/13.5 Mbps, Channel 151 – Authorized-band band-edge, Vertical Peak Plot



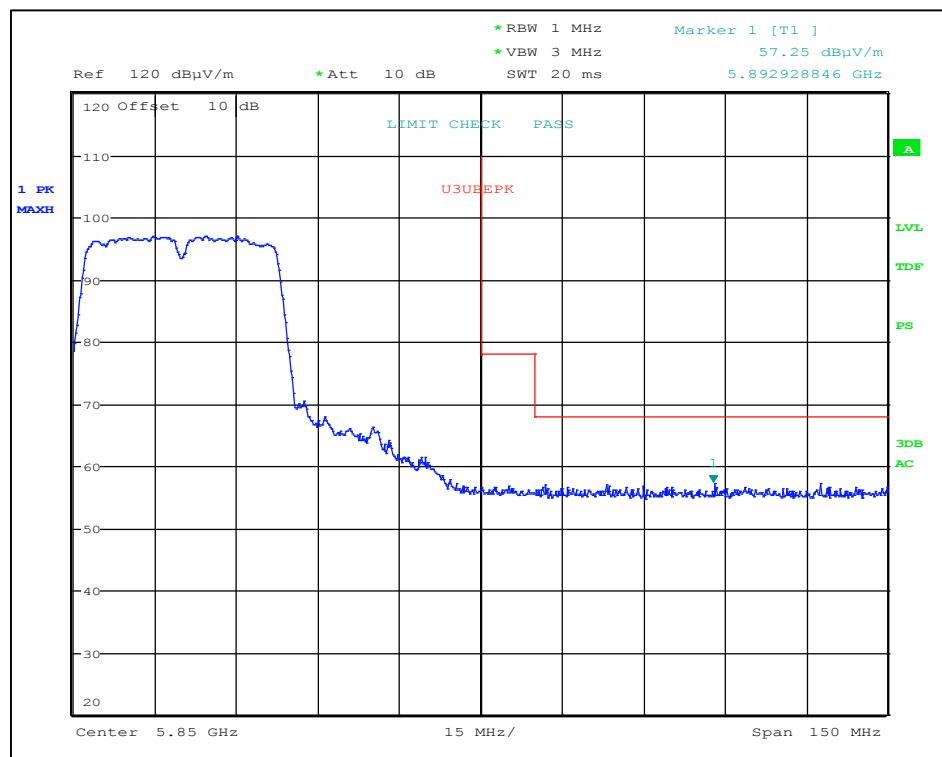
802.11n (HT40): MCS0/13.5 Mbps, Channel 151 – Authorized-band band-edge, Horizontal Peak Plot

### 6.5.12 Radiated Authorized-band band-edge at 5850 MHz [802.11n (HT40), MCS0/13.5 Mbps]

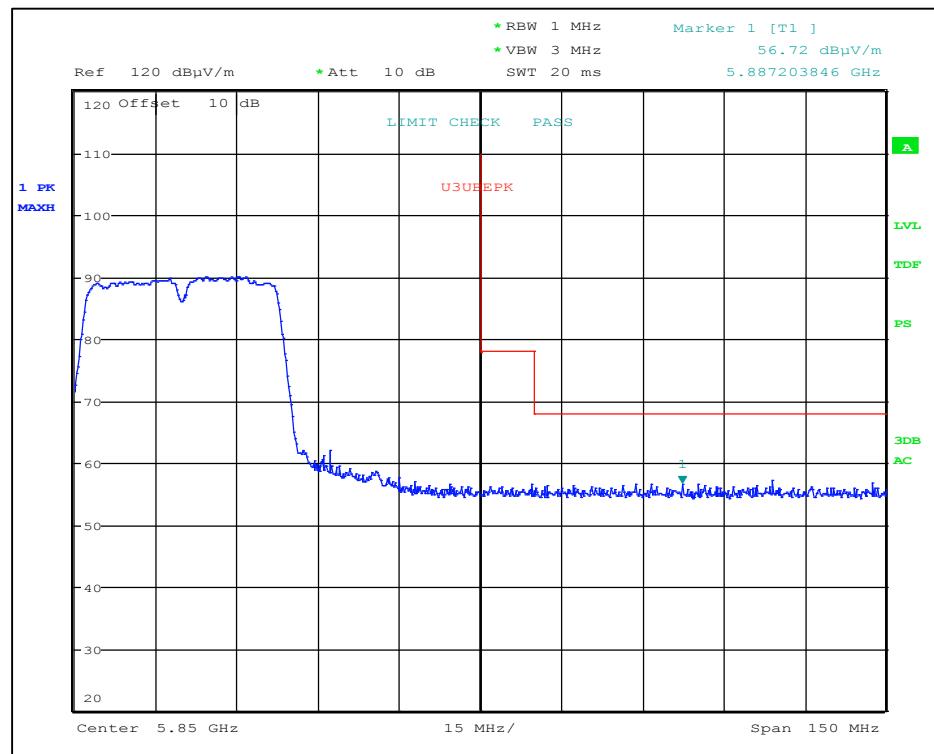
802.11n (HT40): MCS0/13.5 Mbps, Channel 159 (5795 MHz)

| Frequency<br>(MHz) | SA<br>Reading<br>(dB $\mu$ V/m) | Detector<br>PK/AV | Antenna           |                  | Turntable<br>Height<br>(cm) | EUT<br>Antenna<br>Polarity<br>(V/H1/H2) | DC<br>Factor<br>(dB) | Transducer<br>Factor<br>(dB) | Corrected<br>Level<br>(dB $\mu$ V/m) | Limit<br>(dB $\mu$ V/m) | Margin<br>(dB) |
|--------------------|---------------------------------|-------------------|-------------------|------------------|-----------------------------|---|----------------------|------------------------------|--------------------------------------|-------------------------|----------------|
|                    |                                 |                   | Polarity<br>(V/H) | Azimuth<br>(Deg) |                             |   |                      |                              |                                      |                         |                |
| 5892.9             | 57.3                            | PK                | 150               | V                | 195                         | V                                       | 0.00                 | 3.80                         | 57.3                                 | 68.2                    | -10.9          |
| 5887.2             | 56.7                            | PK                | 155               | H                | 305                         | H1                                      | 0.00                 | 3.60                         | 56.7                                 | 68.2                    | -11.5          |

Refer to the following Plots



802.11n (HT40): MCS0/13.5 Mbps, Channel 159 – Authorized-band band-edge, Vertical Peak Plot



802.11n (HT40): MCS0/13.5 Mbps, Channel 159 – Authorized-band band-edge, Horizontal Peak Plot

### 6.5.13 Transmitter Radiated Emissions above 1 GHz (5.15-5.25 GHz Band)

|                       |                     |
|-----------------------|---------------------|
| Worst Case Mode:      | 802.11a             |
| Data Rate:            | 6 Mbps              |
| Measurement Distance: | 3 meters            |
| Operating Mode:       | Continuous Transmit |
| Frequency Range:      | 1 GHz – 40 GHz      |

Note: The pre-scan plots do not show the maximized amplitude, only included for the purpose of identifying spurious emissions requiring final measurements.

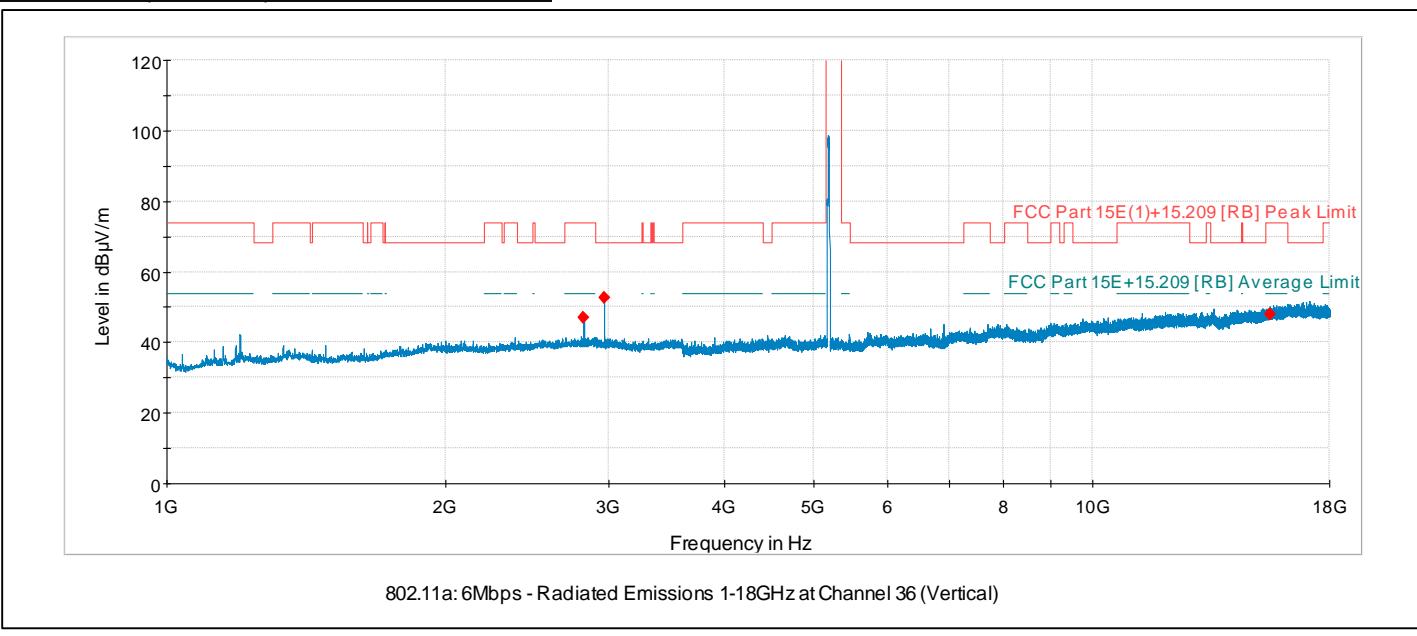
#### Channel 36 (5.18 GHz)

| Frequency (MHz) | SA Reading (dBuV/m) | Detector PK/AV | Antenna     |                | Turntable | EUT Antenna Polarity (V/H1/H2) | DC Factor (dB) | Correction Factor (dB) | Corrected Level (dBuV/m) | Limit [RB] (dBuV/m) | Limit [NRB] (dBuV/m) | Margin (dB) |
|-----------------|---------------------|----------------|-------------|----------------|-----------|--------------------------------|----------------|------------------------|--------------------------|---------------------|----------------------|-------------|
|                 |                     |                | Height (cm) | Polarity (V/H) |           |                                |                |                        |                          |                     |                      |             |
| *2820.5         | 43.8                | PK             | 140.0       | V              | 95.0      | V                              | 0.0            | 1.6                    | 45.4                     | 74.0                | -                    | -28.6       |
| *2820.5         | 31.2                | AV             | 140.0       | V              | 95.0      | V                              | 0.0            | 1.6                    | 32.8                     | 54.0                | -                    | -21.2       |
| 2968.6          | 50.7                | PK             | 140.0       | V              | 0.0       | V                              | 0.0            | 1.9                    | 52.6                     | -                   | 68.2                 | -15.6       |
| *15540.0        | #                   | PK             | -           | V              | -         | V                              | 0.0            | 16.2                   | #                        | 74.0                | -                    | -           |
| *20720.0        | #                   | PK             | -           | V              | -         | V                              | 0.0            | -4.6                   | #                        | 74.0                | -                    | -           |

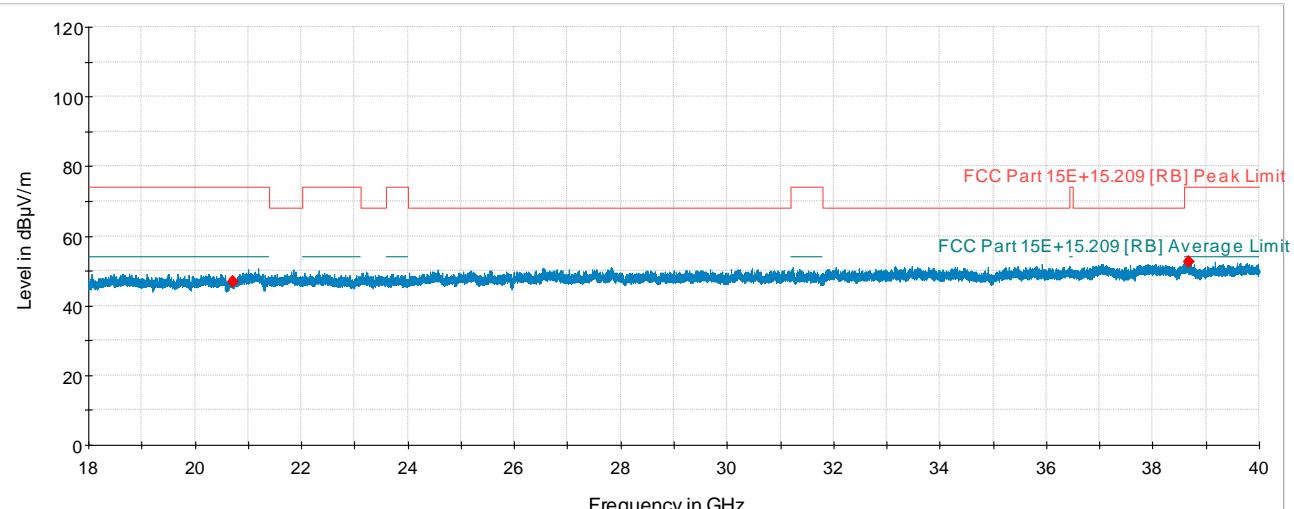
Note: \* - indicates frequency in FCC §15.205 Restricted bands of operation; RB - Restricted Band; NRB – Non-Restricted Band  
 # - the maximized peak measured value was greater than 20 dB below the limit and/or complies with the average limit, thus both peak and average readings were not reported.

#### Radiated Spurious Emissions Pre-scan Vertical and Horizontal Plots

##### Channel 36 (5.18 GHz): 1-18 GHz Vertical Plot

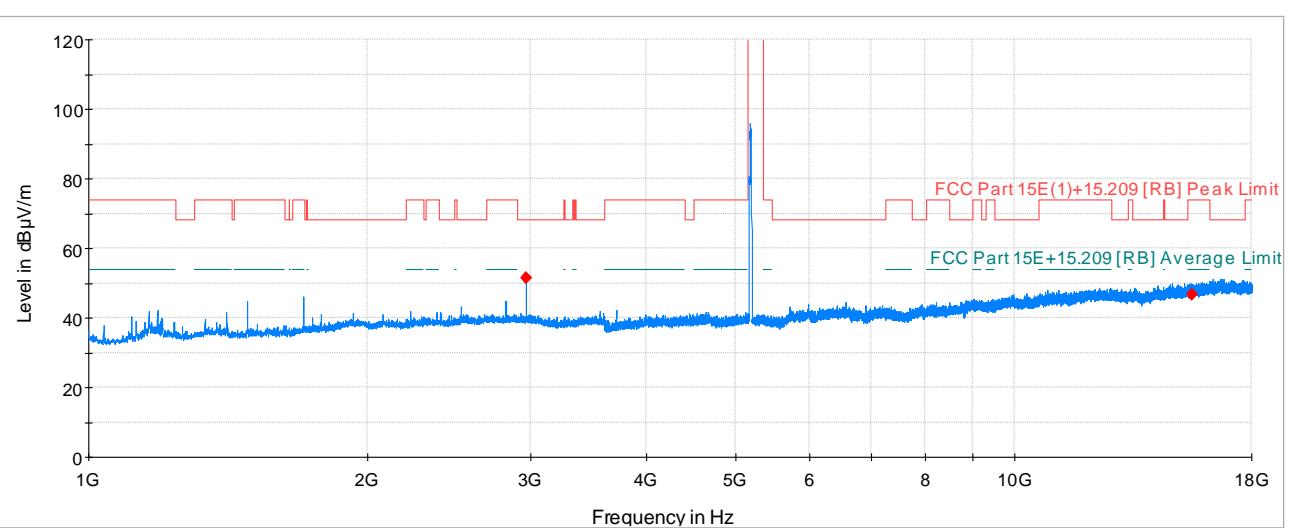


Channel 36 (5.18 GHz): 18-40 GHz Vertical Plot



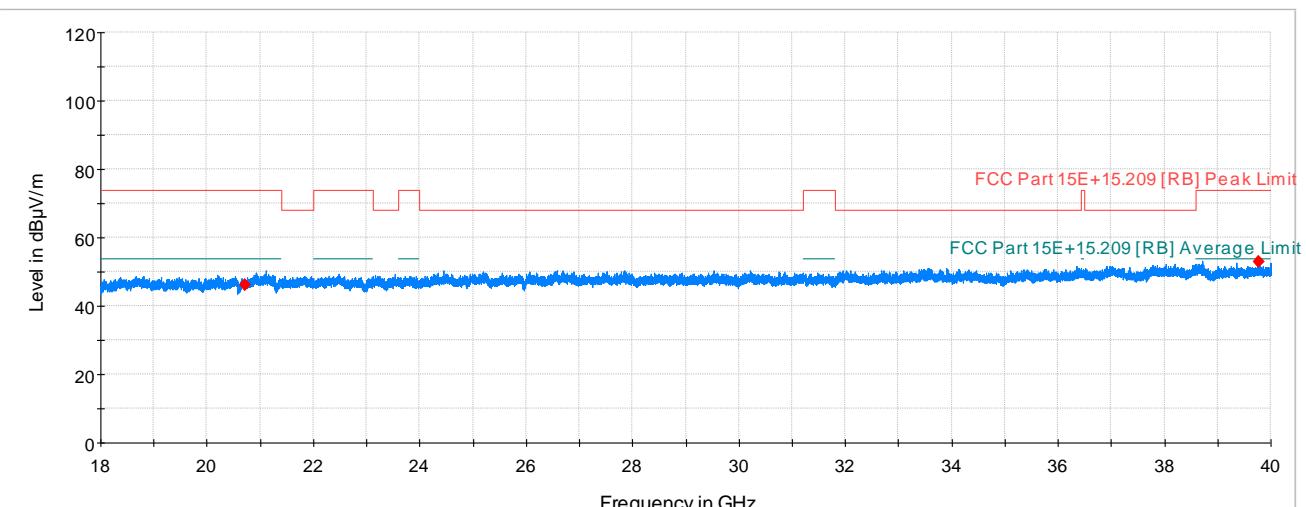
802.11a: 6Mbps - Radiated Emissions 18-40GHz at Channel 36 (Vertical)

Channel 36 (5.18 GHz): 1-18 GHz Horizontal Plot



802.11a: 6Mbps - Radiated Emissions 1-18GHz at Channel 36 (Horizontal)

Channel 36 (5.18 GHz): 18-40 GHz Horizontal Plot

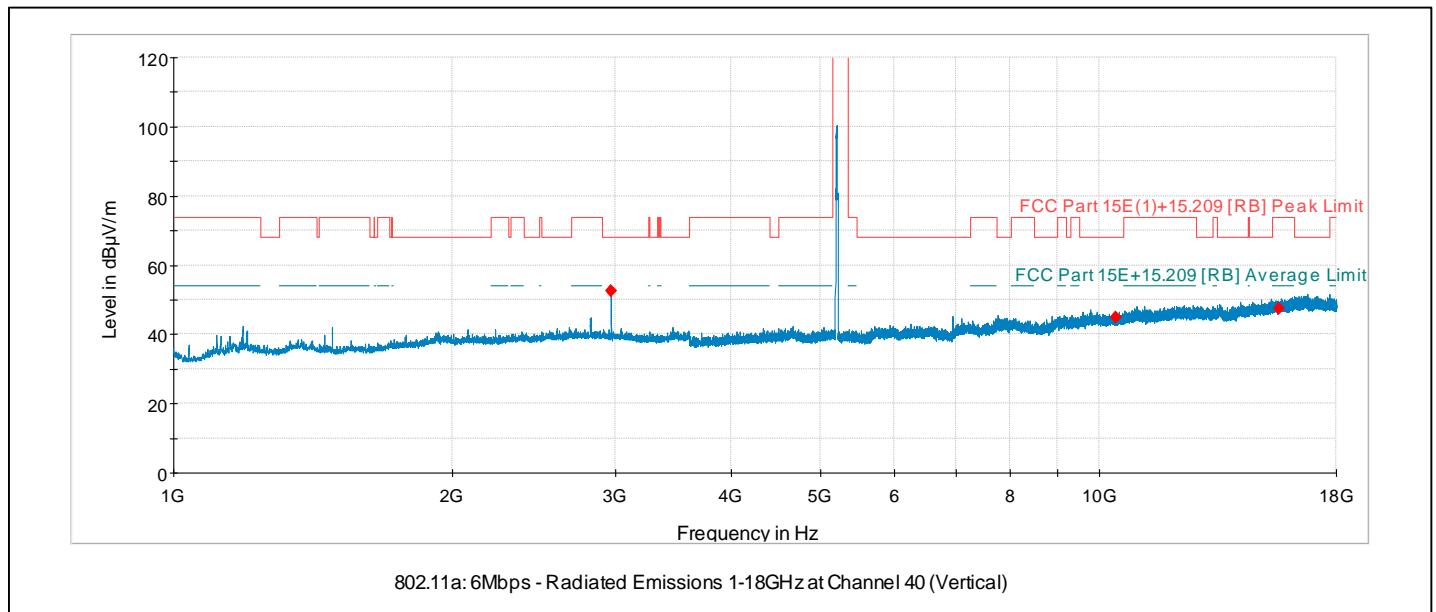


802.11a: 6Mbps - Radiated Emissions 18-40GHz at Channel 36 (Horizontal)

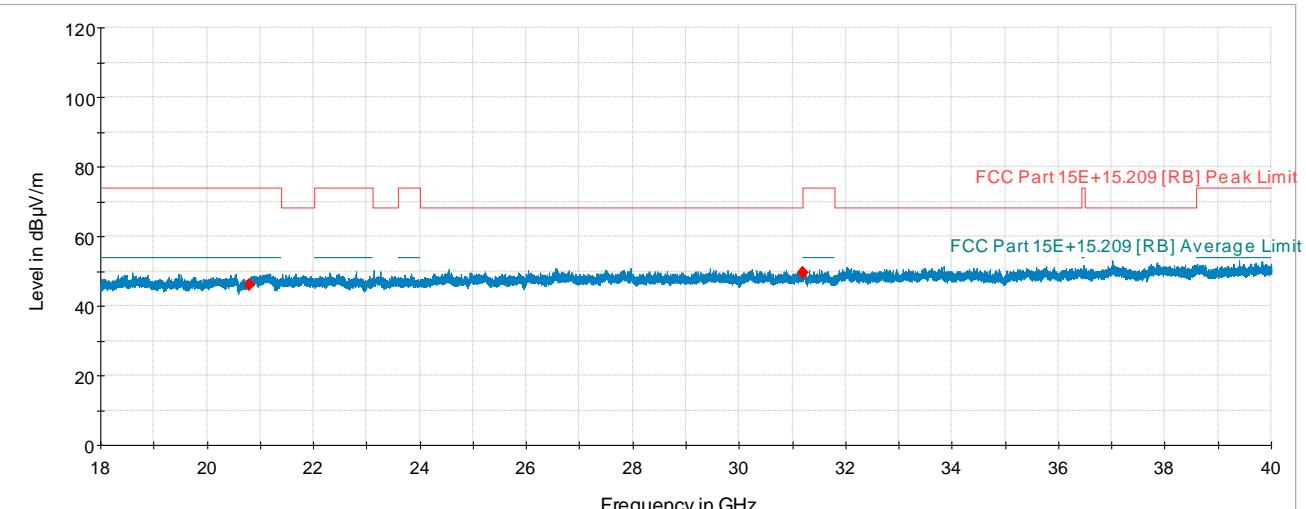
Channel 40 (5.2 GHz)

| Frequency (MHz) | SA Reading (dB $\mu$ V/m) | Detector PK/AV | Antenna     |                | Turntable | EUT Antenna Polarity (V/H1/H2) | DC Factor (dB) | Correction Factor (dB) | Corrected Level (dB $\mu$ V/m) | Limit [RB] (dB $\mu$ V/m) | Limit [NRB] (dB $\mu$ V/m) | Margin (dB) |
|-----------------|---------------------------|----------------|-------------|----------------|-----------|--------------------------------|----------------|------------------------|--------------------------------|---------------------------|----------------------------|-------------|
|                 |                           |                | Height (cm) | Polarity (V/H) |           |                                |                |                        |                                |                           |                            |             |
| 2968.6          | 50.6                      | PK             | 150.0       | V              | 0.0       | V                              | 0.0            | 1.9                    | 52.5                           | -                         | 68.2                       | -15.7       |
| *15600.0        | #                         | PK             | -           | V              | -         | V                              | 0.0            | 16.4                   | #                              | 74.0                      | -                          | -           |
| *20800.0        | #                         | PK             | -           | V              | -         | V                              | 0.0            | -4.5                   | #                              | 74.0                      | -                          | -           |
| *31200.0        | #                         | PK             | -           | V              | -         | V                              | 0.0            | 1.1                    | #                              | 74.0                      | -                          | -           |

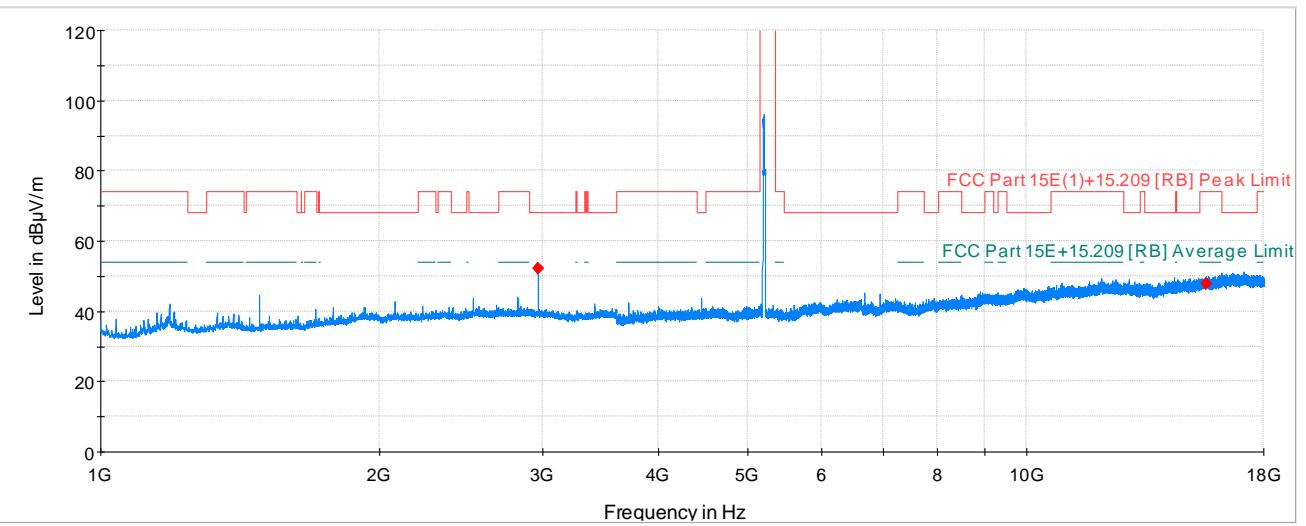
Note: \* - indicates frequency in FCC §15.205 Restricted bands of operation; RB - Restricted Band; NRB – Non-Restricted Band  
 # - the maximized peak measured value was greater than 20 dB below the limit and/or complies with the average limit, thus both peak and average readings were not reported.

**Radiated Spurious Emissions Pre-scan Vertical and Horizontal Plots**
Channel 40 (5.2 GHz): 1-18 GHz Vertical Plot


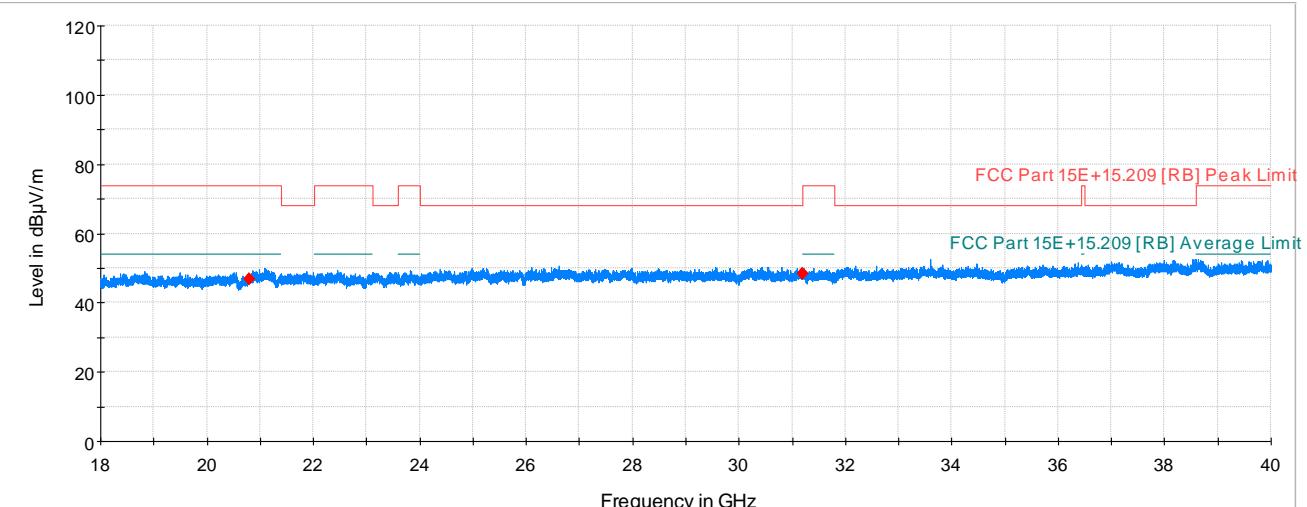
Channel 40 (5.2 GHz): 18-40 GHz Vertical Plot



Channel 40 (5.2 GHz): 1-18 GHz Horizontal Plot



Channel 40 (5.2 GHz): 18-40 GHz Horizontal Plot

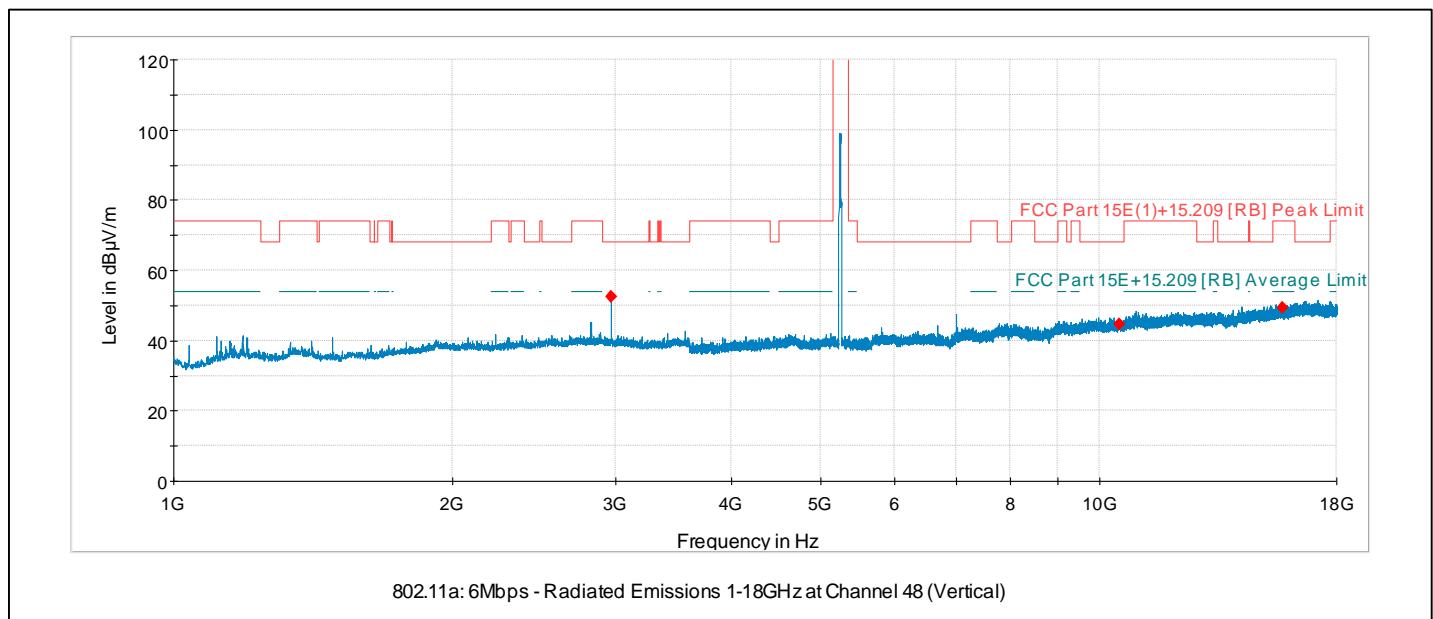


802.11a: 6Mbps - Radiated Emissions 18-40GHz at Channel 40 (Horizontal)

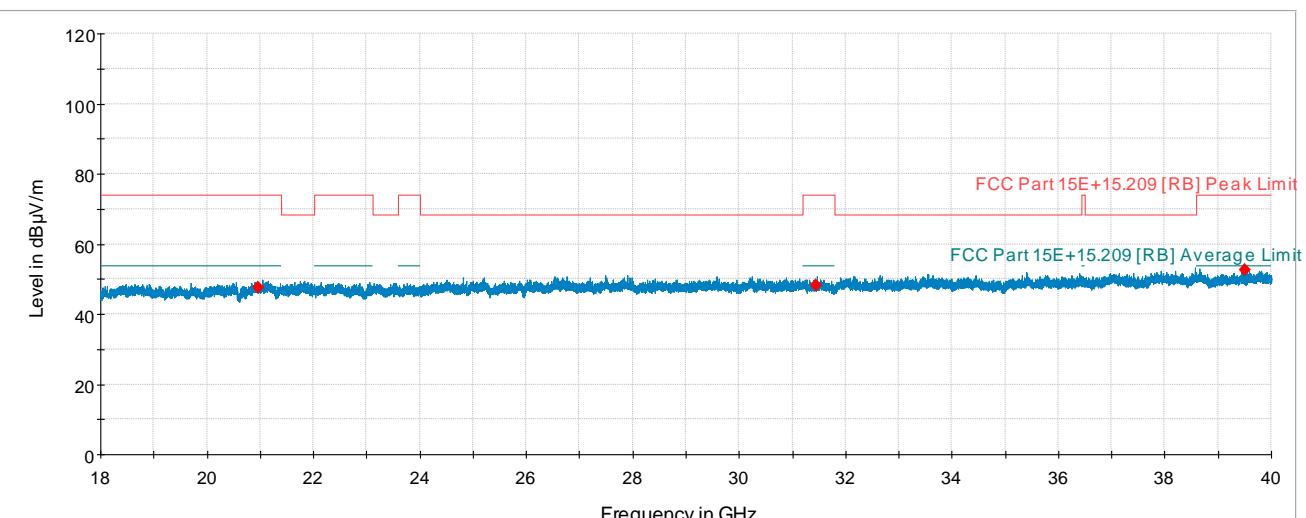
Channel 48 (5.24 GHz)

| Frequency (MHz) | SA Reading (dBuV/m) | Detector PK/AV | Antenna     |                | Turntable | EUT Antenna Polarity (V/H1/H2) | DC Factor (dB) | Correction Factor (dB) | Corrected Level (dBuV/m) | Limit [RB] (dBuV/m) | Limit [NRB] (dBuV/m) | Margin (dB) |
|-----------------|---------------------|----------------|-------------|----------------|-----------|--------------------------------|----------------|------------------------|--------------------------|---------------------|----------------------|-------------|
|                 |                     |                | Height (cm) | Polarity (V/H) |           |                                |                |                        |                          |                     |                      |             |
| 2969.2          | 50.4                | PK             | 150.0       | V              | 0.0       | V                              | 0.0            | 1.9                    | 52.3                     | -                   | 68.2                 | -15.9       |
| *15720.0        | #                   | PK             | -           | V              | -         | V                              | 0.0            | 16.4                   | #                        | 74.0                | -                    | -           |
| *20960.0        | #                   | PK             | -           | V              | -         | V                              | 0.0            | -4.5                   | #                        | 74.0                | -                    | -           |
| *31440.0        | #                   | PK             | -           | V              | -         | V                              | 0.0            | 1.4                    | #                        | 74.0                | -                    | -           |

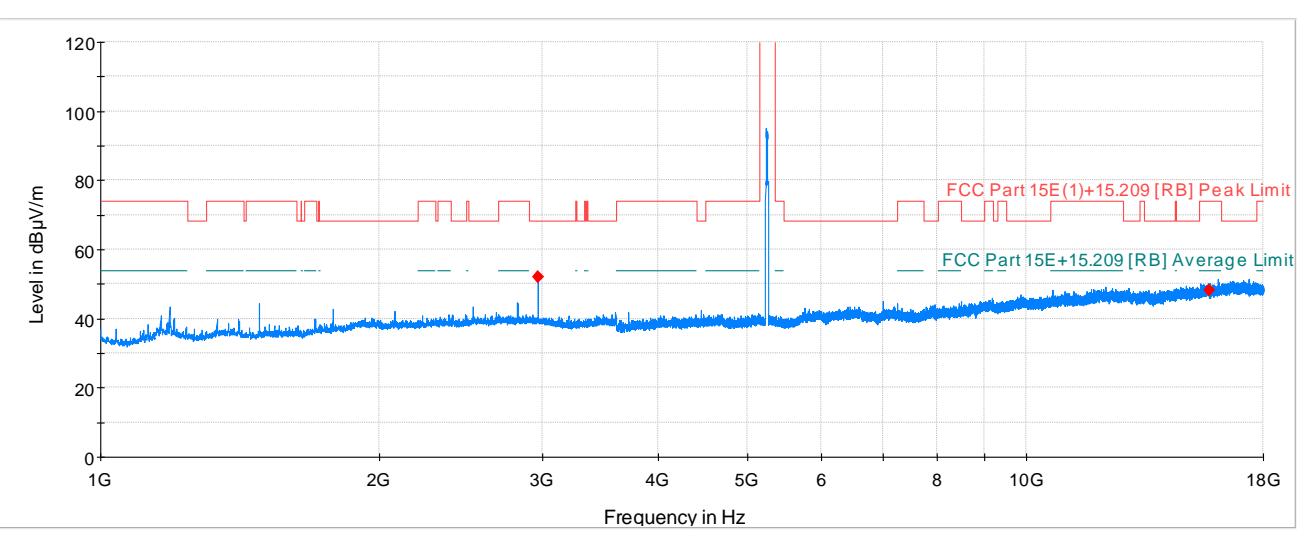
Note: \* - indicates frequency in FCC §15.205 Restricted bands of operation; RB - Restricted Band; NRB – Non-Restricted Band  
 # - the maximized peak measured value was greater than 20 dB below the limit and/or complies with the average limit, thus both peak and average readings were not reported.

**Radiated Spurious Emissions Pre-scan Vertical and Horizontal Plots**
Channel 48 (5.24 GHz): 1-18 GHz Vertical Plot


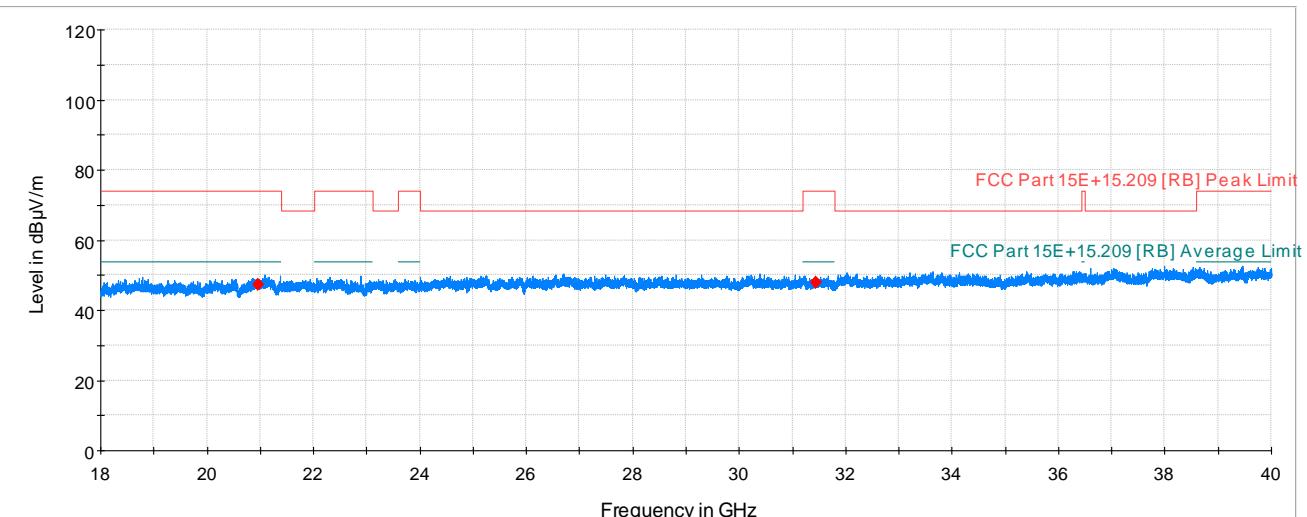
Channel 48 (5.24 GHz): 18-40 GHz Vertical Plot



Channel 48 (5.24 GHz): 1-18 GHz Horizontal Plot



Channel 48 (5.24 GHz): 18-40 GHz Horizontal Plot



802.11a: 6Mbps - Radiated Emissions 18-40GHz at Channel 48 (Horizontal)

### 6.5.14 Transmitter Radiated Emissions above 1 GHz (5.725-5.850 GHz Band)

|                       |                     |
|-----------------------|---------------------|
| Worst Case Mode:      | 802.11a             |
| Data Rate:            | 6 Mbps              |
| Measurement Distance: | 3 meters            |
| Operating Mode:       | Continuous Transmit |
| Frequency Range:      | 1 GHz – 40 GHz      |

Note: The pre-scan plots do not show the maximized amplitude, only included for the purpose of identifying spurious emissions requiring final measurements.

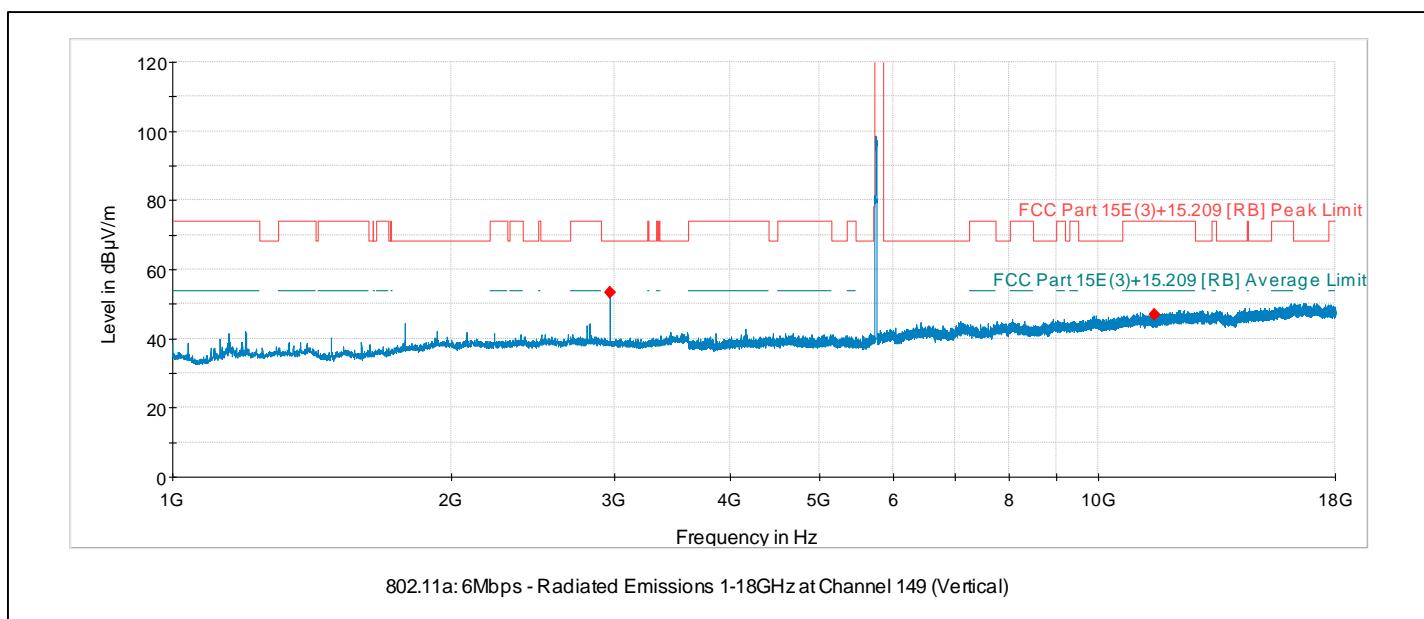
#### Channel 149 (5.745 GHz)

| Frequency (MHz) | SA Reading (dBuV/m) | Detector PK/AV | Antenna     |                | Turntable | EUT Antenna Polarity (V/H1/H2) | DC Factor (dB) | Correction Factor (dB) | Corrected Level (dBuV/m) | Limit [RB] (dBuV/m) | Limit [NRB] (dBuV/m) | Margin (dB) |
|-----------------|---------------------|----------------|-------------|----------------|-----------|--------------------------------|----------------|------------------------|--------------------------|---------------------|----------------------|-------------|
|                 |                     |                | Height (cm) | Polarity (V/H) |           |                                |                |                        |                          |                     |                      |             |
| 2968.6          | 52.1                | PK             | 150.0       | V              | 0.0       | V                              | 0.0            | 1.9                    | 54.0                     | -                   | 68.2                 | -14.2       |
| *11490.0        | 37.9                | PK             | 145.0       | V              | 18.0      | V                              | 0.0            | 12.4                   | 50.3                     | 74.0                | -                    | -23.7       |
| *11490.0        | 25.5                | AV             | 145.0       | V              | 18.0      | V                              | 0.0            | 12.4                   | 37.9                     | 54.0                | -                    | -16.1       |
| *22980.0        | 51.1                | PK             | 160.0       | V              | 20.0      | V                              | 0.0            | -3.4                   | 47.7                     | 74.0                | -                    | -26.3       |
| *22980.0        | 38.9                | AV             | 160.0       | V              | 20.0      | V                              | 0.0            | -3.4                   | 35.5                     | 54.0                | -                    | -18.5       |

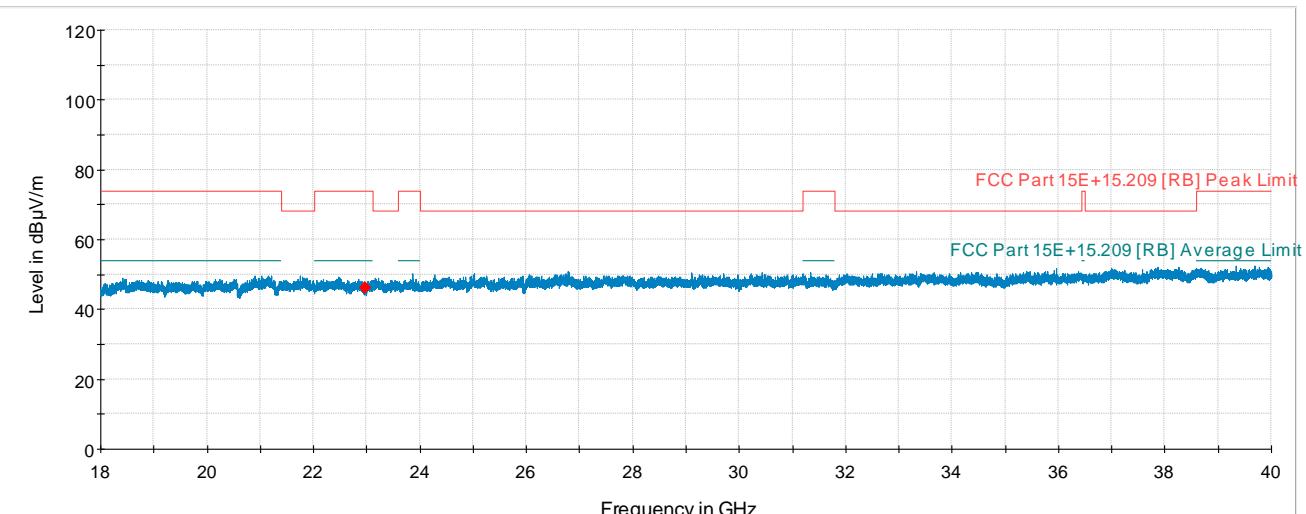
Note: \* - indicates frequency in FCC §15.205 Restricted bands of operation; RB - Restricted Band; NRB – Non-Restricted Band

#### Radiated Spurious Emissions Pre-scan Vertical and Horizontal Plots

##### Channel 149 (5.745 GHz): 1-18 GHz Vertical Plot

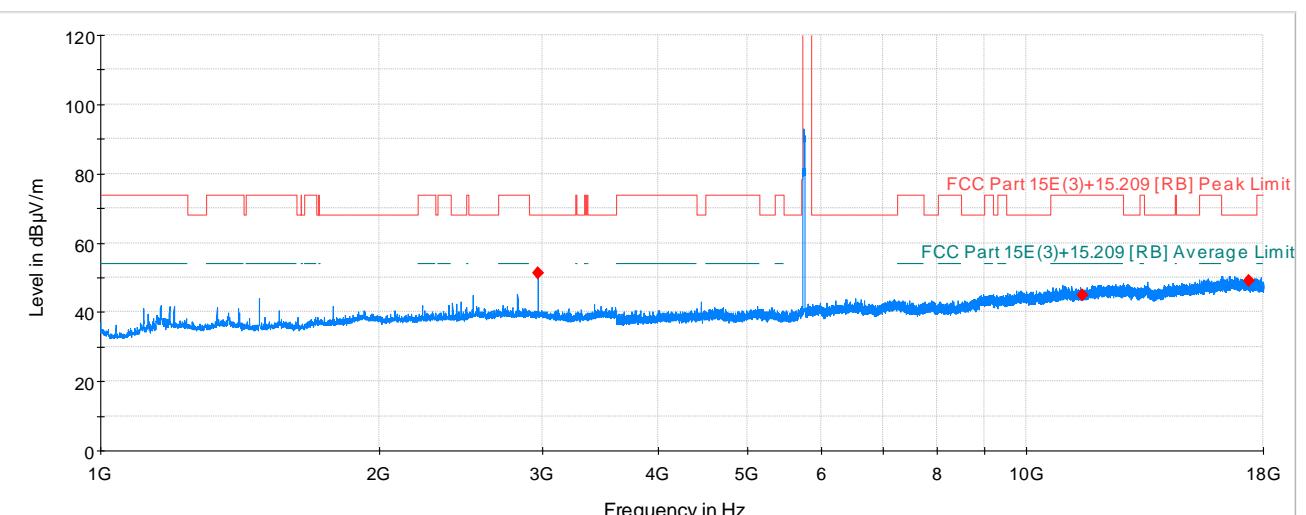


Channel 149 (5.745 GHz): 18-40 GHz Vertical Plot



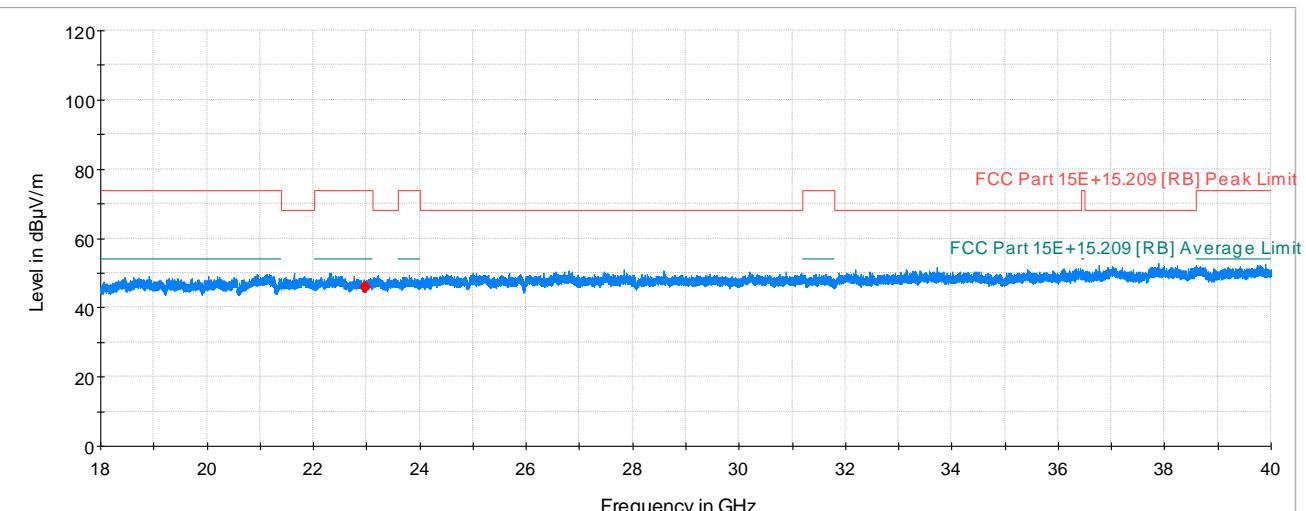
802.11a: 6Mbps - Radiated Emissions 18-40GHz at Channel 149 (Vertical)

Channel 149 (5.745 GHz): 1-18 GHz Horizontal Plot



802.11a: 6Mbps - Radiated Emissions 1-18GHz at Channel 149 (Horizontal)

Channel 149 (5.745 GHz): 18-40 GHz Horizontal Plot

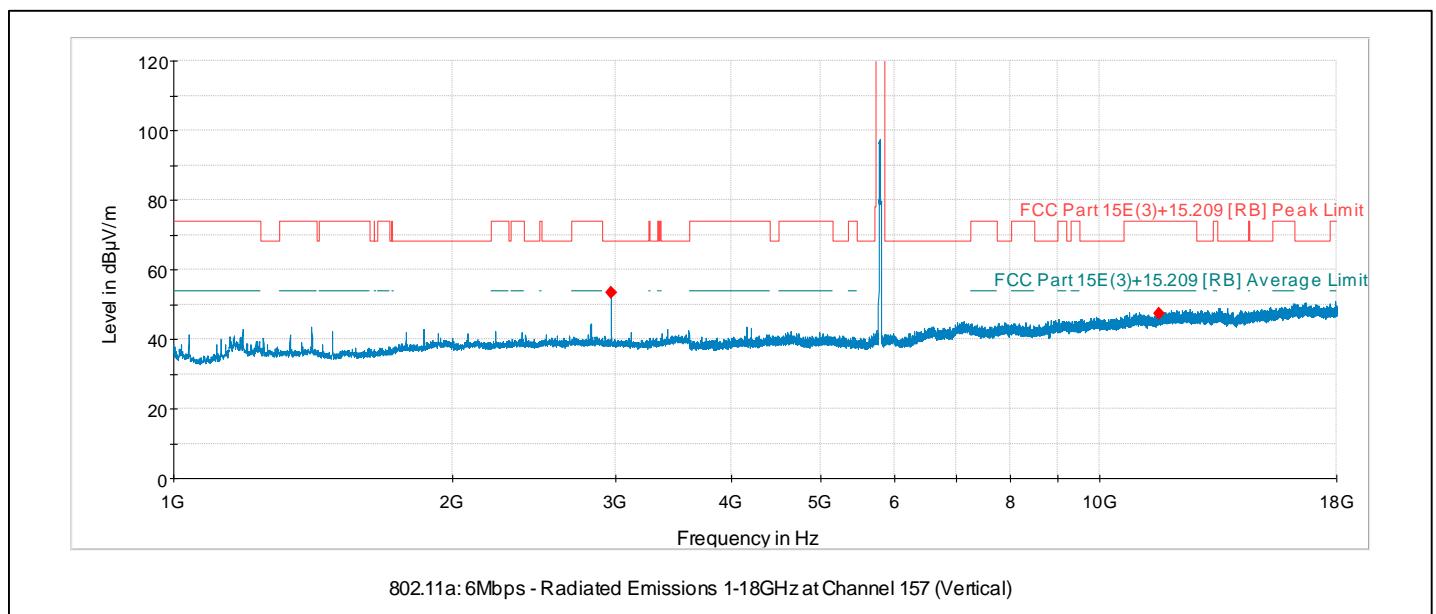


802.11a: 6Mbps - Radiated Emissions 18-40GHz at Channel 149 (Horizontal)

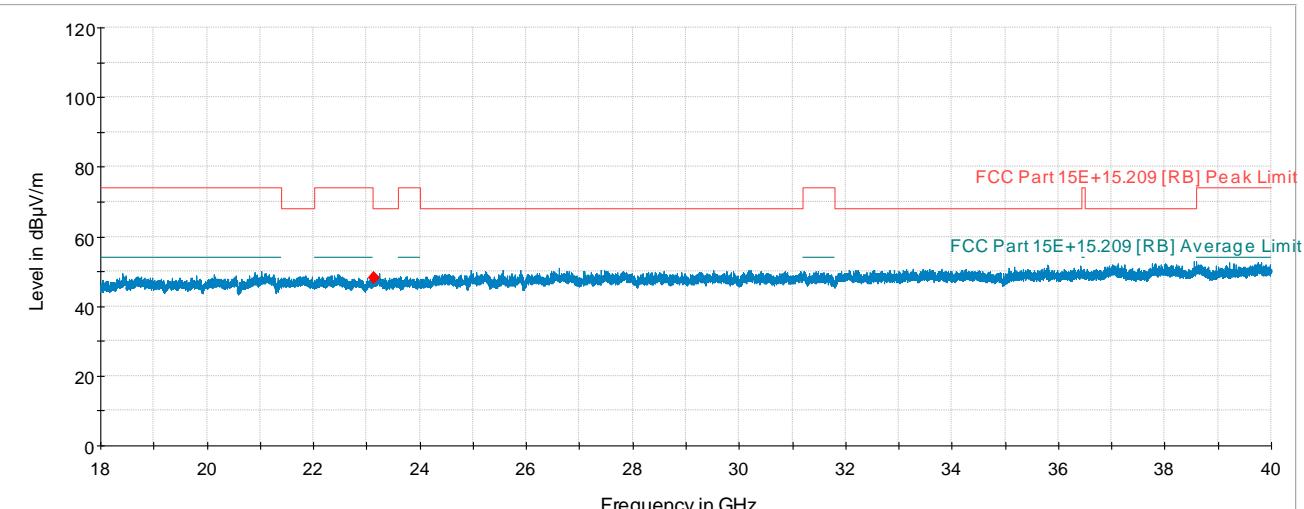
Channel 157 (5.785 GHz)

| Frequency<br>(MHz) | SA<br>Reading<br>(dBuV/m) | Detector<br>PK/AV | Antenna        |                   | Turntable | EUT<br>Antenna<br>Polarity<br>(V/H1/H2) | DC<br>Factor<br>(dB) | Correction<br>Factor<br>(dB) | Corrected<br>Level<br>(dBuV/m) | Limit<br>[RB]<br>(dBuV/m) | Limit<br>[NRB]<br>(dBuV/m) | Margin<br>(dB) |
|--------------------|---------------------------|-------------------|----------------|-------------------|-----------|---|----------------------|------------------------------|--------------------------------|---------------------------|----------------------------|----------------|
|                    |                           |                   | Height<br>(cm) | Polarity<br>(V/H) |           |   |                      |                              |                                |                           |                            |                |
| 2968.6             | 51.5                      | PK                | 150.0          | V                 | 0.0       | V                                       | 0.0                  | 1.9                          | 53.4                           |                           | 68.2                       | -14.8          |
| *11570.0           | 37.2                      | PK                | 145.0          | V                 | 18.0      | V                                       | 0.0                  | 12.4                         | 49.6                           | 74.0                      |                            | -24.4          |
| *11570.0           | 24.9                      | AV                | 145.0          | V                 | 18.0      | V                                       | 0.0                  | 12.4                         | 37.3                           | 54.0                      |                            | -16.7          |

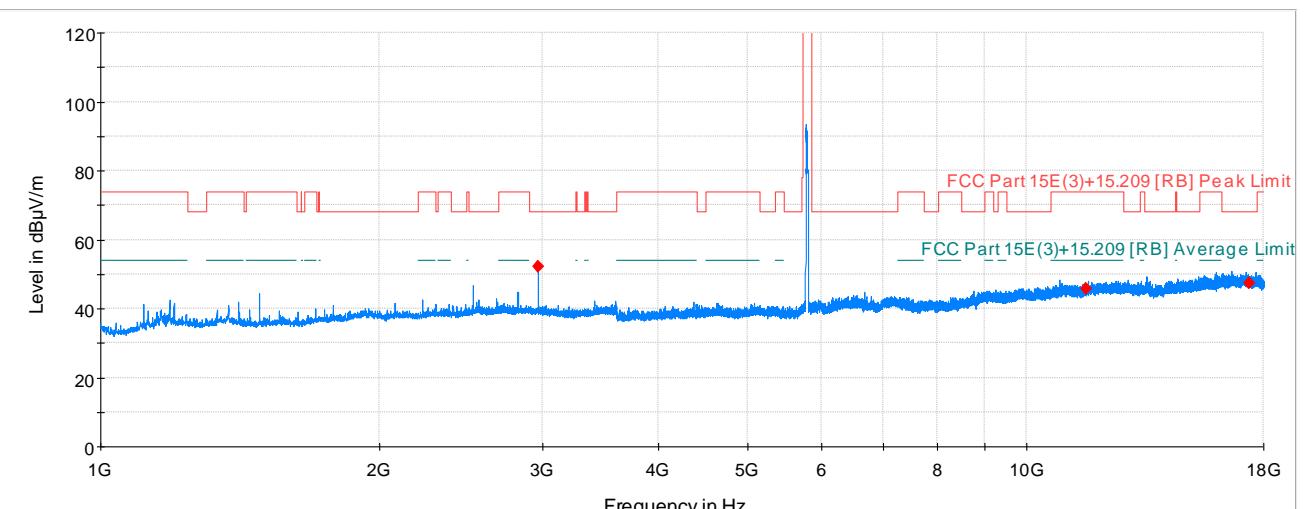
Note: \* - indicates frequency in FCC §15.205 Restricted bands of operation; RB - Restricted Band; NRB – Non-Restricted Band

**Radiated Spurious Emissions Pre-scan Vertical and Horizontal Plots**
Channel 157 (5.785 GHz): 1-18 GHz Vertical Plot


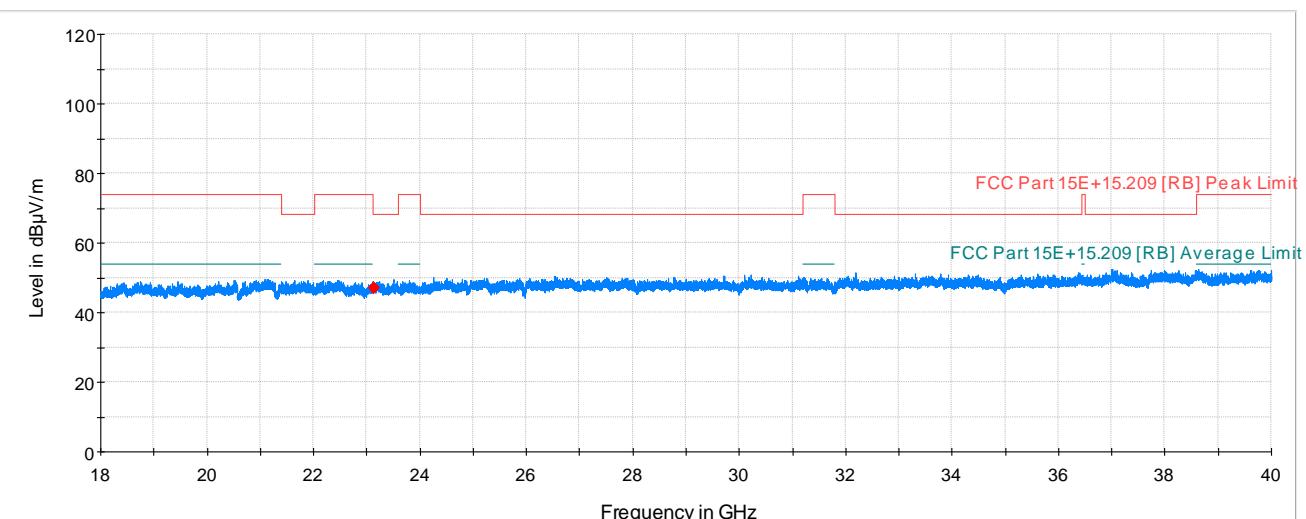
Channel 157 (5.785 GHz): 18-40 GHz (Vertical Plot)



Channel 157 (5.785 GHz): 1-18 GHz (Horizontal Plot)



Channel 157 (5.785 GHz): 18-40 GHz Horizontal Plot

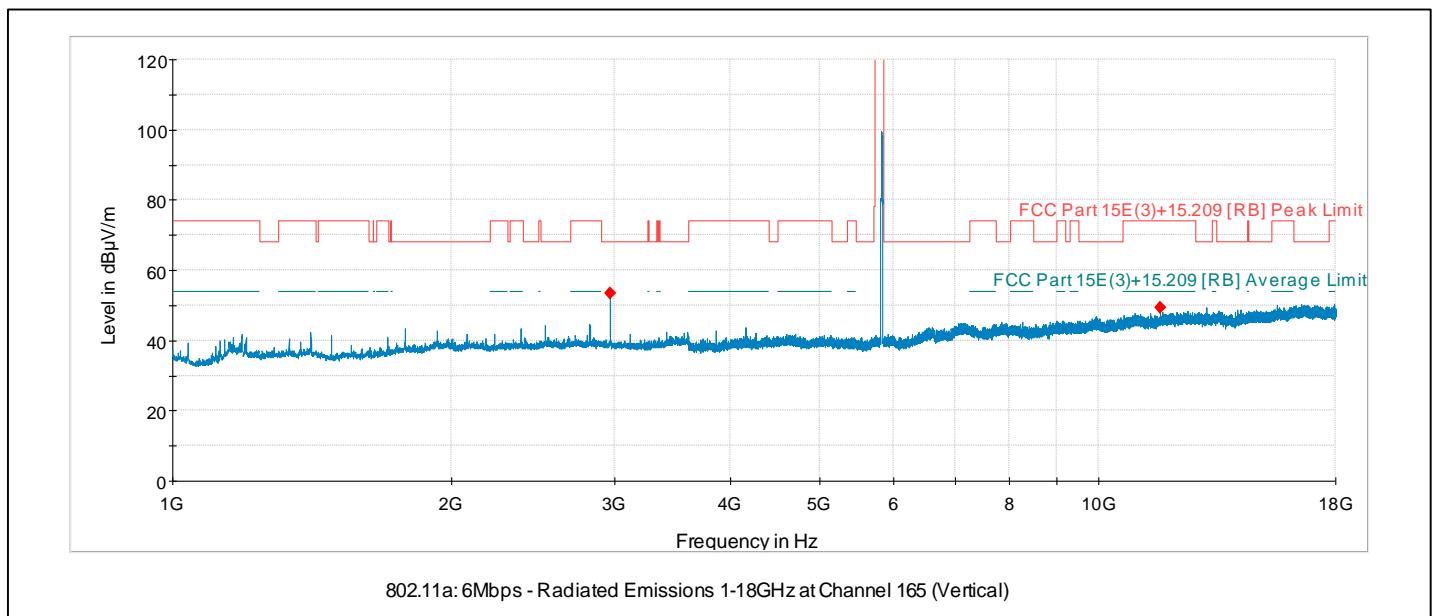


802.11a: 6Mbps - Radiated Emissions 18-40GHz at Channel 157 (Horizontal)

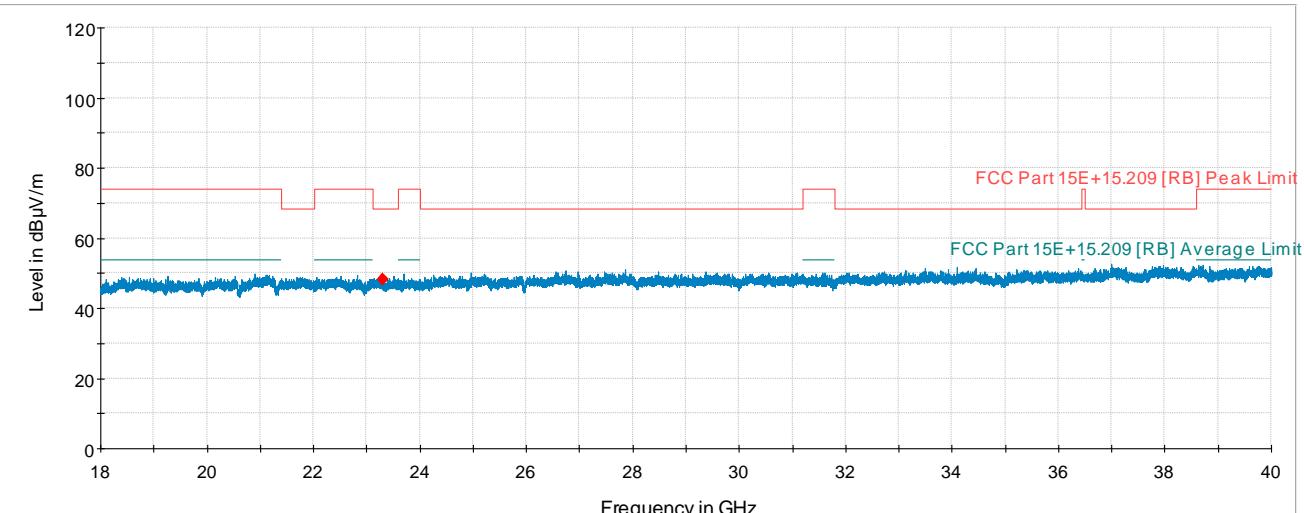
Channel 165 (5.825 GHz)

| Frequency<br>(MHz) | SA<br>Reading<br>(dBuV/m) | Detector<br>PK/AV | Antenna        |                   | Turntable | EUT<br>Antenna<br>Polarity<br>(V/H1/H2) | DC<br>Factor<br>(dB) | Correction<br>Factor<br>(dB) | Corrected<br>Level<br>(dBuV/m)) | Limit<br>[RB]<br>(dBuV/m) | Limit<br>[NRB]<br>(dBuV/m) | Margin<br>(dB) |
|--------------------|---------------------------|-------------------|----------------|-------------------|-----------|---|----------------------|------------------------------|---------------------------------|---------------------------|----------------------------|----------------|
|                    |                           |                   | Height<br>(cm) | Polarity<br>(V/H) |           |   |                      |                              |                                 |                           |                            |                |
| 2968.6             | 51.6                      | PK                | 150.0          | V                 | 0.0       | V                                       | 0.0                  | 1.9                          | 53.5                            | -                         | 68.2                       | -14.7          |
| *11650.0           | 37.7                      | PK                | 145.0          | V                 | 18.0      | V                                       | 0.0                  | 12.4                         | 50.1                            | 74.0                      | -                          | -23.9          |
| *11650.0           | 25.0                      | AV                | 145.0          | V                 | 18.0      | V                                       | 0.0                  | 12.4                         | 37.4                            | 54.0                      | -                          | -16.6          |

Note: \* - indicates frequency in FCC §15.205 Restricted bands of operation; RB - Restricted Band; NRB – Non-Restricted Band

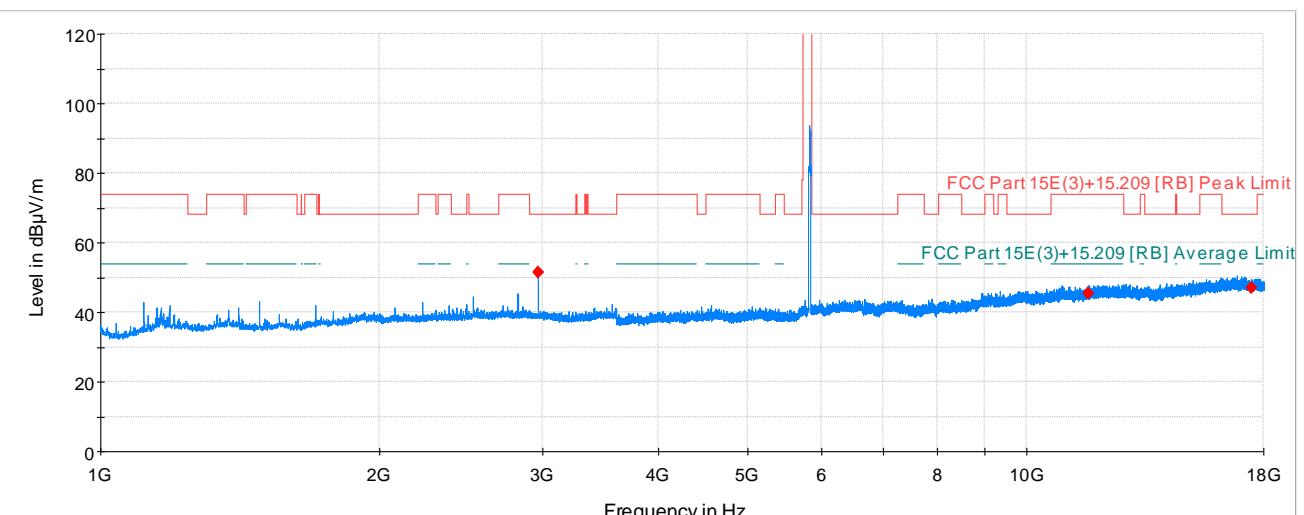
**Radiated Spurious Emissions Pre-scan Vertical and Horizontal Plots**
Channel 165 (5.825 GHz): 1-18 GHz Vertical Plot


Channel 165 (5.825 GHz): 18-40 GHz Vertical Plot



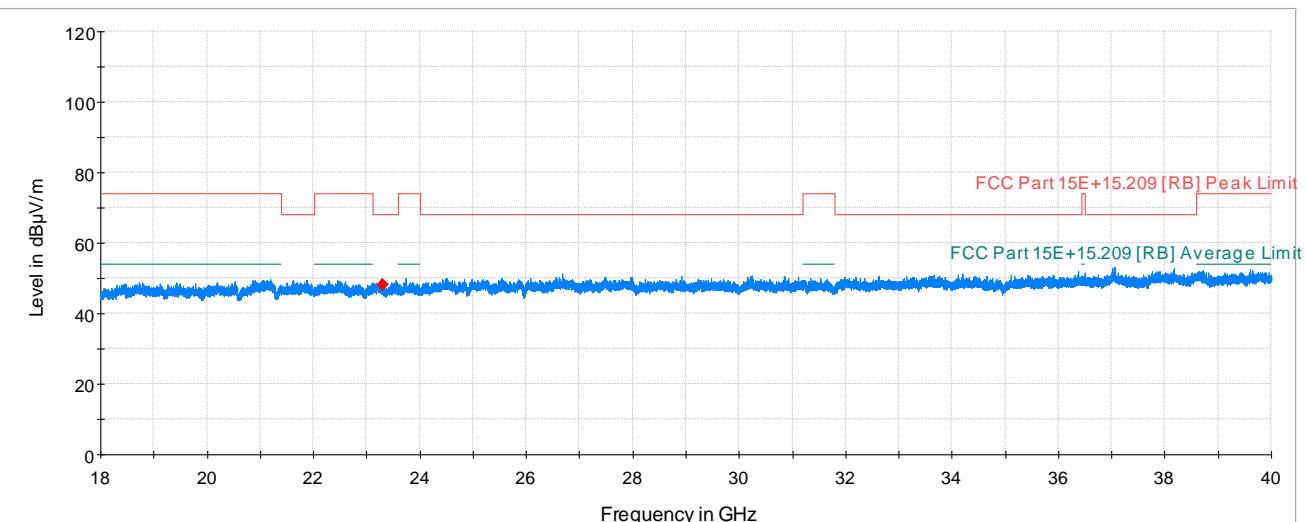
802.11a: 6Mbps - Radiated Emissions 18-40GHz at Channel 165 (Vertical)

Channel 165 (5.825 GHz): 1-18 GHz Horizontal Plot



802.11a: 6Mbps - Radiated Emissions 1-18GHz at Channel 165 (Horizontal)

Channel 165 (5.825 GHz): 18-40 GHz Horizontal Plot



802.11a: 6Mbps - Radiated Emissions 18-40GHz at Channel 165 (Horizontal)

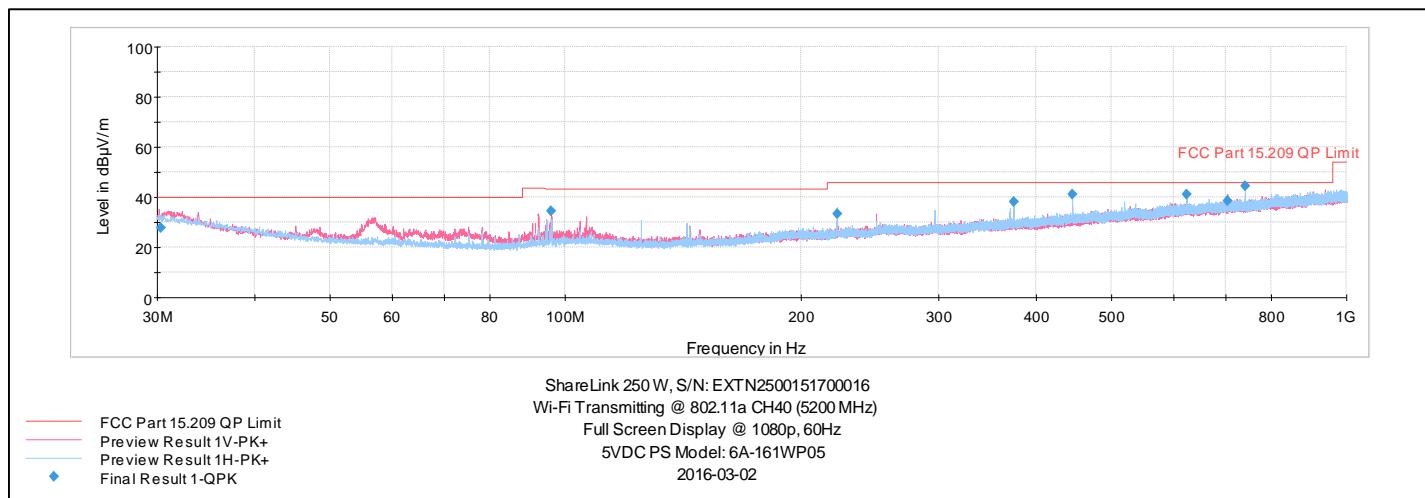
### 6.5.15 Transmitter Radiated Emissions in the 30MHz to 1000MHz

#### A. Using adapter power supply (Model: 6A-161WP05)

|                       |          |                              |            |
|-----------------------|----------|------------------------------|------------|
| Worst Case Mode:      | 802.11a  | Test Date(s):                | 03/02/2016 |
| Data Rate:            | 6 Mbps   | Test Location (Lab):         | Lab B      |
| Measurement Distance: | 3 meters | Temperature (°C):            | 23         |
| Operating Frequency:  | 5200 MHz | Humidity (%):                | 45         |
| Test Channel:         | 40       | Atmospheric pressure (mbar): | 1018       |

Note: EUT at Full Screen Display with 1080p, 60Hz resolution; Wi-Fi Transmitter ON; LAN at 1GB Connection

#### 30-1000 MHz Plot



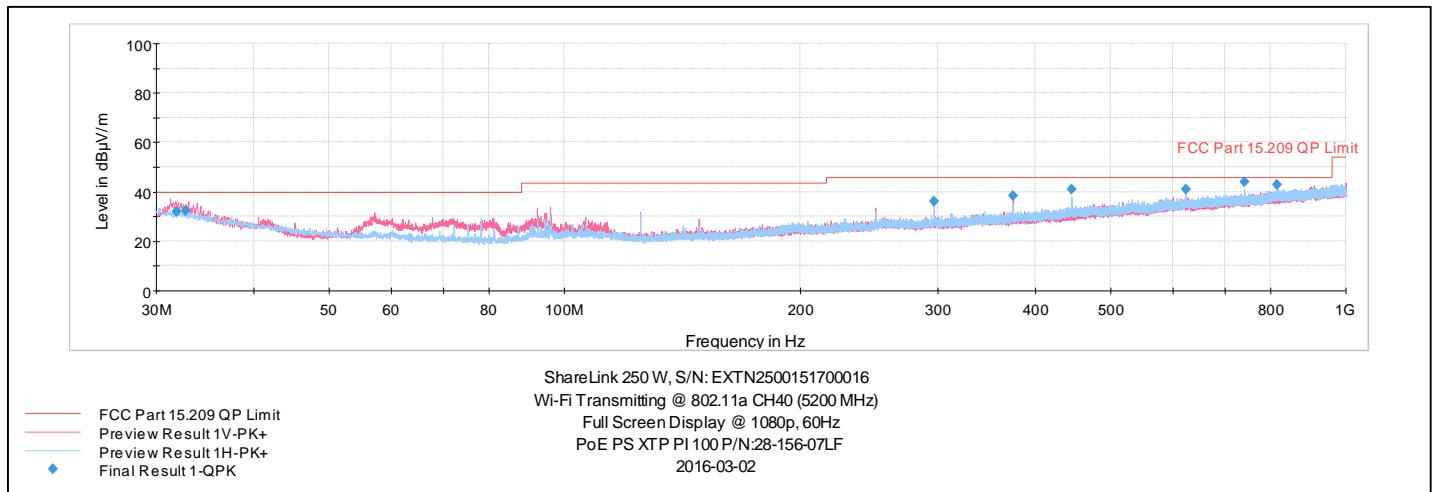
#### Results

| Frequency (MHz) | Amplitude (dB $\mu$ V) | Height (cm) | Antenna Polarization (H/V) | Azimuth (deg) | Correction Factor (dB) | Margin (dB) | Limit (dB $\mu$ V/m) | Detector (QP/PK/AV) |
|-----------------|------------------------|-------------|----------------------------|---------------|------------------------|-------------|----------------------|---------------------|
| 742.180         | 44.4                   | 116.0       | V                          | 278.0         | 23.3                   | -1.6        | 46.0                 | QP                  |
| 445.303         | 41.0                   | 110.0       | H                          | 50.0          | 19.0                   | -5.0        | 46.0                 | QP                  |
| 625.005         | 41.0                   | 100.0       | V                          | 97.0          | 22.0                   | -5.0        | 46.0                 | QP                  |
| 705.078         | 38.5                   | 119.0       | V                          | 137.0         | 23.1                   | -7.5        | 46.0                 | QP                  |
| 374.862         | 38.0                   | 115.0       | H                          | 169.0         | 17.0                   | -8.0        | 46.0                 | QP                  |
| 95.910          | 34.5                   | 110.0       | V                          | 225.0         | 10.2                   | -9.0        | 43.5                 | QP                  |

**B. Using PoE power supply (Model: XTP PI 100)**

|                       |          |                              |            |
|-----------------------|----------|------------------------------|------------|
| Worst Case Mode:      | 802.11a  | Test Date(s):                | 03/02/2016 |
| Data Rate:            | 6 Mbps   | Test Location (Lab):         | Lab B      |
| Measurement Distance: | 3 meters | Temperature (°C):            | 23         |
| Operating Frequency:  | 5200 MHz | Humidity (%):                | 45         |
| Test Channel:         | 40       | Atmospheric pressure (mbar): | 1018       |

Note: EUT at Full Screen Display with 1080p, 60Hz resolution; Wi-Fi Transmitter ON; LAN at 1GB Connection

30-1000 MHz Plot

Results

| Frequency (MHz) | Amplitude (dB $\mu$ V) | Height (cm) | Antenna Polarization (H/V) | Azimuth (deg) | Correction Factor (dB) | Margin (dB) | Limit (dB $\mu$ V/m) | Detector (QP/PK/AV) |
|-----------------|------------------------|-------------|----------------------------|---------------|------------------------|-------------|----------------------|---------------------|
| 742.211         | 44.1                   | 137.0       | H                          | 284.0         | 23.5                   | -1.9        | 46.0                 | QP                  |
| 816.440         | 42.7                   | 100.0       | H                          | 113.0         | 25.3                   | -3.3        | 46.0                 | QP                  |
| 624.996         | 41.1                   | 150.0       | H                          | 78.0          | 22.6                   | -4.9        | 46.0                 | QP                  |
| 445.327         | 41.0                   | 100.0       | H                          | 158.0         | 19.0                   | -5.0        | 46.0                 | QP                  |
| 32.771          | 32.3                   | 100.0       | V                          | 141.0         | 15.0                   | -7.7        | 40.0                 | QP                  |
| 375.009         | 38.2                   | 122.0       | V                          | 270.0         | 16.6                   | -7.8        | 46.0                 | QP                  |

## 6.6 Frequency Stability

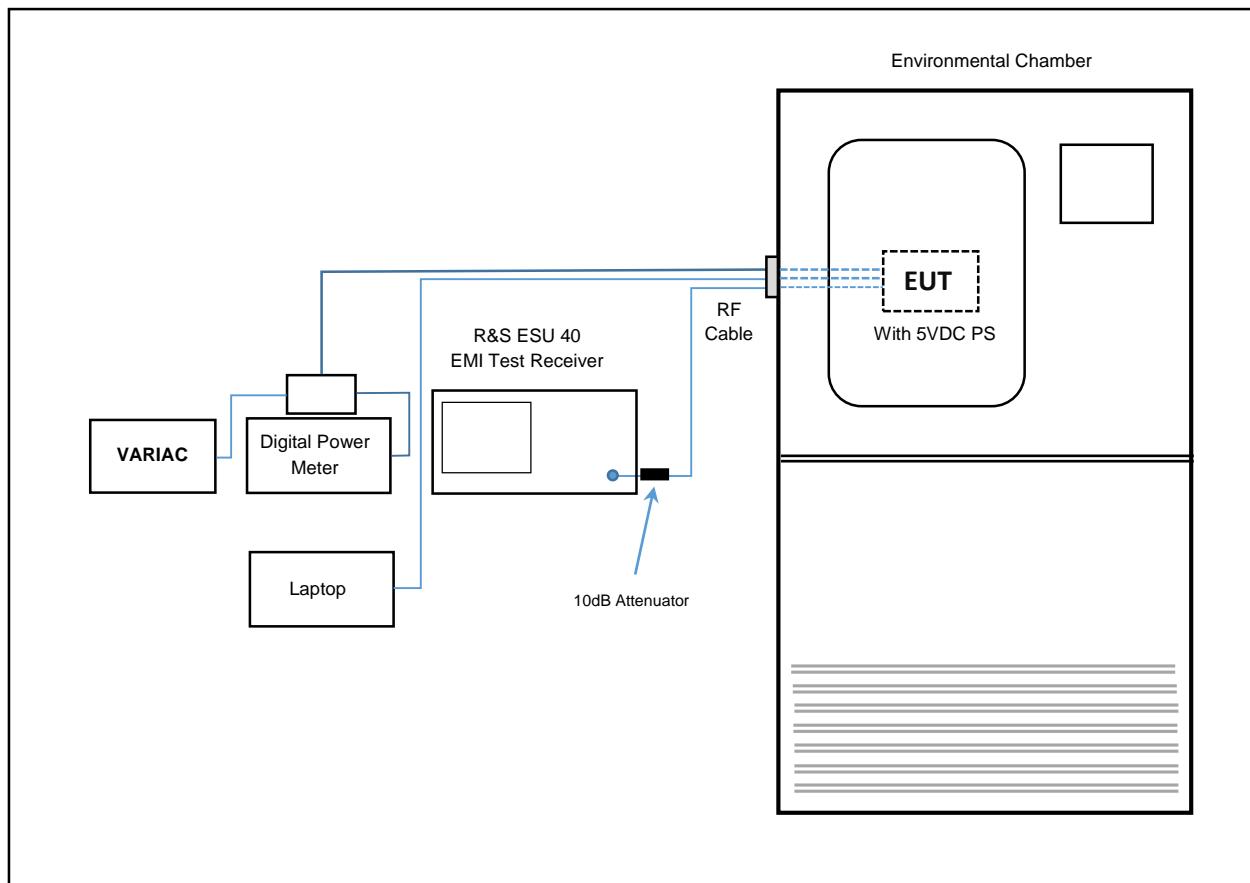
### Limits

FCC § 15.407 (g) - Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation

### Test Procedure

- ANSI C63.10-2013 Section 6.8.1 – for Frequency stability with respect to ambient temperature
- ANSI C63.10-2013 Section 6.8.2 – for Frequency Stability when varying supply voltage

### Test Setup



## Test Results

### A. Frequency Stability with respect to ambient temperature

Operating Frequency: 5.18 GHz

| Power Supply (Vac) | Temperature (°C) | 0 minute                 |                       | 2 minutes                |                       | 5 minutes                |                       | 10 minutes               |                       |
|--------------------|------------------|--------------------------|-----------------------|--------------------------|-----------------------|--------------------------|-----------------------|--------------------------|-----------------------|
|                    |                  | Measured Frequency (MHz) | Frequency Drift (ppm) |
| 120 Vac (Nominal)  | 50               | 5179.9900                | -0.19                 | 5180.0539                | 1.04                  | 5180.0872                | 1.68                  | 5180.1150                | 2.22                  |
|                    | 40               | 5179.9490                | -0.98                 | 5179.9702                | -0.58                 | 5180.0080                | 0.15                  | 5180.0404                | 0.78                  |
|                    | 30               | 5179.9696                | -0.59                 | 5179.9494                | -0.98                 | 5179.9697                | -0.58                 | 5179.9929                | -0.14                 |
|                    | 20               | 5179.9724                | -0.53                 | 5179.9474                | -1.02                 | 5179.9548                | -0.87                 | 5179.9673                | -0.63                 |
|                    | 10               | 5179.9760                | -0.46                 | 5179.9468                | -1.03                 | 5179.9471                | -1.02                 | 5179.9519                | -0.93                 |
|                    | 0                | 5180.0039                | 0.08                  | 5179.9564                | -0.84                 | 5179.9490                | -0.98                 | 5179.9468                | -1.03                 |
|                    | -10              | 5180.0087                | 0.17                  | 5179.9744                | -0.49                 | 5179.9561                | -0.85                 | 5179.9503                | -0.96                 |
|                    | -20              | 5180.0029                | 0.06                  | 5179.9850                | -0.29                 | 5179.9673                | -0.63                 | 5179.9577                | -0.82                 |
|                    | -30              | 5179.9830                | -0.33                 | 5180.0000                | 0.00                  | 5179.9827                | -0.33                 | 5179.9737                | -0.51                 |

Operating Frequency: 5.825 GHz

| Power Supply (Vac) | Temperature (°C) | 0 minute                 |                       | 2 minutes                |                       | 5 minutes                |                       | 10 minutes               |                       |
|--------------------|------------------|--------------------------|-----------------------|--------------------------|-----------------------|--------------------------|-----------------------|--------------------------|-----------------------|
|                    |                  | Measured Frequency (MHz) | Frequency Drift (ppm) |
| 120 Vac (Nominal)  | 50               | 5824.9462                | -9.24                 | 5824.9740                | -4.46                 | 5825.0388                | 6.66                  | 5825.0942                | 16.17                 |
|                    | 40               | 5824.9487                | -8.81                 | 5824.9603                | -6.82                 | 5825.0019                | 0.33                  | 5825.0378                | 6.49                  |
|                    | 30               | 5824.9602                | -6.83                 | 5824.9446                | -9.51                 | 5824.9689                | -5.34                 | 5824.9917                | -1.42                 |
|                    | 20               | 5824.9506                | -8.48                 | 5824.9468                | -9.13                 | 5824.9590                | -7.04                 | 5824.9673                | -5.61                 |
|                    | 10               | 5824.9763                | -4.07                 | 5824.9413                | -10.08                | 5824.9410                | -10.13                | 5824.9452                | -9.41                 |
|                    | 0                | 5825.0058                | 1.00                  | 5824.9650                | -6.01                 | 5824.9426                | -9.85                 | 5824.9401                | -10.28                |
|                    | -10              | 5825.0106                | 1.82                  | 5824.9718                | -4.84                 | 5824.9532                | -8.03                 | 5824.9449                | -9.46                 |
|                    | -20              | 5825.0067                | 1.15                  | 5824.9881                | -2.04                 | 5824.9679                | -5.51                 | 5824.9571                | -7.36                 |
|                    | -30              | 5824.9965                | -0.60                 | 5825.0003                | 0.05                  | 5824.9833                | -2.87                 | 5824.9724                | -4.74                 |

**B. Frequency Stability when varying supply voltage**
Operating Frequency: 5.18 GHz

| Temperature<br>(°C) | Power<br>Supply<br>(Vac) | 0 minute                       |                             | 2 minutes                      |                             | 5 minutes                      |                             | 10 minutes                     |                             |
|---------------------|--------------------------|--------------------------------|-----------------------------|--------------------------------|-----------------------------|--------------------------------|-----------------------------|--------------------------------|-----------------------------|
|                     |                          | Measured<br>Frequency<br>(MHz) | Frequency<br>Drift<br>(ppm) | Measured<br>Frequency<br>(MHz) | Frequency<br>Drift<br>(ppm) | Measured<br>Frequency<br>(MHz) | Frequency<br>Drift<br>(ppm) | Measured<br>Frequency<br>(MHz) | Frequency<br>Drift<br>(ppm) |
| 20                  | 102                      | 5179.9542                      | -0.88                       | 5179.9539                      | -0.89                       | 5179.9651                      | -0.67                       | 5179.9728                      | -0.53                       |
|                     | 120                      | 5179.9724                      | -0.53                       | 5179.9474                      | -1.02                       | 5179.9548                      | -0.87                       | 5179.9673                      | -0.63                       |
|                     | 138                      | 5179.9551                      | -0.87                       | 5179.9538                      | -0.89                       | 5179.9657                      | -0.66                       | 5179.9737                      | -0.51                       |

Operating Frequency: 5.825 GHz

| Temperature<br>(°C) | Power<br>Supply<br>(Vac) | 0 minute                       |                             | 2 minutes                      |                             | 5 minutes                      |                             | 10 minutes                     |                             |
|---------------------|--------------------------|--------------------------------|-----------------------------|--------------------------------|-----------------------------|--------------------------------|-----------------------------|--------------------------------|-----------------------------|
|                     |                          | Measured<br>Frequency<br>(MHz) | Frequency<br>Drift<br>(ppm) | Measured<br>Frequency<br>(MHz) | Frequency<br>Drift<br>(ppm) | Measured<br>Frequency<br>(MHz) | Frequency<br>Drift<br>(ppm) | Measured<br>Frequency<br>(MHz) | Frequency<br>Drift<br>(ppm) |
| 20                  | 102                      | 5824.9519                      | -8.26                       | 5824.9462                      | -9.24                       | 5824.9580                      | -7.21                       | 5824.9663                      | -5.79                       |
|                     | 120                      | 5824.9506                      | -8.48                       | 5824.9468                      | -9.13                       | 5824.9590                      | -7.04                       | 5824.9673                      | -5.61                       |
|                     | 138                      | 5824.9522                      | -8.21                       | 5824.9458                      | -9.30                       | 5824.9574                      | -7.31                       | 5824.9657                      | -5.89                       |

## 6.7 AC Power-line Conducted Emissions

### Limits

FCC § 15.207 (a)

| Frequency of emissions<br>(MHz) | Conducted Limit (dB $\mu$ V) |           |
|---------------------------------|------------------------------|-----------|
|                                 | Quasi-peak                   | Average   |
| 0.15-0.5                        | 66 to 56*                    | 56 to 46* |
| 0.5-5                           | 56                           | 46        |
| 5-30                            | 60                           | 50        |

\* Decreases with the logarithm of the frequency

### RSS-Gen Issue 4 Section 8.8

A radio apparatus that is designed to be connected to the public utility (AC) power line shall ensure that the radio frequency voltage, which is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz-30 MHz, shall not exceed the limits in Table 3.

Table 3 – AC Power Line Conducted Emissions Limits

| Frequency of emissions<br>(MHz) | Conducted Limit (dB $\mu$ V) |           |
|---------------------------------|------------------------------|-----------|
|                                 | Quasi-peak                   | Average** |
| 0.15-0.5                        | 66 to 56*                    | 56 to 46* |
| 0.5-5                           | 56                           | 46        |
| 5-30                            | 60                           | 50        |

\* Decreases with the logarithm of the frequency, \*\* A linear average detector is required

### Conducted Emissions Test Setup and Procedure

The EUT power cord was connected to a LISN and folded back and forth forming a bundle 30 to 40 cm long. All support equipment power cords were connected to an auxiliary LISN via a multiple outlet strip. The EUT LISN was kept at a distance 80 cm from the closest part of the EUT.

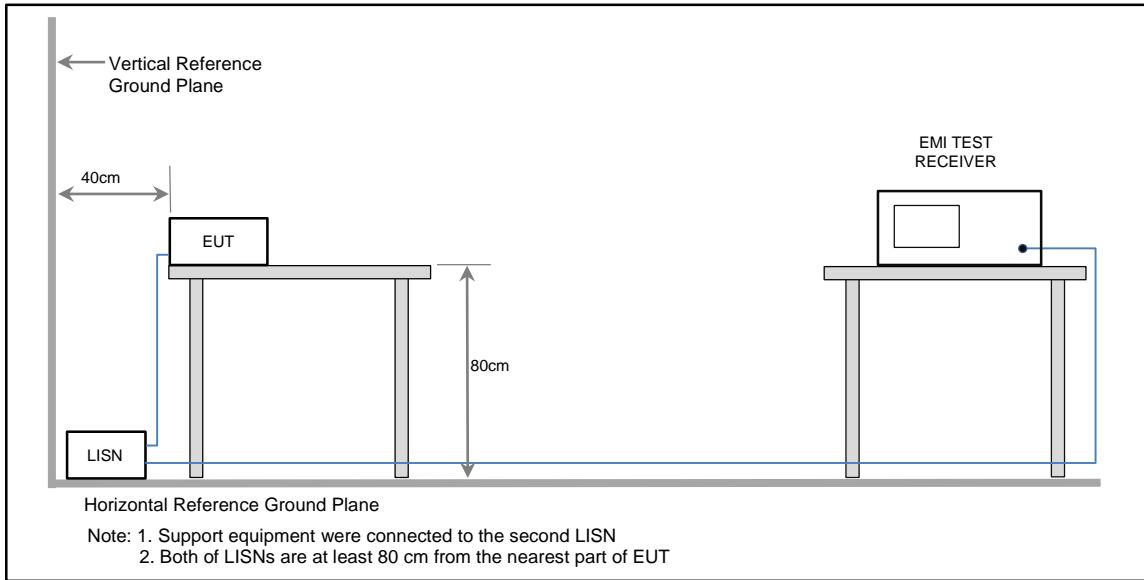
Using the test software, an initial PEAK pre-scan was taken. After the pre-scan was complete, a minimum of 6 highest frequencies were chosen. Quasi-Peak and Average measurements were taken at these frequencies selected. If the test software measured any signal within 3 dB of the limit, then the same signal was re-measured manually using the front keys of the EMI receiver to make sure of the software accuracy. This was performed for both “Line 1” and “Neutral” leads of the EUT power cord.

### Example of Calculations:

Amplitude [QP/AV] (dB $\mu$ V) = Receiver Level (dB $\mu$ V) + Correction Factor (dB)

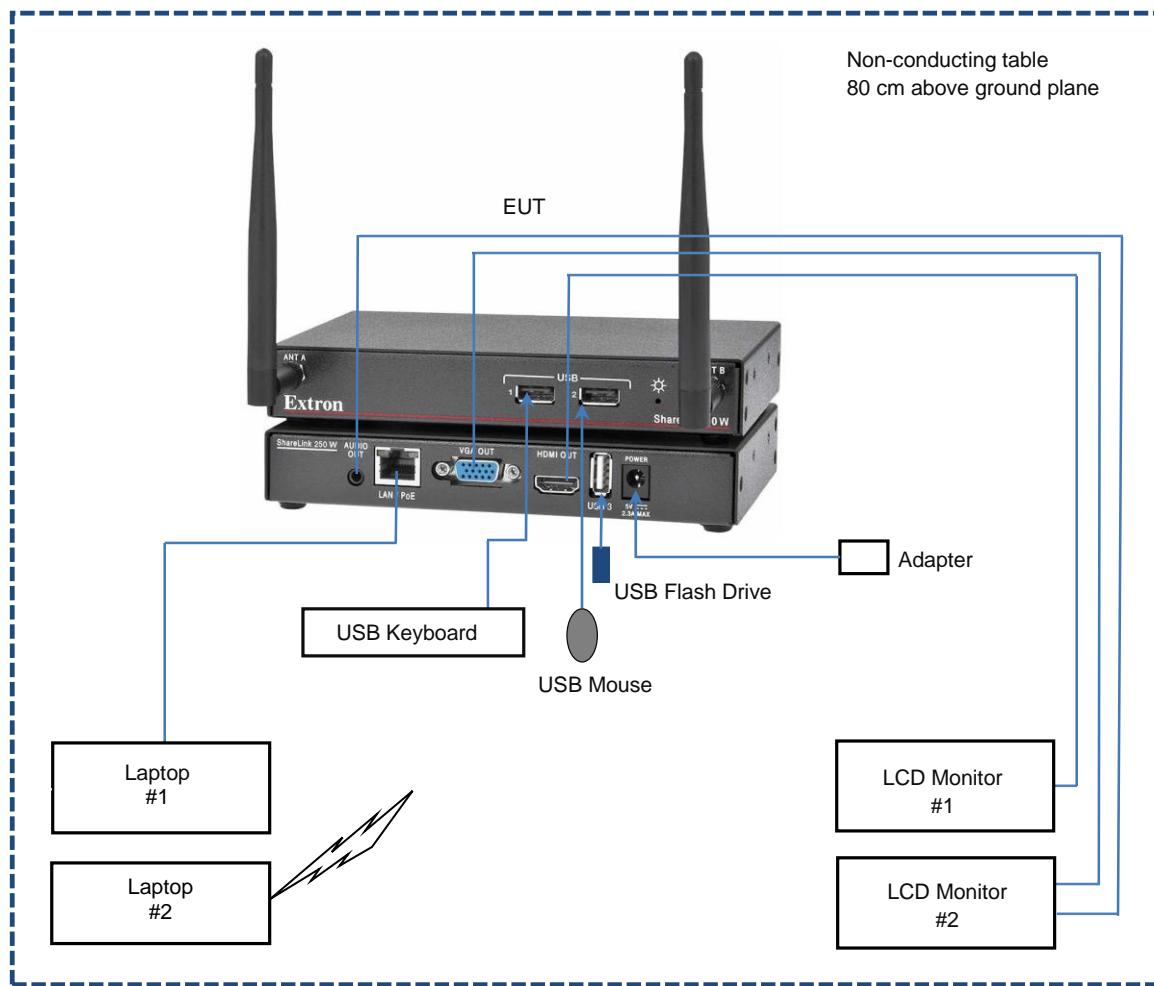
Correction Factor (dB) = Cable Loss (dB) + LISN Insertion Loss (dB) + 10 dB Attenuator

Margin (dB) = Amplitude [QP/AV] (dB $\mu$ V) – Limit [QP/AV] (dB $\mu$ V)



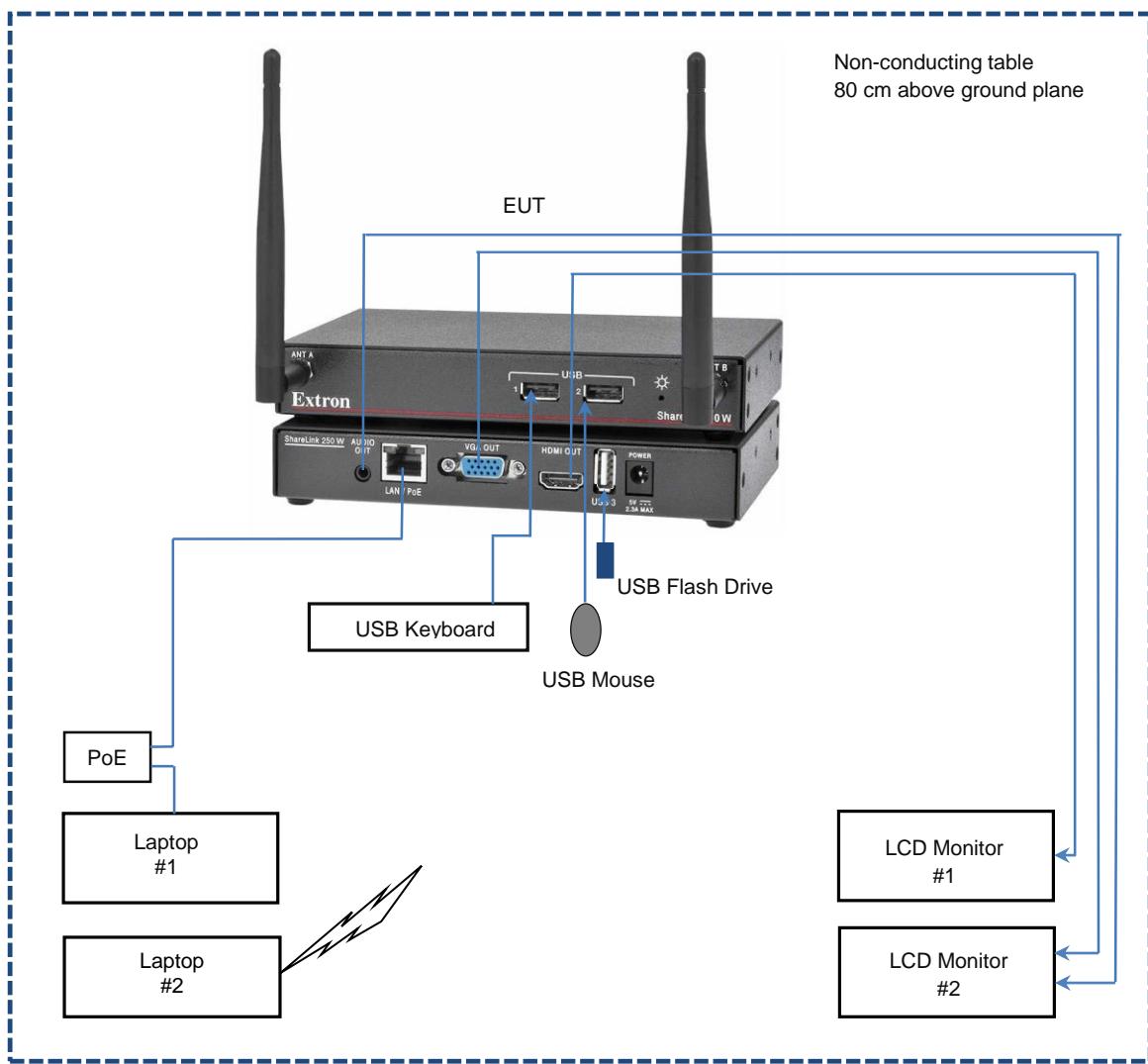
### EUT Connection Diagram

#### a. Using Adapter 6A-161WP05, 5Vdc



- HDMI OUT connected to LCD monitor #1 with 15' HDMI Ultra cable.
- VGA OUT connected to LCD monitor #2 with 35' VGA cable.
- Audio OUT connected to LCD monitor #2 (PC Audio IN) with 25' Audio mini cable
- USB 1 with USB keyboard
- USB 2 with USB mouse
- USB 3 with USB Flash Drive
- Laptop #2 (receive mode) connected to EUT via Wi-Fi
- LAN/POE connected to Laptop #1 with 10' CAT-5e UTP cable
- Power connected to AC Adapter

## b. Using PoE XTP PI 100, +48Vdc



- HDMI OUT connected to LCD monitor #1 with 15' HDMI Ultra cable.
- VGA OUT connected to LCD monitor #2 with 35' VGA cable.
- Audio OUT connected to LCD monitor #2 (PC Audio IN) with 25' Audio mini cable
- USB 1 with USB keyboard
- USB 2 with USB mouse
- USB 3 with USB Flash Drive
- Laptop #2 (receive mode) connected to EUT via Wi-Fi
- LAN/POE connected to PoE Power Supply with 10' CAT-5e UTP cable
- PoE Power Supply connected to Laptop with 10' CAT-5e UTP cable

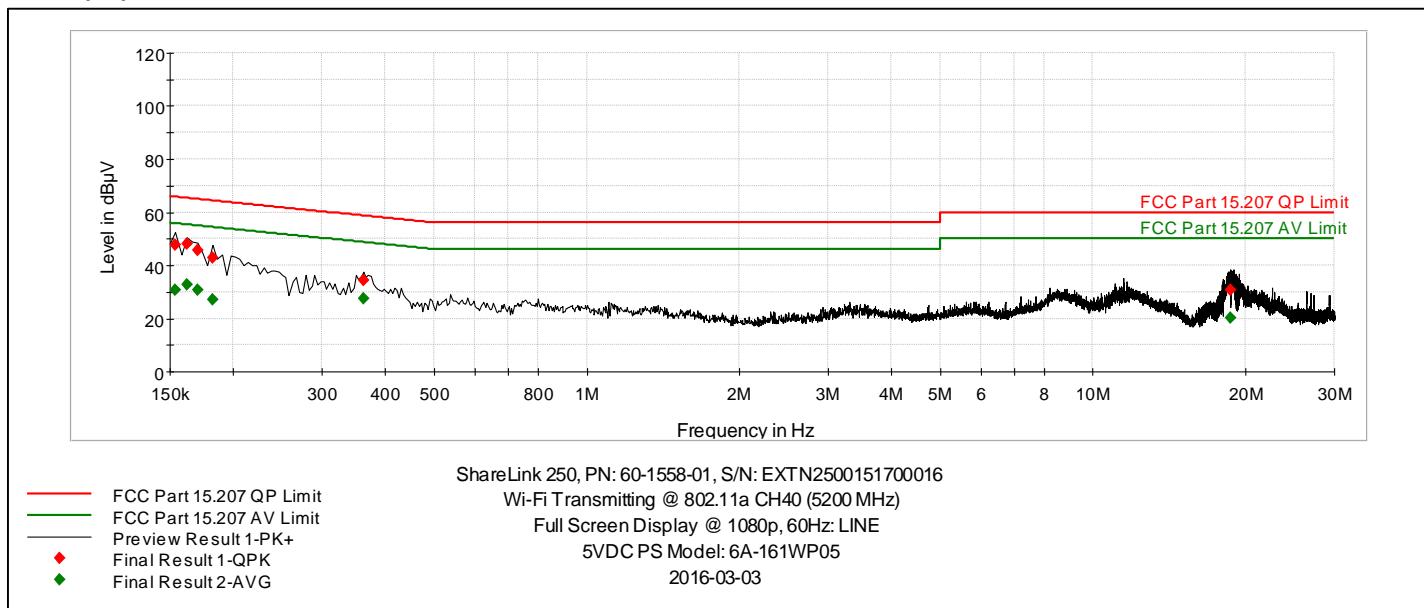
## Test Results

### A. Using adapter power supply

|                            |                   |                              |            |
|----------------------------|-------------------|------------------------------|------------|
| Wi-Fi Operating Mode:      | 802.11a           | Test Date(s):                | 03/03/2016 |
| Wi-Fi Operating Frequency: | 5200 MHz          | Test Location (Lab):         | Lab E      |
| Wi-Fi Channel              | 40                | Temperature (°C):            | 23         |
| Test Voltage/Frequency:    | 120V/60Hz         | Humidity (%):                | 46         |
| Power Supply:              | Model: 6A-161WP05 | Atmospheric pressure (mbar): | 1018       |

Note: EUT at Full Screen Display with 1080p, 60Hz resolution; Wi-Fi Transmitter ON; LAN at 1GB Connection

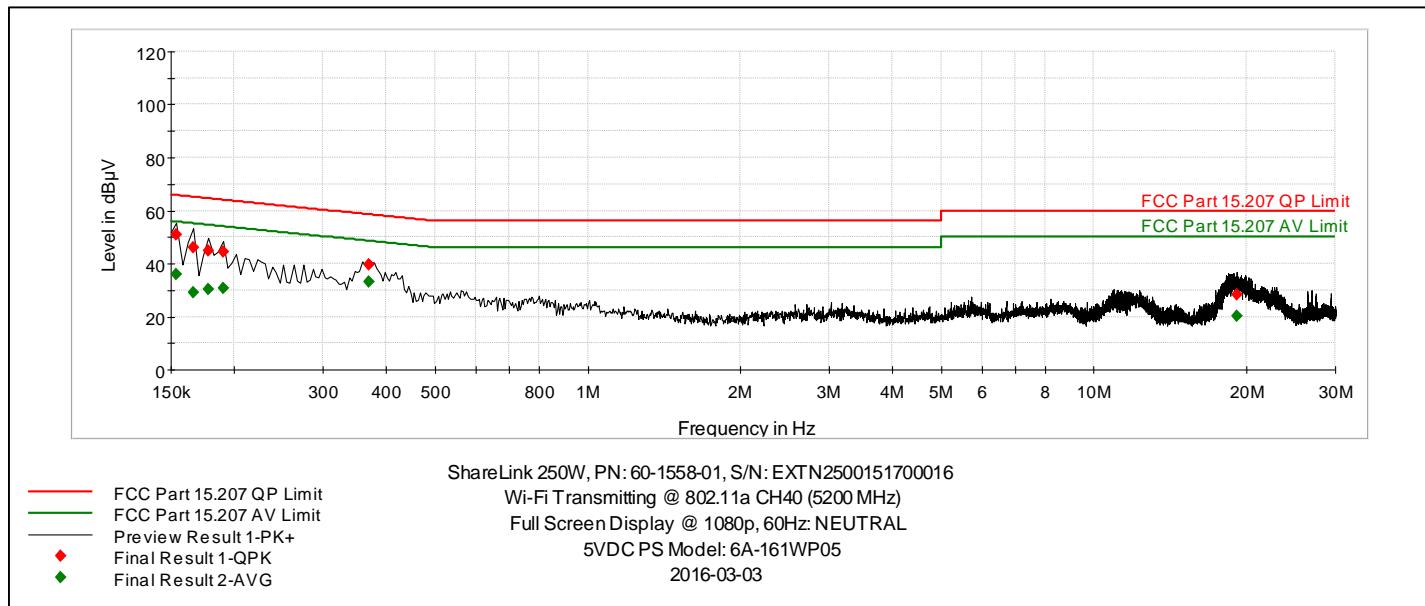
### LINE1 (L1) Plot



### LINE1 (L1) Results

| Frequency (MHz) | Amplitude (dB $\mu$ V) | Line (L1/N) | Correction Factor (dB) | Margin (dB) | Limit (dB $\mu$ V) | Detector (QP/AV) |
|-----------------|------------------------|-------------|------------------------|-------------|--------------------|------------------|
| 0.162           | 48.1                   | L1          | 19.9                   | -17.2       | 65.4               | QP               |
| 0.154           | 47.8                   | L1          | 19.9                   | -18.0       | 65.8               | QP               |
| 0.170           | 45.8                   | L1          | 19.9                   | -19.1       | 65.0               | QP               |
| 0.182           | 42.7                   | L1          | 19.8                   | -21.7       | 64.4               | QP               |
| 0.362           | 34.4                   | L1          | 19.8                   | -24.3       | 58.7               | QP               |
| 18.706          | 30.8                   | L1          | 20.0                   | -29.2       | 60.0               | QP               |

| Frequency (MHz) | Amplitude (dB $\mu$ V) | Line (L1/N) | Correction Factor (dB) | Margin (dB) | Limit (dB $\mu$ V) | Detector (QP/AV) |
|-----------------|------------------------|-------------|------------------------|-------------|--------------------|------------------|
| 0.362           | 27.6                   | L1          | 19.8                   | -21.1       | 48.7               | AV               |
| 0.162           | 32.8                   | L1          | 19.9                   | -22.6       | 55.4               | AV               |
| 0.170           | 30.7                   | L1          | 19.9                   | -24.3       | 55.0               | AV               |
| 0.154           | 30.8                   | L1          | 19.9                   | -25.0       | 55.8               | AV               |
| 0.182           | 27.1                   | L1          | 19.8                   | -27.3       | 54.4               | AV               |
| 18.706          | 20.4                   | L1          | 20.0                   | -29.6       | 50.0               | AV               |

**NEUTRAL Line (N) Plot**

**NEUTRAL Line (N) Results**

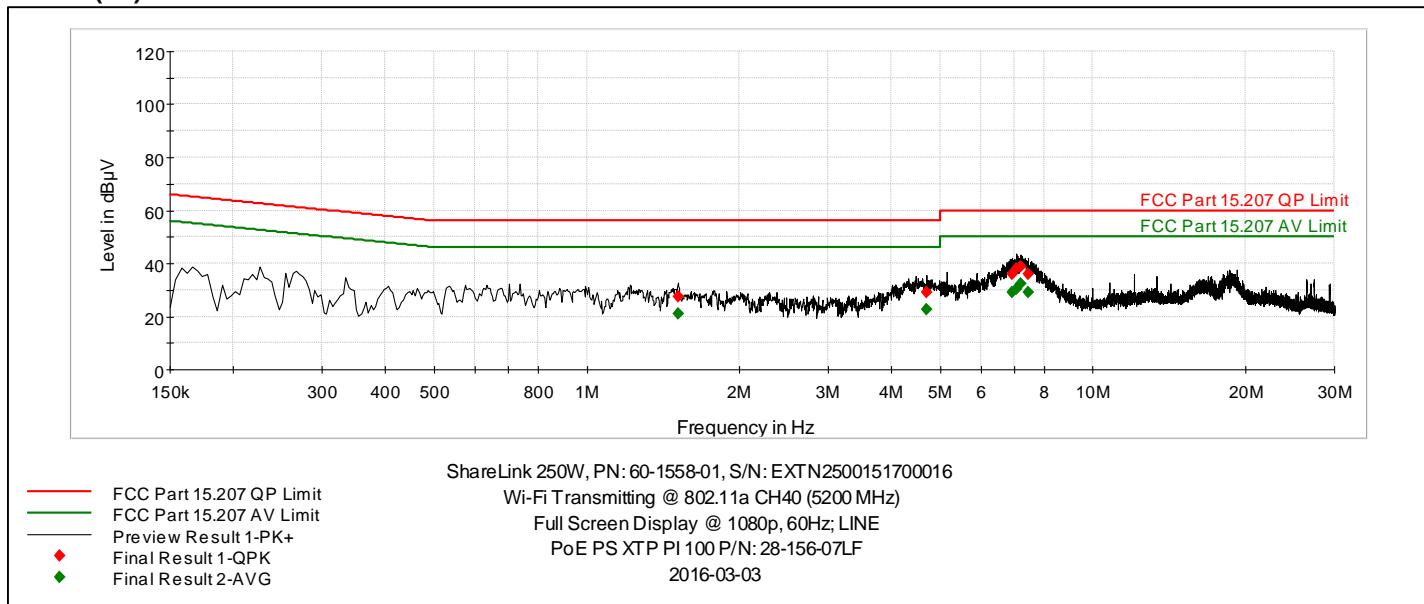
| Frequency (MHz) | Amplitude (dB $\mu$ V) | Line (L1/N) | Correction Factor (dB) | Margin (dB) | Limit (dB $\mu$ V) | Detector (QP/AV) |
|-----------------|------------------------|-------------|------------------------|-------------|--------------------|------------------|
| 0.154           | 51.0                   | N           | 19.8                   | -14.8       | 65.8               | QP               |
| 0.370           | 39.6                   | N           | 19.8                   | -18.9       | 58.5               | QP               |
| 0.166           | 46.0                   | N           | 19.8                   | -19.1       | 65.2               | QP               |
| 0.178           | 44.9                   | N           | 19.8                   | -19.6       | 64.6               | QP               |
| 0.190           | 44.3                   | N           | 19.8                   | -19.7       | 64.0               | QP               |
| 19.182          | 28.2                   | N           | 20.1                   | -31.8       | 60.0               | QP               |

| Frequency (MHz) | Amplitude (dB $\mu$ V) | Line (L1/N) | Correction Factor (dB) | Margin (dB) | Limit (dB $\mu$ V) | Detector (QP/AV) |
|-----------------|------------------------|-------------|------------------------|-------------|--------------------|------------------|
| 0.370           | 33.0                   | N           | 19.8                   | -15.5       | 48.5               | AV               |
| 0.154           | 36.1                   | N           | 19.8                   | -19.7       | 55.8               | AV               |
| 0.190           | 30.7                   | N           | 19.8                   | -23.4       | 54.0               | AV               |
| 0.178           | 30.4                   | N           | 19.8                   | -24.2       | 54.6               | AV               |
| 0.166           | 29.2                   | N           | 19.8                   | -26.0       | 55.2               | AV               |
| 19.182          | 20.1                   | N           | 20.1                   | -29.9       | 50.0               | AV               |

**B. Using PoE power supply**

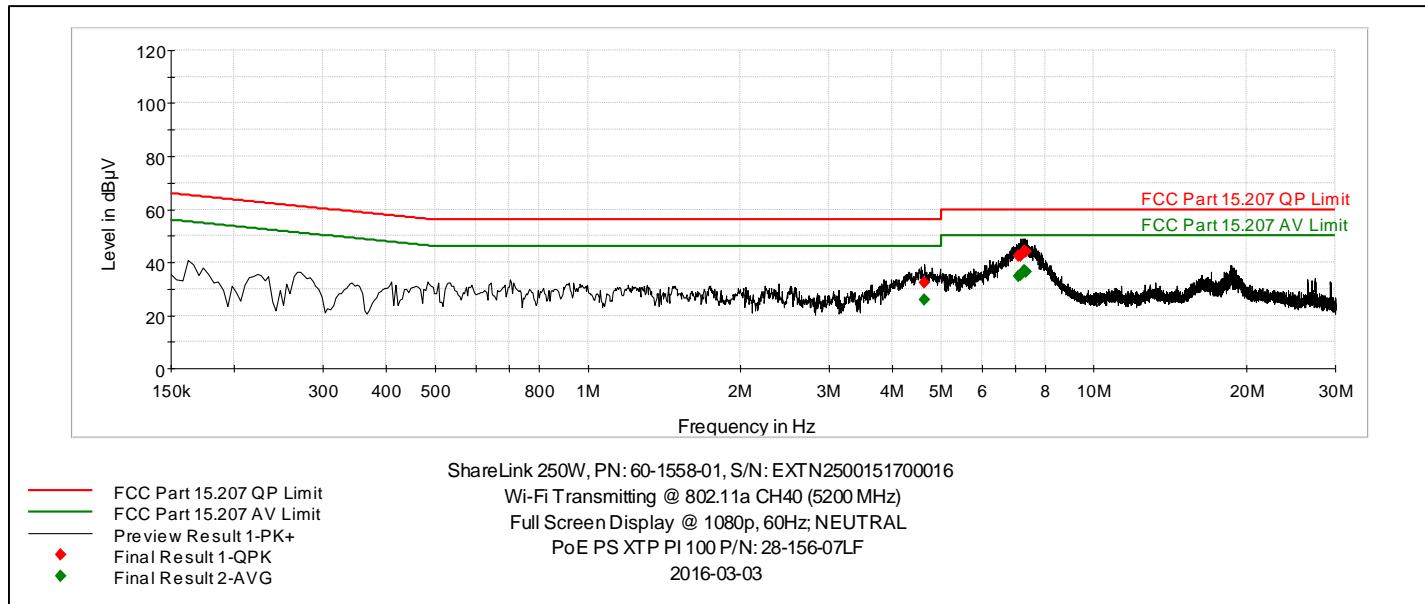
|                            |                          |                              |            |
|----------------------------|--------------------------|------------------------------|------------|
| Wi-Fi Operating Mode:      | 802.11a                  | Test Date(s):                | 03/03/2016 |
| Wi-Fi Operating Frequency: | 5200 MHz                 | Test Location (Lab):         | Lab E      |
| Wi-Fi Channel:             | 40                       | Temperature (°C):            | 23         |
| Test Voltage/Frequency:    | 120V/60Hz                | Humidity (%):                | 46         |
| Power Supply:              | PoE PS Model: XTP PI 100 | Atmospheric pressure (mbar): | 1018       |

Note: EUT at Full Screen Display with 1080p, 60Hz resolution; Wi-Fi Transmitter ON; LAN at 1GB Connection

**LINE1 (L1) Plot**

**LINE1 (L1) Results**

| Frequency (MHz) | Amplitude (dB $\mu$ V) | Line (L1/N) | Correction Factor (dB) | Margin (dB) | Limit (dB $\mu$ V) | Detector (QP/AV) |
|-----------------|------------------------|-------------|------------------------|-------------|--------------------|------------------|
| 7.214           | 38.8                   | L1          | 20.0                   | -21.2       | 60.0               | QP               |
| 7.066           | 37.8                   | L1          | 20.0                   | -22.2       | 60.0               | QP               |
| 7.438           | 36.2                   | L1          | 20.0                   | -23.8       | 60.0               | QP               |
| 6.922           | 36.0                   | L1          | 20.0                   | -24.0       | 60.0               | QP               |
| 4.690           | 29.0                   | L1          | 20.1                   | -27.0       | 56.0               | QP               |
| 1.514           | 27.6                   | L1          | 20.0                   | -28.4       | 56.0               | QP               |

| Frequency (MHz) | Amplitude (dB $\mu$ V) | Line (L1/N) | Correction Factor (dB) | Margin (dB) | Limit (dB $\mu$ V) | Detector (QP/AV) |
|-----------------|------------------------|-------------|------------------------|-------------|--------------------|------------------|
| 7.214           | 32.3                   | L1          | 20.0                   | -17.7       | 50.0               | AV               |
| 7.066           | 30.1                   | L1          | 20.0                   | -19.9       | 50.0               | AV               |
| 6.922           | 29.3                   | L1          | 20.0                   | -20.7       | 50.0               | AV               |
| 7.438           | 29.0                   | L1          | 20.0                   | -21.0       | 50.0               | AV               |
| 4.690           | 22.5                   | L1          | 20.1                   | -23.5       | 46.0               | AV               |
| 1.514           | 21.0                   | L1          | 20.0                   | -25.0       | 46.0               | AV               |

**NEUTRAL Line (N) Plot**

**NEUTRAL Line (N) Results**

| Frequency (MHz) | Amplitude (dBμV) | Line (L1/N) | Correction Factor (dB) | Margin (dB) | Limit (dBμV) | Detector (QP/AV) |
|-----------------|------------------|-------------|------------------------|-------------|--------------|------------------|
| 7.270           | 44.2             | N           | 20.0                   | -15.8       | 60.0         | QP               |
| 7.358           | 44.1             | N           | 20.0                   | -15.9       | 60.0         | QP               |
| 7.318           | 44.1             | N           | 20.0                   | -15.9       | 60.0         | QP               |
| 7.102           | 42.6             | N           | 20.0                   | -17.4       | 60.0         | QP               |
| 7.178           | 42.5             | N           | 20.0                   | -17.5       | 60.0         | QP               |
| 4.618           | 32.3             | N           | 20.1                   | -23.7       | 56.0         | QP               |

| Frequency (MHz) | Amplitude (dBμV) | Line (L1/N) | Correction Factor (dB) | Margin (dB) | Limit (dBμV) | Detector (QP/AV) |
|-----------------|------------------|-------------|------------------------|-------------|--------------|------------------|
| 7.318           | 36.7             | N           | 20.0                   | -13.3       | 50.0         | AV               |
| 7.270           | 36.6             | N           | 20.0                   | -13.4       | 50.0         | AV               |
| 7.358           | 36.2             | N           | 20.0                   | -13.8       | 50.0         | AV               |
| 7.178           | 35.2             | N           | 20.0                   | -14.8       | 50.0         | AV               |
| 7.102           | 34.8             | N           | 20.0                   | -15.2       | 50.0         | AV               |
| 4.618           | 25.8             | N           | 20.1                   | -20.2       | 46.0         | AV               |

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